Purchasing Maturity of Rijkswaterstaat

Process and organization assessment of the purchasing function
Purchasing Maturity of Rijkswaterstaat
‘The quickest way to know a woman is to go shopping with her’
(Marcelene Cox)
Master Research Thesis

Title: Purchasing maturity of Rijkswaterstaat, process and organization assessment of the purchasing function

Graduated student: The-Phan Dang (c1142771)

Graduation committee: Prof. Hennes de Ridder (TU Delft)

Drs. Jules Verlaan (first supervisor, TU Delft)

Prof. Joop Koppenjan (second supervisor, TU Delft)

Drs. Martijn Leijten (substitute for Prof. Joop Koppenjan)

Ing. Frits Houtman (first supervisor, Rijkswaterstaat)

Published: January 2011
1 Preface

To purchase a product is a decision you make, when you believe that it will save you money when you do not produce it by yourself, and when a third party can deliver you a higher qualitative product. If you strive to become a purchasing organization and take the maximum benefits and advantages out of it, then you ought to execute your purchasing activities with strategic purchasing management. Therefore the principles of professionally purchasing are accurate. Professionalism in this regard is the implementation of a wide scope of activities, processes, competencies, procedures, and organizational behavior in order to achieve cost-effective purchasing.

Purchase has been quiet a new profession field for Rijkswaterstaat (RWS), since it has introduced the ‘corporate purchasing strategy’. As it had prescribed the market in a detailed way ‘what’ to do for decades, it ‘buys’ its infrastructure assets from the market now. More initiatives have been expected from and more tasks have been transferred to market parties due to this change. This has caused some organizational and behavioral transformations within RWS. From infrastructure asset-designing to asset-shopping, an interesting development, of which I thought it was needed to assess this new strategic function of RWS. This need originates from the fact that RWS lacks a tool to measure its purchasing performance. To what level has RWS professionalized its purchasing processes and activities? This question is quiet important since RWS strongly announces to become a professional and leading principal in the road infrastructure section.

Every organization has to grow in its new strategy and policy to eventually become mature in them. Therefore the maturity level regarding purchase, which has to be measured, is very useful information in this transformation process. This information is able to identify what purchasing processes still have to be improved and optimized. After all one of the main objectives of RWS towards the society is: create the maximum ratio between the quality of the asset and the price it pays for. And therefore a proper execution of purchase plays a strategic role in this whole process.

My research has attempted to give an impression and an initial appraisal about the current purchasing activities of RWS with a measuring model. I believe that RWS, if it wants to make purchasing as one its core tasks, still has big steps to make in this regard. Although my conclusions have been put down very sharply an critically, I hope RWS will take these as a very useful reflection for itself, and that its serious concern will be expressed in doing further research. I have started the initiative by giving some important recommendations, which can be worked out more deeply. Hopefully these recommendations or parts of them will be taken into account by the concerned persons. I believe that the potential to grow and to become an actual purchasing organization is still there, but therefore the first step is to adopt the right attitude, behavior and culture within the organization.

Anyways, I would like to use the opportunity of this preface to thank the people who made this research possible. First of all I would like to thank the whole staff of Rijkswaterstaat’s IMG (inkoopmanagement GWW) for adopting me as one of their co-workers and for their useful help and relevant information provision during the period I was there. Of course my biggest gratitude
goes to my RWS supervisor Mr. Frits van Hout. He taught and gave me insight about the procurement of RWS and its operational activities. I will miss the many long discussions we had about the current ‘going-ons’ within Rijkswaterstaat. Secondly, I would like to thank my graduation committee for their fantastic input with respect to the content of the issue. Especially Professor H. De Ridder, with his strong vision about this issue, surely brought my thesis on a much higher academic level. From my committee I would like to thank two persons in particular. Firstly Mr. Joop Koppenjan (second supervisor), who has transferred to another university in the meantime. But from the start he put a lot of efforts and attention on supporting and assisting me to set up an effective and proper research proposal. Secondly is Mr. Jules Verlaan (my first supervisor) who was especially a great supporter in the procedural approach of my research. He enabled me to name all the core principles of the book “Ontwerpen van eenonderzoek” by heart. Also his career past with and knowledge about RWS has made him a very effective sparring partner to be critical in my mind thinking. Further I admire him for his eye for detail for what I wrote down. His punctuality and strong pragmatic view has forced me to think twice before making a statement. Besides the content, Mr. Verlaan was also very concerned about the layout of my report, which I very appreciated.

December 2010

The-Phan Dang
# Executive Summary

## Rijkswaterstaat and its purchasing strategy

Rijkswaterstaat (RWS) wishes to limit itself only to its core competences as infrastructure network manager to meet the public needs. Therefore since 2004 RWS has started to implement the so-called ‘corporate purchasing strategy’. It has carried a corporate change through the organization to establish a purchasing function. ‘Market, unless..’ has been chosen as motto for this strategy. This means that instead of doing the executive tasks (e.g. design, maintenance, engineering) for an infrastructure asset in-house, RWS has decided to purchase all these services from the market. This is under the condition that RWS believes it is socially responsible regarding the risks to outsource a certain task to a market party. And through integrating these tasks with the construction of the asset into one contract (e.g Design&Construction contracts), RWS obtains as this matter of fact a whole product.

Like the strategy describes, RWS has the ambition to act less as an operator and more as a director. From a business perspective, RWS namely believes that this outsource of more tasks and responsibilities to the market will lead to a higher cost-effectiveness of the infrastructure assets and more business advantages. Because firstly, the market is able now to deliver higher qualitative and innovative infrastructure assets. Secondly, due to market competition and more efficient work processes the price of the assets will be lower. And as last, RWS is able to operate more work with less people. However, it requires a different market approach in order to achieve this optimal use of the market.

## Measuring professionally purchasing

RWS aims to operate its activities of its purchasing function as a strategic function, of which the purchasing performance actually contributes to the corporate objectives of RWS. This aimed purchasing performance could only be achieved, if the strategic purchasing management is operated in a professional manner. Therefore RWS has commenced to professionalize its purchasing organization and processes.

For successful strategic purchasing management, it needs an effective support from the purchasing function. The purchasing function is operated by a purchasing organization (consisting of structure, culture and strategy) and purchasing processes (supporting and strategic). The combination of organization and processes could lead to valuable synergy between different purchasing bodies and concerned departments. And this synergy has a direct effect on the purchasing performance. After all the purchasing performance is strongly depended on the policy ‘how’ the ‘corporate purchasing strategy’ and the purchasing function is implemented and integrated into the organization. However, this could only be achieved if the implementation and operation of both the organization and processes are done according to the principles of ‘professionally purchasing’
This research has aimed to find out the current status of the strategic purchasing function within the organization of Rijkswaterstaat. This status is primarily determined by the level of professionalism, in which purchasing processes and activities are operated. Anyways, there is no unambiguous definition for professionally purchasing. It could definitely be considered as a wide scope of purchasing activities, competencies and procedures, which are covered in the purchasing organization and processes. And to measure to what extent RWS executes its purchasing activities ‘professionally’, a purchasing measuring model have been developed, the so-called MSU-RWS model.

The MSU-RWS model has been adapted and customized from its original MSU-model, which is applicable within RWS only. Besides it is a measuring model, it also describes a framework for operating a purchasing function professionally. It assesses six strategic and five supporting purchasing processes. These processes are considered as most important for operating a professional purchasing policy. The processes are assessed qualitatively as well as quantitatively on their professionalism. From the qualitative results each process is appraised quantitatively with a score (from 1 till 10). This score expresses a purchasing maturity level, which concludes the professional level of that particular process. Figure 2.1 shows an overview of all the purchasing processes the MSU-RWS model consists of.
The qualitative results also indirectly give an indication of the purchasing status regarding the organization, which is expressed in a description of the purchasing coherence. This coherence depends on the integration of the structure, culture and strategy in the purchasing organization.

The purchasing maturity level and purchasing coherence together determines to what extent RWS operates as a professional purchasing organization. See figure 2.2, which shows the scope (surface dotted grey line) in which the purchasing function is measured on its professionalism.

2.3 Results from MSU-RWS model

This research has mapped the current status of the purchasing processes within RWS. Based on the quantitative and qualitative results generated from the MSU-RWS model it could be concluded that in the transformation process (from procuring to purchasing organization) RWS has still a long path to go. Reasons are firstly, RWS does not operate its strategic purchasing management professionally. The quantitative scores show that the strategic and supporting purchasing processes perform insufficiently with a very low overall score. With a maximum of 10, the strategic processes score an average of 2.16 and the supporting processes 2.

Secondly, based on the qualitative results, also the purchasing coherence could be appraised as poor. This low coherence has been expressed in a no clear purchasing strategy for the lower levels of the organization, lack of an integrated organizational structure for the purchase, and a weak purchasing culture among the employees.

Further, the model has identified a big gap between the purchasing function and the core activities of RWS. This gap has even caused that purchasing has become a secondary and just a supporting process, while the organization should be built around the purchasing function.

Based on the findings with regard to RWS’ purchasing activities and their linkage with the principles of professionally purchasing a summary of the main conclusion are given here. This has been done from the perspective of each purchasing organization aspect.
**Strategy and policy**
Related to the implementation of the strategy, an unambiguous central market strategy is missing, which ought to be the tactical translation of the corporate purchasing strategy. A market strategy aims to control and steer the market in order make optimal use of it;

**Strategic sourcing**
For each project there is no integrated decision-making and no strategic perspective on the purchase. For achieving a cost-effective purchasing plan more integral cooperation between the different specialized departments (costs, market, risk, contract, technical) is required;

**Supplier management**
With regard to supplier management there are three sub-conclusions:
- RWS knows too little about its potential suppliers and the different market sections it acts in;
- There is limited involvement of market parties in the early development stage of the project for the determination of the initial project needs (scope, specifications, design, contract, planning etc.);
- RWS does not adopt the right cooperative behavior and attitude towards bidders to generate maximal value from the market.

**Organization**
- From the organizational perspective RWS misses on tactical level a distinctive central leadership, which is concerned with the implementation of the ‘corporate purchasing strategy’ to the operational level, and integration of purchasing function.
- Further a segregation between the purchasing function and the project management teams, causes that final purchasing decisions are limitedly made from strategic purchasing considerations.

**Performance management**
A performance management policy and system is missing. The performances of neither purchasing team nor suppliers are structurally measured and analyzed. Consequently, improvement and optimization of purchasing processes cannot take place;

**Human resources management**
The human resources management hardly contributes to developing the strategic purchasing expertise and competencies of its purchasing staff.

### 2.4 Recommendations

To achieve a higher purchasing maturity level and make the purchasing function a strategic function for the organization, recommendations have been given to RWS. These recommendations have been set up to improve the current strategic and supporting purchasing processes and procedures. They could instantly cause an effect such that the purchasing function has a more valuable role in the core activities of RWS, and is able to generate a significant contribution to cost-effectively purchasing and to the business advantages for the organization. For each purchasing organization aspect the most important recommendations are shown in the table 2.1 below.
<table>
<thead>
<tr>
<th>Purchasing organization aspect</th>
<th>Recommendation</th>
</tr>
</thead>
</table>
| **Strategy and policy**       | • Developing central market strategy  
• Gaining understanding of market and its suppliers |
| **Strategic sourcing**        | • Installing better coordination for inter-departmental collaboration  
• Earlier market involvement in project development |
| **Supplier management**       | • Developing supplier management policies with regard to interaction, collaboration, approach, knowledge and information analyses, evaluation and involvement |
| **Organization**              | • Designation of tactical management body to lead purchase centrally  
• Showing pro-active policy in implementing strategy  
• Enhancing collaboration between project management-teams and purchasing organization |
| **Performance management**    | • Installing performance management system and structure  
• Establish improvement programs for internal processes |
| **Human resources management**| • Training and developing purchasing staff the strategic purchasing expertise and competencies.  
• Applying specific RWS-cases for training and workshops |

*Table 2.1  Recommendations for each purchasing organization aspect*
# Table of contents

1 Preface .......................................................................................................................... 4

2 Executive Summary .......................................................................................................... 6

2.1 Rijkswaterstaat and its purchasing strategy .................................................................. 6

2.2 Measuring professionally purchasing .......................................................................... 6

2.3 Results from MSU-RWS model ................................................................................... 8

2.4 Recommendations ....................................................................................................... 9

Table of contents ................................................................................................................ 12

3 Introduction ..................................................................................................................... 16

## PART1: Problem background

4 Research Description ....................................................................................................... 18

4.1 Problem background ................................................................................................. 18

4.2 Problem definition ..................................................................................................... 19

4.3 Research objectives ................................................................................................. 19

4.4 Research questions ................................................................................................... 21

4.4.1 Main research question ....................................................................................... 21

4.4.2 Sub-questions .................................................................................................... 21

4.5 Research Methodology ............................................................................................ 21

## PART2: Literature on purchase

5 Towards professionally purchasing .................................................................................. 24

5.1 Definition of purchasing ........................................................................................... 24

5.2 Government and purchase ....................................................................................... 25

5.3 Organizational perspectives on purchasing function .................................................. 26

5.3.1 Centralization-decentralization .......................................................................... 26

5.3.2 Purchasing department-purchasing function ...................................................... 27

5.3.3 Strategic vs. operational activities ....................................................................... 28

5.3.4 Hierarchical position of purchase ...................................................................... 28

5.4 Purchasing management ........................................................................................... 29

5.4.1 Purchasing strategy ............................................................................................. 30

5.4.2 Purchasing organization ...................................................................................... 30

5.4.3 Supplier management ......................................................................................... 31

5.4.4 Strategic sourcing ............................................................................................... 32

5.4.5 Day-to-day purchasing ....................................................................................... 33
PART3: Model development

7  Rijkswaterstaat and its purchasing strategy ____________________________________________ 50
7.1  Rijkswaterstaat organization ______________________________________________________ 50
7.2  Rijkswaterstaat and Purchase ______________________________________________________ 51
7.3  Purchasing organization __________________________________________________________ 52
  7.3.1  M&I (Markt en Inkoop= Market and Purchase) ......................................................... 53
  7.3.2  IMG (Inkoop Management GWW = Purchasing Management Ground- and Waterworks) ________ 53
  7.3.3  BIO (BedrijfsvoeringinkoopOndersteuning = Corporation Purchasing Support ) ________________ 53
  7.3.4  Purchasing manager/advisor ...................................................................................... 54
  7.3.5  Project management ................................................................................................. 54
7.4  Purchasing strategy ........................................................................................................ 55
  7.4.1  Becoming a leading principal .................................................................................... 55
7.5  Procurement policy framework _______________________________________________________ 58
  7.5.1  Legislation and regulations ........................................................................................ 58
  7.5.2  Purchasing strategy .................................................................................................. 59
8  From MSU to MSU-RWS model

8.1  Starting points

8.1.1  Main goal of the model

8.1.2  Reasons for MSU-model

8.1.3  Scope of model

8.1.4  Development track

8.1.5  Development requirements and framework

8.2  Implementation of input

8.2.1  MSU+ model

8.2.2  RWS Purchasing strategy

8.2.3  RWS purchasing and procurement framework

8.3  Processing of the model

8.3.1  Strategic process 1: Making decision about the purchasing needs

8.3.2  Strategic process 2: Developing of tactical purchasing strategy (market policy)

8.3.3  Strategic process 3: Supplier management

8.3.4  Strategic Process 4: Stimulating market innovation

8.3.5  Strategic process 5: Improvement supplier’s performance and control of contract

8.3.6  Strategic process 6: Strategic cost management

8.3.7  Supporting process 1: Determining the purchasing strategy and policy

8.3.8  Supporting process 2: Arrangement of purchasing organization

8.3.9  Supporting process 3: Development of purchasing procedures

8.3.10 Supporting process 4: Performance indicators for purchasing

8.3.11 Supporting process 5: Human resource management

8.4  Final MSU-R model

PART4: Model application

9  MSU-R Model Application and Analysis of Findings
3 Introduction

Today, faced with the aftermath of the global financial crisis, many firms are going through a consolidation process. This consolidation takes place not only in the areas such as marketing, research and development, and production but also in purchasing (Collins, 2009). More and more firms recognize the potential benefits of pooling (common) material requirements (Van Weele, 1994) and start implementing coordinated corporate purchasing strategies. Big multinationals have announced corporate cost reduction programs, aimed at saving millions through corporate purchasing initiatives.

Also Rijkswaterstaat has to deal with cut downs of its budget for managing of the Dutch road infrastructure network. For years Rijkswaterstaat has aspired ‘to operate more with less people’ through letting the market take over most of its executive tasks. Therefore in 2004 Rijkswaterstaat stated to introduce and implement the ‘corporate purchasing strategy’, which has to contribute strategically in achieving the corporate goals of Rijkswaterstaat. This has meant that Rijkswaterstaat instead of doing or producing in-house, it decided to ‘buy’ products and services from the market. Just like it used to be a procuring entity, Rijkswaterstaat strives to become a purchasing organization now. Rijkswaterstaat wishes to see that this change causes a market force, which stimulates market parties to provide a higher quality (innovation, sustainability, creativity) of the infrastructure assets for the same price or the same quality for a lower price. For achieving this cost-effectiveness in the purchase, a proper purchasing performance is required then. This purchasing performance is strongly depended on the policy ‘how’ the ‘corporate purchasing strategy’ and the purchasing function is implemented and integrated into the organization. Therefore since 2004 Rijkswaterstaat has carried a corporate change through the organization to establish a strategic purchasing function.

This research aims to find out the current status of the strategic purchasing function within the organization of Rijkswaterstaat. Therefore a purchasing measuring model have been developed. This model measures to what extent Rijkswaterstaat executes its purchasing activities ‘professionally’. Because for an effective and efficient performance of the purchase a certain level of professionalism of the purchasing processes and activities have to prevail. The model expresses quantitatively this professionalism in a purchasing maturity level. The model is also able to answer qualitatively the question whether Rijkswaterstaat could be considered as a strategic purchasing organization. Moreover, it identifies the purchasing processes and activities that need to be changed or improved, which is useful for further optimization of the corporate change towards a purchasing organization.

This research thesis is primarily focused on describing the process of developing the purchasing measuring model and the application of it on the purchasing function of Rijkswaterstaat. Therefore its roughly consists of five parts. The first part (chapter 4) gives some more background information on the problem and elaborates the research description and its objectives and questions. The second part (chapter 5 and 6) generates knowledge from the literature about purchase and the purchasing function with a special focus on describing the characteristics and definition of ‘professionally purchasing’. Further the third part (chapter 7 and 8) is primarily focused on developing of the measuring model, which will assess the purchasing processes of Rijkswaterstaat. Important input criteria in this regard are the Rijkswaterstaat...
procurement en purchasing framework, its purchasing strategy, and the main principles of professionally purchasing. Then in the fourth section (chapter 9 and 10) the actual application of the developed model on the (internal) purchasing processes of Rijkswaterstaat will be described. As result, findings will be elaborated and also a reflection on the use of the model will be given. Finally in the last and fifth part (chapter 11) the overall conclusion of the research, with regard to the purchasing function of Rijkswaterstaat, will be drawn up, and recommendations directly addressed to Rijkswaterstaat will be given on ‘how’ it could improve and/or optimize its purchasing processes and activities.
4 Research Description

In this chapter the outline of the research approach will be described. First of all the chapter will start off in sub-chapter 4.1 with giving more information on the background of the problem. Secondly, based on this background the problem will be defined. This problem definition is the description, on which the research will be focused. In section 4.3 the research objectives will be explained. These objectives tell what the research aims to do and which results the research would like to achieve. Fourthly, the research questions will be determined. Whether the right results have been achieved depends on if the questions are answered, therefore research questions are important to keep track during the research process. And in the last section 4.5 the research methodology will be elaborated. It describes which resources have been acquired, and followed by an elaboration in what way (method) the research results have been found and the research questions have been answered.

4.1 Problem background

Rijkswaterstaat (RWS) is changing and since 2001 it has started to strive for fully operating as a principal. This means that RWS wishes to limit itself only to its core competences as infrastructure network manager, and purchases its services (e.g. infrastructure maintenance) and products (mainly infrastructure assets) from the market to meet the public needs. As the Director-General of RWS, Bert Keijts (2009) recently said: ‘We want with less people operate more work in a more professional manner. We should become more of a director than an operator; this means more purchasing and less building’. The adoption of this new attitude and behavior have resulted to a change of the RWS organization to become a purchasing organization, to learning of other new competences, and to a development of purchasing strategies for a different market approach. With all this RWS aims to build, operate and maintain the Dutch infrastructure network with lower costs and to deliver a higher quality of infrastructure assets.

In 2001 RWS started to set up a program outline ‘Professional Opdrachtgeverschap 21ste eeuw’ (P-OG21). This outline was like a guide for a practical and effective approach of the necessary transformations of organizational and procedural processes within RWS. This transformation was primarily focused on the relations between RWS and the market. RWS would like to develop as a professional employer for the market and at the same time it would like to emphasize its priority on protecting and meeting the needs and wishes of the public. RWS have attempted to do this by transferring more risks to the market in the form of outsourcing tasks and responsibilities, like design, build, operate and maintain of infrastructure assets, to eventually achieve a higher return. In this way RWS could have focused more on its core-competence: network management.

Referring to this new policy RWS had changed their objectives regarding procurement and purchasing. To achieve these new goals of procurement a ‘Corporate Purchasing Strategy’ (Corporate Inkoopstrategie, 2004) had been set up, as part of the business plan 2004-2008 (Ondernemingsplan 2004-2008). This strategy aimed to approach the market parties in a more innovative and structured manner, to be able to do more work with less people due to optimal use of the market. Innovative procurement systems and integrated contracts were the key
Purchasing Maturity of Rijkswaterstaat

elements of this purchasing strategy. Since the introduction of the strategy these new procurement systems and contracts have been given the priority. In integrated contracts several phases and/or project responsibilities are put into one contract and only one market party will be committed then to design, construct, and sometimes also operate and maintain, according to the list of functional requirements presented by RWS. Turnkey contracts, Design and Build (DB) and Design, Build and Maintain (DBM) and lately also Public Private Partnership (PPP) in the form of Design, Build, Finance and Maintenance (DBFM), have become the major procurement systems from the RWS’ standard ‘contract buffet’ to achieve its corporate goals.

Based on the changes of the work environment the vision of the business plan of 2004 has been continued in the new four-years business plan of 2008, named ‘Agenda 2012’. From 2004 till 2008 it was primarily about setting the foundation of this new purchasing organization and culture, and this latest agenda describes the directions to anchor the new vision in the day-to-day activities of RWS till 2012. One of the four key objectives of ‘Agenda 2012’ is to become a ‘leading principal’ towards the market. This means that RWS aims to professionalize further its purchasing activities and organization. This will be done through optimizing of contracts, developing strategic market policies, realizing earlier involvement of the market, and integrating the purchase as the primary corporate processes.

4.2 Problem definition

RWS aspire to become a leading principal through professionalizing its purchasing function. However within the organization it is not clear defined what ‘professionally’ purchasing is. There is no clear adopted view how professional purchasing should be executed. Moreover, there is no specified tool that can measure the performance of the purchasing function of the organization. A tool that could measure to what extent the purchasing function meets the principles of professionally purchasing and whether it complies with the objectives of the purchasing strategy. At the moment the primary performance indicators are the performance-results of the construction projects related to time, budget and quality. In general when it meets these requirements then it is concluded that the purchasing and procurement processes have been done successfully. However, these indicators cannot measure the development, management and operation of the purchasing policy, and they cannot identify those aspects that need to be improved for efficient and effective purchasing operations, which have a great influence on the quality and price of the purchasing items. Thus it is essential for becoming that ‘leading principal’ and achieve cost-effectiveness in their purchases to know how RWS purchases its services and products from the market and how these activities could be optimized.

4.3 Research objectives

The scope of this research is focused on the strategic and supporting purchasing activities and processes within RWS; from describing the functional specification to selection of supplier and drawing up of contract. In summary this research aims to compare the purchasing performance with the RWS objectives of the purchasing strategy and the principles of professionally purchasing. The findings will give answers about the effectiveness and implementation level of the strategy, and they will identify the purchasing aspects and processes that need to be improved or developed to become a leading principal. The objectives of this research could be
divided into four sections. Firstly, it will define ‘what’ is understood under professionally purchasing with taken into account the objectives of RWS. Secondly, it will describe ‘how’ RWS is purchasing. Therefore an instrument/model will be developed, which can assess the current purchasing activities. Thirdly, it will analyze and evaluate ‘why’ RWS is purchasing in that particular way. And as last, the RWS purchasing practice will be questioned ‘how can it be done better?’. In figure 4.1 a schematic overview is given.

It is the ambition of RWS to execute its purchasing activities ‘professionally’, but there is no standard for professionally purchasing. Therefore it is important to define and identify firstly the criteria for evaluating professionally purchasing. Further, part of the first step is describing the objectives of RWS’ purchasing strategy.

The second phase of this research is to map the purchasing function of RWS. To find out how the RWS operates its purchasing tasks and responsibilities and to what extent these meet the principles of professionally purchasing, a purchasing measuring model will be developed and applied to measure the purchasing maturity of the organization. The purchasing model will set out the framework of the purchasing function and assess its strategic and supporting processes. The outcome of the model is a quantitative score and qualitative appraisal of each process.

Thirdly, the results of the purchasing model could indicate whether the purchasing practice meets the objectives of the purchasing strategy and to what extent RWS could be considered as a professional purchaser. For the next step it is important to find out why the purchasing activities and processes are performing on that certain level. Clarification is gained through identifying the reasons and causes why purchasing processes are practiced in a certain way, and finding out why certain criteria of professional purchasing and strategy are not met. These explanations could be organizational constraints, bottlenecks and difficulties or just shortcomings of the purchasing policy. From the other side also the strategy could be questionable, because it could be not feasible for implementation due to internal and external factors. However, in this research the RWS purchasing strategy will not be appraised, but the conditions and organizational environment in which the strategy is applied will be evaluated.
As last and fourth, the conclusion and results from the three previous research sections will be used to identify ‘what’ purchasing processes and activities could be improved and ‘how’ this can be realized. From the dimensions of professionally purchasing the research would like to improve and develop processes, activities and strategies that could create price advantages, better quality of contracts, and a reduction of the transactional costs. This must lead to strategic purchase and higher efficiency for achieving of a better purchasing performance that meet the corporate goals.

The purchasing processes that will be analyzed and improved are strategic sourcing (strategic market approach, contract optimization), supplier management (partnering, innovation), day-to-day purchasing (efficiency of processes), organization (decision-making, centralization), and supporting processes (HR, IT-systems, knowledge management).

4.4 Research questions

4.4.1 Main research question

To what extent could Rijkswaterstaat be considered as a professional purchaser that also meets its organizational objectives as a manager of the Dutch road infrastructure network?

4.4.2 Sub-questions

1. What is professionally purchasing and what criteria are used to define this?
2. What are the objectives of the RWS ‘corporate purchasing strategy’?
3. How do the processes and activities of the purchasing function of Rijkswaterstaat operate?
4. What are the reasons and causes that a certain purchasing processes do not meet professionally purchasing and/or do not comply with the purchasing strategy?
5. Which processes, activities and strategies of the purchasing function should be improved and developed and how could this be realized?

4.5 Research Methodology

The literature study will find the definition of professionally purchasing and why its processes are so important for a purchasing organization. The research will determine the criteria, which define professional purchasing and the processes that make purchasing a strategic activity. A critical part of purchasing is the process of procurement. This literature will also get deeper into the elaboration on innovative procurement and integrated contracts and their application in the construction industry and as consequence the change that it has created for the client.

The orientation stage will be primarily focused on the organization of RWS, and in particular on the purchasing and procurement divisions. Firstly, the vision and objectives of the purchasing strategy will be identified, because this strategy is the backbone of the RWS’ purchasing function. Secondly a stakeholders-analysis shall be done to identify the parties, divisions and persons and to determine their relations and their role concerning purchasing (actually mapping of the purchasing organization). This analysis will ease the research process when applying the purchasing model, because known is now to who you can come with what kind of questions.
With the literature study and the orientation, the criteria could be identified for evaluating the professional maturity of purchase and the level of meeting the strategy objectives.

For assessing the purchasing function of RWS the Michigan State University (MSU) purchasing model developed by professor Monckza has been chosen as framework. This model is an integral framework generating eight strategic processes and six supporting processes on the field of purchasing management (See figure 4.2 a+b). The outcome of the model is a quantitative score and a qualitative appraisal to each process. The reasons for selecting this global adopted model is because Monckza has analyzed the most successful purchasing processes and he has identified the suitable work methods, approach, and the critical success factors for strategic purchasing. Moreover this model has also been adopted by NEVI (Dutch association for purchasing management) in their ‘Purchasing Excellence Program’ to support private and public organizations with developing purchasing policies. Also PSI-Bouw (Dutch innovation institute in construction industry) started a purchasing program for the construction industry specifically, of which the MSU-model is also applied as purchasing framework.

![Figure 4.2a: Eight strategic processes of MSU model](image)

![Figure 4.2b: Six supporting processes of MSU model](image)

To make the model able to measure the purchasing performance of RWS, the model firstly will be adapted to make it suitable for the conditions and environment RWS works in. Whereupon information is needed from the RWS’ purchasing practice to put in to the model. This information will be gained from interviews, enquiries, and case studies.
Interviews with the concerned persons will be about specific elements of the purchasing organization, like sourcing strategies, project portfolio, organization structure, procedures etc. The enquiries aim to evaluate the conditions of the purchasing function through appraisal from the operating purchasing employees. Subjects that will be raised are like workability of purchasing policy, clearness of procedures, involvement and communication in process, and improvements wished to be seen. And for the case studies an amount of road infrastructure projects of Rijkswaterstaat will be taken into consideration separately to evaluate their purchasing and procurement processes.

In figure 4.3 you can find the total research map, in which four different areas (blue, red, green and purple) have been pointed out. Blue is the literature study and orientation which aim to define what professionally purchasing is with the purchasing objectives of RWS’ corporate strategy. The results could identify the suitable criteria for evaluation of the purchasing function.

Green attempts to get information concerning purchasing processes and activities from the practice, which is just described above. This information is the input data for the MSU purchasing model.

The red square box is the analytical phase, where green and blue come together. In here the results and data will be analyzed and evaluated with the criteria and adapted MSU model ‘how’ the purchasing activities of RWS operates in the current situation. As last is the purple box, which will generate recommendations, based on the ‘how’ and ‘why’ analyses and evaluations, for optimizing the strategic and supporting purchasing processes and activities.

**Figure 4.3: Research map**
5  Towards professionally purchasing

Rijkswaterstaat aims to become a purchasing organization. But what is a purchasing organization? To answer this question the literature research has been focused on the purchasing function and purchasing management of an organization. First of all sub-chapter 3.1 will give a definition of purchase and an elaboration of the term purchasing function, which will be considered from four different dimensions. Then section 5.2 goes deeper into the purchase done by governmental organizations, because this differs from private companies. It will describe the characteristics, constraints, and organizational objectives. Section 5.3 will outline organizational perspectives on the purchasing function, on which it traditionally has been studied. Four dimensions will be explained, for which each a controversy is reviewed. When the organization is established, the management part will take over. Therefore section 5.4 will point out the purchasing activities and processes, which have to be done and followed for professionally purchasing. The critical purchasing management elements are identified in the purchasing house of Kearney. Section five explains how a corporate advantage could be achieved through purchasing. A critical aspect in here is the purchasing maturity of an organization. The last section 5.6 will go further in measuring the purchasing maturity level of an organization through in the MSU+ purchasing model. This model measures the level of professionalism how an organization operates its purchasing function.

5.1  Definition of purchasing

In many cases purchasing and outsourcing have the same meaning, but different boundaries have been given to both definitions. Outsourcing is clearly defined as subcontracting a process, such as product design or manufacturing, to a third-party company (Overby, 2007). But in the context of the public sector the Dutch Association for Purchase management (NEVI) considers outsourcing only as purchasing if the service or product that has to be bought/outsourced, used to produced or executed in-house, but due to policy-changes transferred to third parties (suppliers).

If we take a closer look to the meaning of purchasing, it does not only consist of the operational task of buying but also the more strategic responsibilities such as market research and quality management. From a business perspective purchasing could be defined as the activity of searching and obtaining goods, services and other resources to comply with the needs of the company and with a view to continuing and enhancing the current competitive position of the company (Van Weele, 2005). In fact it includes all phases of the purchasing process, from before the definition of the specification list of the product which is wished to be purchases, over supplier selection and buying to the follow up and evaluation phase. These purchasing processes have to comply with a prescribed purchase strategy of the organization. In summary purchasing function is not simply buying, but it encumbers more dimensions (Monczka, 2005), see figure 5.1.

The technical dimension deals with arrangements for the purchasing processes, like supplier selection, setting up of contract conditions and product specifications, and contract control. The commercial dimensions is more focused on determining the strategy for efficient purchase
through market research, evaluations, and negotiations with potential suppliers. The third dimension is logistic, which is concerned with arrangements after a certain contract has been enforced, like ordering process and incoming goods control. As last is the administrative dimension, as it implies, is concerned with administrative activities for the purchase, like archive documenting and order control.

Many handbooks have added a normative element to the purchasing function and describe purchasing as follows: being responsible that the right products or services with the right quality on the right time on the right place in the right amount against the right price are acquired to accomplish the goals of the company.

But what is a ‘right’ purchase? According to Gelderman (2007) a ‘right’ purchase could only be achieved if the management policy of purchasing is two-folded. From one side the management of relations (strategic) with the suppliers is an important aspect that must be taken into account, and on the other side is the management of transactions (operational level) that must be done effectively and efficiently. For the purchasing function these two components could not be considered separately from each other.

5.2 Government and purchase

Since this thesis will analyze the implementation of the purchasing policy within Rijkswaterstaat, which is a governmental organization, this section will focus on the characteristics of purchasing in the public sector, because procurement in this sector differs from the private sector in a number of ways. The most notable being that it is more highly regulated and politically constrained than the private sector. The Dutch government has promoted a public procurement policy of fair and open competition as the best way to attain efficient and effective purchasing through various purchasing directives and guidelines. There remains a strong emphasis on formal (and Anglo-Saxon) contracts with adherence to tight terms and conditions of contracts and service delivery being closed monitored (Jones, 2007). Despite these guidance and regulations governments within the European Union seek to promote relationships (e.g. Public Private
Purchasing Maturity of Rijkswaterstaat

Partnerships) with suppliers combining competition with co-operation. For example the United Kingdom government states in its purchasing guideline: the form of competition should be appropriate to the value and complexity of the goods or services to be acquired. For example, the cost to both the purchaser and potential supplier will need to be taken into account in deciding whether a full competitive tender is appropriate (HM treasury, 2003). There has been a shift in emphasis from compulsory competitive tendering to one of creating value through partnerships.

Another feature of public sector purchase is the demand for high levels of accountability. Related to this accountability and openness, public sector organizations have significantly different objectives to private sector organizations possibly resulting in the purchasing approaches adopted differing from that in the private sector. One of the most important differences is the corporate objectives. In this way the public sector other factors than only financial returns are considered to determine the organizational goals. Factors like stimulation of local economy, improvement of environment, quality of life, and providing of accountability and transparency in the processes (Ministerie Verkeer en Waterstaat, 1999). These goals are sometimes even more important than the efficiency and effectiveness of purchasing policy.

In the private sector these goals and factors are unusual, because within a business organization the key objectives are gaining of profit, market share, stock value, return on investment, and enhancing of its market position. That is why these organizations, in contrast with the governmental organizations, are more conscious about the potential purchasing efficiency improvements, which make them more willing to invest in developing their purchasing processes. However the public sector has recognized lately that reducing costs within their organization could be achieved through a better cooperation with market parties (Gelderman, 2005).

5.3 Organizational perspectives on purchasing function

In this section, four main dimensions will be reviewed along which the organization of the purchasing function traditionally have been studied: (1) centralization/decentralization, (2) department vs. function, (3) strategic vs. operational, and (4) hierarchical position within the organization.

5.3.1 Centralization-decentralization

Centralized purchasing structures are characterized by all purchases, being managed by a central purchasing group. In this approach, the operating units are consulted but are not fully responsible for their own buying. Centralized purchasing provides the organization with a single, collective sourcing and buying power. This model captures a large part of the potential corporate purchasing synergies, but there could be little user control and responsiveness to local needs. Historically, the primary advantage of centralized purchasing has been to realize a favorable price due to accumulated volumes. Unfortunately, when organizations pursued centralized purchasing, they not only centralized the purchasing parts with suppliers, but also the actual ordering process.
Decentralization occurs when there are multiple purchasing departments within the organization and all purchases are managed by individual business units. In this approach, each business unit has its own autonomous purchasing function. Cross business unit co-ordination is voluntary, ad-hoc and informal. There is no centralized co-ordination or development of policies other than what might appear through financial or other operating policies of the firm. This organization places all responsibility for purchasing activities at the field locations, and it serves to minimize corporate overhead. A disadvantage of this model is that the local purchasing units lack managerial or operating strength to provide the group the economies, synergies, and buying power that is often found in companies with centralized groups (Faes, Matthyssens, 1998).

The next following factors play a critical role in the decision-making whether to implement a centralized and decentralized purchase management:

- Product relationship (the higher, the rather centralized)
- Geographical distance (the bigger the distances, the sooner decentralized)
- Vulnerability of the purchasing market (the more vulnerable, the rather centralized)
- Cost-savings (the more possibilities, the sooner centralized)
- Purchasing expertise (the more expertise needed, the sooner centralized)
- Scale of supplier (the bigger the scale, the sooner centralized)

Only recently, textbooks increasingly pay attention to structures that are neither central nor decentralized, but something in-between (Van Weele, 2005). The hybrid structure should allow selective opportunities to capture the benefits of centralization and decentralization, while ideally mitigating the disadvantages. Two conflicting sets of pressures are driving the developments towards hybrid structures. Globalization, standardization, and efficiency pressures are pushing towards greater centralization. Customization, differentiation, and responsiveness pressures push towards greater decentralization. In other words both decentralization and increased centralization are simultaneously shaping the future purchasing strategies. Eventually different types of co-ordination might be the resulting mid-range positions.

5.3.2 Purchasing department-purchasing function

It is common to make a distinction between the purchasing function and the purchasing department. The purchasing department and its specialists may co-ordinate the basic processes of ‘specifying, selecting, contracting, ordering, receiving, and evaluating’, but this does not necessarily imply that these activities should be carried out by this department. There are often groups of internal experts involved in different parts of buying processes covering various aspects. For example, top management is usually involved in important make-or-buy decisions, and engineering is probably having contacts with suppliers regarding the design of new products. These activities part of the purchasing function. In other words, purchasing processes cut across the entire organization. Some purchasing activities may even take place without any intervention by the purchasing department at all (Faes, Matthyssens, 1998).

Part of this discussion obviously ties back to the well-known concept of the Decision Making Unit (DMU), but one can argue that the DMU as a cross-functional unit has primarily been studied in relation to actual buying decisions. Increasingly, tactical and strategic processes that are not
directly related to a particular buying decision are carried out by cross-functional teams. Particular examples of these are so-called ‘commodity teams’ that, for example, deal with the selection of preferred suppliers and supplier development and evaluation and new product development (NPD) teams in which buyers participate to discuss potential outsourcing and manage the involvement of suppliers in the development project.

5.3.3 Strategic vs. operational activities

The overall purchasing process can be divided into operational, tactical, and strategic activities. Traditionally, these activities were carried out by one and the same person. For example, a buyer of mechanical parts would be in charge of both setting strategies (number of suppliers, type of contracts) and executing operational tasks (chasing orders, payment). Increasingly, in particular at larger organizations, these different activities are allocated to specific units within the purchasing function. Ordering may be allocated to internal users, tactical decisions may be left to purchasers participating in cross-functional NPD-teams, and strategic decisions are left to senior purchaser/ high level commodity teams. When operational and tactical/strategic tasks are to be performed by the same persons, the often more urgent (which is not the same as important) operational tasks tend to get the most attention (the ‘fireman’ syndrome). On the other hand, however, a very high degree of complexity could make it more difficult to co-ordinate various activities within the purchasing department itself.

The division of these functional activities is obviously tightly related to the aforementioned aspects of centralization and cross-functionalization. One of the main reasons for splitting up strategic, tactical, and operational units within the purchasing department is that the remaining units can more easily coordinate with different other functions (Dubois and Wynstra, 2006).

There are, however, also apparent disadvantages. The main disadvantage is that there is an increased need for communication and coordination within the purchasing department itself. Think of a situation where one supplier is dealt with by three different purchasing representatives, on strategic purchaser responsible for commodity strategy development in the supplier’s product segment, one tactical purchaser that is negotiating with the supplier regarding its participation in a development project, and a factory purchaser that is chasing the deliveries of that particular supplier. Increased task division leads to increased coordination needs, for example to feedback operational performance into the supplier evaluation process.

5.3.4 Hierarchical position of purchase

The final dimension which is commonly discussed in relation to the organization of the purchasing function is its position in the organizational hierarchy. By hierarchical position we refer to the level in the organization at which there is a manager solely responsible for the purchasing department.

Traditionally, purchasing has been part of the production or logistic department, but increasingly we see that purchasing has its own representative at executive board levels, as witnessed by the increasing numbers of ‘Chief Procurement officers’ one can find in large companies nowadays.
Obviously, the hierarchical position of the purchasing department, and in particular how its reporting structure relates to other departments, is closely related to the cross-functional organization of the purchasing function. A purchasing department that has been made subordinated to the production and logistic department is usually put in that position to promote collaboration between these departments.

5.4 Purchasing management

Businesses as well as governmental organizations are going through rapid external environmental and internal organizational changes due to increasing globalization, E-business, and outsourcing. As a result, the future of purchasing, and supply management - as a function of the organization, as a process that spans organizational boundaries, and as a profession - raises important concerns for both the organization and the purchasing professional (Zheng et al., 2004). That is why the purchasing function in most organizations has become subject to changes in its internal as well as external relations in recent years. It has developed itself from a buying function to a strategic function, which truly contributes to the market position of the company. In this regard purchasers are expected to operate in a more professional manner regarding to strategic purchasing. Kearney (1998) has identified eight dimensions in his ‘House of Purchasing and Supply’, which describe the critical elements and processes of purchasing.

This purchasing management framework is the result of extensive research conducted by Kearney. The framework consists of the most critical management and supporting practices for purchasing and procurement, see figure 3.2. It describes the three levels of the purchasing discipline: (1) direction setting processes, which are primary processes concerned with developing of purchasing strategy, (2) core procurement processes are processes, which are the main processes of the purchasing. These are critical for the creation of more economic value for the purchasing policy of the organization, the actual enforcement of the strategy. The main processes on this level are purchasing organization, strategic sourcing, supplier management, and day-to-day purchasing, and as last (3) supporting/enabling processes, which are actually the supporting infrastructure to be able to operate the core procurement processes. From the figure can be read that information management, performance management and human resources management are important base for the functioning of the purchasing organization.
When all these processes are executed in the right way which is focused on strategic and efficient purchase, Kearney defines this as professionally purchasing. Based on the model the critical processes of purchasing management will be elaborated. For the processes ‘supplier management’ and ‘strategic sourcing’ Kraljic purchasing approach has been lifted out to show how strategic purchase could be achieved.

5.4.1 Purchasing strategy

To create a professional environment the purchasing strategy must be an integrated element of the corporate strategy (Freeman and Cavinato, 1990). These purchasing objectives described in the strategy go further than the reduction of costs: attention is also paid how to obtain more-value from suppliers through innovation stimulation and market policy. Suppliers should be involved in the these important business processes, such that they can actively contribute to the corporate results through work on supply chain improvements, product innovation, and market approach.

5.4.2 Purchasing organization

A purchasing organization is essential for anchoring the purchase capabilities and knowledge in the core processes. Therefore purchasing should be considered as an added-value discipline through the whole organization (Dubois, 2006). In many companies the purchasing department it is not treated and considered on the same strategic level as marketing and sales, as result that the purchasing department are not or too lately involved in the decision making concerning purchasing of other departments. Further a purchasing organization consists of multi-disciplined teams, which could response rapidly and flexibly on changes of the supplier market. Considerations for the arrangement purchasing organization have been extensively elaborated in the previous section about organizational perspectives on purchase.
5.4.3 Supplier management

Over the years the role of purchasers have changed, from trying to keep costs low, to ensuring that the company is able to withstand all storms on the market. This also puts more pressure on purchasers to make better decisions (Faber, 2004). Therefore purchasing portfolio models have received considerable attention from the academic and business world recently (Gelderman, 2002; Van Weele, 2003; Wynstra, 2000; Olsen, 1997). It is obvious that not all products and all purchaser-supplier relationships could be considered and managed in the same way. In general, purchasing portfolio models aim at developing distinguished purchasing and supplier strategies for supplier management. Kraljic (1983) introduced the first comprehensive portfolio approach for purchasing and supplier management.

Kraljic’s approach includes the construction of a portfolio matrix that classifies products on the basis of two dimensions: profit impact and supply risk (‘low’ and ‘high’). The result is a 2x2 matrix and a classification in four categories: bottleneck, non-critical, leverage and strategic items, see table 5.1. Each of the four categories requires a distinctive approach towards suppliers.

<table>
<thead>
<tr>
<th>Profit impact</th>
<th>Supply risk</th>
</tr>
</thead>
<tbody>
<tr>
<td>Low</td>
<td>High</td>
</tr>
<tr>
<td>High</td>
<td>Leverage products</td>
</tr>
<tr>
<td></td>
<td>Exploitation of purchasing power</td>
</tr>
<tr>
<td>Low</td>
<td>Non-critical products</td>
</tr>
<tr>
<td></td>
<td>efficient processing</td>
</tr>
</tbody>
</table>

Table 5.1: Kraljic’s product classification (strategic quadrants)

This matrix shows the relative power position of the company in the corresponding to supplier markets. Three general purchasing strategies are distinguished, depending on the balance of power in the purchaser-supplier relationship: exploit (in case of purchaser’s dominance), balance (in case of a balanced relationship), and diversify (in case of supplier’s dominance). In annex A these strategies are used to characterize the four quadrants (products) of the Kraljic purchasing portfolio, which includes the description of the relationship between the purchaser and supplier (power-dependence balance).
Supplier management is also meant for controlling the field of tension between exploiting the purchasing potential and the risk of a supplier-relationship. Suppliers are categorized based on strategic interests and risks. Due to this categorization specific relations could be built up and specific purchasing strategies can be developed as well (Gadde and Snehota, 2000).

Further a right approach could diminish opportunistic behavior from both parties. There is a structured policy to measure and evaluate past performance of suppliers. Development programs are there to provide support for the quality system and helping to access new markets. Besides this the performance of the suppliers are incentivized by the application of bonus-arrangements.

### 5.4.4 Strategic sourcing

Professionally purchasing leads to cost reductions through applying of right purchasing strategies. Besides the traditional strategies (like volume concentration through supplier reductions and price comparisons), strategies are also drawn up to create advantages for both client and supplier, like process development, or relations re-structuring (starting of strategic alliances or outsourcing of purchasing functions). Purchase also plays a critical role with standardizing and simplifying of purchasing activities and procedures: supplier market is analyzed in a structured way and structured methods are applied for market approach and supplier selection. Further there is also active information exchange with other organizations, for example about early supplier involvement and supplier development, which could contribute to a better purchasing position in the market (Axelsson, Rozemeijer and Wynstra, 2005).

If the market approach is taken closer purchasing organizations is also able to steer the purchasing status quo for strategic sourcing. It has been described that based on the Kraljic’s portfolio method purchasing- and supplier-strategies could be developed (supplier management). Although the quadrants give a momentary picture of the actual situation, Gelderman (2004) has given Kraljic’ model a dynamic twist by actually stating that you always have to consider all your options. Are there any improvements possible in a quadrant? What actions should be taken then? These are questions that Gelderman wanted to answer with his dynamic model. Roughly he divided the strategic actions in two types: actions that remains the position in the quadrant or actions that cause a switch to another quadrant. Holding on to a position implicitly means that current circumstances are taken for granted. Gelderman has observed that a position in the matrix can be accepted for different reasons, sometimes positive, sometimes referring to a negative choice. A position might be preferred because a firm is convinced that it is the best position for a certain item. In other cases a position might be accepted, because there are no realistic possibilities for change. When possible and desirable, other positions in the matrix are identified and pursued. This split between ‘holding position’ and ‘moving to another position’ has laid the foundation of the conceptual model of strategic directions in the Kraljic-matrix, as visualized in figure 5.3. Annex B will explain each strategic direction/movement, which are numbered in the figure from 1 till 9.
5.4.5 Day-to-day purchasing

Professional purchasers distinguish themselves from normal purchasers due to emphasizing on the strategic purchasing instead of transactional purchasing activities. They do this through outsourcing the operating activities and innovatively applying of E-procurement solutions (information exchange, ordering, and payment). Processes with suppliers are integrated with the organization, which make IT-communication between client and suppliers and automation of process easier. Further the organization has a clear distinction between strategic and operating purchase.

For the day-to-day purchasing several phases could be distinguished. The process starts with a problem or a need that needs to be solved or met and ends with finishing of the purchasing order. Although there are many variants regarding these purchasing processes, the process model of Van Weele (2005) is most well-known. It is a model that is based on the acquisition of investment goods. This purchasing process distinguishes the next six following main phases (see figure 5.4):

1. **Specifying**: Determination of the needs (requirements the product or service has to meet). The specifications could consist of functional, technical, logistic, qualitative, commercial requirements or a combination of these.
2. **Selection**: Selection of suppliers, which could consist of several stages. First is prequalification and then based on criteria the list of potential suppliers will be shortened to five or six parties. Subsequently from these parties bids are asked for a specific service or product. Finally the bids are compared with each other to choose the best bid.
3. **Contracting**: With the company of the best bid negotiations will be followed on price and conditions of the contract. The contract is the agreement between the
client and supplier and is described as detailed as possible to prevent conflicts and misinterpretations at a later stage. There are many kinds of contracts the organization can choose from, e.g. long term, performance based, one time deliverance etc.

4. Ordering; Place an order will be resulted in a deliverance. It is needed to prevent that purchase departments are buying outside the existing contracts and resources (maverick buying), which leads to inefficient purchasing. Therefore important orders within a big organization should be signed by more than one authority.

5. Control; Control of contracts is determining, actualizing, and making accessible of the contract information. It is essential for purchasing control that this information is saved systematically and easy accessible. Therefore proper contract management, including monitoring of performance indicators, could prevent unnecessary costs and risks.

6. After care; After the order had been placed the organization has to monitor whether the suppliers meets the agreements described in the contract (e.g. quality of product and time of deliverance)

![Figure 5.4: Van Weele’s phases of purchasing process](image-url)

### 5.4.6 Information and knowledge management

This process is about continual acquiring, determining and exchanging of information and knowledge between processes, departments and external relations. Companies are leading on the field of purchase, because they record and exchange ‘best practices’ to learn from each other’s experiences and unambiguous purchasing data are available for all concerned employers, which could be used for analyses and evaluations.

### 5.4.7 Performance management

For the advancement of the professionalizing of purchasing, corporate goals should be clearly linked with purchasing goals, purchasing performance should be based on measurement of the quantitative and qualitative indicators, and the supplier performance measurement should be used for continual realization of improvements (Lardenojie, Van Raaij and Van Weele, 2005)
5.4.8 Human resources management

Within the leading purchasing companies training of purchasing competences are given to employers within the purchase division as well as to employers of non-purchasing function. Also the communication concerning purchasing topics is not limited to the purchasing divisions. Furthermore they stimulate the knowledge of purchase through a ‘job-rotation’ program and attempt to stimulate the performances of the purchasers through applying of bonuses, which are linked to the realization of the personal purchasing goals.

5.5 Corporate advantage through purchase

Purchasing function has developed toward a strategic pro-active function contributing, as much as other business functions, to the creation of corporate (competitive) advantage (Herberling, 1993). However purchasing managers do not talk about corporate advantages through purchasing, they rather talk about cost-reduction programs, leverage initiatives, standardization of specifications, coordination of decentralized purchasing or reduction of suppliers (Van Weele, 2003). This section defines what corporate advantage through purchasing is and from what sources it can be derived. Further it will explain in-depth about organizational approaches, which depend on these sources.

If a corporation creates more synergies in purchasing than any of its competitors, then this leads to corporate advantage (Campbell, 1999). Purchasing synergy is described here as any benefit resulting from any form of cooperation between two or more business units belonging to the same corporation. Such cooperation may result in different benefits to the group, i.e. cost savings, better relationship with suppliers (better quality and delivery from suppliers) and better use of suppliers expertise.

Research on purchase has generally suggested that interaction among four main stakeholders within the company is crucial for reaping the benefits of the initiatives aimed at fostering corporate purchasing synergy. These stakeholders are the top management, corporate purchasing coordination, business unit managers, and the business unit purchasing managers. They all have their specific roles and responsibilities in managing sustainable purchasing synergy.

The degree of this corporate purchasing synergy management associates positively with the corporate coherence and purchasing maturity (Rozenmeijer, Van Weele, 2003), see figure 5.5. It could also be derived from this system that good purchasing synergy management will lead to optimal cooperation across business units and eventually to high purchasing performance.
As can be seen from the figure good purchasing synergy management starts with corporate coherence and purchasing maturity. Corporate coherence is related to the extent to which the different parts of the corporation operate and are managed as one entity. Akbar and Lemming (1996) stressed that for a coordinated ‘purchasing organization’ to be effective an appropriate corporate management style (expressed in strategy, structure, and culture) should be present. When major differences in culture and structure exist across business units (low coherence), the integration of the purchasing function will be a significant challenge. Cases have proved that lack of clear corporate strategy, the lack of an integrated corporate structure, and a weak corporate culture are major roadblocks for successfully implementing a corporate purchasing strategy.

Purchasing maturity is related (among others) to the level of professionalism in the purchasing function as expressed in the status of the function, role and organizational status of the purchasing department, availability of purchasing information systems, quality of people involved in purchasing and level of collaboration with suppliers.

Weggeman (2003) has designed a model for corporate purchasing organizational approaches, which is depending on the relation between purchasing maturity and corporate coherence, see figure 5.6. These approaches will help in effective purchasing synergy management. In cases where both purchasing maturity and corporate coherence are low, decentralized purchasing is most likely to be found. Little homogeneity is expected in specifications and across business units. Purchasing synergy could only realized through exchanging information on supply markets, suppliers, and prices, by using voluntary working groups. In cases where both constructs are high, a center-led structure has a good chance to succeed. In such a structure, cross-functional teams conduct coordination activities with active support of the business units, while strongly managed by a corporate purchasing staff. If both parameters have a medium value, a hybrid structure with both central purchasing and voluntary purchasing coordination activities is most likely to be found. Purchasing consists of a small corporate purchasing staff supporting a number of autonomous decentralized purchasing units in their voluntary efforts to exploit potential synergies.
Figure 5.6: Corporate purchasing organizational approaches (Weggeman, 2003)

5.6 Purchasing maturity measurement

As has been described in the previous section the purchasing maturity and corporate coherence are critical for successful management of the purchasing synergy. But how is this purchasing maturity determined. Measurement of purchasing performance has been a hot topic for decades. Works of e.g. Van Weele, Hendrick and Ruch, and Trent and Monczka have contributed to the development of purchasing performance measurements. Publications have been focused on supplier performance or measurement of buyer performance. However, little have been developed for measuring the total purchasing function, of which the result could be considered as the purchasing maturity (Van Weele, 2005). Purchasing maturity is reflecting the level of professionalism in purchasing. The use of purchasing maturity as an explaining variable was inspired by the work of Perrow (1970). His studies found that when structure and communication characteristics did not reflect the underlying ‘department technology’ (main characteristics of the work processes), departments tended to be less effective.

With this thought Monczka (1992) has developed the MSU purchasing model for measuring the purchasing maturity of an organization. MSU stands for Michigan State University. His research for developing this model was based on an extensive benchmarking study in the United States. The critical element of this research was that the participative companies did not only exchange quantitative data, but also knowledge and information about the purchasing processes. This made it possible for Monczka to analyze the most successful processes, identify the suitable work methods and approach, and the critical success factors. As result he came up with this purchasing model, which is a framework consisting of eight strategic processes and six supportive processes concerning purchasing- and supplier-management.

This purchasing model is primarily meant for private and commercial corporations. In contrary the public sector has always been missing a generic model for the development of the purchasing activities. Therefore the NEVI (NederlandseVerenigingvoorInkoopmanagement = Dutch organization for purchasing management) has developed a purchasing model for
5.6.1 **MSU+ model**

With the support of the MSU+ model the purchasing maturity (in Dutch defined as volwassenheidsniveau) could be determined. This model is in particularly meant for non-profit organizations within the public sector. These are e.g. Ministries, provinces, municipalities, educational and health institutions.

Based on the measurement of purchasing maturity it is possible for organizations to identify the purchasing processes and aspects that need to be improved and in this way they are able to further professionalize their purchasing function. At the same time the model also stimulates the exchange of best practices within and outside the organization. As last the model also contributes to the development of a uniformed language regarding purchasing processes.

The MSU+ model is an integral framework consisting of eight (main) strategic processes (figure 5.7) and six supporting processes (figure 5.8) on the field of purchasing- and supply management. All these processes together give a total view with what is indicated with professionally purchasing. The explanation of the processes and the scoring method are given and described in Annex D. For each process requisites and criteria have been developed and determined for evaluation of the process. The evaluation of the process is done both quantitatively and qualitatively. For the quantitative measurement levels of purchasing maturity have been described (from level 1 to level 10) for each process. Objectives have been determined for each level, which has to be met, to achieve a certain level. When a process is not valid for an organization then that process does not apply for the organization and it scores the level 0.

It must be mentioned that the maturity level is not the same an appraisal grade. The maturity level gives an indication for the organizational conditions for the purchasing function. Moreover it depends on the organizational strategy and policy which level a corporation wishes to meet for a certain process.

*Figure 5.7: Strategic processes MSU model*
5.7 Conclusion Remarks

The title of this chapter says ‘Towards professionally purchasing’. Although ‘professionally’ is an undefined term, this chapter has identified what aspects make an organization or corporation a purchasing organization and hereby make efficient and effective purchase possible. It could be concluded that the purchasing function has to be well arranged in both the organization and management regarding purchasing activities and processes. Firstly, within the organization therefore should be a corporate coherence (expressed in strategy, structure, and culture) and a certain purchasing maturity (purchasing status and role) should prevail. Secondly, the purchasing management has to consists of the critical purchasing processes, as has been identified by Kearney.

Monckza has developed a purchasing model which thoroughly covers Kearney’s purchasing management model and the principles of corporate coherence and purchasing maturity. This MSU purchasing model aims to measure organizations’ level of professionalism in the purchasing function.
6 Innovative Procurement

A very important part of the purchase is deciding in what kind of form to bring a certain product/project on the market and to decide which supplier producing it. These decisions are made during the procurement. This chapter will start to define what procurement and procurement-systems are in the construction industry specifically. Then in section two a description will be given about innovative procurement. Based on this in section three the principles of innovative procurement are identified and after that in section four will be elaborated what changes have been implied for the public client since the implementation of innovative procurement. Innovative procurement will also change the contractual and collaborative conditions between client and supplier and this will be explained in the last section about integrated contracts.

6.1 Procurement and procurement system

6.1.1 Procurement

The selection and contracting of suppliers belong to one of the activities of the purchasing function, as could be read in the previous chapter. These activities could be considered as elements of procurement. As Laudre (2006) has defined:

Procurement of assets is in essence a series of decisions about the delivery system, contract model, and compensation format for the design, build, management and maintenance of a given asset.

And therefore procurement is a critical part of the purchasing function. In most of the cases the procurement decisions are based on the purchasing strategy, which satisfies the client’s development and/or operational needs with respect to the provision of constructed facilities for a discrete life cycle (CIB, 1997). The elements of the strategy that will be examined commences once the client has made the critical decision to build an asset and ends when the most appropriate procuring method for the project has been chosen.

6.1.2 Procurement system

The procurement method will be described as the procurement system throughout this report. It should be noted that the contemporary procurement systems can now embrace not only the design and constructing of projects but also their financing, operating, facilities management, etc., and it is therefore proposed that for the purposes of this thesis the following definition will be used for procurement system:

A procurement system is the organizational structure adopted by the client for implementation, and at times of eventual operation, of a project. (Masterman, 2002)

According to Dissanayaka (1997) a procurement system consists of four main subsystems, see figure 6.1; work packaging, functional composition, contractual arrangement and team selection.
The subsystem ‘functional composition’ helps to define specific authorities, responsibilities and risk distribution, and relationships to people and organizations, therefore it is considered as the most important subsystem within the hierarchy of a procurement system. Once the ‘functional composition’ is properly selected (bundling of activities, integral project approach), the choice and decisions of other subsystems will become apparent. Later in this chapter possible functional compositions (integrated contracts) will be described. The ‘work packaging’ describes the project specifications and list of requirements of the asset to be procured. ‘Contractual arrangements’ determine the conditions of the contract and other related matters. And as last is the ‘team selection’, which is concerned with the procurement procedures (criteria for selection, processes to be followed, etc.).

Figure 6.1 also shows which stakeholders are concerned in the combined subsystems. These stakeholders, which take part in the procurement process and throughout the construction supply chain management, are contractor, design team, client and subcontractors.

6.2 Innovative procurement

Traditionally asset management procurement in the construction industry focuses on buying an output such as a new length of road. However, nowadays the infrastructure agencies, like in Britain and the Netherlands, also purchase a level of service from its suppliers to deliver both asset management (maintenance) and the traffic management (operation) to fulfill its network operator role (Winter, 2006). These developments are the result of innovative procurement in the construction industry, which are characterized by integration of construction process-stages and decreased amount of decision-making regarding contracting, which advances the efficiency of procurement. Innovative procurement also stimulates the market from the perspectives of technology development and relationship building with the client.
There are three different areas, which are covered by innovative procurement. These areas are product, process and organization. Firstly, innovative procurement should not only be innovation in relation to the procurement system, but also to the product (Ministry of Economy, 1999). The product must be new with a good quality in respect to the price. Secondly, innovative procurement should also emphasize on the process, in which suppliers are given room and challenged to come up with innovative ideas and solutions to make processes more effective and efficient. And as third, innovative procurement must provide a building-organization, which makes earlier and more intensive collaboration between client and suppliers possible. How the collaboration is arranged depends on the chosen procurement system. Anyhow, innovative procurement would mean a more integrated commitiment of the suppliers through all the project-phases.

6.3 Principles for innovative procurement

It has been recognized that innovative procurement has changed the procurement procedures and processes (design competition, phasing, negotiating opportunities, selection), awarding criteria (best value for money, complexity, past performance, sustainability), procurement systems (integrated), and the building organization etc.

A succession of several major studies during the 1990’s highlighted the inefficiencies of traditional methods of procuring and managing major projects. In particular the problems encountered by awarding contracts solely on the basis of the lowest price have demonstrated that this does not provide value for money in either the final cost of construction or through life and operational costs. Relations in the past between the contracting industry and government departments were also often typically dominated by conflict and distrust, which contributed to a poor performance, especially in the control of costs.

The British Highway Agency (HA) (comparable to Dutch Rijkswaterstaat) recognized that change needs to be led by clients and that they must demand better value and improved performance from suppliers. This means that clients must demonstrate that they will act as good employers and will procure work in a way that allows best value to be delivered and provides fair rewards for good performances (Winter, 2006). To achieve its objectives the HA (2007) has developed ten principles for innovative procurement to achieve best value deliverance in maintaining the infrastructure network:

1. Early creation of the delivery team
2. An integrated and incentivized supply chain
3. Maintaining a competitive and sustainable supply chain
4. Clear points of responsibility with no unnecessary layers of supervision
5. E-procurement
6. Selection of the suppliers on the basis of best value
7. Fair allocation of risks
8. High quality design
9. Partnership approach based on long-term relationships
10. Performance measurement with continual improvement
Annex C has elaborated each of these principles how they could contribute to the innovation of procurement.

6.4 Change for client

Switching to innovative procurement has been promoted to all Dutch governmental organizations for the last decade. The essence of this new vision of procurement is exploiting the market with integrated contracts to stimulate innovative solutions and this has meant a functional and positional change for the governmental client in relation to the market. Based on the experiences, which have been gained through the years, the governmental organizations have encountered the next following principal changes:

1. Integrated project phases
2. Applying the market
3. Performance based specifications
4. Expertise of client
5. System-oriented contract control
6. Trust to suppliers

6.4.1 Integrated project phases

Innovation is stimulated by the integration of contracts. This means that different responsibilities of the different project phases are brought together in one contract to one party. For example the design and realization of a project is executed by one contractor. The contractor can participate in the design with its construction expertise in a very early stage. In this way innovation could be enhanced and the quality be improved (RegieraadBouw, 2006). In the traditional way influences on the project, which are from the different project partners with their expertise, is limited, because these project partners are involved consecutively into the project. However, a disadvantage of integrated contracts is the difficulty for the client to interfere and introduce changes during the project phases as soon as the contract has been signed.

6.4.2 Applying the market

The Rijkswaterstaat aims to do more work with less people by taking off their hands from their tasks and transfer them to market parties. Optimal application of the knowledge and expertise of the market will be realized then and in this way a bigger momentum will be created for innovation and improved quality from the market. As said before early involvement gives market parties the opportunity to construct or deliver the works in the way they think it is the best (PSIBouw, 2006) However this freedom also brings consequences for the market parties. More and higher risks have to be taken now, because one party has taken responsibility for more than one part of the project (Love and Davis, 2008). The exact risk distribution within innovative procurement depends on the selected procurement system and agreements between client and supplier.
6.4.3 **Performance based specifications**

Performance based specification describes the functional requirements of the product. Technical specifications are not included and this means that contractors are given all the freedom to select and develop their own materials, design and construction; as long as the product performs according to the functional requirements of client. Important consideration between realization-costs and maintenance-costs have to be made then by the contractor. In essence is that the client’s problem is transferred to the contractor now. The contractors are given the assignment to find an effective and efficient solution for a particular problem, based on the performance specifications. In this way technological competition is stimulated among the contractors that fosters innovation and technological development (Waara, 2004). Ang et al. (2006) adds here that it also results in improved satisfaction of client, a better price-quality relation, early control of the budget by the client and realization of higher quality.

6.4.4 **Expertise of client**

Innovative procurement requires new capabilities from the client. Since the client focusing on purchasing products and services from the market, the client has to possess the knowledge about efficient and effective purchasing. He needs the ability to outline clearly the functional requirements of the different project elements, instead of technical, to make the contractor perceiving the project in the same way as the client and prevent miscommunication at the end (Altamirano, 2007). Matters not discussed beforehand could cause trouble during design and realization. Further is the appraisal and comparison of the different tender bids of the contractors important. Not only the criterion of price is critical, but quality and sustainability are of equal importance. Besides this appraisal the optimal distribution of risk is a critical factor to select the most suitable procurement system. The client has to consider which responsibilities and risks it would like to transfer to the market. Complexity of the project and the societal responsibility play a big role in this process.

Along with these capabilities is knowledge an imperative possession of the client (Globerman and Vining, 1999). The client should be aware of the latest technological developments on the market, but it also has to be constantly updated about developments in the market regarding price, knowledge development, capabilities of market parties. In principal all knowledge, which is needed for selecting the best contractor for a certain project, is of importance. In this regard the tools and instruments for knowledge management, capturing of experiences, and retaining of knowledge within the organization are not redundant.

As last is the change of the cliental position. Since more responsibilities are taken by the contractors, the client’s task is mainly monitoring and reviewing the performance of the contractor, this also includes the developments of budget, time and quality of the product. This will be elaborated in next cliental change.
6.4.5 System-oriented contract control

System-oriented contract control is a method to control the contract, in which the client uses the information that is gained from the quality system of the contractor. Through a bunch of audits on the system, process and product, the client determines whether the data from the contractor is reliable, whether it complies with the quality plan, and in this way with the requirements of the contract. In this way the client could control the contract on a distance. The controlling occurs on three elements (Systeemgericht Contract BeheersingRijkswaterstaat, 2006). Firstly on the system, this is the whole functioning of the quality plan of the contractor. This includes the organization and the supporting processes that make part of this system. Secondly, audits of the client are done on the processes, which are mainly focused on the risky work processes (pouring of concrete, transport of prefab bridge elements, rolling of asphalt). These processes are described in the quality plan as well. These audits pay attention to e.g. the required expertise, the specific guidelines, the process objectives, and corrective measures. As third and as last is the product-audit, which verifies whether the data, the contractor has put in the quality system, are right. Also the controlling of the product supports the appraisal of the operation procedures of the contractor regarding quality management. The results of the products are compared with the requirement from the contract and the data registration (measures, calculations, inspections etc.).

6.4.6 Trust to contractors

The last aspect that has been changed as consequent of innovative procurement is the trust from the client to the contractors. Since the client attempts to take off his hands as operator of the project elements and give the contractors all the freedom to design and build according to the functional requirements, it requires some trust in the capabilities of the contractor (Commission Economic Department, 2000). This seems very simple, but in practice the distribution of the tasks and risks tend to be more complicated. Sometimes the high societal risks are involved, which makes transferring of the risks to the contractor not responsible in the view of the governmental agency. Or if the contractor takes too many risks in his integrated contract then the chance is big that the contractor falls back on his traditional and reliable techniques, from which they know sure they can control the risks (cost and time) with their experiences and capabilities (Pries and de Ridder, 2005) In both cases behavior of risk avoidance occurs, which does not create room for innovation. In this regard a longer-term relationship with the contractors is recommended, which is based on cooperation, common objectives and trust.

6.5 Integrated contracts

As has been explained, innovative procurement aims to create more room for involvement from market parties and a momentum for innovation. The base for efficient and effective procurement is the selected procurement system. Since decades the traditional procurement method has not been the standard method anymore to work with, but instead numerous procurement methods and systems have been developed, which are characterized by more collaboration. These are described in integrated contracts. The design of the procurement system is based on either the wished procurement package (bundling of activities) or the aimed building organization. In table 4.2 an overview is given on possible main procurement systems.
The four most applied procurement systems in the Dutch road infrastructure industry are 'bid and build', ‘design team’, ‘design and build’, and ‘build, operate and transfer’. These systems are elaborated in annex E, for which each of them also the advantages and disadvantages are explained. The ‘build, operate and transfer’ system could be considered as a form of Public Private Partnership (PPP), which is considerably chosen for big and complex projects. PPP has gained more interest from governmental organizations and have been applied frequently since a couple of years, because of its proof of costs and time savings and quality enhancement.

<table>
<thead>
<tr>
<th>Procurement Systems</th>
<th>Based on procurement package</th>
<th>Based on building organization</th>
</tr>
</thead>
<tbody>
<tr>
<td>Build</td>
<td>Design Team</td>
<td></td>
</tr>
<tr>
<td>Engineering &amp; Build</td>
<td>Turnkey</td>
<td></td>
</tr>
<tr>
<td>Design &amp; Build</td>
<td>Alliance</td>
<td></td>
</tr>
<tr>
<td>Design, Build and Maintain</td>
<td>Management Contracting</td>
<td></td>
</tr>
<tr>
<td>Design, Build, Finance and</td>
<td>Construction management</td>
<td></td>
</tr>
<tr>
<td>Maintain</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Build, Operate and Transfer</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

*Table 6.1: Procurement systems based on procurement package or building organization*

The conditions of the procurement system are determined in the contract, which describes the distribution of the tasks, risks, responsibilities and authority between the client and supplier. Each particular distribution leads to another form of the contract. Consequently there are many forms of contracts possible. For contracts based on procurement package, it is up the client to decide what elements of the project are most efficient and effective to purchase, under consideration of the risks of the project and responsibility towards the society. In figure 6.2 the procurement systems in relation to the procurement packages can be seen.
From the perspective of the building organization, the criteria which are critical for decision on the most suitable procurement system, are distribution of risks and responsibilities through the life-cycle of the project, and the way how the parties wish to collaborate with each other. Regarding the latter the client has to make the decision to what extent the client wants to be involved in constructing the project. Does it want to limit its own influence and transfer the risks and responsibilities completely to the market or does he prefer to keep tight control and is careful towards the ‘hands-off’ behavior. In figure 6.3 the common collective terms for describing relationships between client and contractor in road infrastructure are identified by Rijkswaterstaat and put into this model. Afoot from traditional to turnkey more tasks, risks and responsibilities are transferred to the market parties and the influence of the client on design- and building processes declines.

Although integrated contracts have positive impacts on the design and building processes of a project, it also brings disadvantages to which the client has to pay sufficient attention for effective and efficient application of integrated contracts, see table 6.2 (from several resources).
### Integrated contracts

<table>
<thead>
<tr>
<th>Advantages</th>
<th>Disadvantages</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Design and build are better fine tuned (overlap of interfaces), because elements of different process-phases do better connect with each other</td>
<td>• Less interference opportunities for client during construction for any adjustments. This means less influence on the final product</td>
</tr>
<tr>
<td>• Better control of time, budget and quality (technical and functional)</td>
<td>• Integrated contracts, with high complexity and tender costs, declines the competition on the market</td>
</tr>
<tr>
<td>• Possibilities to involve exploitation, maintenance and/or financing of the project into the contract (DBFM, DBM, BOT)</td>
<td>• The quality of the contractors tender subscriptions depends directly on the quality of the performance specifications of the client</td>
</tr>
<tr>
<td>• Requires adequate decision-making structure, like approval- procedures, joint-decision making and alteration-making procedures</td>
<td>• Due to low level of monitoring on innovative projects and processes, contractors tend to reduce the quality on a given budget</td>
</tr>
<tr>
<td>• Matters not discussed beforehand could cause trouble during design and realization process</td>
<td></td>
</tr>
</tbody>
</table>

*Table 6.2: Advantages and disadvantages of integrated contracts*

### 6.6 Conclusion Remarks

Procurement is an essential part of purchase for deciding on what kind of form to bring a certain construction project on the market and on selection of the supplier for constructing it. This chapter has been about the innovative procurement and its effect in the construction industry. Innovation have been implemented in the procurement process, the to-be-developed product and contractual organization. The effects are clearly visible in the new collaborative relationship between client and supplier and the new contractual conditions. Due to both the bundling and integration of project activities have created a higher involvement from the market in the project developing process.
7 Rijkswaterstaat and its purchasing strategy

This chapter will pay more attention to Rijkswaterstaat as organization and its role as purchaser. Firstly, the total organization and its structure will be explained. In section 7.2 the purchasing environment of Rijkswaterstaat will be evaluated. This is because the purchasing characteristics and conditions of Rijkswaterstaat differ from normal purchasing organizations. Also in the same section there will be zoomed into purchasing organizational structure of Rijkswaterstaat with its different purchasing departments. Thirdly, the purchasing strategy of Rijkswaterstaat will be explained. Therefore the main purchasing objectives will be described. As last, section 7.4 elaborates the procurement policy framework, in which Rijkswaterstaat has to stay for any purchasing or procurement procedures.

7.1 Rijkswaterstaat organization

Rijkswaterstaat (RWS) is the executive body of the Ministry of Transport and Waterways of the Netherlands. This governmental organization manages and develops under supervision of the Minister of Transport the road and water infrastructure network. As described in their mission statement the primary functions of RWS towards the society are working on dry feet for everyone, supplying sufficient and clean water, guarantee smooth and safe traffic flow on water and road, and providing of reliable and useful traffic information.

This organization is run by more than 9000 employees spread over 160 locations in the Netherlands. RWS is built up by a board of directors, national bodies, regional bodies and project directors. In figure 7.1 an organization chart is given of RWS.
Purchasing Maturity of Rijkswaterstaat

The national bodies (landelijkediensten) consist of five departments, for which each department is specialized in a specific field. The primary task of the national bodies is to support the rest of the organization with technical and scientific knowledge. Since this research is based on the purchase of road infrastructure assets, ‘DienstInfrastructuur’ (DI) will only be considered from the national bodies, because this is the only body, which is concerned with the purchasing management of road infrastructure assets. Within DI the emphasis lies on knowledge development, knowledge protection and the management of the bigger road infrastructure projects. Therefore DI is specialized in building technology, purchasing and project management.

In total there are 10 regional bodies (regionale diensten) spread over the country. These regional bodies implement and enforce the RWS policy. Each regional body is responsible for the maintenance, management and construction of the road and water infrastructure in its area.

As last there are project directors (project directies). These are like the regional bodies and is responsible for the practical execution of the RWS policy. Only for very big and long term projects a project director has been set up. At the moment RWS has only one project direction and that is for the project ‘space for rivers’.

### 7.2 Rijkswaterstaat and Purchase

RWS is active in the road and water infrastructure market segment. Infrastructure projects are procured by RWS to market parties, to which have been decided that they are responsible for designing, engineering, construction and/or maintenance. This procurement has been defined as purchase, since RWS has decided to let the market do all the work and RWS only sets the functional requirements and interfere as little as possible with the project activities just mentioned. However, there are certain characteristics, which make the purchasing conditions of infrastructure assets for RWS a unique environment.

Firstly, RWS is generally considered by the bigger contractors as the largest and an important principal in the road infrastructure market segment. Of course there are some lower governmental bodies, like province and municipalities, and a big amount of private parties, but the annual provided budget that RWS gets to invest is the biggest of all. From the perspective of supply and demand the supply in this market segment is relatively low. The reason is that there is a limited amount of contractors who are able to construct the big and complex infrastructure projects, which are brought on the market by RWS. These projects, also could be considered as products, are characterized by:

- Long life-cycle. In many cases a project lasts more than 30 years;
- High construction and maintenance costs. A high price is paid to develop a project;
- The project affects the society in several ways. For example road infrastructure projects could stimulate economic development of an area or influence the commute behavior of car-drivers.

*(Pries, 2006)*
Secondly, RWS activities and agenda is strongly steered by the financial budget which is provided by the Ministry of Transport. The average of this budget has been around five billion annually to achieve the mission of RWS. Since RWS is appraised by its financial results by politics (parliament and Ministry), the realized costs is a very dominant factor within the organization. That is the reason that for years RWS has done their procurement of infrastructure projects based on the lowest price. A couple of years ago RWS received a stimulus fund from the Ministry to accelerate the execution of maintenance and construction of more than 30 projects spread over several years (Spoedaanpak projects). This policy have been enforced to boost up the activity of the construction industry and the economic situation as a whole, which endure a hard time due to the global financial crisis.

As last and third, in contrast to normal market developments, the construction industry has no equivalent situation for the relation between supply and demand, as consequence that a certain market price for a product is missing. There are several causes why there is no general market price. Contractors could execute the work against cost-price to guarantee their organization’s continuation, or also could occur that the capacity of the market is limited and therefore market parties calculate a huge profit margin into their price. These external conditions influence the fluctuations of the price enormously.

### 7.3 Purchasing organization

The RWS purchasing policy is implemented by the purchasing organization. Through the organization there are three bodies which are concerned with purchase, these are Market and Purchase (M&I= Markt en Inkoop), IMG (Inkoop Management GWW), and BIO (BedrijfsvoeringInkoopOndersteuning). Roughly these bodies are concerned with the purchase on strategic, tactical and operational level respectively. M&I and IMG are centrally organized and the BIO are represented at every regional body and this means that there are 10 BIOs. Figure 7.2 shows the organizational structure of DI with IMG and national BIO (red colored) taking part of it. However, the actual purchasing decisions are made by the project management of a particular project. The different purchasing departments and functions concerned with purchase will be elaborated hereafter.

![Figure 7.2 Organization chart of Dienst infrastructure with IMG and BIO part of it (RWS intranet, 2010)](image-url)
7.3.1 **M&I (Markt en Inkoop= Market and Purchase)**

M&I is the body that functions on the strategic level. Therefore it supports the board of directors in developing the policy and practical implementation of the purchasing strategy, which is principally defined as ‘market unless.’ The strategic ambitions of RWS will be elaborated in the next section, but here are some key aspects M&I is concerned with:

- Becoming a professional principal with the right expertise
- Protecting the interest of the public
- Stimulating the market to come up with innovative products and work methods.

*(Intranet Rijkswaterstaat, 2010)*

7.3.2 **IMG (Inkoop Management GWW = Purchasing Management Ground- and Waterworks)**

IMG contributes to the targeted purchase of the road and water infrastructure-portfolio and related services, like engineering. IMG has as main task to anchor the purchasing strategy within the organization, through developing and implementing strategies, monitoring and evaluation of purchase on operational level, providing the right market information for policy development on strategic and operational level and adapt the purchasing tools on new developments and implement them. The scope of IMG stretches from exploration phase to realization, operation and maintenance of infrastructure assets. The ambitions of IMG could be described as follows:

- Being a constructive and critical reflection board for DI, principals of the regional bodies, and BIOs and M&I with the development and implementation of the purchasing strategy;
- Being a consultative body for relevant market information for board of directors, M&I, and principals of the regional bodies, as support for the market approach;
- Monitoring and evaluating the purchasing costs (analysis procurement results, after calculations);
- Being a bridge between the policy and application of model-contracts and contract control;
- Advising on legislative matters during procurement and other RWS project activities.

*(Intranet Rijkswaterstaat, 2010)*

7.3.3 **BIO (BedrijfsvoeringInkoopOndersteuning = Corporation Purchasing Support )**

This body is primarily responsible for advising and support of the line- and project management regarding the involvement of market parties primarily on operational level. Therefore the next following tasks have been assigned to this body:

- Advising and contributing to project plans;
- Leading of the purchasing process;
- Determining of the market approach strategy;
• Setting up of contract;
• Doing costs estimations and cost-benefits analyses, and contributing to cost management;
• Providing of selection and appraisal documents;
• Managing the procurement;
• Providing of legislative advise with contractual conflicts.

(Intranet Rijkswaterstaat, 2010)

Further the BIOs are also responsible for further professionalizing of the purchasing processes. Examples are: unifying purchasing processes, gaining better understanding of market, contributing to risk assessments, building up of financial knowledge and reducing the transactional costs.

7.3.4 Purchasing manager/advisor

Within the organization of BIO there is a crucial position of the purchasing manager/advisor. This person, as only BIO employee, is represented in the project team and has in this team a total overview of the purchasing process. The purchasing process could mainly be considered as determining of the purchasing need and purchasing plan, deciding on a particular market approach and preparing the contractual matters. In principle the main task of the purchasing advisor is determining ‘what’ and primarily ‘how’ should be purchased under the conditions of the RWS purchasing objectives.

Further the purchasing advisors are the main contact person for the BIO during a particular project. They take the lead of the purchasing team and aim to find the right balance of different perspectives for the eventual purchase. Therefore they arrange the involvement of different experts, with right skills and knowledge, and satisfy the needs of the project and contract manager.

7.3.5 Project management

To make things clear final decisions regarding purchase (project scope, bundling, procurement system etc.) are made by the project management team. The purchasing manager/advisor has only an advising and supporting role in this matter, but do not take part in the project management team. Since a couple of years the project management with RWS has been professionalized and uniformed through implementing the IPM model, which means integrated project management. This is a collaborative model, which aims to focus on involvement and collaboration of different departments and finding the right balance between process management and quality control. Therefore five functions could be found in the model, see figure 7.3. The external oriented positions are the environmental- and contract managers. From one hand the environmental manager is mainly focused on the environment, and in particular the public interest. On the other hand is the contract manager, which is more targeted on the market, hereby applying the purchasing strategy principle ‘Market, unless..’ and is responsible for an efficient and effective purchase. Therefore the contract manager and the purchasing manager/advisor work intensively with each other for developing and executing of the contract with the market parties.
7.4 Purchasing strategy

Based on the business plan 2004-2008 RWS started to implement a completely new working method strategy. Besides RWS started to become public oriented, the essence was to do more work with less people and this meant that a huge part of their task-package and responsibilities had to be sourced out to the market. ‘Market, unless..’ was the chosen motto for purchase of products and services from the market. This was called the ‘Corporate Purchasing Strategy’. Continuing on the basic principles of the business plan from 2004, RWS has introduced the ‘Agenda 2012’, which describes the business plan for 2008-2012. ‘Leading’, ‘public oriented’ and ‘sustainability’ are the key objectives RWS would like to achieve.

The realization of the goals described in ‘Agenda 2012’ is based on four pillars:

1. RWS as public oriented network manager;
2. Becoming a leading principal;
3. Reliable and efficient partner;
4. Employees are critical.

Each pillar is related to a target group, respectively the network users, market parties, public partners and the RWS employees. However these pillars are interdependent, for each pillar a strategy and action program have been developed. Since this research is only interested in the purchasing strategy, the description of the ‘Agenda 2012’ will only be limited to pillar two, ‘becoming a leading principal’, because this pillar is targeted towards the market and is concerned with the corporate purchasing strategy.

7.4.1 Becoming a leading principal

A huge part of the executive (design and construction) work of RWS is done by market parties. For selecting the right party it is important to enforce the purchasing processes properly. During
these purchasing processes being a principal goes beyond the tasks of just procuring of assets and drawing up of contracts. It is related to the whole project development, from exploring the more value of market parties and the process of procurement and contracting to the completion of the contract with the final payment and evaluation. In all these phases RWS aims to deliver the highest quality possible and strive for a continual process of learning and improvement.

Strategic approach and involvement of the market parties offers opportunities to realize the project/product faster, better, and against a better price. In this regard purchase is the connection between the ambitions of the organization and the public-orientation and reliability towards the network users and market. To become a leading principal RWS has focused on three strategic areas:

a) Professionalizing of the organization;
b) Stimulating of market parties;
c) Controlling new work methods and processes.

Each strategic area will be elaborated briefly below here.

a. Professionalizing of the organization

- **Purchase based on programming of several years;** The base for further professionalization is long-term planning, and timely preparation of it. A good planning is important for the organizational strategy of RWS, but also for its public partners and market parties, which can tune their capacity planning and investments based on the RWS planning regarding the maintenance and construction of infrastructure assets.

- **Consistent and recognizable market policy;** Last couple of years has been characterized by the transition to new contracts with bundling and integration of work processes and project activities. As result market parties have been given more space to bring in their own creativity and solutions and RWS is able to do more work with less people now. However, underexposed have been the determination of differences between market sections and in which cases and conditions RWS could choose for a particular market approach. RWS also takes the market opportunities (current and future) into consideration in the outsource of works and services.

In general the market approach is based on demanding of qualitative good services and product in a competitive market. This market demands for sufficient dealflow, such that companies can build up their knowledge and new market parties are given the chance to join to create that sustainable competition. RWS also aims to make the purchase and procurement more efficient, this means lower the transactional costs through shorten the procurement period. Overall through good and clear communication potential suppliers know what to expect from RWS, hereby the scope of the contract and project description determines the interest of these market suppliers. The final goal is to be served well by the market in the long run.

- **Optimizing of contracts;** RWS is responsible for providing good public service through purchasing this service from the market. To achieve the best quality of the public service, it is
important to consider beforehand what and how to purchase. In the past there was a lot of fragmentation due to smaller contracts. However this does not fit within an organization, which wants to do more with less people. That is why RWS has the following philosophy for contract optimization:

- Avoiding contract fragmentation due to integrating and bundling of activities, and through this optimize the life-cycle of an asset;
- Public orientation is critical in the way how activities and processes are bundled and integrated;
- Choosing such a contract scope that sufficient competition remains;
- Advancing uniformity through a buffet of standard contracts.

**b. Stimulation of market**

The involvement of the market is a critical success factor for accomplishing the mission of RWS. The changes that RWS would like to implement are not familiar towards the market parties. In this regard the market parties would like to know whether these structural changes are meant for the longer term or are just impulsive interventions. This requires a lot of attention to the dialogue and communication between the market and RWS. Especially when RWS have high expectations regarding the contribution on innovative projects from market parties, an early orientation on the possibilities from the market, and an optimal dialogue concerning the expectations, risk and opportunities are essential for later success. What RWS desires is a better use of the market parties in the early phases of the project.

**c. Control of new work methods and processes**

The own people of RWS are the crucial factor for the realization of the ambition, that has been described in the ‘Agenda 2012’. The last couple of years have been observed that the culture change regarding the new relation between RWS and market, have found limited roots within the organization. The cause of this lays partly in the fact that new standard contracts and work methods were not developed optimally and its procedures were not described well. Therefore the determined ambitions to meet the goals of this strategic area are described as follows:

- Employees have the right competencies to enforce the RWS policy and have made the new work methods and processes their own;
- Targeted improvement tracks are responsible for implementation of performance contracts, Design and construct contracts, and Public Private Partnerships arrangements, through all levels of the organization;
- Seeking for opportunities to design the learning process together with market parties.

For each strategic area the implementation objectives have been identified, which are related to purchase and potentially could be applied in the purchasing model. The results could be found in table 7.1.
### Table 7.1 Purchasing implementation objectives for each strategic area

<table>
<thead>
<tr>
<th>Professionalizing organization</th>
<th>Stimulation of market</th>
<th>Controlling new work methods and processes</th>
</tr>
</thead>
<tbody>
<tr>
<td>➢ Long term planning</td>
<td>➢ Early involvement market:</td>
<td>➢ Strategic personnel analysis</td>
</tr>
<tr>
<td>◦ Based on MIRT</td>
<td>◦ Knowledge and experience</td>
<td>➢ Integration with other pillars</td>
</tr>
<tr>
<td>◦ Optimal purchasing planning</td>
<td>◦ Market consultation</td>
<td>➢ Further development tools:</td>
</tr>
<tr>
<td>◦ Optimal purchase (bundling and integration)</td>
<td>➢ Innovation objectives</td>
<td>◦ Market consultation/market scan</td>
</tr>
<tr>
<td>➢ Consistent and recognizable market policy:</td>
<td>➢ Communication market:</td>
<td>◦ Cost estimation</td>
</tr>
<tr>
<td>◦ Market section strategy</td>
<td>◦ Dialogue risk distribution and opportunities</td>
<td>◦ EMVI</td>
</tr>
<tr>
<td>◦ Product group targets</td>
<td>◦ Project information provision</td>
<td>◦ System oriented contract control</td>
</tr>
<tr>
<td>◦ Market knowledge</td>
<td>◦ More transparency decision-making</td>
<td>◦ Past performance method</td>
</tr>
<tr>
<td>◦ Optimize procurement processes</td>
<td>➢ Functional specification</td>
<td>➢ Purchasing as primary process</td>
</tr>
<tr>
<td>➢ Contract optimization:</td>
<td>➢ Design remuneration</td>
<td>➢ Learning and education</td>
</tr>
<tr>
<td>◦ Purchasing needs</td>
<td>➢ Joint evaluation</td>
<td>➢ Strategic personnel analysis</td>
</tr>
<tr>
<td>◦ Risk distribution</td>
<td></td>
<td>➢ Integration with other pillars</td>
</tr>
<tr>
<td>◦ Standard contracts</td>
<td></td>
<td>➢ Further development tools:</td>
</tr>
<tr>
<td>◦ Considerations optimal contract</td>
<td></td>
<td>◦ Market consultation/market scan</td>
</tr>
<tr>
<td></td>
<td></td>
<td>◦ Cost estimation</td>
</tr>
<tr>
<td></td>
<td></td>
<td>◦ EMVI</td>
</tr>
<tr>
<td></td>
<td></td>
<td>◦ System oriented contract control</td>
</tr>
<tr>
<td></td>
<td></td>
<td>◦ Past performance method</td>
</tr>
</tbody>
</table>

### 7.5 Procurement policy framework

When has been decided what will be purchased from the market, the procurement procedures will be commenced to select the best contractor for a particular project. These procedures have to take place within a certain framework. This section will set out the framework, which is determined by a set of criteria: (1) legislation and regulations, (2) RWS purchasing strategy, (3) procurement starting points, and (4) RWS standard procurement procedures.

#### 7.5.1 Legislation and regulations

Since RWS is a governmental organization, it has to work according to certain legislation and regulations. Also for purchase and procurement RWS has to stay within a particular legislative framework. This framework has been described in the EU-directives for governmental procurement of works, services and deliverances, which have been implemented into the Dutch legislation through the BAO (BesluitAanbesteding van Overheidswerken= Decision for governmental procurements). EU-directives are only applicable if the price of the work, service
or deliverance is above a certain limit. For the cases below this limit the ARW 2005 (Aanbestedingregelswerken= procurement regulations works) is accounted. However for construction and maintenance of most of the infrastructure works of RWS the EU-directives are the guidelines for procurement.

7.5.2 Purchasing strategy

The procurement policy procedures occurs on operational and project level and determines for example the contract scope, procurement system and planning, selection criteria and the applied procurement tools. The development of the procurement policy procedures has to be done within the framework of the corporate purchasing strategy, which is subsequently a direct derivative of the Business Plan 2008-2012. The corporate purchasing strategy is focused on efficiently purchasing of infrastructure assets with an optimal price/quality ratio and optimal use of the market. In this way the procurement procedures facilitates the purchasing strategy. Below here some important purchasing objectives, which are related to procurement, which have been deduced from the purchasing vision document of IMG:

- **MKB (Middel-Klein bedrijf= middle small companies);** Enhancing the chances of participation for MKB through for example lighten the requirements for MKB;
- **Sustainable purchase;** There are different appearances for sustainably purchasing. These could be related to design requirements, life cycle costs, use of sustainable materials, environmental friendliness or energy saving;
- **Market policy;** procurement policy have been adapted to the new relation with the market (dialogue, more space for design, consultation, information sessions);
- **EMVI (Economisch Meest Voordelige Inschrijving= most economic advantage tender);** Improvement of the manual to apply EMVI and simplify the criteria and uniform their definitions;
- **Purchase dossier;** This dossier leads its users to the right model contracts and procurement documents to advance the uniformity of procurement and contracts;
- **Past performance;** Documentation en evaluation of past-performance of contractors based on performance indicators, of which the overall results will be used for selection and tendering.

7.5.3 Starting points of procurement policy

The market, in which RWS operates is not static, and therefore the procurement policy of RWS should be flexible and able to adapt to the current market circumstances. There are three starting points on which the procurement policy is based.

1. **RWS is a competitive-procurer**
   The field RWS works in is wide and RWS is just one of the many principals. That means that a sufficient amount of projects is offered to the market parties, which make them selective in bringing out bids on projects. RWS should adapt to this situation. For example: if RWS sets too high requirements, it could lead to a limited amount of subscribers. A competitive procurer knows its market and optimal communication with market parties is of importance.
2. **Market is in principle self-controlled**
   This starting point indicates that RWS should limit the market as little as possible with conditions or requirements. This complies with the strategy ‘market, unless,’. Market parties are able to decide by themselves to participate with a certain procurement or not, to execute a certain project individually or in a joint venture, or whether they apply sub-contractors.

3. **RWS strives to achieve:**
   a) *Sustainable and effective competition*
      This means that new companies have easy access to a certain market section and poorly-performed parties make space for well performed ones. It is an advantage for RWS if new companies have the opportunity to grow (from MKB to big construction entities) and which can acquire bigger projects in the long run;
   b) **Efficient procurement process**
      RWS should be more conscientious regarding the made costs during procurement. Well considered cost management during procurement process have to be applied to achieve efficiency. Efficiency could only primarily be achieved through reduction of transactional costs for the procurer as well as the subscriber.
   c) **Optimal price/quality ratio**
      RWS strives to create a procurement condition that market parties are given the opportunity to distinguish themselves not only the price, but also on the quality.

Between these starting points occurs a certain tension, and therefore the procurement procedure policy should seek the optimal balance between these. For example: new participants advance the sustainable competition, but the efficiency of the procurement does not benefit from too many subscribers.

### 7.5.4 Purchasing process

In the figure 7.4 the total purchasing process of RWS is given together with the decisions that has to be made by the principal. The steps and procedures described in here should be followed through the whole organization. The process consists of four main sub-processes:

1. **Project preparation;** This process is primarily concerned with determination of the purchasing needs, drawing up of the purchasing plan and the contractual documents. Also the cost estimations and project control plan are drawn up here for project preparations.
2. **Project assignation;** this process is about selecting and tendering of the market party, which will be responsible of the project. The process takes place within the procurement policy procedures.
3. **Project control;** is controlling the quality of the project through the contract conditions. Also the delivered performance of the concerned parties is measured, to approve the realized results or change the conditions of the contracts.
4. **Project finalizing;** this process is mainly concerned with the evaluation of the project, from the perspective of the process and product.
Figure 7.4 Purchasing processes and decision-making of Rijkswaterstaat
8 From MSU to MSU-RWS model

For this chapter the developing of the MSU-RWS model is the central subject. This model aims to measure the purchasing maturity of Rijkswaterstaat as road infrastructure principal. The development of the model is primarily based on the information, which is described in the previous chapters, about purchasing and the organization of Rijkswaterstaat (RWS). The chapter commences with the starting points. This means the initial requirements and framework, in which the model has to be developed. Then section 8.2 the inputs of the model will be discussed. These are the original MSU model, RWS purchasing strategy, and the RWS purchasing and procurement framework. Subsequently the model will be processed due to going through the Deming Circle in paragraph 8.3. In the last and fourth section the final result of the model will be elaborated.

8.1 Starting points

8.1.1 Main goal of the model

As described in the introduction the goal of the model is to measure the purchasing maturity of Rijkswaterstaat as road infrastructure principal. Therefore the model will assess the purchasing processes and activities of RWS. The result of this assessment does not appraise the performance of RWS on the field of purchase, but rather indicates the status quo of RWS’s implementation of the purchasing policy and its purchasing activities. In essence it measures quantitatively and qualitatively to what extent RWS does professionally purchasing, which is called the purchasing maturity in the model. Enclosing to this the model also aims to identify the thresholds, which barrier an efficient and effective purchasing execution.

8.1.2 Reasons for MSU-model

To assess whether RWS is an actual purchasing organization and to evaluate whether its purchasing activities and processes comply with the RWS purchasing strategy, a new model has been developed, based on the principles of MSU purchasing model. The reasons why the MSU model have been used as base are:

- A Dutch variant of the original MSU model is the MSU+, which has been developed by NEVI (see chapter 3.6) for non-profit organizations from the Dutch public sector specifically. This has been applied for measuring the maturity of the purchasing function (role, position, conditions and execution). Since RWS works on behalf of the Ministry of Transport the MSU+ will comply in general sense with the conditions and circumstances in which RWS is operating;
- It makes benchmarking possible; the quantitative results and performances could be compared among the different operational bodies. Analyses could be done based on the differences of the processes and performances through understanding why these processes are applied in a certain way. Subsequently these processes could be improved through learning from each other (share of best practices and qualitative results);
- The model assesses, and could manage and improve the purchasing processes, which cover a wide range of strategic, operational and supporting purchasing activities, including the
critical purchasing aspects, identified by Kearney: supplier management, cost management, strategic sourcing, purchasing organization, performance management and supplier involvement in production;

- The model emphasizes on improving the decision making (strategy and purchasing needs) through formal procedures and involvement of cross-functional teams. Hereby evaluation is a critical activity;
- The model gives an understanding of the organizational coherence (strategy, structure and culture) regarding the purchasing function of a corporation. The purchasing function is not only operational purchase, but the total organization has to be taken into account (strategic, tactical and operational levels), and this model does that.

This model has to be developed in such a way that RWS is able to apply it accurately and that is the reason why this new model is called MSU-RWS. As abbreviation MSU-R will be applied, for which the ‘R’ is referred to Rijkswaterstaat. The input of the model is based on the principles, information and characteristics described about the MSU model, the RWS purchasing strategy, and its purchasing and procurement framework in the previous chapters.

### 8.1.3 Scope of model

The scope in which this model will be applied could be considered from the procedural as well as the organizational perspective. First of all the processes of asset acquiring for an organization will be explained. Roughly four process stages could be identified in the purchasing processes, and these are:

1. Determination of the wishes for the asset
2. Purchase of asset
3. Delivering of asset
4. Usage of asset

The first process is concerned with describing of the product specifications (acquired asset). This could be in the form of list of requirements and/or functional and technical specifications that complies with the wishes of the client. Then the second process is the actual purchase of asset on the market. Relating purchasing activities have to be done then, like market research and supplier selection, to come to an optimal purchasing decision. As third is the deliverance of the asset. In the road infrastructure industry the asset usually has to be constructed by a contractor. And as last is the usage of the asset. For the case of RWS this process covers the operational and maintenance phases of a piece of road or any other infrastructure asset. In figure 8.1 a schematic drawing is given of the processes plus the scope in which this model will be developed. As can be seen the model will cover the ‘purchase’ phase wholly and partly the phases of ‘wish determination’ and ‘deliverance’ of asset.
Secondly, from the organizational perspective the model will look at the internal purchasing organization. If the functional separation (strategic, tactic and operating) of an organization is taken into consideration, the focus of the model will be set on the tactical management. It has been described that the corporate purchasing strategy of RWS is given. This strategy has been developed on strategic level. The aim of this model is to see and to measure how this strategy has been translated and implemented to the lower organizational levels. Critical in this regard is the purchasing management on tactical level and therefore the scope ranges from partly strategic, through the whole tactical department, to partly the operational level, see figure 6.2.

8.1.4 Development track

Figure 8.3 gives a simplified scheme of the development track of the model. After had done the literature research about purchase the basic model MSU+ will be adapted to the conditions and circumstances of RWS. These adaptations depend on the strategy and framework in which RWS execute its purchasing and procurement policy. This will result in changing of purchasing processes, identification of criteria for evaluation and re-description of the purchasing maturity levels.
8.1.5 Development requirements and framework

For the developing of the MSU-R model the next initial requirements have been set up, which the model has to meet:

- The model has to comply with the corporate purchasing strategy of RWS, which have been introduced in the business plan of 2004-2008. In the business plan of 2008-2012 describes to continue and enhance the current strategy. Hereby the ‘vision document’, deduced from the business plan is essential for including the RWS purchasing focal objectives;
- It is compatible for purchase and procurement of road infrastructure assets or maintenance, enforced by RWS;
- It should be generic, and that means that the model could be applied separately with the several regional bodies in combination with the corporate management level, and that it could be applied for different years, such that benchmarking is possible;
- The principles of the professionally purchasing forms the base of the model (as described by Kearney’s critical aspects of purchase, and Monckza’s strategic and supporting purchasing processes)

Besides these model-system requirements, the to-be identified and described purchasing processes, criteria and maturity levels will also be developed within a certain framework, which is described as follows:

- The model should assess whether the current purchasing activities and policies comply with the purchasing strategy of RWS;
- It should be adapted to the conditions and circumstances of the road infrastructure industry and the regulations and legislation of public procurement;
- It does not have to appraise the quality and the efficiency of the to-be-followed corporate policy;
• It does not concern the development process and substantiating of the being followed corporate purchasing strategy.

In this research there is this focus on the procurement and purchase of road infrastructure assets. This means that most of the time RWS is the client of (specialized) contractors and engineering firms, which design, construct and maintain the RWS infrastructure assets. These contractors and engineering firms will be named suppliers or market parties in this report, because they provide a certain service to RWS from the market. This term has been adopted from the original MSU model.

8.2 Implementation of input

In this section the three input elements for the to-be-developed model will be discussed. These three input elements are:

1. MSU model
2. RWS purchasing strategy
3. RWS purchasing and procurement framework

8.2.1 MSU+ model

The MSU+ model is a framework of purchasing processes, eight strategic and six supporting (see chapter 3.6.1). With the described purchasing maturity levels it could assess an organization to what extent it enforces professionally purchasing. However the model cannot be applied to RWS, because it is focused on organizations with other characteristics than RWS. For example for the purchase of a product, RWS has to conclude a contractual agreement with a contractor, who is responsible for construction of the product. Another characteristic of the organizations, on which the MSU+ model is primarily focused, is that they are production/supply chain organizations with large scale purchase of same materials and/or products. While RWS is concerned with building of once only, unique, complex and financially huge products. That is the reason the purchasing organization, processes, activities and objectives of RWS differ from the organizations, for which the MSU+ model is actually meant. Therefore this model has to be adapted on its processes, criteria and the description of the maturity levels.

8.2.1.1 Processes

The processes of the initial model will be scrapped, merged and changed.

a) Scrap of processes

- Strategic process 6: integrate suppliers into order fulfillment process

For the strategic processes, process 6 has been scrapped. This is because RWS does not have long-term relationships with its suppliers. According to EU-regulations they are not allowed to. Suppliers are only approached with procurement procedures on project base. Further RWS is not a supply chain organization, therefore it does not have a production chain, which have to be adapted to the input of suppliers. However, involvement of suppliers into the development process of a RWS project have been emphasized in the other processes.
Supporting process 5: develop and implement enabling E-systems

This process is about the integration of IT-system in the purchasing processes. RWS is not a supply chain organization, which is focused on strategic purchase based on standardization and centralization. This is because RWS is not concerned with products of the same kind and further it has no long-term relationship with suppliers, which are involved in product development. Therefore E-systems do not apply to the characteristics of an organization like RWS.

b) Merge of processes

Supporting process 3: establish and leverage a world-class supply base
Supporting process 4: establish appropriate strategic alliances

The strategic processes 3 and 4 have been merged into one process, for which the title have been changed into ‘supplier management’. These two processes are reluctant, since RWS is not in the position to build up long-term strategic relationships or alliances with its suppliers. However, information and data about suppliers is still relevant for purchase and strategic approaches have to be developed on the supplier’s market circumstances. In this regard a supplier base is critical to archive all the information and data. That is the reason for merging these two strategic processes.

c) Change of processes

For all the processes the name have been changed and/or slightly other characteristics have been given to them. All the processes will be discussed below here:

Strategic process = SP

- SP1: Insourcing/outsourcing, have been changed into ‘making decision about the purchasing need’. Purchasing needs cover a lot more aspects how to bring a certain project on the market, which means how to buy from the market. More decisions have to be taken in this regard and therefore deciding on insourcing/outsourcing is to limited.
- SP2: Develop commodity/purchase family strategies, has changed in the name ‘developing of purchasing strategy’. This strategy is primarily focused on the purchasing strategy on tactical level. Market policy in this regard is a vital aspect, in which also market section- and product group- strategies play a big role. These are other names for commodity and purchase family strategies.
- SP3: Supplier management, see section ‘merge of processes’
- SP4: Integrate suppliers into new product/process/service development process, has become ‘stimulation of innovation’.
- SP5: Supplier development and quality, has been named ‘improvement of supplier’s performance and control of contract’
- SP6: Manage costs strategically across the supply chain, has been altered to ‘strategic cost management’. This is because RWS does not really have a supply chain for its product development.
In figure 8.4 the total overview of the adapted strategic processes is given.

**Figure 8.4 MSU-R strategic processes**

**Supporting process= XO**

- XO1: Establish integrated and aligned procurement and supply chain strategies and plans, this name has been changed into ‘determining purchasing strategy and plan’.
- XO2: Develop organization and teaming strategies; This process has been named ‘arrangement of the purchasing organization’ now.
- XO3: Development of purchasing procedures, remains the same.
- XO4: Develop procurement and supply chain measurements, have been changed into ‘performance indicators for purchasing’. In this regard purchasing is an overall definition, which also covers procurement processes.
- XO5: Establish human resource development/training/retention, has simply become ‘human resources management’.

Figure 8.5 shows the total overview of the adapted supporting processes.
8.2.1.2 Criteria

The MSU+ model misses criteria on which the processes are evaluated. The to-be developed model will identify the concerned criteria for each process, which are deduced from the strategic and supporting process descriptions. The identified criteria will be elaborated in the section 6.4, ‘processing the model’.

8.2.1.3 Purchasing maturity levels

The purchasing maturity level descriptions, which could not be applied on the situation of RWS, are removed from the model. However, it has been attempted to remove as little as possible through re-writing as much as possible. In this way there is a possibility to benchmark with other organizations as well, which also apply the MSU+ model.

8.2.2 RWS Purchasing strategy

The second input is the RWS purchasing strategy. One of the main goals of the MSU-R model is to assess whether the purchasing activities of RWS comply with its corporate purchasing strategy. Therefore the objectives of the RWS purchasing strategy should be included in the model. The objectives have already been described in the previous chapter. It has been described before that the Business Plan ‘Agenda 2012’ consists of four pillars. One of those pillars is to become a ‘Leading Principal’, which is concerned with the purchasing strategy. Deduced from the ‘vision document’ this pillar is focused on three strategic areas: (1) professionalizing of organization, (2) stimulating of market parties and (3) controlling the new work methods and processes. And for each area its main strategic objectives have been derived (see section 7.4.1).

Two scenarios could occur regarding these strategic objectives. Firstly, the objective is already part of the MSU+ model. In this case the objective only has to be re-written, in such a way that it is RWS-specific. Secondly, the objective is not part of the MSU+ model, then the objective has to be explicitly added to the criteria of the model and included into the performance level.
description. Further the consideration of aspects, which are neither mentioned in the strategy, nor in the MSU+ model, goes beyond the scope of this research.

The objectives are sub-divided into the purchasing processes, which have been identified for the MSU-R model, see table 8.1. This scheme shows the allocation of the objectives to its concerned process. Certain objectives belong to more than one process due to their overlapping characteristics. Not all the supporting processes are mentioned here, because some particular processes are not influenced by the purchasing strategy.

<table>
<thead>
<tr>
<th>SP1: Purchasing needs</th>
<th>SP2: Purchasing strategy/Market policy</th>
<th>SP3: supplier management</th>
<th>SP4: Innovation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Purchasing needs</td>
<td>Market section strategy</td>
<td>Past performance-method</td>
<td>Innovation objectives</td>
</tr>
<tr>
<td>(optimal purchase and contract)</td>
<td>Product group target</td>
<td>Joint evaluation</td>
<td>Dialogue and information with and to market</td>
</tr>
<tr>
<td>Standard contracts</td>
<td>Market knowledge</td>
<td></td>
<td>Market consultation</td>
</tr>
<tr>
<td>Risk distribution</td>
<td>Early market involvement</td>
<td></td>
<td>Functional specification</td>
</tr>
<tr>
<td>Early involvement</td>
<td>Planning based on MIRT</td>
<td></td>
<td>Design remuneration</td>
</tr>
<tr>
<td>market</td>
<td>Optimal purchasing planning</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Market consultation</td>
<td>Optimize procurement processes</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Market scan</td>
<td>Procurement procedure policy</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>SP5: Quality and contract control</th>
<th>SP6: Cost management</th>
<th>X02: Purchasing organization</th>
<th>X06: Human Resource Management</th>
</tr>
</thead>
<tbody>
<tr>
<td>System oriented contract control (SCB)</td>
<td>Cost estimation</td>
<td>Purchase as primary process</td>
<td>Personnel analysis development</td>
</tr>
<tr>
<td>EMVI</td>
<td></td>
<td>Integration with other pillars</td>
<td>Learning and education</td>
</tr>
<tr>
<td>Supply chain management</td>
<td></td>
<td>External transparency of decision making</td>
<td></td>
</tr>
<tr>
<td>Joint evaluation</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Table 8.1  RWS purchasing objectives subdivided into the purchasing processes

8.2.3  RWS purchasing and procurement framework

The third input is the RWS purchasing and procurement framework. This have been described extensively in the previous chapter. The purchasing procedures and procurement processes have been influenced by the kind of project and industry RWS is concerned with. Moreover RWS is a public organization, which has to work according to EU regulation and legislation and is steered and limited by political decisions with the Ministry of Transport as their only principal. This framework is not mentioned explicitly in the model, but will be taken into account through all the processes. It supports the purchasing maturity level-descriptions to make the conditions more RWS-specific.
8.3 Processing of the model

In this section the model will be explained through describing the processes of the model separately. It has been chosen to go through the Deming Circle for the description of each process. The reason for using the Deming Circle is because in this way a good overview could be given which activities have to be done, and subsequently ease the process of describing the maturity levels in the next developing stage. The purchasing activities and processes, which has to be prepared, enforced and evaluated, will be identified and described according to the purchasing strategy and principles of professionally purchasing.

The first phase of the circle is ‘PLAN’. In this phase the choices and activities are identified, which are needed for the particular purchasing process. These will be described and prepared. Subsequently is the actual enforcement of these activities, so what has to be done to achieve the goal. This is called the ‘DO’-phase of the Deming Circle. After that, the evaluation phase takes place of the enforced activities. In this phase there are checks whether the activities have met the in advanced determined objectives, therefore it is called the ‘CHECK’-phase. The results of the evaluation and the learning points derived from it are used for next projects and to optimize current purchasing processes. The implementation of improvements and/or learning points is considered to be part of the ‘ACT’-phase. For processing of the MSU-R model this last phase will not be taken into account, since this phase concerns activities for the future. Going through all these phases due to continual application of the Deming Circle will lead to strategy improvement, and process- and activity- optimization for the organization. Therefore the set up of the Deming Circle forms a strong base for implementing the purchasing processes into the organization of RWS.

For each process the goal will be described first, and then the process will go through the ‘PLAN’-, ‘DO’-, and ‘CHECK’-phases of the Deming Circle. As last the identified criteria for that process will be defined. The six strategic processes will be elaborated first and subsequently the five supporting processes.

8.3.1 Strategic process 1: Making decision about the purchasing needs

**Goal**
This process is about making a strategic decision regarding ‘what’ and ‘how’ to purchase and this is defined as the purchasing need. Primarily this process happens on operational (project) level. The purchasing needs could be achieved due to the right procurement system, contract scope, bundling of activities or purchasing planning. Efficiency is hereby a keyword for efficient purchasing. By going through the Deming Circle the different aspects will be subdivided into the circle’s main steps ‘PLAN’, ‘DO’ and ‘CHECK’.

**Plan**
Determining the purchasing needs is a cross functional and strategic decision making process. Therefore as first it is critical for a successful purchasing policy that multi-disciplined teams are involved in the decision making process. This means besides project management, also the purchasing advisors and other specialized departments (e.g. risk, financial and technical) should be part of the team. Hereby the team have to take into consideration their own intern-
organizational capacity, competencies, and the procurement efficiency (optimal transactional costs).

Secondly, strategic decision making is based on research and analyses. These research and analyses have to give more information about the current circumstances and conditions (market, financial) and short- and long-term risks of the project. Extensive risk and cost-benefit analyses are essential in this regard, to decide on the procurement system or the scope of the project to bring on the market. Parallel to these analyses the project team should gain knowledge from the market to come to an effective and efficient purchasing need. Market research have to be done to identify the quality, and capacity of the available market parties (contractors, engineers) and identifying potential service providers. Also direct communication to these parties is of importance. Therefore consultation with potential market parties is a desirable process to share ideas about the project scope, consult about forms of collaborations, and identify the capacity and wishes from the market.

Do
There should be a systematic approach in regard to the decision making of the purchasing need. This means that a formal process has been written out, which describes for each purchasing step which activities have to be undertaken. Each project has a clear assignation which person or department has the orders to organize the purchasing project team, which will provide the project management with advice and relevant information from the market and concerning the project. In the most desirable situation the person, who makes the final decision in what form the project is brought on the market, has to make a considerable decision based on the advice and information this purchasing team gives.

Also standard contracts of different procurement systems, which cover all relevant subjects of contract, make the decision-making process easier. These contracts have clearly defined the task and responsibility distribution between RWS and the market party.

Check
As last is the evaluation of the decision-making process and results, which have to be done frequently to improve the process. The evaluation is based on the corporate purchasing goals and strategy. Therefore quantitative as well as qualitative indicators has to be determined for assessment of the decision-making process. The results of evaluation are used for other projects and are well documented, which include the analyses of the actions and improvement measurements.

Criteria

<table>
<thead>
<tr>
<th>Nr.</th>
<th>Criteria</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.1</td>
<td>Strategy</td>
<td>Short term and long term purchasing strategies are taken into account with deciding the purchasing need</td>
</tr>
<tr>
<td>1.2</td>
<td>Team-allocation</td>
<td>Cross-functional or multi-disciplined teams which make the decisions (including staff of purchasing and other disciplines)</td>
</tr>
<tr>
<td>1.3</td>
<td>Market parties</td>
<td>Are involved through market consultation; sharing ideas for project scope, consulting about forms of collaboration and identifying the capacity and wishes from the market. Also market analyses is used</td>
</tr>
</tbody>
</table>
1.4 Cost-benefit and risk analyses
Financial and economic analyses are used for determining the purchasing needs and also the project risks are identified.

1.5 Decision-making process
The decision-making process is structured, including systematic approach on the supporting aspects, like risk management, cost management and supplier management.

1.6 Implementation process
Structured implementation of the purchasing needs; different standard contracts, which describe clearly the responsibilities and task distribution between RWS and market.

1.7 Evaluation
Evaluating the decision making process of the purchasing needs.

8.3.2 Strategic process 2: Developing of tactical purchasing strategy (market policy)

Goal
This process describes how the corporate (purchasing) strategy is translated into a purchasing strategy, which includes the purchasing policy and the approach towards the market. This could be called the market policy. The development of this occurs on the tactical level of the organization. Among the activities of this process are for example identifying the parties which are involved, and applying of purchasing tools and using of relevant information for policy development. The resulted strategies could be distinguished by type of project or service, or specific market sections (like tunnel installations, dynamic traffic management DVM, or road infrastructure).

Plan
To assure that project teams come up with an optimal purchasing plan, which is primarily focused on the market policy and efficiency, the purchasing strategy has to be adequate and based on short- and long-term goals, which is developed for different market sections or project-types. As support of this process purchasing tools or models could be applied to distinguish project types or market sections.

The department, concerned with this purchasing strategy, has to be cross-functional (e.g. purchasing-, financial-, risk-, market-, contract-, technical-experts) Hereby specialized departments are assigned to formulate the purchasing objectives for each market section or project type. Also important is that there is consultation with the concerned departments to gain relevant information.

Besides internal information, market knowledge is also of great importance for developing of purchasing strategy. There should be an understanding of the structure and development of the market, this includes companies’ specification, competencies, performances and results of current suppliers and potential suppliers. Besides this market research also involvement of important market parties into the process of developing the strategy is pivotal, to be able to identify their needs and requirements.

Risk analyses have to be part of the of the decision making process as well, risks of the construction market as well as risks concerning the project type. Such an analysis will result in an overview about the strengths, weaknesses, opportunities and threats of a specific project type or market section. Note that it is essential that RWS knows a sufficient time in advance which different projects will be brought to the market. An overview of this is called the project flow.

This project flow has a great influence on the strategy to be developed, especially regarding the planning.
Do
A purchasing strategy is the final result of this process. A specific purchasing department is assigned, which is concerned with developing of the strategy. To execute all the developing activities (communication, internal collaboration, analyses, research) properly, formalization of the decision-making process on this department is essential. From the organizational perspective intensive collaboration with the concerned departments, would cause more commitment and successful implementation in the long run.

Check
For effective evaluation of the purchasing strategy SMART (specific, measurable, attainable, realistic, timely) goals have to be determined, which are in line with the purchasing policy. There should be a continual process of strategy evaluation. Benchmarking could research the implementation of the strategy on the different projects or regional bodies (operational level). Adding to this, identifying and implementing improvements for the strategy is important. Also feedback regarding purchasing policy from market parties should be taken in account.

Criteria

<table>
<thead>
<tr>
<th>Nr.</th>
<th>Criteria</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>2.1</td>
<td>Market analyses/knowledge</td>
<td>Use of market research, market consultation to specify the market policy and purchasing strategy</td>
</tr>
<tr>
<td>2.2</td>
<td>Strategy developing</td>
<td>Is the purchasing strategy based on the short-term or long-term goals and is this strategy distinguished for products and markets (use of purchasing models, product definition?).</td>
</tr>
<tr>
<td>2.3</td>
<td>Purchasing flow and risk analyses</td>
<td>Purchasing flow and risks are analyzed to identify strengths, weaknesses, opportunities and threats of a product or market. These could influence price and processes</td>
</tr>
<tr>
<td>2.4</td>
<td>Decision-making process</td>
<td>Formalization of the decision-making process. The parties involved in the process. Documentation of the process</td>
</tr>
<tr>
<td>2.5</td>
<td>Involvement interest parties</td>
<td>Is there communication to internal (e.g. engineering departments) and external (market) interest parties and are they involved in the decision-making process. (steering/consultation-groups)</td>
</tr>
<tr>
<td>2.6</td>
<td>Evaluation and improvement</td>
<td>SMART goals have to determined, which are in line with the purchasing policy and strategies should be evaluated and improved based on these goals.</td>
</tr>
</tbody>
</table>

8.3.3 Strategic process 3: Supplier management

Goal
This process aims to gain knowledge about suppliers and their market through market research and performance measurement. In such a way that profiles of each supplier (contractors, engineering firms etc) will be created and documented (supplier base). This information will be used for developing purchasing strategies and optimal market approaches, selecting suppliers in the tendering process and defining the purchasing needs.
Plan
In the plan phase, the Deming Circle describes the way how market parties (suppliers) are approached, the market strategy, but in this report called the supplier management. It is important that relations with suppliers are managed in such a way that it benefits the organization as a whole and in particularly the purchasing process (procurement phase). This supplier management is tuned with the purchasing strategy. Therefore communication with and knowledge (gained from research) from the market are of great importance for being updated about the last market developments and for identifying potential suppliers, and getting information to be able to appraise the suppliers. Frequent appraisal of suppliers is needed to get and remain understanding of the suppliers and their future possibilities and competences in relation to the current and future needs and requirements of RWS.
Since purchasing strategies are distinguished into market sections and project types, suppliers could also be approached and classified according to this distinction. Therefore strategies must meet RWS’ aim to create a wider market with sustainable competition with also opportunities for middle-small companies (MKB), such that more capable parties could participate in bidding on projects.

Do
All relevant information concerning the suppliers are saved in the supplier base. The information of suppliers includes their turnover, risks, and past performances. With purchasing models and the information from the supplier base, suppliers could distinguished and measured on their performance. Distinction will result in specific strategies and actions which are developed and taken for each supplier or supplier-group. In this way different market approaches are implemented for different suppliers. For pre-selection/qualification the data from the supplier could also be useful.
For RWS the selection of supplier (awarding project) during tendering is a critical process. The selection process should not only be based on lowest price, but also on quality. Therefore an advanced suppliers measurement system has been introduced with RWS which is called EMVI, most economic advantaged tender. The quality-criteria are related to innovation, sustainability, functionality, and public orientation, but also the quality control system of the supplier is assessed.
Distinguished strategies are important for creating a sustainable and competitive market, pre-qualification requirement should simplified, equal conditions and access for combinations with limited responsibility for MKB, and project scope and bundling should give an optimal participation rate from market.

Check
For improving the performances of the suppliers, their past performance should be communicated and improvement programs discussed. The supplier information from the supplier base should be available for suppliers and concerned parties. For evaluation purposes decision-making processes (selection) and supplier- and market analyses should be documented and available for concerned persons.
Criteria

<table>
<thead>
<tr>
<th>Nr.</th>
<th>Criteria</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>3.1</td>
<td>Supplier selection</td>
<td>There is a multi-disciplined supplier selection process. Selection is not only based on the lowest price, but also on quality aspects. This system is called EMVI, most economic advantaged tender. The quality-criteria are related to innovation, sustainability, functionality and public orientation.</td>
</tr>
<tr>
<td>3.2</td>
<td>Appraisal/measurement suppliers</td>
<td>Appraisal of potential suppliers is needed for supplier selection, which is primarily based on past performance, purchasing risk and their capacity.</td>
</tr>
<tr>
<td>3.3</td>
<td>Supplier market research</td>
<td>This market research is meant for identifying potential suppliers, and get information to be able to appraise the suppliers for selection. For this also good understanding of their corporate goals and requirements is needed.</td>
</tr>
<tr>
<td>3.4</td>
<td>Distinguished strategy</td>
<td>Market section and products-groups have distinguished strategies and suppliers are also classified and approached with respect to this distinction. Strategies are developed with purchasing models.</td>
</tr>
<tr>
<td>3.5</td>
<td>Documentation</td>
<td>Documentation of decision-making process and analyses (purchasing models, analyses suppliers)</td>
</tr>
<tr>
<td>3.6</td>
<td>Optimization supplier base</td>
<td>Tools are applied to optimize the supplier base. These tools aim to distinguish suppliers, measure and distinguish them.</td>
</tr>
<tr>
<td>3.7</td>
<td>Communication</td>
<td>Communication to suppliers about their performance and discuss improvement programs. Also information like status supplier base and supplier performance.</td>
</tr>
</tbody>
</table>

8.3.4 Strategic Process 4: Stimulating market innovation

Goal
This process is all about stimulating of the market to come up with innovation (functional, technical or in process). This could be achieved through early and suitable involvement of market parties in developing of infrastructure projects.

Plan
Innovation from the market could only be achieved when project management team actually provide sufficient space for market parties to apply their innovative ideas. Hereby it is important that there is a continual research of the market regarding innovation and early involvement of market parties during project development, such that they can have a valuable input on the project in an early stage. Early involvement will give the project team extra knowledge and experience from potential suppliers. This could be done through consultation and is also meant to check the interest from market parties for a certain project, and to discuss about possible risks and responsibility distributions.

Do
The purchasing policy have to be focused on encouraging innovation from the market. Therefore the purchasing plan has to create maximum space for innovation from market parties. This plan describes the procurement system, procurement method and contract control. In this plan is clarified at what stage RWS prefers to involve external parties into the project. A market scan
could support the development of this plan. This is a more-value assessment tool that supports the decision making regarding optimal involvement of market parties and most suitable procurement system. Another way to promote innovation is to describe the project requirements functionally. Also important is that privacy intention and property right regarding innovative ideas and work methods are taken into account and protected by RWS.

To be an innovative organization market research is important to gain knowledge about the current developments on the field of innovations, but also to get information regarding work and innovative capabilities of potential suppliers. Design remuneration also works as a stimulation for market parties for working on the projects extensively and come up with innovation.

Check
Evaluation should be done with the market parties about the purchasing and procurement process for identifying processes that need to be improved, and learning from experiences (best practices or failures) in such a way that RWS can procure innovatively.

Criteria

<table>
<thead>
<tr>
<th>Nr.</th>
<th>Criteria</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>4.1</td>
<td>Market research</td>
<td>research on market to gain knowledge about the market competencies and capacity regarding innovation.</td>
</tr>
<tr>
<td>4.2</td>
<td>Purchasing and procurement policy</td>
<td>is the policy that is followed to stimulate innovation from the market. This could be for example a particular contract-form, purchasing plan, performance contracts etc.</td>
</tr>
<tr>
<td>4.3</td>
<td>Evaluation and improvement</td>
<td>evaluation of the innovation aspect and the interaction with the market for improvement</td>
</tr>
<tr>
<td>4.4</td>
<td>Market involvement</td>
<td>integrating the market in the innovation process (e.g. with market consultation and dialogue sessions) and adequate information provision during procurement.</td>
</tr>
<tr>
<td>4.5</td>
<td>Decision making process</td>
<td>the parties which are involved and the procedures that has been drawn up and followed.</td>
</tr>
</tbody>
</table>

8.3.5 Strategic process 5: Improvement supplier’s performance and control of contract

Goal
This process is dedicated to the improvement of the supplier’s performance. Therefore the performance of the suppliers has to be measured and improved where needed, and RWS needs the knowledge and capability to support this process and control the quality of the contract.

Plan
To protect the quality and improve the performances of suppliers, suppliers and RWS have to learn from their own faults and learn from experiences from other projects. Contract conditions have to give suppliers enough space to have its own input and optimize the quality of deliverance. Opportunity have to be given to choose their method of planning, execution and material, such that they can optimize by themselves. Also could quality be incentivized due to applying a bonus/penalty system. Another contract condition is to require certain standards regarding control of the process and the quality of the project from the supplier.
Do
Performances of suppliers have to be measured with a measure system. The results of these are documented in a past-performance file for each supplier separately. Beforehand is agreed what quality aspects will be evaluated and therefore qualitative and quantitative performance indicators are determined. Adding to this, it is considered to be important that RWS communicates well and clear and give constructive feedback to suppliers, such they can learn from experiences and possibly set up a system or program to improve the activities and services of its suppliers.

For controlling the contract, RWS applies system oriented contract control (SCB) to check strictly whether the supplier implements its quality and process control system, and if it is applied in the right way, including checking whether actions are taken when the quality was deviated. The aspects of process and quality control should be stimulated due to adding these aspects in the EMVI-method of selecting the supplier.

Check
With the performance measurement the suppliers are appraised for their delivered performance. This could work stimulating regarding project quality, when the aspects, used in the performance measurement, are taken into account as past performance in the selection of suppliers in a next project as well. Also the project team should be evaluated regarding leading the purchasing process and ways have to be found how certain processes and contract conditions could be optimized to encourage the quality aspect with suppliers maximally.

Criteria

<table>
<thead>
<tr>
<th>Nr.</th>
<th>Criteria</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>5.1</td>
<td>Performance measurement</td>
<td>Performance of suppliers are measured with a measure system. And these are documented in past-performance file</td>
</tr>
<tr>
<td>5.2</td>
<td>Contract control</td>
<td>Control of contract by RWS with system oriented contract control to check whether supplier delivers according the requirements. Also involvement of supply chain</td>
</tr>
<tr>
<td>5.3</td>
<td>Performance indicators</td>
<td>Beforehand is agreed what quality aspects will be evaluated and therefore qualitative and quantitative performance indicators are determined</td>
</tr>
<tr>
<td>5.4</td>
<td>EMVI</td>
<td>Quality and quality control are stimulated through EMVI method of selecting supplier</td>
</tr>
<tr>
<td>5.5</td>
<td>Contract conditions</td>
<td>To what extent is bonus/malus applied for stimulating quality. And also what space in the contract is given to supplier for his own input to optimize the quality deliverance.</td>
</tr>
<tr>
<td>5.6</td>
<td>Evaluation and improvement</td>
<td>Communicating feedback with suppliers, learning from experience and determining improvement program</td>
</tr>
</tbody>
</table>

8.3.6 Strategic process 6: Strategic cost management

Goal
Strategic cost management is the process to identify costs and its originators of purchasing activities to draw up improvement strategies to reduce the transactional costs and create an efficient purchasing process. But also the life cycle costs of the project is taken into consideration during development to keep this at a minimum level.
Plan
Within the organization there is a cost management policy, which make clear how the costs are managed and who is responsible for what. Policy aspects could be efficiency targets in contracts and formal decision making process regarding costs improvements. At the end RWS strives to reduce the transactional and construction costs. For the latter cost management has to adapt to the latest innovative developments from the market to be able to make costs estimations realistic and reliable.

Do
For fundamental reduction of costs and structuring of the costs consultations should be hold with concerned parties (suppliers and other departments). Like brainstorm sessions with market parties how the purchasing process could be followed in a more efficient way. Or multi-disciplined teams and suppliers work together on integral costs reductions, of which the costs of a project is based on life cycle costs. Programs should be set up that stimulate internal policy and suppliers to come up with ideas for cost reductions.
Also cost models, like Public Private Comparator (PPC), and other tools should be applied to select the most appropriate and economic most efficient procurement system and supplier and to improve the costs structures. PPC assesses whether a project development based on public private partnership (PPP) is economically feasible.

Check
Costs of each project has to be evaluated. Real costs and estimated costs are compared with each other and analyzed for each project element. Results of analyses are used for next projects to enhance the cost estimations.

Criteria

<table>
<thead>
<tr>
<th>Nr.</th>
<th>Criteria</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>6.1</td>
<td>Cost management policy</td>
<td>Policy makes clear how the costs are managed and who is responsible for what. Therefore cost management has to adapt to the latest innovative developments from the market.</td>
</tr>
<tr>
<td>6.2</td>
<td>Cost models and tools</td>
<td>Tools and models are available as support for cost management and decision making.</td>
</tr>
<tr>
<td>6.3</td>
<td>Involvement other parties</td>
<td>Consultation with concerned parties (suppliers and other departments) about costs structures and cost reduction.</td>
</tr>
<tr>
<td>6.4</td>
<td>Evaluation</td>
<td>Cost analysis of the real costs and estimated costs. Results are used for enhancing cost estimation.</td>
</tr>
<tr>
<td>6.5</td>
<td>Stimulation</td>
<td>Programs that stimulate internal policy and suppliers to come up with ideas for cost reductions (construction and transactional)</td>
</tr>
</tbody>
</table>

Hereafter the supporting processes will be discussed.

8.3.7 Supporting process 1: Determining the purchasing strategy and policy

Goal
This process describes to what extent the purchasing-plans, purchasing and market-policy, and the general corporate strategy and their objectives do reconcile with each other. In this regard all the described purchasing processes (strategic and supporting) in this MSU-R model should be
twined in the purchasing strategy and policy, and according to their relevance be part it. This process is different than strategic process 2, which is only concerned with developing purchasing and market policy on tactical level, while supporting process 1 is considering the implementation of the corporate purchasing goals through the whole organization.

Plan
Purchasing goals are deducted from the corporate purchasing strategy. Based on these goals a purchasing and market policy has to be developed, which is applied by all operational departments. The policy is based on detailed understanding of the supplier market and their profile information. Also the innovative opportunities from the market is known. As for the time planning for bringing the projects on the market, this is determined through the MIRT (multiannual plan for infrastructure, space and transport), and analyses on the capacity of the market.

The strategies set out in the purchasing policy have to be translated into the purchasing plan subsequently, which also could be considered as the procurement procedure policy. Project teams on operational level will work with this document, which describes the way how the market and the project will be approached, reflected in e.g. the contract scope, contract choice, and quality- and selection requirements.

Do
The purchasing strategies should be focused on developing optimal relations with the market parties. Therefore a targeted market policy is needed. The strategies also have to include the efficiency of the purchasing processes.

For developing purchasing strategies, policies and plans multidiscipline teams (market and concerned departments) have to work on it and thereby the identification of the risks and opportunities of the supplier market should be an integral part of these processes as well.

Check
Benchmark analyses have to be done and taken into account for continual improvement and optimization of the purchasing processes. The organization has to learn from mistakes and best practices from the different projects and operational departments. Therefore documentation and evaluation of the purchasing process is of importance.

Criteria

<table>
<thead>
<tr>
<th>Nr.</th>
<th>Criteria</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.1</td>
<td>Purchasing strategy and policy</td>
<td>strategies and plans, which describe in what way has to be purchased. This includes the market policy.</td>
</tr>
<tr>
<td>1.2</td>
<td>Procurement procedure policy (purchasing plan)</td>
<td>operational implementation of the purchasing strategy and plan. This could be reflected in contract or procurement procedures.</td>
</tr>
<tr>
<td>1.3</td>
<td>Evaluation and improvement</td>
<td>Evaluation of purchasing process and actions to improve purchasing activities/strategies/processes. Also comparisons between regional divisions</td>
</tr>
<tr>
<td>1.4</td>
<td>Market involvement</td>
<td>consulting the market to advise in developing purchasing strategy and plan</td>
</tr>
<tr>
<td>1.5</td>
<td>Allocation team</td>
<td>involvement of other departments in developing strategy</td>
</tr>
<tr>
<td>1.6</td>
<td>Risk and opportunities</td>
<td>research of the market to the risk and opportunities of a particular market section</td>
</tr>
</tbody>
</table>
8.3.8 Supporting process 2: Arrangement of purchasing organization

Goals
This process primarily focuses on the arrangement of the purchasing organization. The important factors in the process are: that purchasing has a strategic position in the organization, that has the involvement of all relevant and concerned parties in the purchasing process, and that the organization structure supports the functional separation, with its strategic, tactical, and operational purchasing processes.

Plan
RWS has the ultimate ambition to become a leading principal and professional purchaser, who works on the principles of giving the ‘service to public’ the main priority. Therefore an effective organization and coordination is needed for successful implementation and application of uniform work processes, such as the purchase.

Do
Within the organizational structure of RWS there should be clear distinction of functions (strategic, tactical and operating) regarding purchasing activities. Strategic and tactical level could be organized on corporate level and operational purchasing on regional level. Besides vertical collaboration and coordination between the different levels, also horizontal collaboration is of importance, since RWS is quite a large organization. In this regard there should be collaboration between the ‘purchased’ projects and the regional purchasing bodies, and there should be involvement of specialized departments on the different levels.

Check
In the organizational system consisting of strategic, tactical and operating levels should be a continual loop of feedback/evaluation and improvement. A separate internal consultancy group could be designated, which is concerned with optimizing the purchasing activities and processes on organizational level.

Criteria

<table>
<thead>
<tr>
<th>Nr.</th>
<th>Criteria</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>2.1</td>
<td>Coordination and collaboration</td>
<td>is the cooperation and communication between different purchasing departments of the organization (horizontal as well as vertical)</td>
</tr>
<tr>
<td>2.2</td>
<td>Evaluation and improvement</td>
<td>Evaluation of the purchasing performance and identify organizational processes or aspects that could be improved</td>
</tr>
<tr>
<td>2.3</td>
<td>Organization</td>
<td>The structure of the purchasing organization and decision making, and separation of functions</td>
</tr>
<tr>
<td>2.4</td>
<td>Involvement market</td>
<td>Market involved in evaluating the purchasing performance of RWS</td>
</tr>
</tbody>
</table>
8.3.9 Supporting process 3: Development of purchasing procedures

Goal
Next to the fact that governmental purchasing activities are bounded to regulation and legislation, RWS also strive to create uniformity in the purchasing processes. Therefore this supporting process is about the development and application of purchasing procedures. These procedures described the to be followed purchasing processes/steps. Also integrity principles is a subject that is taken into account in this process.

Plan
There are procedures for public responsibility, dealing with legislation and regulations, and for operational, tactical and strategic purchasing processes. Also there is a policy regarding the integrity of employees and suppliers. The requirement for developing the procedures:

- All concerned parties/stakeholders are assigned a position in the descriptions of the procedures
- The procedures line out a sufficient intelligibility regarding the process steps and responsibilities (roles and task)
- The procedures have been drawn up according to the Dutch and European legislation and regulations.
- The procedures should provide sufficient space for innovative and optimization opportunities.

Do
Purchasing procedures have to be communicated with concerned employees, such they have an understanding and able to follow them. Also interest parties, in particular the participating parties in procurement process, should be informed well about the procedures RWS takes out regarding procurement processes and activities. Measures have to be taken to advance and stimulate the employees to work conform the purchasing procedures. This could be enforced through simulating cases and processes or organizing discussion-meetings.

Check
Periodic audits should take place to check whether processes are enforced conform the procedures regarding the regulations and external collaboration. The audits do also evaluate whether there has been worked according the integrity principles by the employees. Succeeding on the audits, evaluation and feedback regarding purchasing procedures and integrity principles must occur for optimization and improvement of the activities. Sometimes penalties could be applied for violating integrity principles.

Criteria

<table>
<thead>
<tr>
<th>Nr.</th>
<th>Criteria</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>3.1</td>
<td>Legislation and regulation</td>
<td>To what extent are legislation and regulation taken into account in optimizing the purchasing procedures: EU directives for procurement, public governance and compatibility</td>
</tr>
<tr>
<td>3.2</td>
<td>Integrity</td>
<td>The way how integrity of the purchasing employees are protected in the organization</td>
</tr>
</tbody>
</table>
8.3.10 Supporting process 4: Performance indicators for purchasing

**Goal**
This process is about measuring the performance of the suppliers as well as the purchasing performance of the internal organization.

**Plan**
Main activity in this process is of the measuring the performances of suppliers as well as the internal purchasing performances.

**Do**
An internal system should be implemented for measuring the performance of suppliers. Therefore an extensive integrated package of performance indicators have to be determined, which measures the suppliers on their performance during operational stage. Indicators for the supplier could be quality, price, delivering service, communication, innovation, and costs for not performing on project level. These measured values have to be documented in a past performance file and are used for other projects. Internal measurement should be focused on the efficiency, is the maximum output achieved with a minimal input. These purchasing indicators should be an integral part of the corporate performance indicators.

**Check**
Regular self-evaluation of purchasing process to measure the performance in comparison to others, internal departments as well as external organizations (benchmarking). Evaluation results should lead to improvement plans, which are initiated in partnership between RWS and market parties. For encouraging the implementation of improvement activities, the improvement process should also be accounted as a performance indicator. As last review the purchasing measurement system and its purchasing performance indicators periodically to make sure it stays in line with changes in strategies and context in which the system operates.
Criteria

<table>
<thead>
<tr>
<th>Nr.</th>
<th>Criteria</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>4.1</td>
<td>Supplier’s performance indicators</td>
<td>Indicators that measure the delivered performance of the supplier</td>
</tr>
<tr>
<td>4.2</td>
<td>Internal purchasing performance indicators</td>
<td>Indicators that measure the purchasing performance of RWS. These indicators are related to the efficiency of the purchasing processes.</td>
</tr>
<tr>
<td>4.3</td>
<td>Evaluation and improvements</td>
<td>Indicators are compared with purchasing/performance targets and based this analysis improvement plans are developed, if necessary.</td>
</tr>
</tbody>
</table>

**8.3.11 Supporting process 5: Human resource management**

**Goal**
Human Resource Management describes the process of identifying the necessary competences for realization of the corporate and purchasing goals, up to the implementation of this. Aspects like rewards, training, recruitment, selection, integrity principles, and knowledge management are integrated into this process.

**Plan**
Human resource management (HRM) should provide support to the purchasing processes and activities through developing and training of purchasing competencies, and select and retain the right people with right skills for being active on the purchasing departments.

**Do**
Designing personal development plans for employees with personal targets. Strive to achieve a career planning that goes beyond the functional borders of the purchasing division. The HRM strategy for the purchasing departments should include goals, training, selection and planning concerning the human resources. Also IT is applied.

**Check**
There is competency evaluation within the organization to identify the available competencies and shortcomings, such that the HRM policy could be adapted on that. Mutual evaluation sessions take place with employees, teams or whole divisions. Important in this regard is that clear targets are set beforehand.

Criteria

<table>
<thead>
<tr>
<th>Nr.</th>
<th>Criteria</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>5.1</td>
<td>HRM-support</td>
<td>The support for purchasing department from Human Resource Management. This could be competence evaluation, HR strategy, function profile, recruiting, training, career plan or IT</td>
</tr>
<tr>
<td>5.2</td>
<td>Evaluation and bonus system</td>
<td>Evaluation of the purchasing performance of the employees with a related bonus system.</td>
</tr>
<tr>
<td>5.3</td>
<td>Integrity</td>
<td>The way RWS promotes and protects the organizational integrity principles</td>
</tr>
</tbody>
</table>
5.4 Competence evaluation and development
Evaluate available competence within the organization and identifying competences for further development.

5.5 Teams
The way how purchasing performances are evaluated (multidisciplined or management board) and targeted (team, division or individual).

### 8.4 Final MSU-R model

The final step is to describe the Purchasing maturity Levels (PLs). Each (strategic or supporting) purchasing process consists of ten different levels, level 1 till 10, for which level 1 means poor performance and level 10 excellent performance on the purchasing process. This means that the higher the level, the more mature and advanced the purchasing activities are for that process. A certain maturity level has to be met completely before the next level could be achieved (strict-step principle).

The description of the maturity levels is based on the identified criteria and the results of the Deming Circle elaborated in the previous section. Before writing out the PLs, specific objectives have been determined firstly for each level. These objectives are aspects that have been derived from the criteria. It could occur that more than one criteria could play a role in a certain level.

It has been attempted to make the PL-descriptions as RWS-specific as possible, through implementing its strategy and framework and re-write and adapt the standard PL-descriptions. Also at the same time has been aimed not to lose the principles of professional purchasing as the MSU+ model has determined. However there are some processes and activities that could not be applied with RWS, therefore these have been removed.

In Annex F the final result of the MSU-R model could be found. For each level the next following templates can be read, see table 8.3 and table 8.4. For table 8.1 square 1 gives a brief description of the process. Square 2 is the purchasing maturity level, from 1 till 10. For each level there is a PL description and this could be found in square 3. As last square 4 indicates the PL-objectives that is related to the concerned level.
Table 8.2 MSU-R example process template with purchasing maturity levels

Table 8.4 gives an overview of the criteria and in which purchasing maturity levels they have been taken into account. If a certain criterion counts for a level, then the level-box for that particular criterion describes the requirement that has to be met. A level-box has been colored blue in the figure.

Table 8.3 MSU-R example process template with purchasing maturity levels
9 MSU-R Model Application and Analysis of Findings

The main purpose of the MSU-R model is to measure the purchasing maturity of Rijkswaterstaat. This chapter will describe the application and the analyses of the results of the MSU-R model, applied on the RWS organization. The first section will describe the application of the model. This means how the needed information and data have been gained for research and analysis and subsequently processed. Further it also explains the method of determining of purchasing maturity level of the 11 processes. Section 9.2 will analyze the maturity level results of these processes. This will be done through analyzing and explaining the concerned criteria for each process. At last, this chapter will end with an evaluation on the achieved performance levels, and describe the main findings which are drawn up from the results.

9.1 Application of model

The model have to be applied to acquire results, which will be in the form of a maturity level for different purchasing processes, as designated in the previous chapter. These maturity levels give an indication to what extent RWS is an actual purchasing organization and reflect the level of professionalism in purchasing. For application of the model and evaluation of the purchasing policy a comprehension of the RWS purchasing activities and processes in practice is needed. The information and data for this understanding and view have been gained from interviews, project documents and project evaluation reports. Most of the useful information have been gathered from the interviews with the RWS people, who are concerned with the purchasing activities.

9.1.1 Interviews

In total 23 interviews have been conducted with people, who are concerned with procurement or purchase within the organization of RWS. The average time for one interview was about 1.5 hours. For the interviews there was a danger that subjectivity of the interviewees could influence the result of the model. Therefore only open questions have been put forward, such that the interviewee had the chance to elaborate purchasing actions in the past, explain current processes and share experiences from projects. Since the MSU-R model seems to be like a checklist, it has been prevented to present the questionnaire like this. This is because an objective appraisal can only be achieved if it is based on both facts and extensive substantiating of the followed processes and policy. Further common answers from different interviewees have been adopted as an actual occurrence within the organization. The research has aimed to identify ‘what’ is done, but also obtain the understanding ‘why’ it is done in that particular way. Also from the interviews have been attempted to derive and gain understanding of the purchasing organizational structure and procedural conditions.

The interviews were hold with purchasing advisors from the BIOs, contract managers, project managers, head of IMG, market specialists, tool developers, cost managers, market parties, and IMG contract advisors. The whole list of interviewees could be found in Annex G. Purchasing advisors are primarily from the regional body Utrecht (Dienst Utrecht) and central body for infrastructure works, Direction Infrastructure (DI= Dienstinfrastructuur). For each interviewee
individually a selection of processes (from the model), which are primarily part of their concern, were discussed. Hereafter an overview will be given for which processes what kind of interviewees have been approached.

**Strategic processes**

All the strategic processes affect the activities and processes on project level. However these strategic processes are given form trough guidelines and determinations from the tactical middle management. Therefore operational and middle management employees, concerned with purchasing policy implementation and/or developing have been approached for the interviews. For each strategic process (SP) will be pointed out which persons are concerned:

- **SP1, making decision about purchasing need**: purchasing advisor and project manager
- **SP2, developing of purchasing strategy**: IMG market specialists, purchasing advisors and BIO purchasing strategists
- **SP3, supplier management**: purchasing advisors, IMG market specialists, and market parties
- **SP4, stimulation of market innovation**: contract managers, IMG contract advisors, market parties, and project managers.
- **SP5, improvement of supplier’s performance and control of contract**: Project manager, contract manager, and market parties
- **SP6, Strategic cost management**: cost manager

**Supporting processes**

How the current purchasing activities and processes are done depends for a big part on the supporting processes (OX). Therefore most of the information regarding strategy determination, policy implementation, organizational matters, and performance indicators, respectively XO 1, 2 and 4, has been deduced from the interviews, which were hold for the strategic processes. Additional information regarding human resource management and other organizational and procedural matters has been gained through the head of IMG, head of IMG market and purchase, head of IMG contract management and head BIO Utrecht.

**9.1.2 Determination of purchasing maturity level**

The data and information gathered from the interviews, documents and evaluations have been analyzed through the framework of the MSU-R model. The result for each process of this model is a certain Purchasing maturity Level (PL) that has been achieved, a number from 1 till 10. The descriptions of the maturity levels and the related criteria of each process could be found in Annex G. How the PL of a process will be determined is clarified by table 1, which is giving an example of a process and its result of an evaluation based on the criteria.
As can be seen from the example table the criteria will only be colored for a specific PL, if the criteria are an actual part of the PL description. For example criterion ‘coordination and collaboration’ is part of PL 2, 4, 6 and 8. If the compartment is colored green that means that a particular criterion has been met for that PL. For criterion ‘coordination and collaboration’ means that only its conditions in PL 2 is met and for PL 4, 6 and 8 are not, which is showed by the red color. Orange means that the conditions are partly achieved.

The result (the bottom row of the table) will count up all the colors for each PL. For example PL 2 scores for all the criteria green, so that means that PL 2 is completely achieved and therefore get the color green as result. On the contrary PL 4 has only a red compartment, thus PL 4 has not been met. Orange means that the PL is only met partly, which counts for PL 7, 8 and 9.

After all the results have been counted up for each PL, the final PL-result for the whole process could be determined (compartment in right bottom corner). The scoring method is based on the principal of ‘strict-step’, which means that for a certain level all the criteria have to be met before the criteria of the next PL are relevant. In this way in the example the maturity level of 3 have been achieved for this process. Although PL 5 is also green, but because PL 4 has not been met PL 5 is reluctant. In this regard an improvement of PL 4 could create an increase of two maturity levels.

9.2 Analysis Results of model

In this section all strategic and supporting processes will be analyzed. The starting points of the analysis will be elaborated here:

- Each criterion of the processes will be clarified separately. A description will be given of the current purchasing situation from the perspective of the contemplated criterion. Any deviation from the purchasing principles of the model will be explained in a substantive way.
- A certain criterion for a PL is only completely accomplished if the described level conditions or requirements are:
  - Applied or done consistently by the concerned person;
  - Is occurring structurally in more road infrastructure projects;
  - Common accepted and implemented by the regional bodies and/or corporate management levels.
- Different infrastructure projects have been reflected on the purchasing activities and processes. However these projects have not been evaluated separately with this model. The projects just give practical examples how certain processes are implemented and
Purchasing Maturity of Rijkswaterstaat

The MSU-R model is meant to give an evaluation of the purchasing function of the overall purchasing organization. Project cases only cover the operational level and therefore do not give sufficient information to evaluate all the strategic and supporting processes. However, some processes do only refer to the activities on project level.

The results will start with the analyses of the strategic processes and after that the supporting processes. Each process analysis will end with a scoring table, which shows the achieved purchasing maturity level, and a reflection, which gives a brief evaluation and possible policy improvements of the pivotal aspects in that process.

9.2.1 Strategic Process 1: Making decision about the purchasing need

Explanation for each criterion

1.1 Strategy

Lack of market policy
The conclusion from most of the purchasing advisors is that there is a lack of a clear purchasing strategy, and in particular for the market policy. Tangible strategic guidelines (e.g. bundling, purchasing planning) are missing for how to bring projects on the market and how to approach market parties in the most effective and efficient form, and therefore a long term vision regarding purchasing needs does not exist. Some purchasing advisors believe a better description of the purchasing objectives from the higher management would make their input more effective, but these are not available. However, there were some project- and contract managers, who proclaimed that every project is unique and has to deal with specific and complex circumstances and therefore any general market analyses or policy would not add extra value in the decision-making. Moreover, they are convinced that in the big infrastructure projects in many cases always the same contractors apply for the bid, thus the playfield of the market is well-known then. Remarkably, all the interviewees did not mention how to create more sustainable competition in the determination of the project needs. Also considerations about the efficiency of the procurement processes are not taken into account.

Standard contracts
To some extent the purchasing strategy could be found back in the standard contracts (contract buffet), but this rather could be contemplated as a legislative framework than a strategic description about the purchasing needs. However this standardization eases the implementation during the work processes.

‘Market, unless..’
The main principle which is used by the project teams to determine the purchasing need is ‘market, unless..’. This means that the whole project is given to the market, unless there are reasons to keep certain activities within the organization. Based on a risk analysis the peel-off method is applied to determine which procurement system could be the most optimal for a particular project. The first option, which is complete transfer of project (including all the risks) to market, is started to be assessed. RWS evaluates for each risk whether it is acceptable to be taken over by the market. If not, then RWS decides to keep the responsibility of that risk with
itself, which has as consequence that it affects the eventual procurement system. Decisions made here are risk oriented and based on the interest of the public.

1.2 Team allocation

*Late involvement of purchasing advisors*

In many interviews purchasing advisors did their complain about their late involvement into the project, especially the purchasing advisors from the regional bodies. They just have little influence on the decision making of the project needs. Usually the consultation with them and their work activities commences in the middle of project development when the procurement processes starts. In this way for example the purchasing advisors are not involved in deciding about the scope of project, whilst the consequence of this determination hugely influence the purchasing processes in the further stages. However their advice about the purchasing needs is sometimes useless, because there has been a political decision, which cannot be altered. Another cause could lie on the difference of views with the project management.

*No purchasing advise from the beginning*

A contract manager told that the involvement of purchasing managers could generally be improved. Early involvement will give the project team more information from the purchasing perspective. However, it all depends on the initiative of the project management to what extent the purchasing advisor is valuable for this decision making. In the big and complex projects purchasing advisors are approached occasionally, but since they are not part of the Integral Project Management (IPM) team, there is no systematic structure for their involvement. The reason that purchasing advisors are left out frequently is because, according to some project managers, they cannot give relevant information that could be valuable in the decision making process. In reverse purchasing advisors say they cannot be valuable because they are not involved, and remain being just an advisor.

However for some recent projects, which are part of the infrastructure stimulus projects (Spoedaanpak-project), a successful and intensive collaboration with purchasing managers has resulted in optimal contracts. These managers were involved from the beginning and had to think about a strategy for developing the project plan and determine the most optimal and efficient project needs.

*Other specialized departments*

For each project an IPM organization structure is established, consisting of different disciplines (contract, environment, technical and project control). Based on this management structure the project needs decisions are made (level5). Specialized expertise from the risk department and financial departments are an integral part of the decision making process as well (level4). Many times certain aspects of the project has already been decided by the political authorities, like the procurement system, the bundling of project activities or the date for delivering, which does not leave much space for the project management for changing the project needs.

1.3 Market Parties

*Market parties from the beginning*
Market parties are not involved in the determination of the project needs. The only time that this happened was on the projects of Spoedaanpak. An exceptional situation, on where market parties were involved in the decision making before the actual design-traject-decision (OTB=ontwerptracebesluit) had been made. In this way information was gained about for example the capacity of the market and its view on the project at an early stage which could be taken into account in the decision of the project needs, but also the whole procurement process was reduced from six to four months.

**Market information**

It is not part of the systematic approach that the knowledge and experience from the market are consulted during project plan development. Besides, market information is hardly used in the decision-making process. Partly the reason for this is that structural market analyses are hardly done. Some purchasing managers pointed out that there is a central database missing with relevant market information and analyses. Right now purchasing advisors has to find out market information and analyses or any other relevant information about suppliers by themselves, and this only happens on an occasional base. It also occurs that purchasing advisors are not capable to do an extensive market analysis.

1.4 **Cost-benefit and risk analysis**

For projects above 60 million Euros the Public Private Comparator (PPC) is applied to assess whether the project is financially feasible to apply for a Public Private Partnership (PPP). Also market scans based on costs are used to gain more information about the market capacity. However, not much value is attached to the results of this instrument, is told by a cost manager. The cost estimations are only related to the construction costs. Business and economic analyses of the project are done by external consultancies (level9), but does not influence the determination of the project needs, because they have been made for plan development purposes. Cost management, which is focused on the efficiency of the project plan and economic objectives of the project needs is missing, for example financial comparisons of the different procurement systems, or project bundling alternatives. RWS strives to control the project through majorly orientating on the risks, and therefore for the deciding on the project needs the risks are critical. Therefore extensive risk analyses are made (level6).

1.5 **Decision making process**

A clear systematic approach for the decision making of the purchasing needs could not be encountered, since every project team had its own method and procedures. In some projects the purchasing advisors played a bigger role than in others and not always the same criteria were used for the decision. For determining of the purchasing needs the market policy is very critical, although the project management primarily focuses on the main characteristics (technical requirements, quality and time). The focus is different for every project. For example for a bridge the quality will be given more priority and for a maintenance project perhaps the traffic flow. It is for certain that the decision making process is not consistently focused on the effective market approach and efficient purchasing.
For decision making in some cases the politics has the final word. For example for a project the Ministry of Transport insisted DBFM as procurement system, while this public private partnership-form causes fragmentation in the maintenance of the infrastructure network. This is against the operational policy regarding maintenance. Therefore the integrated contracts usually do not include the maintenance component. However based on political criteria DBFM is promoted and encouraged.

1.6 Implementation process

The standard contracts are very useful for the implementation of the purchasing needs. Besides they give the legal framework within the project has to be developed, the different contracts for different forms of collaboration (procurement systems) and types of projects, describe the responsibilities and task distribution between RWS and market as well (level7)

1.7 Evaluation

Evaluations for this decision making are hardly made. For example evaluating the positive and negative consequences (in costs or performance) of the determined project needs, in such a way that the results are used for other projects. The most common answer, which was given, on why evaluations are not done for this process, is that the project- and contract managers, and purchasing advisors barely have time to reflect on the decision they made in the past. They have to continue to the next project and do not see the benefits of such an analysis.

Table 9.1  Purchasing maturity level result strategic process 1

| Reflection SP1 |

The purchasing maturity level, RWS scores in this strategic process, is rather low. The lowest level of 1 is achieved here (see table 1). RWS should develop a clear market policy, based on market research and analyses. Also market parties should be more involved in the determination of the project needs, because the addition of their experience and knowledge could make the project needs suit better with the market’s wishes and requirements. If RWS wants to purchase from the market, then a better understanding of market should be gained.

The information and data used for determining of the project needs are based on gathering from different specialized departments individually. It is up to the project management to make a decision then. However, efficiently purchasing is influenced by a combination of variables: risk,
costs, market, technical, and contract. Therefore all these departments should have more horizontal collaboration to eventually come up with the most efficient and effective project needs, since they all affect each other (interdepartmental interaction). Right now the involvement is multi-disciplined, but every department only focused on its discipline (sub-optimization), as result that there is no integral view on the purchasing needs.

Further it could be concluded that efficiently purchasing is not the main priority in the decision making of the project teams.

### 9.2.2 Strategic process 2: Developing of tactical purchasing strategy (market policy)

#### 1.1 Market analyses/knowledge

**Category management**

On the department of IMG(purchasing management for infrastructure works) category managers has been assigned for research to the development, capabilities, planning and knowledge of the market. Four categories have been distinguished: road infrastructure, water infrastructure, installations and engineering works. Based on the analyses of market information and past-procurement results, the category managers give strategic advise how projects should be purchased. However, the implementation of category management (CM) seems to be unsuccessful and during this research the activities of CM for infrastructure works were even at a low ebb. Possible causes for this are:

- There is not a central database where all the information about the market could be obtained. Purchasing managers have to contact the category manager case by case for any advice;
- There are too many regions with their own purchasing supporting department, of which each has their own category approach;
- According to purchasing advisors the information given from CM is not adequate and does not fill in their practical activities, as consequence that most of the purchasing advisors never have approached the category manager;
- There are only four category managers, some of them even part-time, who has to research their whole category field. Due to this lack of manpower extensive and useful market analyses, for purchasing managers could not be achieved.

**Market days**

Market days have been organized, on which RWS invited market parties to discuss vital topics concerning their collaboration and identify the wishes and requirements of the market. One of the main conclusions that was drawn there is the existence of this huge gap between what RWS desires and what the market is capable to realize. More of these exchange sessions have been planned in the future, but they are not organized on a regular base.

#### 1.2 Strategy developing

**Market section and product-group strategy**

This strategy should be focused on market strategy and developing a consistent policy for how approaching the market. Therefore the category management is aimed for having a market
Purchasing Maturity of Rijkswaterstaat

Section policy and developing specific purchasing strategies for each market section. However, a clear market strategy for infrastructure works from the corporate purchasing management has been missed by the operational purchasers. Also for some product groups, it has been decided to develop specific strategies, the so-called product group strategy (Dutch: deel-inkoopstrategie). This separate strategy is needed for the products with an imperfect market, because for example there are not enough suppliers. A list of products has been set up, but so far only for one product, tunnel installations, a specific strategy has been developed.

**Purchasing models**

Purchasing models are not used for strategy developing, strategic sourcing of products and supplier management. The category managers do know about purchasing models (e.g. Kraljic), but do not apply them for their market analyses. This also counts for the purchasing managers when they work in the initial phase of a project.

**SMART-goals**

SMART (specific, measurable, attainable, realistic and timely)-goals for the purchasing strategies have not been determined. This makes evaluation of the market policy an difficult process, while these goals are important for continual improvement and developing of the strategy.

**Long-term**

The long-term aspects of the market policy are hard to identify since there is not a concise policy (level4). However, RWS aims to stimulate innovation from the market and therefore provide in its strategy sufficient space in contracts for market parties to come up with new ideas and work processes (more about this in strategic process 5)

As last, worth mentioning is that all the purchasing advisors indicated that the market policy and indirect the whole purchasing strategy (tactical level) from IMG is totally unknown or not clear to them. The policy is incomplete, misses a practical application and do not guide them in their purchasing activities. As result that each purchasing advisor has its own way of approaching the market or are enable to advise the project management about it effectively.

1.3 **Purchasing flow and risk analyses**

The only risk analyses, which are done, are for the infrastructure projects itself. But during the process of strategy development hardly any reported risk analyses are set up for the market or purchasing and procurement processes. These kind of analyses would also help in a better understanding of the market and purchasing processes due to identifying the strength, weaknesses, opportunities and threats of these.

Purchasing flow is not analyzed as well. From the Ministry of Transport dates have been determined for the delivering of a certain infrastructure projects. This is part of the political provision, which makes deviation from this decision not possible, and it is up to RWS to meet this requirement. The consequence for RWS, given this condition, is that it is difficult to make an optimal purchasing planning, which suits the capacity of RWS as well as the market. Also the planning is managed regionally, and since there is little cohesion between the regional bodies this does not advances the efficiency of the planning. The planning is publicized timely on the ‘purchasing list’ (so-called inkooplijst), which is accessible for all potential market parties, such
that they can adapt their planning on the planning of RWS. The question remains whether this is the most optimal planning.

1.4 Decision making process

The decision-making process regarding the development of the strategy is not clearly formalized. It is for certain that any instrument or strategy/policy to be implemented within RWS have to go through M&I (market and purchase)-department, which has to provide the final approval. Cross-functional teams are not installed for the strategy development, but specialists are approached when needed, which happened during the development of the product group strategy for tunnel installations.

The employees, who has to do deal with purchasing operationally, mentioned that a clear overall market policy is missing, as consequence that they have to develop their own vision and strategy regarding how to approach the market. They decide for themselves what the best approach is and this has caused that within the organization a fragmented market policy is followed.

1.5 Involvement of interest parties

Consultation groups

Within the organization of RWS there are some commissions or consultations boards which discuss and improve the procurement processes of RWS. There are two groups:

1. CC-CP(category coodinatoren-contactpersonen), consisting of the category managers and contact persons from the regional BIOs.
2. KAG (kenniskringaanbestedingen), knowledge platform for procurement, in which IMG and the regional purchasing managers come together.

In both groups the attendees discuss the procurement results and –analyses, and exchange experience and knowledge concerning the market and purchasing activities. In this way the groups aim to identify possible improvement aspects for procurement.

Market parties

Market parties are limited involved in the development of strategies. Also there are hardly any analyses to find out about what they want and their requirements. Procurement results discussed in the groups mentioned above are focused on projects costs and the arrangements of the procurements, but do not tell anything about the perception of the market towards the purchasing and procurement policy of RWS. Communication with the market is missing in this regard. Further they discuss issues that they have heard from the market in the ‘walking aisle’, but documentation or evaluation reports about it are missing.

In the Spoedaanpak-projects the market has been directly approached to consult about the project needs, possible innovative ideas and how the projects could be brought to the market in the most optimal form and composition. However, involvement of the market parties like this does not happen and is not very common on every project. Usually the time and efforts what has to be put into this process restrain the project management to approach and involve the market in such an early phase of the project.
1.6 Evaluation and improvement

**TTA and TTC**

Structural evaluations of the purchasing strategy and plan are hardly made, as result that the cycle of continual evaluation and improvement seem not to take place. Evaluation only occurs based on the procurement results, which describes the costs and arrangements of procurement. The two groups TTA (taskforce tender analysis) and TTC (taskforce tender criteria) take these results into consideration for identifying improvement aspects for procurement. TTA is more focused on optimizing the procurement results and TTC is more emphasized on clarify the legal issues of procurement.

**Consultation groups**

However, evaluation of the procurement processes is not done consistently. At least it is not documented, as such it can be shared with other project teams or policymakers. The two consultation groups CC-CP and KAG do review the procurement processes, in which market experts of IMG and purchasing advisors of regional BIOs are represented, but these groups are rather more a forum for exchange of knowledge and experience than intensive collaboration for improving and developing of market strategy.

**External evaluation**

Also External consultants have been hired occasionally to analyze procurement processes for specific projects, like for the project ‘A2 rondweg Den Bosch’ or ‘TweedeCoentunnel’. These analyses give a better understanding about the procurement progress, communication and interaction, and the consequences of the given project(tendering)conditions. Also recommendations are given for further improvement, but whether these recommendations have been taken into account in strategy developing is a question mark.

**Workgroup purchasing improvement**

Further within IMG a workgroup has been set up for optimizing the purchasing track. This group is especially focused on improving the relation between RWS and market parties in the context of purchasing and how RWS has to adapt to become a purchasing organization. This group works on a high level in the organizational structure.
Reflection SP2

Also for this strategic process RWS achieves the lowest maturity level of $1$ (see table 9.2). The main reason is that market strategy developing activities on tactical level for infrastructure works do not take place, whilst this market policy is critical for the translation of the corporate purchase strategy to operational purchasing policies. Since project teams are not supported by a strong market policy, they have to develop their own market vision and strategy as result that RWS has a very fragmented market approach.

It is mainly IMG which is concerned with the policy towards the market and the purchasing activities. It seems that this department is seeking to their position and responsibilities regarding this matter in the organization. From one hand they just have an advising role, and on other hand they also should develop and describe a clear RWS market strategy. However, IMG does well in setting the legislative framework with the standard contracts, but on the field of market knowledge they know very little. IMG should use the purchasing vision document as the base of their objectives and make the right translation from this document to the operational level.

At the same time there should also be a continual process of strategy evaluation and improvement. Evaluations for purchasing and procurement processes should be centralized and analyzed, and the market policy adapted, where needed, based on these results.

9.2.3 Strategic process 3: Supplier management

3.1 Suppliers selection

Suppliers selection due to EMVI (economic most valuable tender) have been carried through the organization. EMVI is a system that does not select the suppliers only based on lowest price, but also on quality (level7). The selection criteria of EMVI are related to innovation, sustainability, functionality and public orientation. For each project the focus of the selection criteria will be different.

But from the market there are also some critics on EMVI. Common complaints are:

- Each project uses a different definition of the selection criteria;
- The value-appraisal method is not uniform and different for every project;
- The defined criteria, RWS applies, do not give market parties sufficient chances to distinguish themselves from others, which make the price in most cases still being the critical factor for selection.

It could be concluded that some unequivocality within the organization is missing in the implementation of EMVI. This is confirmed by the contract and purchasing managers, who are of the opinion that the corporate purchasing management have not given sufficient guidance for the practical application of EMVI.

In the Spoedaanpak-projects a new method had been added for supplier selection; individual interviews were hold with the project managers of the interested market parties. In this interview RWS aimed to assess the management capabilities of the project managers in a face to face conversation.
3.2 Appraisal/measurement of suppliers

Pre-qualification
For the big infrastructure projects in normal cases a non-public procurement is applied. For a non-public procurement RWS makes a selection of suppliers who would like to participate in the procurement process and make a bid on the project. The qualification criteria, which is used for this selection, are based on the financial state of the company and the experience with an equal project. For the financial state, a certain minimal annual turnover has to be achieved by the company. This amount is based on the value of the project. And for experience with equal project the supplier has to show in other reference projects that they are capable to manage and execute such a project.

Past performance
In the described purchasing policy of RWS, RWS would like to introduce an appraisal system based on the past performance (PP) of that specific supplier for the pre-qualification or tendering. After each project, the supplier finishes for RWS, the performance of its deliverance will be measured. But till now this system has not been developed yet and reasons for this are:

- Legal issues restrain implementation of past-performance, since the selection process should be based on equality of all participating suppliers, according to the European regulations. Past-performance could violate this equality, because certain parties could be affected disadvantageously then (there could be more information from one company than the other);
- According to project managers it is a difficult process to measure the criteria of this system in an objective way;
- Also the appraisal would be very focused on an individual project manager or project team of the supplier, and he does not represent the whole company.

3.3 Suppliers market research

There is no structural process of supplier and market research to get and remain understanding of the suppliers and their future opportunities and competences. Purchasing advisors occasionally do some research when they believe it is needed to give the right advise concerning the project needs. However there is no such as a central body within the organization, which keeps market information updated and do fundamental analyses, like SWOT(strength, weakness, opportunity and threat)-analyses, for specific market sections and suppliers. IMG does provide market analyses to purchasing managers, but only on request for a particular project. It is worthy to mention that many purchasing advisors rarely use this service, because they think that the information they get does not add more details on what they already know or just do not see the importance of certain market information and analyses.

3.4 Distinguished strategy

Product-group
Distinguished strategy has been determined for some products (tunnel-installations, DVM-systems, de-icing), for which they find themselves in an imperfect market, RWS doesn’t have control on that market, or RWS would like to steer to certain developments in this market. This product-group strategy is mainly based in what way the product should be put on the market,
hereby the vital questions are to bring the contract integrally (bundled) or categorically (separate) and to what extent. Most of the strategies are still in the process of development (level6).

**Market section**
The market section strategy has not been determined. There is category management, which supposed to develop strategies regarding the specific market sections, but this did not work out successfully for road infrastructure and water infrastructure. For engineering services on the other hand a mantle contract has been drawn up for a group of procured engineering firms (preferable suppliers), for which the same conditions and prices count. The strategic process of drawing up of such a contract has been done through intensive market research and collaboration with market parties. Learnt-lessons should be concluded from this process. Purchasing models have not been applied during the development of the different purchasing strategies, which actually are inevitable for developing distinguished strategies.

3.5 **Documentation**
The developed product group strategies are elaborated in a report, in which the results of the analyses and the strategy is explained. It shows what the reasons and substantiating are for deciding on a certain strategy-direction.

Further documentation is this existence of this database, called company’s profile, which only describes the general information of the company, and procurement and project results they have involved in. All persons have access to this database. The information the database provides is not sufficient enough to follow a distinguished management policy towards the different suppliers, because it does not show any results of analyses or performances of them.

3.6 **Optimization of supplier base**
The product-group strategies do not make a link with how to do the management of suppliers. RWS does not have the intention to optimize its supplier base (level1). It tends to focus more on how to bring projects to the market than on building up strategic relationships with market parties. Therefore specific characteristics of suppliers (market participation, risks, competencies, performance) are not collected and no distinction is made based on this information and purchasing model between the suppliers to develop market and management strategies for different suppliers (level6). Also no tools are applied to measure suppliers and no actions are taken to improve their performances.

3.7 **Communication**
The communication between RWS and the market parties regarding performance and possible improvements hardly takes place. Sometimes evaluation-sessions are taken place after a certain project is finished, but these are not documented and do not suggest long-term improvement actions to achieve common goals. Most project managers do not face the urgency of this evaluation, because the chance is big that they do not have to work with the same supplier’s project team in the next project.
The supplier management activities of RWS scores a 4 (See table 9.3). RWS does well in the implementation of the appraisal/measurement system (pre-qualification, tendering) of suppliers on project base. EMVI in this regard is a very critical tool for making the final decision of the selected bid. However, it fails to create a vital foundation for developing market strategies. This means that there is little market research, little communication to market parties on evaluation and improvements and hardly any documentation of decision making processes and suppliers’ performances.

The supplier management should be more focused on acquire information about suppliers and adapt its strategy to the circumstances of the market. It seems that RWS knows exactly what it wants to purchase from the market, but it does not know from who they are buying. Market sections and product-groups have been identified for distinguished strategies, but development of effective purchasing strategies could only be done when knowledge and characteristics are gained from market and suppliers.

As last RWS strives to have a wider market, because it has encountered that its supply from the market is small. Therefore it should pay more attention and efforts for implementation of strategies to influence the participation degree and competition of the market.

**9.2.4 Strategic process 4: Stimulating market innovation**

4.1 Market Research
There is no extensive research on the market to gain knowledge about the market competencies and capacity regarding innovation (product and process). RWS is also not identifying specific best practices applied by suppliers involved in RWS projects to reproduce or reprocess successful innovative ideas or methods. RWS believes that if market parties have innovative ideas they would come by themselves and RWS does not need to search for it.

4.2 Purchasing policy

*Little innovative space*
For road infrastructure projects, it is usually difficult for market parties to draw up an innovative design, because of the settlement of the road due to the political ‘design alignment decision’
Purchasing Maturity of Rijkswaterstaat

(OTB= Ontwerp Trace Besluit). Also the functional specifications of the project leave too little space to come up with innovative designs. This is contained by the market parties as well as RWS project managers. They find that the functional specifications are not described on the right level; the requirements are too detailed. This makes it difficult for market parties to distinguish themselves from the perspective of the design. While they officially work under a ‘Design and Build’ contract, this rather seems to be an ‘Engineering and Build’. Causes for this occurrence is that the specifications are drawn up by technical engineers who do not want to lose control on the project and they do not dare to leave it all to the market because of the danger of risks. Usually also many detailed specification are put in the contract regarding subjects, which went wrong on previous projects. Besides, solutions for the problem are found first before RWS comes up with a functional specification, whilst it has to be the other way round. RWS is still inexperienced in specifying functionally. Making optimal functional specifications is still in his transition phase from its traditional method.

**Unclear innovation objectives**

To many market parties it is unclear on what fields RWS expects innovation. They believe that RWS should be more clear about the innovation objectives for a particular project, because innovation is also a standard selection criteria implemented in EMVI. Also a limited time-scope is given to the market to come up with a bid, which does not give the market parties the opportunities to think and work out innovative ideas properly.

One example of a project, where innovation was stimulated successfully, was A2-Maastricht. The interested parties were given a limited budget to design an integral spatial planning. It was the goal that the market parties create as much value as possible with the budget given. This resulted that the different parties had much freedom and space, and developed very innovative and distinguished alternatives and designs. For the bigger projects there is a design remuneration for the best five bidders, which cover partly the made costs of the market parties. There is no intelligible policy towards remuneration. The reason why it is remunerated partly is to encourage market parties to invest in the capability of selective and efficient procuring. However, the market believes RWS demand too many unnecessary and detailed documents, which cost the market parties a lot of human resources.

**4.3 Evaluation and improvement**

Evaluation with the market parties about the purchasing and procurement processes for identifying processes that need to be improved rarely take place. The communication between the two parties in this regard is nil. Market parties do not feel to be understood by RWS. Some common complaints they brought up:

Too many documents are requested during the procurement process, like project management plan, environmental plan, quality management plan. They believe that it is better to discuss these plans in detail with the final party. For other parties the many efforts they put in the plans would become wasted. Moreover, a RWS project manager confessed that RWS even does not check every document.

RWS should understand that it takes time to develop a plan/design from nothing to a complete bid. The limited time RWS gives to the market parties constrains the quality of the procurement deliverances.
Functional specifications are too detailed, which seem rather to be a technical specification. As consequence that the degree of freedom and innovation is limited. The planning of the projects are not brought to the market optimally. Sometimes couple of big projects are procured at the same time, which create an overrun of the capacity of market parties. In this way the procurement processes do not learn from experiences and determine best practices and failures. For example past external consultancy research have identified ineffective procurement process aspects, but it seems that not all regional of RWS have taken them into consideration, since the same complaints still appear.

4.4 Market involvement

Consultation
For some infrastructure projects (like Spoedaanpak-projects) RWS has introduced market consultation before the actual OTB has been determined (vervlechting). Certain market parties are invited to include their expertise into the project developing and discuss about the project needs. In this way the conditions of the project could be adjusted to the needs and circumstances of the market. It must be noted that this process could violate the equality principles of procurement, since some parties have been involved very early and have foreknowledge about the project, which could disadvantage other interested parties.

Dialogue
Another policy for more involvement from the market, which have been more developed within RWS, is the dialogue during the procurement process (concurrentiegerichtedialoog). This has been successfully applied in several infrastructure projects (A4 Burgerveen-Leiden, A12 Veenendaal-Lunetten). This process consists of two phases. First is the consultation phase, in which the party is given the opportunity to alter the project plan and requirements. Second phase is called the dialogue, in which bilateral discussion will be hold about the proposed (innovative) ideas and the distribution of the identified risks (level6). For proposed ideas property right and privacy intention are respected.

However, for most of the projects the involvement-level of market parties is substantially low during plan development. Simply RWS comes with a plan and it is the task of the market parties to design and build this plan. Hardly any chance is provided for the market to influence the project.

Information provision
Evaluation reports describe that market parties do experience the information provision during procurement as very accurate and effective. The information sessions and digital provisions give sufficient, timely and clear information regarding any project alterations and updated project data. However RWS do receive a lot of unnecessary questions from the participating parties, which consume much time during procurement. RWS attempts to reduce the amount of these questions. The information provision regarding the procurement results and feedback lacks clear directives. It is for each project different. Especially the qualitative evaluation of the supplier’s bid is not done consistently. Indicators or criteria have to be determined, assessed on the bids, and
eventually communicated with the supplier, such they can be selective on participating in certain procurement project, or improve the quality of its bids, which could stimulate innovation.

4.5 Decision making process
There is no clear formal decision making about the stage of involvement of market in developing of project. For each project the project management decides based on complexity and risks what procurement processes should be followed. For the different procurement process-forms procedures have been drawn up, which describes the process steps that has to be followed. Further the market scan is used for determining the optimal involvement of the market, thus that means assessing which procurement system is most suited for a particular project. This tool is applied as a more-value assessment.

<table>
<thead>
<tr>
<th>Table 9.4 Performance result strategic process 4</th>
</tr>
</thead>
</table>

**Reflection SP4**

Stimulation of the market innovation only achieves performance level 1 (see table 9.4). RWS has created the right framework for promotion of innovation, but is unsuccessful in giving the right filling-in, as result that actual design innovation by market parties cannot be realized. That is the reason many performance levels are orange colored; The right framework is provided with Design and Build-contracts, but little space is given, and no clear project-objectives are described for innovation. RWS is still careful to leave it all to the market. This could be the result of underestimation of suppliers. RWS does not want to lose control and therefore it is still not able to describe the functional specifications on the right (minimal) level, although this is improving. The fact that RWS is careful towards market innovative initiatives is because the lack of knowledge about their competencies and innovative developments on the market.

RWS has improved step by step with regard to the involvement of market parties through consultations and dialogue last couple of years. These processes have contributed positively to the collaboration between RWS and market, but limitedly to innovation. Therefore evaluation and improvement developments in this process should take place more consistently.

9.2.5 Strategic Process 5: Improvement supplier’s performance and control of contract

5.1 Performance measurement
At the end of project suppliers are not measured with a specific system, which also documents the results. Suppliers have only the responsibility to finish the project within the time and budget, and finish it according the quality requirements. Therefore only during the period of the project construction shortcomings, related to the specifications of the project, are discussed between RWS and the supplier and resolved on the spot.
5.2 **Contract control**

The RWS contract control is based on system oriented contract control (SCB=systeemgerichtecontractbeheersing) (level 6). The main thought about this system is that contract conditions could be controlled by RWS through the quality-monitoring system of the supplier. For this the supplier has described his working methods in its quality management plan. The minimal requirements regarding this plan is also described in the contract and forms hence the base of contract control. Random tests are done by RWS to check if specific data from the quality plan of the supplier comply with the data from the contract-control plan of RWS.

**Sub-contractors**

Not all parties of supply chain of the construction is considered in the contract control. Sub-suppliers work under the authority and responsibility of the main supplier. Therefore RWS would not like to interfere in those work processes and only sees the main supplier as the point of contact. RWS requires from the main supplier a project management plan, in which also is described how sub-suppliers are integrated and controlled by their supervisor. Further RWS has described in its vision document to do research how quality requirements, determined in the contract, could be passed further in the supply chain through the contract and agreed quality. But this research has not been commenced yet.

5.3 **Performance indicators**

There are no specific performance indicators determined to measure the performance of the supplier. Only the traditional criteria budget, time and quality are used to measure the successfulness of a project. These criteria do not say anything about the work processes and collaboration between RWS and supplier.

Recently a new performance measure system have been introduced for only engineering services. This is a survey for RWS project managers to appraise the performance of the project in which they have been involved. The performance indicators are related to the following fields: quality of the product, quality of the process, collaboration, and innovation and sustainability. Results will be communicated to the suppliers as feedback. The system is currently still in his pilot phase and only applied for engineering works.

5.4 **EMVI**

Quality management, which RWS requires from the suppliers in the bid, is an important criteria in EMVI (level 5). Since the whole RWS contract control is based on this plan, RWS has also established minimum requirements, which the suppliers have to meet in describing their quality management plan.

5.5 **Contract conditions**

The only reference which is used to measure the performance of the suppliers are the conditions of the contract. To stimulate the suppliers to deliver the work according to these conditions a bonus/penalty system have been implemented for good or poor performance (level 3). However, some suppliers are of the opinion that RWS is too focused on the contract, as result that they give a lot of penalties to suppliers, whilst bonuses are rarely given. They prefer to see that
problems are solved collaboratively. Some RWS project managers agree with this attitude and behavior (Dutch: houding and gedrag) to work with market parties as partners instead of in a strictly distinguished client-supplier relationship.
As already have been described, minimal requirements are given for the quality management plan, but each supplier has to design its own plan. This give them space to optimize its quality monitoring processes (level 4). SCB is a quiet new method applied by RWS, therefore the market parties needs some time to transfer and adapt to this new system. According to project managers the market has grown up a lot in operating its quality management system last couple of years and that it is still learning and developing.

5.6 Evaluation and improvement
Since there are no specified performance indicators and not a particular measurement system, suppliers are hardly evaluated on their delivered performance.
Also RWS does not follow a policy for improving the performance of the suppliers. For example organizing programs or workshops, in which RWS share knowledge, ability and experience to support suppliers to improve their activities. It must be noted that RWS cannot build up long-term relationships with specific market parties since they are a public organization, but they could make an approach to the whole market or just a section.

Table 9.5  Purchasing maturity level result strategic process 5

| Nr. | Criteria          | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | PL Result |
|-----|------------------|---|---|---|---|---|---|---|---|---|---|-----|-----------|
| 5.1 | Performance measurement | | | | | | | | | | | | 3 |
| 5.2 | Contract control  | | | | | | | | | | | | |
| 5.3 | Performance indicators | | | | | | | | | | | | |
| 5.4 | EMV               | | | | | | | | | | | | |
| 5.5 | Contract conditions | | | | | | | | | | | | |
| 5.6 | Evaluation and improvement | | | | | | | | | | | | |

| Result | 3 |

Reflection SP5

Table 9.5 shows that purchasing maturity level 3 has been achieved in this process. The maturity could even have grown to level 6, if RWS had clear performance indicators. What RWS is missing is a performance measurement system for suppliers, which can make evaluation possible and realize supplier’s performance improvements. More attention has to be paid to evaluation and therefore performance indicators are needed.
As part of the quality warranty the contract control through SCB seems to be implemented successfully and the contract conditions regarding quality management have been adapted to this. Although market parties still need some time to optimize its quality management system, progression is made step by step. The system makes it possible for RWS not following the supplier constantly for his realizations on the construction site, because controlling could be done ‘on distance’ now.
9.2.6 Strategic process 6: Strategic cost management

6.1 Cost management policy

Procedures
There is a document which describes the procedures for how to follow the cost management policies. The cost management is mainly focused on the construction costs and set up of estimations for projects. It does not take into account the economic consequences and nor it does draw up the cost and benefit analyses of the project for society. This has been done by external experts before the project is actually presented to RWS. Also the cost management does not do analyses during procurement processes to identify aspects of contract or process, which could be enhanced in efficiency. Several purchasing managers also indicated that the transactional costs during procurement are minimal comparing to the final constructions costs, and that is the reason that transactional costs do not get that much priority.

Steering-group
There is a steering group (called ‘Kostenbewust’) consists of cost managers from different regional bodies, which is concerned with the implementation of efficient-cost management. According to a cost-manager there should be more awareness about the costs that are made. Therefore this steering group aims to fulfill a more broadened role on cost management to enhance cost-estimations for a project. For example there should be more understanding of the technical aspects of the project solution. Only in this way cost advisors are capable to advise the project managers how to optimize the design to make it financially cheaper.

Life cycle
In the cost management policy the life cycle is not taken into account. Therefore the project team has no long-term vision on the construction of the project. For new construction projects maintenance is not even consistently included as a tendering criteria and the reason for this is because the budget for construction and budget for maintenance are from two separate divisions within RWS. And it is from the organizational perspective too complicated to combine the two divisions, a cost manager said. Usually in the contract with the supplier a usable-guarantee for a period of 5 till 10 years is demanded from RWS.

6.2 Cost models and tools

Not that many tools or other cost models are applied to support the cost management policy. Only a PPC and market scan, which take the financial aspect into consideration, are used to determine the most optimal procurement system from the financial perspective. This have been explained in strategic process 1 (level6).

6.3 Involvement other parties

The level of involvement from other parties and departments on cost management is low. Cost advisors miss the capacity to have an all-round view on cost management. This means having an understanding of aspects which influence the total costs, like technical, purchasing and contractual aspects. They tend to only make estimations based on standard prices and standard project solutions and this is also one of the reasons why many bids from the suppliers do not come close to the RWS project estimations. Involvement and collaboration with for example
Purchasing Maturity of Rijkswaterstaat engineering department and contract team to optimize design and contract conditions on efficiency rarely happens. Also the efficiency process is disturbed due to the fact that for infrastructure project not that many space is provided to suppliers to come up with innovative and cheaper designs and ideas. RWS does also not pay attention to evaluation with market parties how the transactional costs could be reduced and how market parties could participate and work on the bids with the least efforts (optimizing of processes).

6.4 Evaluation
Evaluations for the cost estimations are only limited to the comparison of the estimated numbers with the real costs. However, they are not done consistently and when they are done then the experience and knowledge deduced from the evaluation are not shared with others. Due to this other departments cannot learn from faults their colleagues have made before. There is coordination missing between the different regional departments, which make centralizing of knowledge and data regarding costs an almost impossible process. A contract manager believes that innovation on the field of cost management has to come from the work floor, therefore evaluation is critical. He also ascertains that more people are put in steering groups on a high strategic level in the organization and less people put on the operational floor, which make effective cost management has become more difficult.

6.5 Stimulation
There no stimulations programs for purchasing staff to generate ideas and strategies for cost reduction (transactional and total contract). The only steering group which is concerned with these topics is ’Kostenbewust’, as mentioned before.

Table 9.6  Purchasing maturity level result strategic process 6

<table>
<thead>
<tr>
<th>No.</th>
<th>Criteria</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
<th>7</th>
<th>8</th>
<th>9</th>
<th>10</th>
<th>PL-Result</th>
</tr>
</thead>
<tbody>
<tr>
<td>6.1</td>
<td>Cost management policy</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>6.2</td>
<td>Cost models and tools</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>6.3</td>
<td>Involvement other parties</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>6.4</td>
<td>Evaluation</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>6.5</td>
<td>Stimulation</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Reflection SP6**

Also this process, like strategic process 5, scores maturity level 3 (see table 9.6). It could have scored higher if the cost management policy is more focused on the efficiency of the project. The cost management should be more concerned with how RWS could achieve maximum output for minimal input. A strategic approach in this regard is missing. At the moment the cost management department is only limited and concerned with construction costs. There should be more integral collaboration with other specialized departments, like risk, technical, purchase and contract, to define the project needs. For example collaboration on analyzing the possibilities which contract conditions could be lessened inferiorly on quality to create a huge reduction in the price. Therefore more coordination is required to organize this process. Cost management
should be a vital element to bring a project efficiently on the market. Hereby it is also important that knowledge and experience gained from these activities are shared centrally.

After this the supporting processes will be considered. ‘OX’ is the abbreviation of supporting process.

9.2.7 Supporting process 1: Determining purchasing strategy and policy

7.1 Purchasing strategy and market policy

The RWS purchasing strategy on strategic level is clear and fine. The current strategy of RWS originates from 2004. Since this year the strategy has been focused on the principle of ‘market, unless.’. This means that RWS aims to put out all its work to the market, unless there are circumstances (e.g. high project risks) that makes fully market responsibility not acceptable. RWS prefers to be a network manager and would like to do more work with less people in this way. This has resulted in a switch to new contracts with bundling and integration of work processes. Also it aims to provide the market more space to bring in their own creativity and solutions.

The business plan for the period 2008-2012, called ‘Agenda 2012’, continues the strategy principles of ‘market, unless.’. In this agenda RWS has also set goals to become a leading principal towards the market. Therefore a realization plan has been set up for achieving this goal. Actions are determined regarding enhancing of cost control, optimizing purchasing organization, efficiency of purchasing process, and project quality improvement. Also critical in this regard is that the purchasing strategy is translated to a consistent and recognizable market policy.

This market policy seems to be missing in the purchasing activities of RWS. For the market section of road infrastructure no understanding of the market and its suppliers has been gained to develop targeted market strategies for this specific section. Market knowledge appears not to be considered as important for operating the purchasing strategy effectively. As for the part of product group strategies, these have not completely been developed and implemented as well.

7.2 Procurement procedure policy

The implementation of the market policy takes place through the procurement procedure policy, which occurs on project (operational) level. The policy, which is outlined in the purchasing plan, results among others in a certain project scope, contract choice, project planning, selection criteria and a certain procurement procedure. Briefly the policy describes how the project is put into the market, or in other words how the purchase is done from the market and which procedures are to be followed (purchasing plan). But this differs from project to project, because each project has its own unique conditions and circumstances. Integral efficiency for efficient purchasing has not been taken into account.

However for many purchasing advisors the market policy is unclear or underdeveloped, as consequence that a market policy (so far there is one) is rarely applied. There is no overall market strategy, which supports the project team in determining the project needs. Purchasing advisors do research by themselves if they think they need some information about the market.

7.3 Evaluation and improvement
Documented evaluations of procurement processes or contract results are hardly done. These are the operational effects of the purchasing strategy. Since there are no tangible criteria identified to determine the success of the purchasing strategy, it is difficult to evaluate and improve the strategy.

The only body where knowledge and experience regarding purchasing are shared and discussed is in the steering-group, in which market experts of IMG and managers of BIO are represented. However, according to purchasing advisors these meetings happen on a too high level, which does not result in improving and optimizing the purchasing operational activities. They believe that the group only comes together to talk and IMG subsequently do little with the information they get from these meetings.

During this research there was a benchmarking analyses going on between the regional BIOs on how the purchase is done. The results have not been presented yet but the initiator of this benchmarking project told that the BIOs show a very poor performance regarding purchasing. Anyhow, this benchmarking does not happen in a regular manner and is a voluntary initiative from the regional bodies.

7.4 Market involvement

Market parties are not involved in the developing of purchasing strategy and market policy. Since market knowledge is already limitedly used for the market policy, the involvement of market parties is not described in the activities for better development of market approach. Sometimes market parties are only approached for consultation at the beginning of a project regarding the project needs.

7.5 Allocation team

IMG has the task to develop the purchasing and market policy. Hereby they also introduce instruments which aim to make the purchasing processes for the project team easier and more effective. However during the development process the involvement of purchasing-concerned parties is minimal. According to most employees of BIO, IMG has no practical understanding of what happens on the work floor, as result that the guidelines and instruments IMG provides are too theoretical to be implemented in practice by the project teams, and purchasing advisors in particular.

IMG also does not do extensive analyses and evaluations of best practices and experiences of purchasing- and contract managers on the operational purchasing level, which could be taken into account in the strategy and policy development.

7.6 Risk and opportunities

As already mentioned market research is hardly done for developing the purchasing and market policy. Identifying the risk and opportunities from the infrastructure market section for infrastructure projects is therefore an activity that does not take place. It seems that market parties know more about RWS than RWS knows about market parties. Many purchasing advisors
think that they understand the market well, but are not aware that deeper market research is needed for an effective market policy and purchasing plan for a specific project.

![Table 9.7 Purchasing maturity level result supporting process 1](image)

**Reflection OX1**

Poor performance is achieved in this supporting process and therefore it has only scored level 1 (see table 9.7). The most critical aspect that is missing here is the development of a clear and strong market policy, which is the concern of IMG. It could be concluded that IMG has failed in the development of this policy. The corporate purchasing strategy is clear and has been set out for a period of four years. But the operational purchasing with the procurement procedure policy (purchasing plan) should be supported by a strong market policy. That is the reason the BIOs encounter a lack of support for executing the purchasing strategy. The market policy should be the translation of the corporate purchasing strategy into operational guidelines. It consists among others of market section- and product-group strategies, supplier management strategy, and tools for procurement. And for giving effective support for drawing up the most optimal purchasing plan more knowledge from the market should be acquired and also best practices have to be identified and spread. Further evaluation of the purchasing processes has to be done for improving and optimizing the market policy. Hereby involvement of market parties is elementary for effective development of policy.

**9.2.8 Supporting process 2: Arrangement of purchasing organization**

8.1 Coordination and collaboration

**Vertical collaboration**

RWS consists of 10 regional and 3 national bodies and each body has its own purchasing department. The regional bodies could be considered as autonomous entities, as result that the different purchasing departments operate with a fragmented purchasing policy and therefore an unambiguous approach towards the market is missing. Central coordination is not there to develop this.

IMG supposed to be the collaborative partner from the corporate level with the regional BIOs. However communication between these two departments is sluggish. According to a BIO manager IMG does not meet the needs of supporting BIO in their purchasing activities. The right translation of the purchasing strategy to a clear market policy, which could be implemented practically by the BIOs, has not been achieved. One of the reasons is that IMG is too theoretical in their approach and does not have a wholly understanding about purchasing in practice. Vice versa IMG blames the low capability level of purchasing managers for not executing a proper
purchasing policy. The collaboration level between these two departments is very low. IMG does not involve the BIOs in developing policy and BIOs do not involve IMG in their operational activities. This altogether has not created a fruitful and cohesive collaborative environment.

**Horizontal collaboration**

Also on horizontal level some collaborative issues occur. In contrary with the purchasing advisors contract managers are part of the integral project management (IPM), which makes the position of purchasing advisors not as strong. In the hierarchy they just have an advisory role towards the project management. For example the contract manager decides on the contract decision and the project manager determines the project scope. Purchasing managers are involved in the purchasing process relatively late, whilst they possess the purchasing knowledge and expertise. Many cases has occurred that tensions between the contract manager and purchasing managers caused by opinion conflicts in procurement policy. In the opinion of purchasing advisors the contract manager only involves them as his assistant and when he think his knowledge and expertise is needed. Up on it contract managers do admit that the expertise of the purchasing advisors is only used as framework within the purchasing and procurement procedures how it should be done. Therefore many purchasing managers believe that their position is heavily undervalued with regard to purchase. It has to be noted that the purchasing managers from the bigger projects, do not share the same experience, but they also agree that purchasing managers should obtain a bigger role in the purchasing and procurement processes. Right now they primarily fill in an administrative role during procurement. Several people also are of the opinion that the contract is drawn up first and then purchase is taken into consideration, whilst the project team have to look at purchasing considerations first and then the contract has to be given form based on this purchasing information.

**Integral collaboration**

From the project plan to tendering the project goes through several stages. For each stage different parties and departments are concerned with the project. But purchasing managers have encountered that there seems to be walls between the different departments. It makes collaboration difficult, as result that there is this silo-working process. The departments and teams (e.g. plan study-team, purchase, project team) are only concerned with their own task and are not involved in other stages or departments. This causes sub-optimization of the different stages. For example the plan study-team does not think about the final project goal objective, which is putting the project on the market in the most efficient way. Therefore purchasing experts should be involved in the plan study as well. It could be concluded that an integrated chain in project plan development has not been established.

8.2 Evaluation and improvement

Evaluation of purchasing results are hardly done. There are purchasing/procurement steering groups, but they do not look at the purchasing organizational aspects specifically.

8.3 Organization

**Functional separation**

If the RWS purchasing organization is considered from the functional separation perspective, it could be clearly seen that the department Market and Purchase (M&I=markt&inkoop) is the
initiator for developing the purchasing strategy on strategic level. The operational level is reserved for the BIOs, who has to implement and execute the purchasing strategy with the procurement procedures. In between on tactical level it is not clear what the role of IMG is. There are many opinions about it. Many people of the IMG staff consider themselves as just an consultancy group, which gives advice and support regarding purchase and develops the legislative framework for procurement. Originally they were, but BIO demands more support for example a clear market policy and tangible guidelines regarding purchasing policy. Most purchasing managers miss the translation how the strategy should be implemented effectively in practice. However, in the mission objectives of BIO is described that BIO is also partly responsible for tactical management of purchase.

**Project management - Purchasing management**

At the moment the purchasing policy is mainly developed in the project-team, but it could be concluded that purchase has definitely no strategic position in here. Main reason is that the leaders of the project, principal and project managers, lack the knowledge about or do not see the importance of purchase. If you approach the project-team from the purchasing organizational perspective you also could see that there is a gradation of strategic (principal), tactical (project manager) and operational (contract manager) level. The only communication and instruction regarding purchase takes place on operational level between contract manager and the purchasing advisor (BIO). Therefore it has been encountered that there is a lack of communication between the purchasing line- and project line-management in the higher levels.

**Centralized vs. decentralized**

In principle RWS has a decentralized organizational structure, but it has developed into a hybrid organization, in which decentralized as well as centralized purchasing take place. The regional bodies have their own purchasing department. These bodies could be considered as individual business units with their own autonomous purchasing function. This means that there is no centralized coordination or development of market strategies. IMG is the corporate purchasing management for central implementation of tools and functions as advisory board for procurement and market strategies. For projects above 35 million the project is sent to the DirectielInfrastructuur (DI), the national body of RWS, which will be responsible of the project then. Part of DI is also the central tenderboard, for bid evaluations, and the central purchasing department (BIO-DI).

8.4 **Involvement of market**

No cross-functional teams are assigned to work together with market suppliers for further improvement and innovation of the purchasing organization and processes.
Reflection OX2

An extreme low result has been achieved regarding the purchasing organization. Like in supporting process 1, this process also scores maturity level 1 (see table 9.8). All the human resources’ competencies and expertise are there for effective and efficient purchasing and also the organization is well structured to a certain extent, but the organization misses coherence and because of that the right collaboration and coordination (horizontally as well as vertically).

It could be ascertained that the tactical management level is the weak spot of the RWS purchasing organization, while this level is vital for implementing any strategy on the operational level. For the current situation it is vague what and who is responsible for determining the purchasing strategy on tactical level. Is it the regional BIOs with IMG as a sort of consultancy body or is it IMG which has to develop concise purchasing guidelines the BIOs have to follow? It is for sure that central coordination is missing for implementing an uniform purchasing strategy. Certain concluding organizational aspects that have to be enhanced or changed:

- Position of purchasing advisor regarding contract manager in relation to project involvement. This could possibly integrated into one function;
- The advising role of IMG. IMG could switch to bear the responsibility for implementing the purchasing strategy;
- Involvement from BIOs into the activities of IMG. Therefore a pro-active attitude is needed from IMG;
- Coordination to integrate different specialized departments for determining purchasing policy (risk, costs, market, technical, contract). This means establishment of cross-functional teams for decision-making;
- Communication between project line- and purchasing line-management.

9.2.9 Supporting process 3: Development of purchasing procedures

9.1 Legislation and regulation
Since RWS is a governmental organization, it has to follow and respect the legislation and pre-described regulations well, and therefore these have been taken into account in the purchasing and procurement procedures. The legislative framework is derived from the EU-directives concerned with procurement of public works. These directives are implemented in the Dutch law through the BAO (BesluitAanbestedingsregelsOverheidsopdrachten).

9.2 Integrity
Since the ‘bouwfraude’ has been uncovered at the beginning of this millennium the integrity matter has a high priority with RWS. There is attention paid to analyze cases on their integrity
principles by integrity experts from IMG. These persons also provide integrity advice regarding proper behavior during procurement and collaboration with market parties. Heavy measurements are taken, when integrity principles have been violated. This could vary from suspension till dismissal. Usually for the transparency of the decision-making these information are announced to all concerned employees, such that they can learn from it. Also discussion meetings are hold, in which integrity practical situations are discussed on how should be acted, but these are not consistently organized through the whole organization, and attendance is without any obligations. There are many cases for which a right answer could not be given. Anyhow employees of RWS are very careful towards receiving presents and accept invitations for dinner from suppliers. There are clear procedures for declaration-duty when these situations occur.

9.3 Communication
The communication regarding integrity has just been pointed out in the previous criterion. The communication to suppliers regarding the procurement procedures is experienced in a good way by market parties. They are well informed and updated about the procurement procedures, whenever they participate in a bid. Also during procurement they are provided with adequate information regarding the project through IT application. During the information-sessions in procurement processes suppliers are allowed to ask questions to RWS regarding project or procedures. However suppliers wish to see more transparency in the decision-making of the procurement and tendering results.
Internally there is no transparency or communication regarding the performance on the field of procedures, regulations and external collaboration.

9.4 Procedures for purchase and procurement
For the middle and higher management there are strict procedures which has to be followed regarding the decision-making process. Also on operational level for the purchasing supporting department, BIO, guidelines for purchasing have been written out. These consists of process descriptions for different kinds of purchases and process schemes, with elaborated steps which has to be followed for approaching different projects. Also for the procurement phase guidelines have been determined, which cover different procurement aspects, like tendering criteria, pre-qualification, procurement procedures and pre-qualification.
It is generally expected that the employees are aware of these procedures and work conform them, but this is not monitored.

9.5 Evaluation and improvement
There is hardly any reported evaluation regarding purchasing and procurement procedures. Although there is some internal demand for more monitoring whether employees work according the procedures and evaluation of this. On the operational level there is collegial control for different products of purchase. This means that co-workers check each other on their delivered work or performance (purchasing plan, and selection and procurement document). However, improvement aspects are not identified and optimization of procedures takes place too little. Sometimes there are theme-sessions with the concerned department, which discuss a certain topic that scored badly in the evaluation of audits and different checks. These sessions are not organized consistently and the effect regarding improvement actions is doubtful. It has
to be noted that these sessions takes place on regional level and evaluations are not gathered centrally. In this way best practices or failures are not shared with other regional bodies.

9.6 Audits
Audits concerning purchase is only focused on application of the financial system SAP, whether the procedures are followed up in the right way. Further they are no audits taking place regarding enforcement of purchasing activities and its procedures.

9.7 Public responsibility
Towards external parties the communication is well regarding procedures that is given out by RWS. The procurement procedures, RWS applies, are well known with the market parties, because RWS provides sufficient information about these matters and they are also documented. In this regard the transparency is achieved to be public responsible.

9.8 Tools
Tools are applied to make purchasing and procurement processes more efficient and effective:

- There are standard contracts to uniform the contracting processes and conditions.
- Application of IT for providing of digital information regarding project. There is sort of intranet system, on which all concerned suppliers can have access.
- There are decision making models (afwegingsmodel) and tools (market scan, PPC) to determine the right procurement system.
- IT financial SAP system, which eases and simplifies the financial administrative activities.

### Table 9.9 Purchasing maturity level result supporting process 3

**Reflection OX3**

RWS scores relatively high in this process with PL4 as result (see table 9.9). It could score higher, because there is a strong fundament of purchasing and procurement procedures, on which RWS is working. The procedures set up for purchasing and procurement activities and processes are
according regulations and legislation and based on integrity principles. Also the communication towards external parties regarding these procedures is experienced as sufficient and desirable. Since RWS is a quiet big organization procedures are important for keeping uniformity. However on operational level different policy enforcements are given to the guidelines and procedures. Therefore there must be more evaluation and audits to advance uniformity and continual optimization of the procedures. The current situation lacks these activities and that is the reason that it could not score higher than level 4.

9.2.10 Supporting process 4: Performance indicators for purchasing

10.1 Supplier’s performance indicators

The only performance indicators that RWS use for measuring the performance of the suppliers are budget, time and quality. Did the supplier provide the service within the agreed time and budget, and was the delivered according to the conditions of the contract. These data are collected in a central database by IMG. It must be mentioned that RWS does measure the performance of the supplier on quality constantly with the system oriented contract control (SCB). With SCB RWS controls whether the quality of the supplier complies with the agreed conditions of the contract.

There is not an extensive package of performance indicators for suppliers of infrastructure works. However, an evaluation survey has just been introduced only for engineering works. At the end of the project the RWS project manager could appraise and measure the performance of the supplier on collaboration, quality of process, quality of product, and innovation and sustainability. These data are collected and evaluated with the market parties. However this evaluation survey is only in his pilot stage.

10.2 Internal purchasing performance indicators

Even though in the Realization Plan 2012 RWS aims to have a more efficient purchasing process (lower transactional costs, reduce contracts and suppliers), there are no performance indicators which measures this efficiency. The project team and purchasing managers don’t have tangible goals that they have to achieve. Partly the reason for this is that the purchase is considered as a secondary process. From the corporate perspective there is no eye that more influence of a purchasing policy is able to bring projects in a more efficient way on the market, get maximum value for minimum money. Moreover, RWS only mentions about lower transactional costs and reduce contracts etc, but the cost reduction that is gained from here is minimal comparing to the total construction costs. RWS should take the project in the overall perspective, what do you put in, what is the output thereof and should ask themselves whether a lower input could generate the same output. This is what efficient purchasing about.

Further there are some guidelines (performance indicators) regarding supplier selection based on quality (EMVI).

10.2 Evaluation and improvement

There are hardly any indicators for external and internal evaluation of the purchase. Also there is rarely feedback to suppliers about their delivered performance. Since structural evaluation is not
there, it makes the implementation of improvement measures difficult. This is because evaluation has to identify weak aspects of the purchasing and construction process. Data and experience from finished projects are not collected and taken into account in purchasing plans for other projects. As result that best practices and failures just stay within the regional bodies or even with individual person and not spread to the whole organization.

<table>
<thead>
<tr>
<th>Table 9.10 Purchasing maturity level result supporting process 4</th>
</tr>
</thead>
</table>
|反映了OX4

From table 9.10 can be seen that performance level 2 is scored here. The main thing that is missing in this supporting process is a proper measurement system for internal purchasing performance as well as for the performance of the suppliers. The system aims to quantify the efficiency and effectiveness of actions, and corresponding guidelines. This is to increase the accountability within the organization, motivate individual purchasing employees and it functions as a supporting tool for continuous improvement.

Critical performance indicators should be identified first, before any evaluation could be done. These indicators should be linked to the purchasing strategy. The evaluation and analyses based on the performance indicators is vital for improving the purchasing processes as well as the work activities of the suppliers. Without performance indicators weak aspects could not be identified and progression could not be determined.

### 9.2.11 Supporting process 6: Human resource management

#### 11.1 HRM-support

RWS aims to give a quality impulse to the purchasing department through providing education for purchasing advisors. They are given the opportunity to obtain purchasing certificates at the NEVI (Dutch purchasing institute). This program teaches the basic principles of purchasing. There is no personal development plan for employees of the purchasing department, neither there is a specific HRM strategy for recruiting and selecting new purchasing personnel.

#### 11.2 Evaluation and bonus system

There is no monitoring system whether the purchasing procedures are followed and no evaluation about the purchasing performance. Also there is no bonus system for the project team for achieving purchasing targets or for good performance.

#### 11.3 Integrity

Integrity is promoted within the organization. IMG is concerned within setting an ethical framework in which RWS can behave morally during the purchasing and procurement processes.
Therefore discussion-meetings are held in where integrity-cases are presented to employees. These discussion-meetings does not take place with employees from the operational level, like the project manager and contract manager. IMG gives cased-based advise and analyses and evaluate the integrity liaison when there is a suspicion of moral misbehavior.

11.4. Competence evaluation and development
Within the organization there is this opinion prevailing that the purchasing competence of the purchasing managers, especially in the regional bodies, is really low. They do not have the right understanding of the principles what efficient purchasing mean, therefore they cannot meet their responsibilities and give valuable input. One of the reason is that since the strategy change couple of years ago within RWS, many people with totally no purchasing background have just been shifted to a purchasing position. Also in the middle management is lack of people with a real purchasing background. As result that the organization misses a strong purchasing mind-set and culture. Also on the way of communication (interpersonal skills) to and collaboration with market parties the RWS project-teams can make a huge catch up. However, these critical aspects are not evaluated and competences are not further developed. Purchase is also not part of the management development evaluation.

Of course employees have periodically meetings with their direct supervisor. In these meetings the activities of the employee are evaluated and they are given the chance to indicate the competences they want to develop further.

11.5 Teams
There are no multi-disciplined feedback sessions organized regarding the behavior and performance RWS during purchasing, and the procurement process in particular.

![Table 9.11 Performance level result supporting process 5](image)

**Reflection OX5**

Human resource management is not specifically focused on recruiting and training of purchasing staff. That is the reason why RWS only scores maturity level 2 in this process (see table 9.11). RWS strives to become a purchasing organization, but the purchasing mind thinking and culture has not prevailed yet within the organization and the human resource support for this is lacking. Concerned employees blame each other for not having the right purchasing expertise. Perhaps it is true that RWS misses experts with a real purchasing background. That does not mean that RWS cannot develop and train the current purchasing staff through sharing knowledge,
experience and best practices from other regional bodies or finalized projects. Therefore RWS could provide case-based training for developing strategic thinking on purchase. At the moment purchasing advisors are required to follow courses at NEVI, but this education institute only teaches the general principles of purchasing. The way the purchase of infrastructure works is a different case, which is more complex, and effective training could only be achieved by giving examples from practice. Also attention should be paid to application of purchasing models, which advances the processes of strategic purchase. These internal training programs should not be limited to only purchasing advisors, but project- and contract managers should be involved as well, because the purchase is also affecting them.

Evaluation in this regard is vital. The weak competences of employees should be identified for further development. For example RWS is still not very strong in its communication to the market. Many people could use training in presentation and interpersonal skills, but unfortunately these important aspects are not identified and improved.

9.3 Analyses of findings

This section will show the final performance level results of all the processes and describe the most important findings of the analysis. Therefore the strategic and supporting processes will be considered separately.

9.3.1 Findings strategic processes

In graph 9.1 the PL-results of the six strategic processes are shown. In overall it could be concluded that for the strategic processes RWS has achieved an insufficient final result and that RWS is an immature purchasing organization regarding the strategic processes. For three processes RWS even scores the lowest score of 1 (SP1: purchasing needs, SP2: tactical strategy, and SP4: innovation). The highest score that has been achieved is PL4, which is obtained by SP3: supplier management. SP5: supplier improvement and contract control, and SP6: cost management both have been awarded PL3.
Based on these results nine main findings have been deduced from the analyses regarding the purchasing activities of the strategic processes:

1. Purchasing and procurement tools/instruments are applied consistently and are well used (market scan, PPC, SCB, EMVI, standard contract). They still have to be developed further and optimized step by step, but certainly the RWS purchasing staff are getting more acquainted and market parties have learnt how to deal with them. These tools have been implemented into their purchasing procedures and activities. Note that the documentation of supplier’s performance have been an important key objective of the purchasing strategy for selection and tendering, but till now the ‘Past- Performance’ method has not been developed and implemented.

2. During the procurement process there is sufficient communication to market parties through dialogue and information sessions to discuss risk distributions and alterations to project specifications. However, there is a limited involvement of market parties for the determination of the project needs. Knowledge and experience from the market remain unused in this decision-making process. Also market research and analysis is an activity which is done poorly and are not taken into consideration for deciding on the project needs.

3. For a project there is no integrated decision-making and integral consideration on the purchase. Each specialized department (costs, market, risk, contract, technical) is only focused on its own part for its analysis regarding ‘how’ and ‘what’ to purchase. As result that the information and advise gathered is multi-disciplined, but not integrated, which creates fragmentation and sub-optimization of the analysis and project needs advise. The project management team receives unconnected puzzle pieces now, whilst an efficient and effective purchasing advise should be developed from different strategic perspectives. Figure 9.1 illustrates this occurrence. The blue dotted lines and arrows indicate the ideal situation for an integrated advice, which have been realized through collaboration between the specialized departments.
4. Cost management is not focused on advancing the efficiency of the actual purchase through analyzing the cost-aspect of the project specifications, contract scope, contract conditions and the procurement process. Right now it is only concerned with the actual construction costs. Therefore, as explained in the previous conclusion, integral collaboration should occur for obtaining the most efficient purchase, which means maximum ratio between output and input.

5. RWS lacks a tactical purchasing strategy, which could be considered as the market policy. This policy consists of specified strategies of the market sections and product groups, which is a tactical elaboration of the corporate purchasing strategy. The market policy suppose to support the project teams in their operational purchasing activities, especially on how to approach the market, and on decisions about purchasing needs and procurement procedure policies.

6. There is little till no continual evaluation of the purchasing activities. Best practices and learnt lessons of the regional bodies or projects are hardly shared with others for further improvements. Consistent evaluation and improvement processes are missed on:
   - Purchasing strategy and policy
   - Procurement processes
   - Purchasing processes and their decision making
   - Cost management and efficiency
   - Supplier's performance
7. RWS fails to create a vital foundation and gain resources and information for centrally developing of the market strategy. Root causes for this are:
   - Little market research and analyses
   - Little communication to market parties (evaluation and improvement)
   - Lack of targeted supplier management (documented performance and analyses)

As result of this each regional BIO has developed its own market strategy, which has caused a fragmented market policy enforcement throughout the RWS organization.

8. Innovation of the process and product have not been successfully stimulated. Little time and little space is provided to market in the design phase to apply innovative ideas due to too detailed project specifications and moreover the innovative objectives of a project are not made clear sufficiently by RWS. The latter is because RWS knows too little about the latest innovative developments on the market.

9. RWS lacks a performance measurement system, which measures the performance of suppliers for a finished project, based on the determined performance indicators. Therefore in the current situation it is not possible to do these evaluations and realize supplier’s performance improvements.

In figure 9.2 an overview is given of the findings and placed in the procedural context of the purchase. The red colored text means that that particular activity is lacking or not done so well, and green colored text means good implementation.

![Figure 9.2 findings strategic processes placed in procedural context of purchase](image)
9.3.2 Findings supporting processes

Like the strategic processes the supporting processes also receives an overall negative and poor purchasing maturity level, based on the results of the MSU-R model, see graph 9.2. For XO1: *strategy and policy* and XO2: *organization* RWS both score the lowest maturity level of PL1. Organization and strategy form the base for a purchasing function, and if these processes do not perform well together then the purchasing maturity of an organization is far to seek. The best result has been achieved by XO3: *procedures*, for which PL4 completes this process. XO4: *performance indicators*, and XO5: *human resource* are both appraised on PL2.

![Graph 9.2 Overview result supporting processes](image)

Also for the supporting processes eight main findings have been drawn up regarding the purchasing supporting arrangement of RWS:

1. Clear purchasing management on the tactical level is missing, which should be concerned with developing of the market strategy. The questions have been raised up: has the tactical management been partly integrated into both M&I and BIO department or is IMG assigned to enforce this task? It is certainly vague what the exact position of IMG is, a consultancy body or (corporate) tactical purchasing management? Regarding this matter even the IMG staff gave different answers. Figure 9.3 shows that there is a virtual direct connection from the strategic to operational level regarding purchasing policy development and that the tactical level (dotted) is passed over here.
2. BIO misses strategic purchasing support due to the lack of an unambiguous market policy. This policy supposed to be the translation of the corporate purchasing strategy to operational guidelines, which consists of practical and applicable resources and information. Missing of clear and practical purchasing guidelines and objectives reduces the success of efficient and effective purchase on project level.

3. From the perspective of the project management, communication regarding purchase only occurs on operational level between the contract manager and the purchasing advisor. This is the reason why through the project line-management no strategic purchasing mind-thinking have been developed and adopted, as consequence that within the project team purchasing considerations, as the MSU-R model has defined, for determination of the purchasing needs and procurement policy is subordinated to other aspects, which make purchase actually still a secondary process. This is clearly reflected in the late involvement of the purchasing advisor during project and purchasing plan development. Figure 9.4 shows that the higher project management level does not get sufficient purchasing input, while the whole project management team makes final decisions regarding purchasing matters through determining the project needs. The only communication line that occurs is between contract manager and purchasing advisor (marked as red). Further it must be noted that the scope of the purchasing staff is currently only limited to the purchasing organization (M&I, IMG, BIO), whilst the project management team is doing the actual purchase.
4. There is no central coordination to integrate different specialized departments (interdepartmental interaction) for determining purchasing plan and procurement policy. Because of this occurrence, horizontal collaboration hardly takes place. More information see finding 3 of the strategic processes.

5. There is a divorced collaborative relationship between the department IMG and the regional BIOs. This has led to the following main issues:
   - IMG cannot identify wholly the needs of BIO and adapt its policies to these needs;
   - The support and guidelines of IMG are too theoretical and has no practical fill-in for BIO;
   - There is little involvement of the BIO, in particular purchasing advisors, in developing of purchasing policy at IMG;
   - IMG is passed over when market advise has to be obtained
   - IMG is only approached on occasional base for advice regarding purchase
   - Information IMG and BIO exchange with each other is not valuable enough for strategy analyses or improvement management.

6. There is a strong fundament of purchasing and procurement procedures, on which RWS is working. However, too little audits are taken place to monitor whether all the purchasing departments enforce the policy as described in the procedures.

7. Performance indicators are insufficiently determined and applied in measurement systems. Performance indicators and consistently measuring of them are important for improvement of internal procurement and purchasing processes as well as the work activities of the suppliers.
8. HRM-support is not focused on recruiting and training of purchasing staff. This has caused the following issues:

- There is no analysis of personnel capacity and competences regarding purchase;
- There is no development and training through RWS specific project cases and experiences from past projects;
- Purchasing quality is lacking on operational level, especially in the regional bodies. There are little employees, who has the right strategic purchasing expertise and mind-thinking. This affects the quality of the purchasing advise, procurement and eventual decision-making.

Figure 7.5 gives an overview of the above mentioned findings placed in an organizational context of the purchase. The red colored text means that that particular activity is lacking or not done so well, green colored text means good implementation, and purple describes characteristics of a particular relationship or body.

9.4 Reflection on Results

*RWS cannot be a professional purchaser?*

RWS strives to become a fully professional purchasing organization, but based on the purchasing maturity results of the MSU-R model the organization is far from that. It could be wondered whether such an assessment-model is suitable to be applied on RWS, because there are reasons why it is difficult for RWS to become a professional purchasing organization as it is defined in business environmental industry; Firstly, RWS has to deal with political constraints. The Ministry of Transport steers the strategic policy of RWS and make decisions about the project’s planning and design requirements, and even in some cases enforces a certain contract type. Secondly, due
to strict governmental regulations, in which fair and open competition is promoted, RWS is not allowed to build up long-term (preferred) relationships with suppliers. For every project a new public procurement procedure has to start up, in which every supplier has to be given an equal opportunity to take part. The third reason is that RWS does not purchase big volumes of products of the same kind. Every project is unique with different conditions and requirements and needs a different approach. And as fourth, effective and efficient purchasing policy is not always the main priority. The societal responsibility of RWS makes it putting more value on improving the quality of life and environment, and stimulating the economy in most cases.

Lack of purchasing culture
Although the reality is that it is difficult for RWS to become a professional purchaser, as models and theories have defined, does not mean that RWS cannot strive to become an efficient and effective purchaser. Firstly, there must be a strong purchasing culture predominating within the organization. Currently, it seems that the traditional mind-thinking, RWS as engineering organization, still prevails over the perspective of RWS as a purchaser. This could be seen in the fact that RWS still wants to be highly influential on the technical aspects during design and construction processes. Although the organization is in transition but it has been six years already since the new corporate purchasing strategy was introduced. This purchasing culture should have been developed and rooted in the organization during this period. Unfortunately, till now there are internally still different perceptions given towards the definition of purchase, which do not advance RWS to become an uniform purchasing organization.

Secondary role of purchase
In the current situation purchase seems to be more an administrative process, with leading the procurement process as one of its main tasks, while there should be a strategic approach towards purchase to improve the position of RWS as principal and achieve significant cost efficiency. The fact that a strong tactical purchasing management is not being missed within the organization, concludes the corporate priority that is given to purchase. RWS knows exactly ‘what’ they want to buy from the market, but knowledge about ‘who’ and about the market section they buy from is lacking. And this influences the arrangements ‘how’ is purchased enormously with the doubt whether the decided arrangement is the maximum ratio between the purchasing output and input.

Small progressions...
However, the RWS purchasing and procurement procedures are well based and extensively described. Also procurement processes have faced progression regarding communication towards the market, selection/tendering, and application of procurement and purchasing instruments. Many internal staff have also indicated that it all can be done better. But therefore evaluation is critical to realize improvements, especially when an organization is in a transformation phase towards becoming a purchasing organization. Perhaps the Deming Circle...
would help in this process. Certainly there should be more central coordination and structure for action taking and implementation of the purchasing strategy.

Anyways, it is not all bad regarding purchase what have been encountered. Also exceptions have been contained, on which projects were purchased by sophisticated purchasing people; They tried out innovative ideas and new work methods, the purchasing mind thinking was better adopted, better market involvement applied, and a higher purchasing efficiency and effectiveness achieved. Different individual initiatives are taken to improve the purchase and communication with suppliers. However, the higher management of RWS seems not to pick this up and learn from these new developments. To make steps forward to that intended purchasing organization more efforts must be paid to identification of best-practices, evaluation of failures and to the spread of them to other operational bodies. Promoting and supporting uniformity is important in this regard.
Purchasing Maturity of Rijkswaterstaat
10 Reflection on model MSU-RWS

After have developed and applied the MSU-RWS model on the purchasing processes of RWS, this chapter describes a reflection on the model itself. Therefore this chapter consists of four sections; Firstly the application of the model will be evaluated through pointing out and describing the ‘pros’ and ‘cons’. Secondly, a validation on the model has been done with the contribution of purchasing experts, and in this section the results of it will be shown. Section 8.3 will cover aspects in relation to the use of the model that could have been improved or better approached during research. As last, the chapter will end with closing remarks.

10.1 Evaluation application of model

Based on the experience of applying the MSU-RWS model a list of ‘pros’ and ‘cons’ regarding the use of the model have been drawn up.

10.1.1 Pros

- For developing of MSU-R model, the original MSU model has been adapted and altered to make it suitable for the conditions and environment RWS works in. This has meant that certain processes and activities have been removed or added, in such a way that it is valid to the purchasing activities of RWS;

- The model assesses the purchasing processes, which cover a wide range of strategic, operational and supporting purchasing activities, including the critical purchasing aspects, identified by Kearney: supplier management, cost management, strategic sourcing, purchasing organization, performance management and supplier involvement in production. Note that the proper execution of all these purchasing processes is theoretically considered as professionally purchasing;

- It makes benchmarking possible; the quantitative results and performances could be compared among the different operational or regional bodies. Besides this, the qualitative results could be used for the improvement of certain process and the share of best practices. Also, the results could function as comparison material, such that the development of the implementation process of purchasing policy could be observed for a period of time;

- Throughout the qualitative assessment it is also possible to make a judgment about the corporate purchasing coherence, although the model is focused on the purchasing processes. This coherence could be expressed from three aspects: (1) the level the purchasing strategy have been implemented through the organization, (2) the degree of integration of the purchasing organization, and (3) the level of adoption and spreading of the purchasing culture among the employees;

- The model frameworks the purchasing function for the organization. It gives an extensive description of the purchasing activities, of which the purchasing function has to consist. Therefore the model is a great support for implementation of purchasing policy, and developing of purchasing processes and activities;
The application of the model is very practical for the individual employee (concerned to purchase). Employees could select only the processes, which are in their concern, because of the sharp distinction of the processes. The working of the model is totally not complicated and no extra courses are needed for usage. For each process already extensive descriptions have been given of the purchasing maturity levels and the related criteria. Therefore this model is a very good self-reflection/-evaluation tool of the employees’ purchasing activity.

10.1.2 Cons

- The model does not evaluate the current corporate purchasing strategy. It does not assess the efficiency and effectiveness of the followed purchasing policy. In the research the corporate purchasing strategy was even a given input data for developing of the MSU-R model. The model is rather a checklist for the purchasing processes, which audits whether a certain purchasing activity or procedure is executed;

- The model just identifies the purchasing procedures and activities, which are lacking or needs to be improved, but it does not guide or advise the organization how to make the arrangements for professionalizing the process;

- The purchasing maturity level-scores are generalized for the whole organization. Since the purchasing organization within RWS is not integrated and the regional bodies work rather autonomously (decentralized purchase), it would be in principle not legitimate to consider the score for the overall organization;

- It is difficult to draw the line whether a criteria of a maturity level is met or not. Firstly, the model objectivizes subjective observations. In this regard it could happen that someone’s interpretation or perception of the situation could lead to failure of the process, but with someone else a contrary judgment could have been drawn. Secondly, exceptions could occur, for instance some people do not act and work like the procedures prescribe. The question will be raised: do you have to take this into account in the overall appraisal of the organization then? Finding the right balance in appraising the criteria in this regard is hard, since the model has only two options;

- Misinterpretation of the final score: if a low maturity level is scored for a certain process, does not immediately mean that the whole process is executed poorly. Due to the ‘strict-step’ method it could occur that higher maturity levels are achieved, but could not be counted into the final score, because a lower level has not been met. Therefore in this particular situation the final score should not be considered as an overall appraisal of the process, but better be considered as a presence of a threshold or bottleneck which causes a low score for the process. This is clearly shown in strategic process 5, which has achieved level 3. If this process had accomplished level 4 as well, then it would have been acknowledged maturity level 6. Aspects in level 4 are the bottlenecks in this regard.
10.2 Validation of model

The original MSU model was meant for business orientated companies. Although this model has been altered and adapted, it still could remain purchasing aspects which are not valid for RWS or not applicable on the purchase of RWS. Therefore for the validation of the model the twelve most important aspects of the model have been presented to a group of purchasing experts in the form of statements (see table 8.1). The selected group consists of five prominent RWS employees concerned with purchase, see annex G. These persons had to react individually on the statements, including their substantiating. The table below shows the results whether a purchasing aspect is suitable for RWS or not. The ‘agreed’ and ‘not agreed’ results are expressed in a percentage of the group.

<table>
<thead>
<tr>
<th>Purchasing aspect</th>
<th>Statement</th>
<th>Agreed (%)</th>
<th>Not Agreed (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 Early involvement market and market section evaluation for strategic decision making</td>
<td>For strategic decision making on ‘what’ (project scope) and ‘how’ (contract type, bundling, planning) to purchase, could only be executed with a risk analysis of the market section, for which the project is meant, and with input and early involvement of the market parties (knowledge, experience).</td>
<td>80</td>
<td>20</td>
</tr>
<tr>
<td>2 Integral and interdisciplinary decision-making</td>
<td>One integral and inter-disciplinary (technical, market, contract, risk and cost) analysis and decision-making is needed for an optimal purchase.</td>
<td>80</td>
<td>20</td>
</tr>
<tr>
<td>3 Market evaluation and supplier analysis for market policy</td>
<td>Market-knowledge, -analyses and -developments, and detailed supplier characteristics are essential for an effective market policy for purchasing.</td>
<td>100</td>
<td>0</td>
</tr>
<tr>
<td>4 Product-group strategies or targeted market policy</td>
<td>Specific product-group strategies for a targeted market policy should be developed for an efficient and effective purchase.</td>
<td>100</td>
<td>0</td>
</tr>
<tr>
<td>5 Past performance documentation of suppliers</td>
<td>For effective supplier management documentation of suppliers' past performances is necessary</td>
<td>60</td>
<td>40</td>
</tr>
<tr>
<td>6 Distinction and classification of suppliers</td>
<td>Distinction and classification of suppliers (groepering op basis van karakteristieken en eigenschappen) have to be done for approaching the different suppliers in the most effective and efficient way during procurement</td>
<td>20</td>
<td>80</td>
</tr>
<tr>
<td>7 Early market parties involvement</td>
<td>Market parties must be involved into the project at an early stage, preferably when the purchasing/procurement plan still has to be developed</td>
<td>80</td>
<td>20</td>
</tr>
<tr>
<td>8 Freedom to market parties in design and construction</td>
<td>Market parties should be given the freedom to be innovative and therefore RWS should limit its project requirements to the functionality of the asset.</td>
<td>80</td>
<td>20</td>
</tr>
<tr>
<td>9 Responsibility to improve suppliers performances</td>
<td>RWS has the duty as leading principal in the road infrastructure industry to set up programs or systems for improvement of suppliers' performances for future projects.</td>
<td>60</td>
<td>40</td>
</tr>
<tr>
<td>10 Performance indicators for RWS purchase</td>
<td>Performance indicators have to be set up by RWS to measure its own purchasing performances.</td>
<td>80</td>
<td>20</td>
</tr>
<tr>
<td>11 Continual evaluations of purchase</td>
<td>Continual evaluations of procurement/purchasing processes and decision-making are necessary to optimize purchasing strategy and activities.</td>
<td>60</td>
<td>40</td>
</tr>
<tr>
<td>12 Specific HRM for purchase</td>
<td>Human Resource Management must be focused on the training and development of purchasing competencies within the purchasing organization and members of project-teams.</td>
<td>100</td>
<td>0</td>
</tr>
</tbody>
</table>

Table 10.1 Validation statements and results
From the table could be seen that the majority agree on all purchasing aspects, except on statement 6 about classification of suppliers. Opponents believe it is not necessary to develop a specific strategy-approach and therefore that the market knowledge does not have to entail the classification of suppliers. Note that some of the respondents thought that this statement was very unclear in its formulation, which could have given them another interpretation of the statement.

For three statements (5, 9 and 11) a conflict of opinions prevails, because of the 60-40 division in the group. These statements could be considered as discussion statements. The three purchasing aspects, on which this occurs are ‘past performance’, ‘improvement of suppliers’, and ‘continual evaluations’. Firstly, for ‘past performance’ opponents think it would not work because for the bigger projects nowadays more and more temporary joint ventures are awarded to construct, which consist of several parties. This makes it difficult to appraise the individual party and the information cannot be used for next procurements. On the other hand supporters of past performance believe it has to be obligatory, but also mention that time is usually a hindering factor. Secondly, ‘improvement of suppliers’ is a criterion on which is disagreed because regulation and legislation do not prescribe RWS that it is responsible to do this. Agreed respondents believe better relationships have to be built up with suppliers, such that the RWS policy could be better tuned with the wishes of the market, as result an improved quality of the product the market delivers. And as third, on the aspect ‘continual evaluations’ there is a tension between the doubt of effectiveness of evaluations versus that evaluations are necessary. I believe that both parties agree on evaluations on the condition that information is well used and analyzed.

On all the other statements there is clearer consensus within the group. Remarkable is that respondents mention that certain aspects are already part of the RWS purchasing policy and/or strongly agree with them, but while in practice those aspects not sufficiently implemented into the organization. Another remark worth to mention is that the common arguments that are given, when disagreement for an aspect strikes up is, are: ‘it does not belong to the task of RWS’, and ‘it is not necessary, because the current procedures is good enough’. The answers missed some concern with regard to purchasing content.

Based on the results of this validation it could be said in conclusion that there is an overall acceptance by RWS purchasers that the MSU-R measure model, with its defined purchasing aspects, is highly suitable for RWS-use.

10.3 Improvement of research

During research the model has been applied on the purchasing organization of RWS. Since this was the first time using this model some experience have been gained to improve the assessment of the purchasing function with this model for the next times. Therefore in this section three main research aspects of improvement will be elaborated:

- Basically the base for developing the MSU-RWS model was the theoretical framework from the literature and the input of the RWS purchasing strategy and organization. The
question could be raised if more specific research about RWS’ current purchasing activities and procedures was needed to develop a more customized model for RWS. Indeed more specific conditions and aspects, in which RWS works, would have been identified and applied into the model. However, the danger could be that what RWS current operations are considered to be good and implemented into the model;

- Since the purchase of RWS is decentralized for the big part, it would have been more legitimate if the research results had made a distinction between the regional body (Utrecht) and national body (the only two operational bodies which have been analyzed). Right now an overall conclusion have been given for the organization. And to get a representative overall conclusion of the organization all regional bodies should have been involved into this research;

- On the operational purchasing level the interviews should have been taken on a case(project)-based approach. Right now the questions to the interviewees were too much focused to get direct answers about the general purchasing activities in regard to organization, procedures and structure. A better process/approach would have been analyzing the general purchasing aspects by using the answers on the actions and procedures of a particular project.

10.4 Closing remarks

The results of the MSU-RWS model show a very well substantiating reflection of the current purchasing activities of RWS, and they have identified purchasing processes and procedures that need to be improved. These have even led to further research for the organization about for instance the optimal balance between centralized/decentralized purchasing organization and optimization of integral decision-making. Some have claimed that MSU-R is inappropriate for RWS, because of its governmental restrictions as public organization. However, RWS should put more efforts to look for the borders for what is possible or not, because there is a lot of space left over, for instance regarding supplier management. Of course the model is not completely perfect and brings some ‘cons’ with it, but this chapter also has suggested improvements for next assessments to (partly) overcome these ‘cons’.

Anyways, the results of the validation has shown that the content of the model is very acceptable for RWS-use. Therefore RWS could consider to apply this model on the different regional bodies, to compare and identify differences between each other. Further RWS also could use it over a period of time to track the progressing status and the development towards becoming a ‘professional’ purchaser (benchmarking).

The term ‘professional’ purchasing have been mentioned several times through this thesis. But it is difficult to a give a clear and unambiguous definition of this term, because some sense of subjectivity has been covered in the word ‘professional’, and moreover professionalism is a wide scope of activities, competencies, characteristics and procedures, which cannot be described in a couple of sentences. However, professional purchasing is certainly characterized by proper execution of the purchasing processes described in the MSU-R model. It is not expected from every organization to score a 10 on every process, because this depends on the priority and
policy of the organization, but the model is very useful as framework and base (at the same time) for building up that intended purchasing organization.
11 Conclusion and recommendations

This final chapter will elaborate the main conclusions and recommendations of this research thesis. In section 11.1 the conclusions have been drawn up, with regard to the purchasing maturity of RWS. These conclusions are based on the interconnection between the research findings and the principles of professionally purchasing. Further in section 11.2 recommendations have been given, which aim to improve and optimize the current purchasing processes, activities and procedures of RWS. And as closure an overall perspective on the purchasing organization and function have been explained. This closing remark emphasizes on the corporate aspects, on which RWS has to pay more attention for further development of the RWS as purchasing organization.

11.1 Conclusions regarding purchasing maturity

Based on the original MSU-model a new purchasing model (MSU-RWS) has been developed to assess the purchasing maturity of RWS. With the input of the RWS ‘corporate purchasing strategy’, and its conditions and environment, the original model has been customized and adapted for application within RWS only.

The model has evaluated and analyzed the strategic and supporting purchasing processes of RWS purchasing function. Primarily based on the findings, listed in section 9.3, and their linkage with professionally purchasing, 11 main conclusions regarding purchasing maturity have been drawn up in this section. The conclusions have been considered from the six main purchasing organization aspects, which are part of Kearney’s ‘House of Purchase’ (see section 5.4). These aspects are:

1. Strategy and policy
2. Strategic sourcing
3. Supplier management
4. Organization
5. Performance management
6. Human resources management

The first three aspects belong to strategic processes, and the aspects from four till six could be considered as supporting processes of the purchasing organization. Each aspect is a particular perspective on the purchasing function and altogether they describe very clearly the organizational status regarding the purchasing maturity. Therefore the conclusions are described from each perspective separately hereafter.

11.1.1 Strategy and policy

1. On strategic level Rijkswaterstaat has clearly stated the organizational objectives regarding the purchase of infrastructure assets and the market approach. However, a defined central market policy is missing, which ought to be the tactical translation of the corporate purchasing strategy. Due to this lack of an unambiguous market policy the operational (regional) bodies execute a fragmented purchasing policy towards the market, and experience insufficient support to achieve the corporate purchasing objectives. Too much is expected from the regional bodies' ingenuity, competence and flexibility on implementing and executing the purchasing strategy.
11.1.2 Strategic sourcing

2. Purchasing and procurement tools/instruments are applied consistently and are well used on the operating level of purchase, in order to come up with the best purchasing plan, contract and supplier. In spite of the effective support of these tools and instruments, the determination of the project needs (‘what’ and ‘how’ to purchase) is practiced undesirably. For each project there is no integrated decision-making, and no strategic perspective on the purchase. Each specialized department (costs, market, risk, contract, technical) is only focused on its own scope for its analyses regarding ‘how’ and ‘what’ to purchase. This results in information and advise (gathered separately) is multi-disciplined, but not integrated. The consequence is sub-optimization of both the analyses and the project-needs advises.

3. Further the concern for a cost-effective and efficient purchase is insufficient and even under exposed. Cost management is not focused on advancing the efficiency of the purchase, it is only concerned with the actual construction costs. More value should be generated from purchasing, for instance through analyzing the input and outcome of a purchase, and subsequently identifying the most optimal purchasing plan due to varying project specifications, contract scope, contract conditions, and certain arrangements of the procurement process.

11.1.3 Supplier management

4. RWS tends to show RAW-process and -behavior (traditional-procurement) during procurement, while D&C contracts demand sufficient interaction between RWS and the suppliers. Suppliers experience a formal environment during meetings for questions and answers, and experience the information exchange as unsatisfied. Main issues that occurs: suppliers’ questions cannot be formulated carefully through email, RWS acts reserved with freight to make procedural mistakes, and openness is diminished due to legislative fill-in of the procedures. The attitude and position RWS adopts and takes is critical for the level of interaction and collaboration between RWS and suppliers/bidders.

5. Rijkswaterstaat knows too little about the market and its (potential) suppliers. It could be concluded that Rijkswaterstaat knows exactly ‘what’ (product) it would like to buy from the market, but that it does not know from ‘who’ (suppliers) and the market segment they buy from. Neither extensive structural market analyses, nor supplier analyses are done to gain information (risks, opportunities, strengths, requirements, capabilities, competencies, interests and needs etc.) in order to develop specific supplier approach and useful market strategies.

6. During the procurement process there is an improved communication to market parties (suppliers) through dialogue and information sessions to discuss risk distributions and alterations to project specifications. However, there is a limited involvement of market parties in the early development stage of the project for the determination of the initial project needs (scope, specifications, design, contract, planning etc). Consequently, valuable knowledge, experience, and innovative input from the market remain unused in the project developing process.
7. There is limited design freedom for suppliers. Primarily because the RWS functional specifications are too specified and detailed that not that much scope is left over for supplier’s own input and innovative ideas. In conclusion D&C contracts are in practice Engineering and Construct contracts. Only the technical fill in of the project is mainly what is left, for instance construction techniques or material use.

11.1.4 Organization

8. Rijkswaterstaat misses on tactical level a distinctive central leadership regarding the implementation of the ‘corporate purchasing strategy’. This management level should be concerned with the central development of the tactical market strategy, and concerned with the support (instruments/tools, analyses, information) of the operating (regional) bodies in their purchasing activities. However, the legal department of IMG provides very well support on contract regulations and legislations and the development of standard contracts. But because of the lack of a clear and distinguished tactical level in the organization the operating bodies give different interpretation to the ‘corporate purchasing strategy’. Consequently, fragmented market policies are developed. The purchasing strategy has been spread in the organization, but everyone operates slightly different. Because regional bodies of Rijkswaterstaat do not act uniformly, market parties experience different approaches.

9. There is too little communication and collaboration, and hardly any links between the purchasing organization and project management teams. This is partly the reason why project management members (principal, project manager, contract manager ) have not developed and adopted strategic purchasing mind-thinking. While project management teams make the final decisions regarding ‘what’ and ‘how’ to purchase. Because of this lack of a strategic mind-thinking, purchasing is just a supporting function. Purchasing considerations for determination of the purchasing needs and procurement policy, as the MSU-RWS model has defined, are subordinated to other project aspects. This makes purchase in essence a secondary activity in the project development process.

11.1.5 Performance management

10. The performances of neither purchasing team nor suppliers are structurally measures and analyzed. Also evaluations of purchasing processes, policy or decision making do not consistently or hardly take place. For instance there is a high demand from suppliers to have proper feedback on their lost bid. Hence the missing of this concrete performance management policy does not create incentives, or an environment to reflect on delivered performances for concerned parties/persons to improve themselves. Anyways, purchasing processes and procedures that need to be optimized and improved cannot be identified without a formal evaluation/measurement system.

11.1.6 Human resources management

11. The Rijkswaterstaat human resources management is not focused on supporting and developing specifically the purchasing department and other internal staff concerned with either purchase or procurement. This has caused a lack people within the organization, who require the right
Purchasing Maturity of Rijkswaterstaat

strategic purchasing expertise and competencies. This explains partly why the purchasing-culture have not been developed and rooted yet in the organization.

Table 11.1 shows an overall summary of the conclusions:

<table>
<thead>
<tr>
<th>Purchasing aspect</th>
<th>Appraisal</th>
<th>Explanation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Strategy and policy</td>
<td>2</td>
<td>Fragmented purchasing policy towards the market</td>
</tr>
<tr>
<td>Strategic sourcing</td>
<td>2</td>
<td>Lack of integral and inter-disciplined decision-making</td>
</tr>
<tr>
<td>Supplier management</td>
<td>2</td>
<td>Too little is known about suppliers, lack of market involvement, and RWS hasn’t adopted the right attitude</td>
</tr>
<tr>
<td>Organization</td>
<td>2</td>
<td>Missing of tactical purchasing management and purchasing function segregated from actual purchase</td>
</tr>
<tr>
<td>Performance management</td>
<td>2</td>
<td>No measurement, documentation and feedback on internal and external performances</td>
</tr>
<tr>
<td>Human resources management</td>
<td>2</td>
<td>Not focused on developing the strategic purchasing expertise and competencies</td>
</tr>
</tbody>
</table>

Table 11.1 Summary of the conclusions

11.2 Recommendations on strategic and supporting processes

Based on the findings of the previous sections could roughly be concluded that RWS does not fully operate like how a professional purchasing organization ought to do. A significant amount of purchasing processes have to be improved to higher its purchasing maturity level. Moreover, fundamental and structural changes within RWS are even needed for approaching ‘excellence’ in its purchasing activities. However, recommendations on the latter would not be feasible for now. More extensive analyses are required to create a vision, to which the organization of RWS has to develop to become that efficient and effective purchasing organization in the long run. The 16 recommendations in this section have been set up to improve only the current strategic and supporting processes and procedures of the purchasing function. They could instantly cause an effect such that the purchasing function has a more valuable position in the core activities of RWS. The processes of the purchasing function must be able to generate a significant contribution to cost-effectively purchasing, and to the business advantages for the organization. From the perspective of each purchasing organization aspect the relevant recommendations have been elaborated.

11.2.1 Strategy and policy

1. A central purchasing market strategy/policy has to be developed on tactical management level. This market strategy determines how the form of a certain project (or a bunch of projects) is brought to the market (scope, contract, planning, requirement) for a certain project, including how the market and suppliers has to be approached. The market strategy should at least consists of purchasing goals, practical and applicable market resources and information, and specific
market and supplier strategy for each type of a project (category management). In order to use
the market optimally, a market strategy has to be developed, which is able to steer and control
the market.

2. In order to develop an effective market strategy extensive information and knowledge must be
structurally and consistently gained from the concerned market segments and potential
suppliers. An understanding of the market is important for optimal use of its suppliers. The
information should be gathered and analyzed from: supplier’s past performance reports,
suppliers’ analyses (interest, needs, competencies, capacity), and market development analyses
(economic and technical).

11.2.2 Strategic sourcing

3. More coordination and collaboration between concerned departments is needed for inter-
departmental purchasing decision-making during developing of an optimal purchasing plan. A
stronger leadership from the project management is required to combine and analyze integrally
the different purchasing variables (costs, markets, technical, market, risk, and contract) to
prevent sub-optimization and fragmentation of the decision-making (establishment of cross-
functional teams). With regard to this, the whole life-cycle of project should also be taken into
account;

4. The market strategy should be taken into account earlier, preferably during the project plan
study, when the borders and scope of the project still have to be determined. The project
management teams should be aware that market aspects is of critical importance for achieving
cost-effectively purchasing. The contract-type on itself should not determine the purchasing
objectives of the project. Therefore awareness has to grow that the purchasing process starts
before any decision have been made on the contract and its conditions, and not the way around.

11.2.3 Supplier management

A strong and clear policy has to be developed for the execution of supplier management by the
tactical and as well as the operational purchasing management. The current supplier
management should at least be improved on the next following elements:

5. Effective supplier management aims to gain and analyze information from the suppliers. This is
essential in order to develop specific strategies for effective supplier approach (or group of
suppliers). Therefore more information must be centrally gathered from suppliers, which are
documented past performances and research results of suppliers’ characteristics, needs, interest,
capacities and (innovation) competences. Data from past performances should also be used for
pre-qualification of the suppliers’ bids;

6. There should be structural communication/interaction sessions with suppliers and market (in
form of evaluation or market-sessions). This should be part of the purchasing policy in order to
learn from each other and build up a mutual trust. Also in this way, RWS is able to determine the
needs, wishes, and difficulties and thresholds of its suppliers. This information is useful, because
RWS could adapt its purchasing policy and its developed tools to the desired situation, if
necessary. Moreover, interaction with the market could also create a mirror for RWS on its
performances and acts, on which RWS could anticipate or improve; More time and attention should be paid to joint evaluation after the project-finish.

7. More collaboration between RWS and suppliers on the development of activities and programs, which have to result in improvement of certain performances of suppliers during construction or tendering. RWS could give workshops to specific market parties about mistakes suppliers consistently make, or could share best practices from other projects (knowledge transfer);

8. Earlier involvement of suppliers during the development of the project, in such a way that valuable knowledge, experience, and innovative input from the market could contribute to the form on ‘how’, ‘what’, and ‘when’ the project is brought to the market. RWS should find the borders in which they legally can act and protect equality;

9. There should be an overall better and more professional communication between RWS and the market parties during the procurement processes. Therefore RWS should act more like a facilitator during the information and consultation sessions, openness and flexibility are important aspects in this regard. It should show a stronger attitude of willing to collaborate and therefore it should create an environment to encourage suppliers to come up with best value bid, instead of sticking on the formal client-supplier relationship. The communication and interpersonal skills of individual RWS procurement managers have to be improved and therefore better trained and developed;

10. Further RWS should be more flexible in accepting and adopting alterations of the project specifications given by market parties during procurement stage. Anyhow the problems of a project will come up after all, and it is more efficient to identify these problems at an early stage, and therefore RWS has to create a wider scope for itself, which make anticipation on the project possible.

11.2.4 Organization

11. The purchasing organization of RWS should be more structured. It must be arranged in such a way that the purchasing policy is centrally led on tactical level. The tactical level is then responsible for further professionalizing and integrating of the purchasing activities, and for translating the ‘corporate purchasing strategy’ into operating processes and activities. At the same time the actual purchases could remain decentralized in the regional bodies. Considering the current situation, IMG should be more capable in and concerned with developing a clear market strategy/policy, which aligns the ‘corporate purchasing strategy’ with the operational policy. The purchasing ‘vision document’ in this regard should be its basic instruction booklet to work-out strategic purchasing directives for the operational purchasing teams. Besides this, it has been a finding that more human resources have to be put on this matter as well.

12. Further IMG should adopt a pro-active attitude towards the regional bodies through more collaboration with the BIOs to promote a uniform purchasing culture, e.g. sharing best practices, doing purchasing evaluations or developing policies and tools together. It should not be longer an unofficial advisory or consultation board, but an official tactical purchasing department, which
primarily is concerned with the implementation of the ‘corporate purchase strategy’ in the organization.

13. Members of the project management teams, project- and contract managers in particular, should be more involved in developing of the purchasing and market strategy on tactical level. Primarily for the reason that they make the final decisions on the actual purchase. Also they should consistently be provided with information and knowledge about strategically and cost-effectively purchasing.

14. Designation of a so-called purchasing-team for each project, which consist of people specialized in purchase, procurement, and contract. The head of this team takes part in the project management team and will replace the contract manager. The integration of the different functions into one team will advance an earlier involvement of purchasing expertise during the project development phases. Because purchase, procurement and contract are strongly inter-related with each other, this purchasing-team will enforce collaboration between the different scopes for deciding on optimal project needs and procurement policy.

### 11.2.5 Performance management

15. It is important in a transition period (from procuring to purchasing organization) to evaluate the new activities whether they meet the purchasing strategy and whether they are operated in an efficient and effective way. RWS should learn from lessons and deliver continual improvements, because these are vital for achieving the best performance. In other words for successful implementation of the new strategy performances have to be measured.

This performance management should not only be focused on financial results, but also on the aspects which underlie these results: product (quality, innovation, cost, sustainability, specification), suppliers (collaboration, satisfaction, involvement), and process (quality input, time, communication, selection). Therefore for the purchasing activities RWS has to set clear goals in form of performance indicators, measure these, analyze and act upon it where needed. For the latter programs for improvement has to be established as well. A handy tool would be the ‘Deming Circle’ (plan, act, check and do) then, which should be carried more widely through the organization in their activities.

### 11.2.6 Human Resources

16. Human resources’ policy has to prevent that the purchase are done and led by people, who make purchasing activities an administrative function. Therefore the HR of the purchasing department should show more commitment to develop the strategic purchasing expertise among its concerned employees on operational as well as tactical level. Central lead has to be taken by HR through being more active and visible in the regional bodies on providing training and workshops. These training sessions and workshops has to be focused on purchase of project in the specific environment and conditions of RWS, for instance knowledge transfer based on best practices or failures from past projects, and RWS project/case-based trainings.

Table 11.2 shows an overall summary of the recommendations:
### Table 11.2 Summary of the recommendations

<table>
<thead>
<tr>
<th>Purchasing organization aspect</th>
<th>Recommendation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Strategy and policy</td>
<td>• Developing central market strategy</td>
</tr>
<tr>
<td></td>
<td>• Gaining understanding of market and its suppliers</td>
</tr>
<tr>
<td>Strategic sourcing</td>
<td>• Installing better coordination for inter-departmental collaboration</td>
</tr>
<tr>
<td></td>
<td>• Earlier market involvement in project development</td>
</tr>
<tr>
<td>Supplier management</td>
<td>• Developing supplier management policies with regard to interaction, collaboration, approach, knowledge and information analyses, evaluation and involvement</td>
</tr>
<tr>
<td>Organization</td>
<td>• Designation of tactical management body to lead purchase centrally</td>
</tr>
<tr>
<td></td>
<td>• Showing pro-active policy in implementing strategy</td>
</tr>
<tr>
<td></td>
<td>• Enhancing collaboration between project management-teams and purchasing organization</td>
</tr>
<tr>
<td>Performance management</td>
<td>• Installing performance management system and structure</td>
</tr>
<tr>
<td>Human resources management</td>
<td>• Training and developing purchasing staff the strategic purchasing expertise and competencies.</td>
</tr>
<tr>
<td></td>
<td>• Applying specific RWS-cases for training and workshops</td>
</tr>
</tbody>
</table>

### 11.3 Closing remarks

This research has mapped the current situation of the purchasing processes within RWS. It could safely be concluded that in the transformation process becoming that intended purchasing organization RWS has still a long path to go. The overall low purchasing maturity level-scores, from the MSU-RWS model assessment, have shown that there are still a lot of improvements needed on both strategic and supporting purchasing processes.

Lack of centrally organized purchasing policy and market strategy, and decentralized purchasing activity by the regional (autonomous) bodies, have majorly contributed to a segregation between the purchasing function and the core activities of RWS. This gap has even caused that purchase has become a secondary and just supporting process, while the organization has to build around the purchasing function.

This occurrence is related to another interesting observation from this research, which encounters that there is a low coherence within the organization as well. Although no measurements regarding to this aspect have been done, the qualitative results have proved this low coherence. The low coherence has been expressed in a no clear purchasing strategy for the lower levels of the organization, lack of an integrated organizational structure for the purchase, and a weak purchasing culture among the people.

The low purchasing coherence and low purchasing maturity underlie together the reasons why the integration of the purchasing function and implementation of the purchasing strategy in the RWS organization have been quiet of a big challenge. In a study Van Weele (2003) already has pointed out that the effective cooperation across and synergy between purchasing departments and bodies on purchase is highly depending on both purchasing maturity and coherence (see
This cooperation is critical, because it is directly linked to the purchasing performance of an organization. This is shown in figure 11.1.

RWS has the potential to grow and become that actual purchasing organization. However, progression in the ambition to become a professional purchaser, therefore has to start with restoring the coherence within the organization, and at the same time improving the purchasing processes.

RWS has to be aware that the implementation of a new strategy does not go along with only organizational changes, but also with cultural alterations. Professionalism is not only about capability and competences, but also adopting the right attitude and behavior. Ramanarayan (2007) has described in his book about change management that four core tasks are put down for the organization to implement the change successfully and these are: (1) appreciating change, (2) mobilizing support for change, (3) executing change, and (4) building change capability. It is the latter on which RWS has a lot of work to do.

‘People make the business’ is often said. In this regard the critical weakness of RWS is the strategic purchasing expertise and competencies among the purchasing staff, which is underdeveloped. RWS should be more aware of the change of its position and function due to the purchasing strategy, whereupon the behavior of its organization and the attitude of the people have to adapt.

Therefore RWS must dare to make rigorous structural transformations in the organization, execute more control and guidance in the strategy implementation process, and as last RWS must adopt a more visible and pro-active policy in realizing the cultural and behavioral transition in order to achieve its purchasing corporate objectives effectively and efficiently.
## 12 List of abbreviations and definitions

<table>
<thead>
<tr>
<th>Abbreviation and/or term</th>
<th>Definition</th>
</tr>
</thead>
<tbody>
<tr>
<td>BIO (Bedrijfsvoering Inkoop Ondersteuning)</td>
<td>This body is primarily responsible for advising and supporting of the project management regarding the involvement of market parties on operational level.</td>
</tr>
<tr>
<td>Client</td>
<td>The company that purchases from the market. In this thesis RWS is marked as client, which purchases from its suppliers.</td>
</tr>
<tr>
<td>Corporate purchasing strategy</td>
<td>Strategy that has been implemented since 2004 to establish a purchasing function within RWS. ‘Market, unless..’ has been the motto, which means all executive tasks of infrastructure assets are purchased, unless it is socially not responsible due to the high risks.</td>
</tr>
<tr>
<td>D&amp;C-contract (Design and Construct)</td>
<td>An integrated contract, in which the project phases of design and construction are awarded to one supplier.</td>
</tr>
<tr>
<td>DI (Dienst infrastructuur)</td>
<td>Is a national body of RWS, in which the emphasis lies on knowledge development, knowledge protection, and the management of the bigger road infrastructure projects. Therefore DI is specialized in building technology, purchasing and project management.</td>
</tr>
<tr>
<td>EMVI (=Economisch Meest Volledige Inschrijving)</td>
<td>In English defined as Most Economic Advantage Tender (MEAT). This is selecting best value bid approach during procurement, which is not focused on lowest price. Also quality aspects, like sustainability and inconvenience during construction, have a critical role in the selection making process.</td>
</tr>
<tr>
<td>IMG (=Inkoop Management Grond en waterwerken)</td>
<td>IMG is a tactical body within the purchasing organization of RWS and has as main task anchoring the purchasing strategy within the organization, through developing and implementing strategies, monitoring and evaluating of purchase on operational level, providing the right market information for policy development on strategic and operational level, and adapting the purchasing tools on new developments and implement them.</td>
</tr>
<tr>
<td>M&amp;I (Markt en inkoop)</td>
<td>Is the body that functions on the strategic level. Therefore it supports the board of directors in developing the policy and practical implementation of the purchasing strategy</td>
</tr>
<tr>
<td>MSU-model (Michigan State University)</td>
<td>Is the original purchasing measuring model, developed by prof. Monkza, on which the MSU-RWS is based.</td>
</tr>
<tr>
<td>Term</td>
<td>Definition</td>
</tr>
<tr>
<td>-------------------------------------------</td>
<td>-------------------------------------------------------------------------------------------------------------------------------------------</td>
</tr>
<tr>
<td>MSU-RWS model (MSU-Rijkswaterstaat)</td>
<td>Is the customized and adapted purchasing measuring model for the assessment of RWS’ purchasing organization and function specifically.</td>
</tr>
<tr>
<td>NEVI (Nederlandse Vereniging voor Inkoopmanagement)</td>
<td>Dutch association for purchasing management</td>
</tr>
<tr>
<td>OTB (Ontwerp Trace Besluit)</td>
<td>Is the political (legal) determination of a road infrastructure project design, which cannot be changed or adapted by the executive parties.</td>
</tr>
<tr>
<td>OX</td>
<td>Supporting process of the MSU-RWS model</td>
</tr>
<tr>
<td>Procurement</td>
<td>Is part of the purchasing process. The procuring phase is primarily concerned with the selection of the best bid for executing a project.</td>
</tr>
<tr>
<td>Purchase</td>
<td>In the context of RWS is purchasing the obtaining of services (engineering, designing, maintenance) or products (bridge, road trajectory), which complies with the needs of RWS.</td>
</tr>
<tr>
<td>Purchasing manager</td>
<td>Is, as only BIO employee, represented in project team and advises the project management ‘what’ and primarily ‘how’ should be purchased under the conditions of the RWS purchasing objectives.</td>
</tr>
<tr>
<td>Purchasing organization</td>
<td>Purchasing organization covers all processes (from project needs determination to purchasing organization arrangements) and activities, which supposed to lead to strategic purchasing.</td>
</tr>
<tr>
<td>SP</td>
<td>Strategic process of the MSU-RWS model</td>
</tr>
<tr>
<td>Supplier</td>
<td>The market party, which delivers the service and or product to its client. In the purchasing circumstances of RWS the supplier is in most cases the contractor and the clients is RWS.</td>
</tr>
<tr>
<td>RWS (Rijkswaterstaat)</td>
<td>Is the executive body of the Ministry of Transport and Waterways of the Netherlands. This governmental organization manages and develops under supervision of the Minister of Transport the road and water infrastructure network. This means that the construction, maintenance and operation of the road infrastructure belongs to its core tasks.</td>
</tr>
</tbody>
</table>
13 References


Commissie Economische zaken, ‘Verslag overleg plan Professional inkopen en aanbesteden’, 2000


Pries, F. and Ridder, De H, ‘Innovatief aanbesteden; doen we het nu niet goed dan?’, 2005


