



# Research/Analysis Local Applications & Maintenance/Configuration of CMDB IT-Ops Local Apps of UPC Netherlands

*- Drawing a clear picture for the local applications team -*

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| Hogeschool Utrecht  | Eelco Tienstra | University mentor |
| UPC Netherlands     | Michael Butler | Company mentor    |



## Foreword

**T**his research/task description paper is about my traineeship at UPC Netherlands. This paper is the final stage of the Information Engineering course that I am taking at the Hogeschool Utrecht. During my traineeship I learned a lot about the work that I did there with the help of a group of enthusiastic colleagues. I would like to thank UPC Netherlands for giving me the opportunity for this traineeship, enabling me thus to complete my Information Engineering course.



First I will discuss the company UPC Netherlands. In later paragraphs, I will describe the tasks I was entrusted with, what the deliverables were and how I envisioned achieving them.

I would like to thank my mentor at UPC Netherlands, Michael Butler, and my University mentor, Eelco Tienstra, for their mentoring. I would also like to thank Michael Kroes for introducing me to UPC Netherlands and Bram van Haren for providing me with crucial information during this traineeship. Finally, I would like to thank Petra Verbeek and the Exam committee for their cooperation and for arranging of an extra graduation session for me.

Amsterdam, 06/23/2007 Terence Burt Eric Kroes



## Summary

UPC Netherlands has recently acquired the company Priority Telecom. All IT related activity of Priority Telecom has been integrated into that of UPC Netherlands. This integration created an unclear picture of the local applications and processes for the local applications team. This event resulted in my traineeship at UPC Netherlands.

The main problem/question was:

“How can the local applications team of IT Operations Local Applications UPC Netherlands, get a clear picture of, or insight in, the local applications and processes?”

The following questions make it a lot easier to answer the main question:

- “What information does the local application team need?”
- “Where can this information be found?”
- “How should this information be stored and presented?”

The “Inventory Local Applications” chapter in this paper focuses on the inventory of all the local applications that the local applications team uses. This will give the local applications team an idea of all the applications that are available.

The “Operation Procedures Manual” chapter in this paper will describe the drafting procedures for the Operation Procedures Manual. The manual will provide proper guidelines for the local applications team. In this chapter there is a Research & Analysis on the Local Applications. Different sources are used to achieve this research. The main research is done around the inventory and analysis of the local applications (further mentioned in this document as LA) and their processes. The term “processes” should be seen as the rules, procedures of those applications and the influences their actions have on other systems.

The “Maintenance & Configuration” chapter in this paper deals with the maintenance and configuration of the Configuration Management Database (further mentioned in this document as CMDB). In the CMDB the infrastructure of all local applications and their components is incorporated. This gives the local applications team (LA Team) at IT Operations Local Applications (IT-Ops Local Apps) a complete picture of LA infrastructure.



## 1. Introduction

**T**his chapter describes the structure of this document. The first paragraphs discuss how this traineeship came to be, the objectives of the different aspect, during this traineeship, the role an Information Engineer plays at UPC Netherlands, the main problem and also the official task description provided by UPC Netherlands for this traineeship.

In 4 stages, the chapter “Plan of Approach and Initialisation of Tasks” gives a global view of the completion of this traineeship with its different tasks. An account is given on those 4 stages with the requirements and restrictions for each of these stages.

In the last two chapters “Conclusions and Suggestions” and “Evaluation”, conclusions and suggestions are added, which were of great importance and there is also an evaluation of all the steps, methods and decisions made during this traineeship and in the above mentioned paragraphs.



### *1.1. How this traineeship came to be*

**N**owadays media or media-applications play an important role in almost everything. Because of this, UPC Netherlands wants to offer their customers a variety of multimedia-solution services. UPC Netherlands has therefore incorporated a “Triple play” strategy.

With “Triple play” consumers get access to different services via one connection. This technology makes it possible for people to watch television, surf the Internet and make phone calls via a super fast broadband Internet connection.

This is why, UPC Netherlands acquired the company Priority Telecom.

All IT related activity of Priority Telecom have been integrated into that of UPC Netherlands. The result of this integration is that it has become difficult for the LA Team to effectively do their job. This traineeship originated from that situation. The assignment of this traineeship was: to write an Operations Procedures Manual (OPM) and to maintain/configure a CMDB.





## 1.2. Objectives of the different aspects of this traineeship

The different aspects of this traineeship and its deliverables each have their own purpose (objective):

*This paper is*

- for UPC Netherlands as a reference for this traineeship
- the final stage for the Information Engineering course

Research/Analysis

- description of the inventory and research/analysis on/of the local applications and their processes

Operations Procedures Manual

- description of procedures and information which are important for a go-live of an application

Maintenance and Configuration

- population, configuration and maintenance of a Configuration Management Database



### *1.3. The role of Information Engineer at UPC Netherlands*

The role an Information engineer fulfils at IT-Ops Local Apps UPC Netherlands is that of an information analyst/specialist. A general description of the role of an Information Engineer at UPC Netherlands is that he/she has to ensure that all the available information is adequately synchronized with the information requirements within the company in respect of the different departments. In the case of this traineeship it means that an Information Engineer has to adequately synchronize the available information between the LA (available information) and the LA Teams requirements at IT-Ops Local Apps. The trainee must provide data availability and data consistency of all information for the LA Team.



#### 1.4. Main problem

The following main problem/question has occurred:

- How can the local applications team of IT Operations Local Applications UPC Netherlands get a clear picture of the local applications and processes?

*Sub-questions:*

The main question can be divided in the following sub-questions:

- What information does the local applications team need?
- Where can this information be found?
- How should this information be stored and presented?



### 1.5. Task description

UPC Netherlands has recently acquired the company Priority Telecom. All IT related activity of Priority Telecom have been integrated into that of UPC Netherlands.

The official task description of UPC Netherlands for this traineeship is literally:

"You will mainly focus on documenting the Local Applications team's process and procedures which my team severely lack. This would involve the drafting of an Operational Procedures Manual which would give the team a breath of understanding of the Local Applications infrastructure and provide proper guidelines.

Furthermore, I would like you to build a Configuration Management database so the LA team has a complete picture of LA infrastructure."

The greatest challenge in this project will be to structure and process the large amount of information, construct a timeline with various deadlines/milestones for the deliverables and also make sure that all targets are reached.



## 2. Introduction UPC Netherlands & Priority Telecom

In this chapter the companies UPC Netherlands and Priority Telecom are introduced. On both companies general information is provided, as well as a description of their products & services. There will be a more in-depth look at the company UPC Netherlands because, this traineeship took place there. A brief history of this company will be given, along with the IT NL company structure. The reason why only the structure of IT NL is provided in this paper is, that it is the most important department for this traineeship and also because a company overview of all of UPC Netherlands would take too much time and stray from the main subject of this paper.



## 2.1. Company information UPC Netherlands

### History of UPC Netherlands

In September 1999 cable company A2000 and Telekabel merged into UPC Netherlands. At a later stage the following local cable companies were acquired:

- Gelrevisie (1999)
- Tebaccari (1999)
- ENECO K&T (2000)
- Haarlem (2000)
- Alkmaar (2002)

UPC Netherlands, Liberty Global's local affiliate, is the second largest broadband cable operator in the Netherlands and part of the UPC Broadband division in Europe. UPC Netherlands provides video, broadband Internet (Chello), traditional, VIOP and mobile telephony services. With 2.3 million customers UPC Netherlands is the leader in advanced media- and telecommunication services in the Netherlands. UPC Netherlands has high grade communication networks in Noord-Holland, Zuid-Holland, Friesland, Gelderland, Flevoland and Noord-Brabant.

With the brand Priority Telecom, UPC Netherlands delivers services for the business market, so helping prestigious hospitals, energy companies and travel agencies to realise their business objectives.

(source: [www.upc.nl](http://www.upc.nl))



Figure 1 UPC Netherlands Kabelweg

Their Vision: Simply for everyone

"We believe that this exciting, but also complex digital world should be accessible to everyone. To make this possible, we will try to work as simply and as humanly possible in everything we do."



### 2.1.1. Company structure UPC Netherlands

The figure below represents the company structure of IT NL, UPC Netherlands. UPC Netherlands has different service centres in different cities. Because of the large size of UPC Netherlands, only the IT department is represented in the figure below.

#### **Coordinating mechanism and organisation configuration framework according to Mintzberg.**

From the figure below we can see that UPC Netherlands is a big and complex organisation. There is a clear hierarchy within the organisation and this organisation is divided into specialised divisions. According to the organisation configuration framework of Mintzberg, this would make UPC Netherlands a “Divisional organisation” with the coordinating mechanism “Standardisation of output”. (source: Organisaties en Informatie vijfde druk, drs.ir.R.T.M.Bots, dr. W.Jansen)

#### **LA Team**

The role of the LA Team is to help create the detailed technical requirements, to build the reporting/queries and to maintain the web and database parts, and to accept the project output for support and maintenance in IT Operations.

#### **CIO**

The role of CIO is to validate the development of the monitoring tool and to install and host hardware infrastructure for the server part of the monitoring platform.







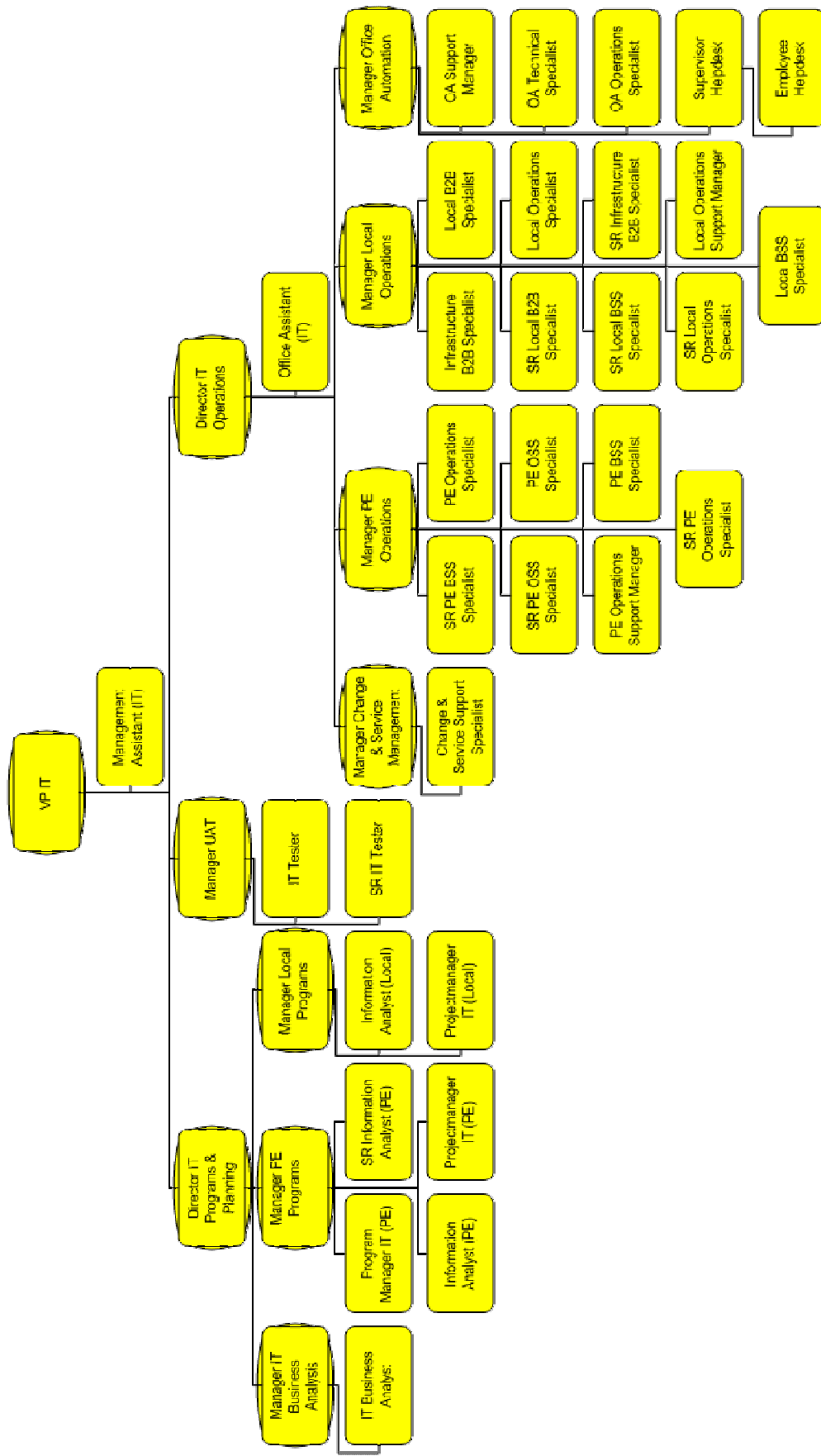


Figure 2 Organisational Structure IT<sup>1</sup>

### 2.1.2. Products and services UPC Netherlands

As mentioned earlier, UPC Netherlands is the leader in advanced media- and telecommunication services in the Netherlands. The services that they provide to their customers are divided into three categories; Broadband Internet (Chello), Telephony and Radio&Tv. Below, the above mentioned services and their products are described:

#### **Broadband Internet (Chello)**

**Chello** is a UPC Broadband Internet service. Chello offers a broadband Internet connection at a fixed monthly price without extra costs for a telephone landline which makes a fast and easy way to get access to information and entertainment possible. The different international Chello portals give access to carefully selected local, national and international broadband information. Products offered are Chello Starter, Chello Easy, Chello Light, Chello Power, Chello Classic and Chello Extreme. (source: [www.upc.nl](http://www.upc.nl) , [www.chello.nl](http://www.chello.nl) )

#### **Telephony (both landlines and mobile telephony)**

UPC Netherlands provides telephony services for both land lines as well as mobile telephony. UPC Netherlands also provides service for digital telephony over the Internet (VOIP).

##### **Land lines**

UPC Netherlands provides house phones (fixed landlines) with products such as Basic Telephony, FreeTime Telephony and AnyTime Telephony.

##### **Mobile Telephony**

UPC Netherlands provides mobile products and services for consumers. The services it provides are Prepaid Starter and Complete Prepaid packages (text messaging, voice mail, international calls, etc)

#### **Radio & Tv**

UPC Netherlands provides services for radio and television. There is a standard analogue service for radio&tv and also digital radio&tv services (Video on demand, interactive TV, etc).

#### **Complete packages**

UPC Netherlands also provides consumers with complete all-in-one packages with broadband Internet & Telephony such as UPC Internet Bellen Basis and UPC Internet Bellen Onbeperkt .

## 2.2. Company information Priority Telecom

### What Is Priority Telecom

**“P**riority Telecom is a privately held telecommunications company that offers comprehensive solutions to businesses and governments in The Netherlands and Austria. Besides governmental organisations, we target the healthcare, educational, financial services, utilities, security and retail markets. To serve these organisations in the best possible way, Priority Telecom exploits its own, resilient fibre network of over 9000 km length.

Because smooth communication is a prerequisite for attaining corporate objectives, our customers' ambitions form the starting point for the development of our business communications solutions. Whether your organisation aims at increasing profitability, lower costs, strengthening the relationship with its customers or increasing productivity: our solutions help you to realise these ambitions.

We base this promise on our years of experience in the delivery of voice, data, Internet and customer contact solutions. Although we operate nationally, our regional offices allow us to literally and figuratively be close to our customers. This involvement allows us to offer solutions that are exactly right for them.

We guarantee the reliability of those solutions by issuing detailed Service Level Agreements. Depending on the customer situation, we can partially or entirely take over the management of most solutions, so that customers may focus on their core competences.

### Services Priority Telecom

Priority Telecom, the business telecom specialist, anticipates on your unique and specific business situation through a refreshing and different approach. We use market- and customer based segmentation based on the size of activities, market sector, one or more locations, centralized or spread out applications and your business ambitions. This enables Priority Telecom to offer a solution, based on our complete and innovative portfolio of Telephony, Data and Internet services, which you can rely on.

Offering attractive solutions, using infrastructures with multiple access technologies, results in competitive advantages. The integration of telephony and data using our IP-VPN and VoIP solutions is one key example. But also optimal reach ability of your organisation through 088-company numbers and intelligent voice routing based services like 0800- & -0900 service numbers, Fall Back Routing and Customer Contact Solutions.”  
(source: [www.prioritytelecom.nl](http://www.prioritytelecom.nl))



### 3. Plan of Approach and Initialisation of Tasks

To effectively address the problems and tasks during this traineeship, it is important to handle them in a well structured order. This is why the tasks are divided into 4 stages (for a complete plan of approach, see Appendix A).

#### *The 4 stages in this Traineeship*

The first stage is the inventory of the LA that the LA Team uses. The second stage is the analysis, description and documentation of all those applications. The third stage is writing an OPM, using the information gathered in the 2<sup>nd</sup> stage. The fourth and final stage is the maintaining/configuration of the CMDB. The information gathered in the 1<sup>st</sup> stage is of great importance.

Account of the 4 stages

Before the 4 stages can commence, an account is given of these four stages. This gives an idea of the importance of these 4 stages, why the work is divided in 4 stages and how these 4 stages will be initialised.

Summary of the 4 stages:

- Inventory LA
- Research & Analysis LA
- Operations Procedures Manual (OPM)
- Configuration Management Database (CMDB)



### 3.1. Inventory local applications

#### Account of Inventory Local Applications

In this paragraph an account is given of the inventory of the current LA.

The inventory can be seen as a preliminary step for the research/analysis and the configuration/maintenance stage. This inventory describes the LA with which the LA Team has to work.

Research questions:

- What applications are there?
- Where can these applications be found?
- Where can information on these applications be found?
- What information on the applications should be described/documented?

Restrictions<sup>2</sup>

- Applications information missing items
- Information on applications are not found in a central place
- Some applications are not used anymore
- No consistency in information LA
- Information in current CMDB is outdated

#### *Applications information missing items*

While searching for the information needed to properly inventory the LA it became clear that a lot of information was missing (e.g. no IP address or hostname given, making it hard to search for the systems that the applications run on).

#### *Information on applications are not found in a central place*

The information on the LA was not found in a central place or repository. Some information was stored in the CMDB, on the SharePoint site and the remaining information was only known to the LA Team. Also, some of the LA Team members were no longer with the company resulting in information on certain applications being lost (or information being difficult to come by).

#### *Some applications are not used anymore*

During the restructuring within the company, some applications were not used anymore (causing redundancy in the information gathering stage of the inventory).

#### *No consistency in information LA*

There was no consistency in the different information on the LA. As mentioned above, the information on the applications had to be found in different places (systems). e.g. an application sometimes had opposing/conflicting information when found in the different places (different IP addresses, etc).

#### *Information in current CMDB is outdated*

The current CMDB contains a lot of information that is inaccurate or outdated. This means that for the greater part, the CMDB was of little or no use during the inventory of the LA.

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<sup>2</sup> The definitions of "restrictions" in this paper are the requirements and obstacles encountered during the account of stages in this traineeship.



### 3.1.1. Initialisation Inventory Local Applications

Using the questions in the account of the LA as a guideline, the realisation of the inventory of the LA is as follows:

In order to simplify the inventory of the LA, this inventory is done in 4 phases.

Phase 1: Finding out what applications there are and where information on these applications can be found

Phase 2: Establishing what information on the LA should be documented in the inventory stage

Phase 3: Documenting in full the information from previous phases

Phase 4: Verifying the information gathered from the previous phases

*Phase 1: Finding out what applications there are and where information on these applications can be found*

A list of the local applications was provided by the company mentor. This list contained the names of the applications supposedly used by the LA Team. Those LA were categorised by business value. The higher the business value of an application, the higher the priority this application has. The higher the priority, the more important this application is and the more attention should be paid to it.

After some research, it became clear that information on the different applications could be found in the current CMDB of CIO, on the SharePoint (Intranet) site at UPC Netherlands and with the LA Team.

The LA Team members are the persons using these applications and these applications are also their responsibility.

*Phase 2: Establishing what information on the LA should be documented in the inventory stage*

By taking a quick look at the CMDB, it became obvious what information should be documented for all LA.

The information that had to be documented for the LA was: Hostname, IP Address, Serial Number, Type, Manufacturer, Model, Location, Room, Rack, Asset Tag, Application, Country and Environment, OS. All this information was also used to populate the CMDB at a later stage.

*Phase 3: Documenting in full the information from the previous phases*

Now that it was clear which applications there were, what information of these applications should be documented and where information on these applications could be found, all that was left was to start the documentation (inventory) process. As mentioned in phase 2, the first place where information on the applications was searched for, was the CMDB. In the CMDB there was a search-function present which allowed searching the entire database for (information on) applications and components. Because this function did not work as it should, the whole contents of the CMDB had to be exported to an Excel-spreadsheet. This spreadsheet made it possible to still search through the contents of the CMDB.

It was made clear by the LA Team as well as the company mentor that the information on the applications in the current CMDB was not accurate and outdated. Therefore, the only information from the CMDB that was used for the inventory, were the table names to create a template for the inventory of the LA. The same template was used at the CMDB stage to provide the correct information and structure for the input of the information on the applications in the CMDB.

The next place, where information on the applications had to be searched for, was on the SharePoint site. On this site, some documentation on a few of the applications could be found. Documents were not found in a central repository and different templates were used when drafting these documents. This made searching for information, just like in the CMDB a difficult task. The remaining/missing information of the LA lay with the LA Team. A checklist was sent to the LA Team members to obtain information on the LA. This list provided valuable information on the LA, such as IP Addresses, Hostnames. It made clear which applications were no longer used. The complete inventory list could thus be filtered, to exclude those applications that were no longer used.

*Phase 4: Verifying the information gathered from the previous phases.*

In this final phase of the inventory, all information on the applications derived from the previous phases had to be verified. This verification could be made possible by visiting the Datacenter. The Datacenter is the repository for all the applications. It also informs where they are physically housed (on servers). In order to make gathering information from the Datacenter as effective and efficient as possible, a checklist had to be drafted. At a further stage of this traineeship, the CMDB has to be maintained and configured to contain all the data on the LA gathered in this inventory stage. The CMDB is maintained by a Configuration Manager at CIO. The use of a checklist from CIO, ensured that a certain consistency is maintained in the information gathered in this inventory stage and the way they will be entered in the CMDB in the maintenance and configuration stage further on in this traineeship.



## 3.2. Operations Procedures Manual (OPM)

### Account of Operations Procedures Manual (OPM)

In this paragraph an account is given on the Operations Procedures Manual that has to be drafted for the LA Team, what methods have been used to draft this manual, the restrictions and what questions arose.

The Operations Procedures Manual is a guideline for the LA Team to effectively do their job. The OPM serves as a support document with procedures and guidelines to prepare a project/application to go live. (Live status).

Important questions:

- What should the OPM be about?
- In what detail should it be described?
- Who will use the OPM (for whom should it be written)?
- Is there an existing method for drafting these types of manuals within the company?

Restrictions

- OPM should be placed on the SharePoint (Intranet)
- No existing concept/procedures for drafting the manual
- A lot of different documents on SharePoint (manuals, etc)
- The OPM should be drafted in English.

#### *OPM should be placed on the SharePoint (Intranet)*

The SharePoint site is the central document repository for the placement of information on all subjects within UPC Netherlands. It was decided by the company mentor that once the OPM is completed, it should be put on the SharePoint site. From the SharePoint, hardcopies of the manual can be printed, should there be a need for it.

#### *No existing concept/procedure for drafting the manual*

There was no existing concept or procedure for the drafting of the OPM. This meant that a template had to be made where it is clearly defined what information about the applications should be described and how this must be done.

#### *A lot of different documents on the applications on the SharePoint*

Because there are a lot of different documents of all the different applications on the SharePoint, it was important to firstly establish how the new OPM should be drafted (see “No existing concept/procedures for drafting the manual”). Information found in all the different manuals on the SharePoint should not be put in the new OPM to ensure that there is no redundancy in the information. The new OPM is not drafted to replace the other manuals. A link is put in the OPM referring to the place where the other manuals can be found.

#### *The OPM should be drafted in English*

It has been decided that for the uniformity of the OPM, this OPM should be drafted in English.



### 3.2.1.Initialisation Operations Procedures Manual

Using the questions in the account of the OPM as a guideline, the realisation of the OPM is as follows:

In order to simplify the OPM this stage is divided into 3 phases.

Phase 1: What should the OPM be about and what information is needed for it?

Phase 2: Division of the OPM in 3 layers (drafting a template for the OPM)

Phase 3: Gathering the information needed

*Phase 1: What should the OPM be about and what information is needed for it?*

After consulting with the company mentor, the result was that the OPM should contain information needed to support the LA Team to successfully implement a go-live for the applications. What is meant by “live” status is: the stage where an application or project has completed its implementation phase and is ready for use by the end-users. It is essential: what processes, procedures, components are needed and what effects the applications have on other systems.

*Phase 2: Division of the OPM in 3 layers (drafting a template for the OPM)*

As mentioned in the account of the OPM stage there was no existing template or procedure for drafting the OPM. A general template had to be made to efficiently document the information on the applications in the OPM. When drafting the template, the OPM was divided into 3 layers. Each layer has its own purpose and is designed to maximise the effective usage of the OPM. The 3 layers of the OPM are:

Layer 1: Quick summary application information

Layer 2: Procedures and Approvals

Layer 3: In-depth look applications

*Layer1: Quick summary applications information*

This layer provides a quick summary of important information on a specific application. Key information such as: Hostname, IP address, OS, Firmware, Patch history, URL, Database, Key personnel is displayed. A link is also placed in this layer to an Excel-spreadsheet(temporary local CMDB), because some of the information on one of the items mentioned in this layer might change and the local CMDB would contain the most up-to-date information.

*Layer2: Procedures and Approvals*

In this layer all procedures regarding the specific application are documented. These procedures have to pass certain channels to get approval. It is important that these procedures are followed and approvals are acquired before an application can/may be changed. For the change of each application, a request for change or RFC or request for service RFS has to be submitted and approved (best practice ITIL)

*Layer3: In-depth look applications*

In this layer, an in-depth look is documented on the specific application. There is an in-depth look on critical processes and success factors for the successful go-live of the specific application. Here matters are documented such as: requirements, influences of changes of these applications in regards to others (systems and users), backups, etc.

*Phase 3: Gathering the information needed*

In this phase information is gathered for all the layers in the second phase. The information for Layer 1 can be found in the inventory stage that is done on the LA that the LA Team uses. The information goes through a filtering process to determine what information of the inventory is necessary to add into the OPM. Not all information from the inventory is needed for the OPM. The information for Layer 2 and Layer 3 can be found in the “Research & Analysis Local applications for OPM “further in this document, where information is documented on the processes that these applications have. The information for Layer 3 can be found in the inventory of the LA stage as well as the “Research & Analysis Local Applications OPM “





### 3.3 Research & Analysis Local applications

#### Account of Research & Analysis Local Applications for OPM

This stage will describe the steps taken to gather and documents the information needed for layer 2 and layer 3 in the initialisation Operations Procedures Manual. In order to get the information needed for the two above-mentioned layers, a few fundamental questions had to be answered:

##### Layer 2: Procedures and Approvals

- Are there existing rules and procedures for the go-live of the applications?
- Where can these rules and procedures be found?

##### Layer 3: In-depth look applications

- What are the requirements/information needed prior to a go-live of an application?
- What are the effects of a change (go-live) of an application for other company resources (servers, applications, etc)?
- Where can information on the above stated questions be found?

##### Restrictions

- No existing method
- Information on LA and its processes lay with the LA Team member
- Existing procedures not known to LA Team members
- Relationship with other departments

##### *No existing method*

There was no existing method for analysing /researching the applications and their processes. A method had to be created to analyse/research the applications.

##### *Information on LA and its processes lay with the LA Team members*

The information on the LA and the processes concerned with these LA, had to be found at the LA Team members. Each member is responsible for certain applications.

##### *Existing procedures not known to LA Team members*

Each of the applications has their own procedures that have to be followed. These procedures were not always known to the LA team members. Because these procedures are not stored in a central document, they were not know to all LA Team members, old or new.

##### *Relationship with other departments*

Some applications have a link or interfaces with other applications. Some of these applications are used at(belong) to other departments. This means that special attention has to be paid to these applications for they affect other departments as well.



### 3.3.1 Initialisation Research & Analysis Local Application

Using the questions in the account of the Research & Analysis as a guideline, the realisation of the research & analysis is as follows:

In order to simplify the research & analysis of the local application this research and analysis is done in 3 phases.

Phase 1: Deciding what information on the applications is of importance

In order to find the information that is important for the functioning of the applications, one has to look for it in different places. A good source for this kind of information are the different manuals on the SharePoint site. Some of these manuals have not been drafted recently, so in order to get the most accurate and up-to-date information, a walkthrough of the application is needed. In order to achieve this, time is spent with the LA Team members, as they perform routine tasks/procedures in the different applications. All this is then documented. The reading of the manuals before watching the team members perform their routine tasks ensures that one has some beforehand knowledge of the applications, eliminating the need for constant explanation on certain procedures. The results of the “walkthrough” of the applications by the LA Team members is the information provided as mentioned in the three layers in the “Initialisation Operations Procedures Manual”.

Phase 2: Identifying procedures

Layer 2 R&A:

Before an application can go “live” or a change has to be made, a request has to be submitted. This is called an RFC or Request For Change (best practices ITIL). Each application also has an RFS or Request For Service. This RFS is needed when service is required for one of the applications. Each procedure of these requests had to be documented. (Some of these requests have to be approved by managers and have to go through the appropriate channels). It is important for an LA Team member to know at what stage these procedures are before a change can be made on an application. It is important to find these procedures on the requests and add them to the OPM. Most of these procedures had already been drafted but are housed in different documents or lay with certain key people within the company.

Layer 3 R&A:

It is important is to know what effect a change in the application will have on other resources within the company. Such resources can be other applications and systems. Multiple applications run on one server so it is important to know what other applications run on the systems the applications of the LA Team are installed on. Other important information is to know what patches and backups such an application has, what licenses there are and what the license number is, how many users it has and how many users will be affected if the application is changed.

Phase 3: Documenting information previous phases (preparation for OPM)

The information that has to be documented will mostly be descriptive. If needed, diagrams and workflows will be drafted. In most cases, the LA Team members had already made such diagrams and workflows. With their permission, if there are changes in the procedures, these diagrams and workflows will be edited accordingly.

The results of all the 4 phases are reflected in the OPM. Because of the confidentiality clause within the contract signed at UPC Netherlands, only the template of the OPM will be enclosed as an appendix. A request for further information requirements has to be cleared with UPC Netherlands first.

Information gathered in this research & analyses are also of use on another project within UPC Netherlands. This project entails the drafting of a handover-document for management. In this document a template is created for management, to properly hand over a project(new application, etc.) to IT Operations. Attention is also been paid to work on this project alongside the drafting of the OPM.



### 3.4 Configuration & Management Database (CMDB)

#### Account of Maintenance/Configuration CMDB

In this paragraph the maintenance and configuration of the CMDB will be discussed.

For a large-sized organisation such as UPC Netherlands, it is very important to manage all its applications and processes. To do this UPC Netherlands uses the best practices<sup>3</sup> method ITIL<sup>4</sup>.

As organisations become bigger they are increasingly dependent on IT in order to satisfy their corporate aims and meet their business requirements. This automatically leads to an increased requirement for high quality IT services

ITIL helps organisation highlight potential weaknesses in their previous operations and encourages pro-active improvements, shortened resolution times, better management control, more reliable IT services and the implementation of permanent solutions to formally acknowledged problems.

By applying ITIL Best Practice to IT Operations in an organisation, that organisation can take full advantage of many ways to better cost control and cost reduce. A lower Total Cost of IT Ownership (TCO) can be achieved through increased efficiency and productivity, lower incident volumes, faster incident resolutions and less business disruption because of service failures.(source: Business Service Management – The ITIL Way, [www.axiossystems.com](http://www.axiossystems.com))

ITIL also gives a clearer understanding of IT's critical importance to the business operation. Organisations consider it to be enough to simply maintain the IT infrastructure by adjusting and upgrading after the need has arisen. Today IT managers are expected to support the success of the entire business by planning ahead and pro-actively shape the business IT environment.

#### Intro-CMDB

A CMDB is mostly associated with the best practices of ITIL. A CMDB is a central federated repository for all components related to the business operations. The CMDB contains CIs or configuration items. This gives an organisation a complete overview of the company assets and can therefore manage those assets accordingly.

#### Important question

The different questions are defined as follows:

- Which local applications and processes are there?
  - What information should be added into the CMDB?
  - Are there certain standards/rules/procedures for adding CIs into the CMDB?
  - Should the current database be used to store the information on the LA?

#### Restrictions

- The CMDB is managed by a Configuration Manager
- Items are missing in the CMDB
- Duplicate entries in the CMDB
- Missing applications in the CMDB
- Search function of the CMDB not working properly
- CMDB owned by CIO
- Procedures for adding information in database
- Possible replacement for current CMDB

<sup>3</sup> [http://en.wikipedia.org/wiki/Best\\_practices](http://en.wikipedia.org/wiki/Best_practices)

<sup>4</sup> ITIL Information Technology Infrastructure Library



*CMDB is managed by a Configuration Manager*

Every time something has to be changed in the CMDB a request has to be submitted. This means that adding information into the CMDB is time-consuming.

*Items are missing in the CMDB*

When searching for information on applications in the CMDB, it proved that they lacked certain information. This made for an incomplete inventory of those applications or components during the inventory stage.

*Duplicate entries in CMDB*

The CMDB has a lot of duplicate entries. This allows for redundancy in information. Some of the duplicate entries (e.g. hostname, IP) had conflicting or missing items resulting in inaccurate inventory of the local applications.

*Missing applications in the CMDB*

Not all applications could be found in the CMDB. This makes it difficult to update them. Only the Configuration Manager can add new applications or components into the CMDB.

*Search function of the CMDB not working properly*

The search function of the CMDB does not work properly, which makes finding applications a time consuming task. In order to get information out of the CMDB, the whole content of the CMDB had to be exported to an Excel-spreadsheet.

*CMDB owned by CIO*

The CMDB is the property of CIO. This means that all components and applications from CIO take precedence over other departments within UPC Netherlands and are better documented in the CMDB. CIO has certain procedures for documenting information on the applications where as other departments do not have them.

*Possible replacement for current CMDB*

While communicating with the Configuration Manager (person in charge of the CMDB), it became clear that in the near future, the current CMDB might be replaced. The current CMDB is a temporary solution until the new CMDB is implemented.



The **Information Technology Infrastructure Library (ITIL®)** is a framework of best practice approaches intended to facilitate the delivery of high quality information technology (IT) services. ITIL outlines an extensive set of management procedures that are intended to support businesses in achieving both high financial quality and value in IT operations. These procedures are supplier-independent and have been developed to provide guidance across the breadth of IT infrastructure, development, and operations.<sup>5</sup>

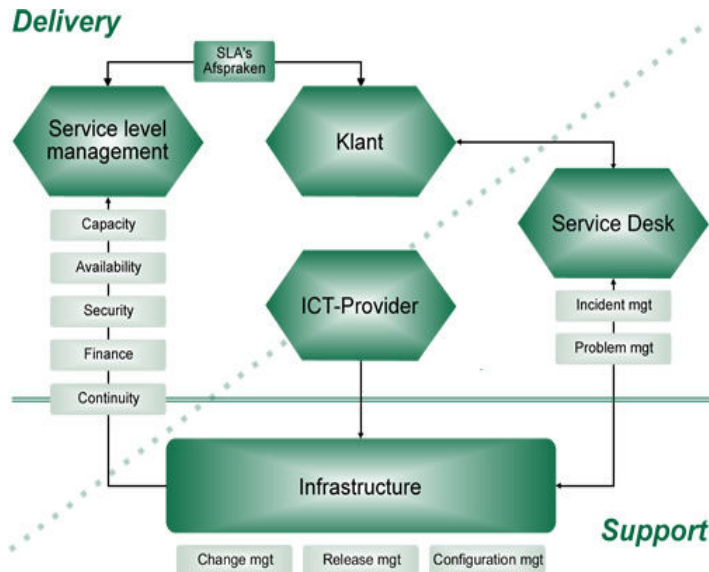


Figure 3 ITIL Delivery/Support

ITIL Service management has 11 disciplines:

|                          |                          |
|--------------------------|--------------------------|
| Incident Management      | Problem Management       |
| Change Management        | Configuration Management |
| Release Management       | Service Desk Management  |
| Service Level Management | Capacity Management      |
| Availability Management  | Finance Management       |
| Continuity Management    |                          |

During the early stages of the traineeship, it was decided by the company mentor that all the applications should be incorporated in a CMDB. The reason for this is that such a CMDB already exists and is also being used within UPC Netherlands. This database runs on SQL technology. The CMDB is maintained by a Configuration Manager at CIO.

<sup>5</sup> <http://en.wikipedia.org/wiki/ITIL>



### 3.4.1 Initialisation Configuration & Management Database

Using the questions in the account of the OPM as a guideline, the realisation of the OPM is as follows:

- What information should be added into the CMDB?

The first task was to find what information should be added into the CMDB.

During the inventory stage a quick look was taken of the CMDB. This had a dual purpose. First, it had to become clear what information should be documented at the inventory stage and secondly what and how information was stored in the CMDB. This made it clear what information should be added into the CMDB

- Are there certain standards/rules/procedures for adding CIs into the CMDB?

After establishing what information was needed to populate the CMDB, the next step was to find out what procedures and rules there were regarding the input of information in the CMDB. While searching for these procedures, information was found that the CMDB was managed by a Configuration Manager at CIO. (For further information see *Appendix D: Literature study (background information)*)

Contacting the Configuration Manager (CM) was the next logical step. Communicating with the CM about procedures for the CMDB resulted in the knowledge that the current database was a temporary solution for storing information on all information of all components (CIs) within the organisation. A new CMDB will be implemented in the future.

Regarding the procedures for the CMDB, a compromise has been reached that any information found on the applications and systems used during this traineeship, will be sent to the Configuration manager. The CM will then take responsibility for adding this information into the CMDB.

Because the current CMDB is managed by CIO, their components take precedence over that of other departments. CIO does a physical check of all components (servers and systems) but not on a regular basis. The solution for this problem is that each department may do their own inventory. Therefore the CM has given access to the Datacenter (where the servers are housed) for a physical audit on the servers. (See initialisation inventory local applications “Phase 4: verifying the information gathered from the previous phases”)

- Should the current database be used to store the information on the LA?

Although a new CMDB will be implemented, the current CMDB is still used to store information on CIs (components of the applications). In this way there still is a central federated repository for storing information on CIs and thus the current CMDB will be used to store the information of the LA. The information found during the inventory stage is stored in an Excel-spreadsheet. This Excel-spreadsheet will be sent to the Configuration Manager to update the CMDB every time a change occurs in information on the LA. The spreadsheet is drafted from the export Excel-spreadsheet and has the same structure as the information stored in the current CMDB, which makes an easy and quick updating of the current CMDB possible. The spreadsheet will also be used as a temporary local database for the LA Team and will be placed on the SharePoint for easy access until the new CMDB is implemented. All documents will refer to the locally placed spreadsheet. This will force the LA to make use of the Excel-spreadsheet and allow them to familiarise themselves with the use of a CMDB.



## 4. Conclusions and Suggestions

In this chapter conclusions and suggestions are described for the 4 stages during this traineeship.

### General

- Consistency of information (standardisation). All information has to be kept consistent. Information on the SharePoint has to be synchronised with the CMDB; otherwise conflicting information will exist.
  - A simple solution would be to place a hyperlink in all documents containing the address to the Excel-spreadsheet (temporary local CMDB).

### Inventory

- Difficult task sifting through all the documents on the SharePoint and the audits on the systems, servers and components on which the LA run.
  - The moment there is a change of an item, the change has to be submitted to the CM to add to the CMDB. This requires less time and effort than to do a full audit on all servers, systems and components on an irregular interval.

### Analysis

- All applications that have to go-live have certain procedures that have to be followed to ensure a successful go-live. These procedures are not always known to the LA Team members responsible for the different applications and their go-live.
  - Placing these procedures on the SharePoint would provide a central repository for those procedures and would also give the LA Team members access to (all) those procedures.

### OPM

- Different manuals for each application making it important that the information is accurate and up-to-date
  - A hyperlink to where the Excel-spreadsheet can be found should be placed in the manuals. This eliminates the need to manually edit and make changes to information on the LA if there is one. Making a change in the CMDB of Excel-spreadsheet is a lot easier and faster.

### CMDB

- The CMDB has to be updated regularly. Each time there is a change of some sort in the information on an application or a component, it has to be identified and the CMDB has to be updated with the new information immediately
  - An LA Team member could be assigned to track changes and submit them to CIO to update the CMDB.
- The search function of the CMDB has to be looked at and fixed. In its current state, it can only find specific applications.
  - The search query should be looked at for searching for applications. The configuration manager can be contacted for this manner. Anyone using the CMDB should be able to find any applications in the CMDB.
- Duplicate or unknown components in the database have to be addressed or removed in order to overcome redundancy and to maintain a well organised database (the biggest problems here are the blank hostnames and IP addresses that are now present in the CMDB)
  - A physical check is required to discover the missing (blank entry) information. The teams servicing the Datacentres where all the applications and servers are stored can perform such an audit.





## 5. Evaluation

In this chapter, an evaluation is made of the whole period of the traineeship. The things that are discussed here are mainly the problems that occurred during the traineeship and the different learning aspects dealt with.

At the beginning of this traineeship, a company restructuring was underway. As mentioned a number of times in this paper, UPC Netherlands acquired Priority Telecom and all IT-related activity of Priority Telecom have been integrated into that of UPC Netherlands. This restructuring was finalised during this traineeship, resulting in a lot of unclear understandings in procedures and work that had to be done and constant changes in procedures, personnel, use of applications, etc.

This had a lot of impact on this traineeship and had a lot of consequences, ranging from belated information required for the different stages during this traineeship to unexpected changes in the deliverables for the traineeship (later it became clear that the current CMDB will be replaced by a new one in the future, change in procedures for the use or change of applications, etc).

During the inventory stage it became immediately clear that this would be a long and difficult process. Especially the physical audit on the servers and systems was and is a time-consuming process. This inventory will thus commence during the whole traineeship. The inventory was of great importance, because elements from the inventory stage are used in both the OPM and the CMDB.

The drafting of the OPM presented its own obstacles. On the SharePoint site a lot of documents (manuals, procedures, plan of approaches, etc) were found and sifting through all of those documents in search for information was an intense reading process. The trick in writing the OPM was not to replace or rewrite all those documents (not trying to invent the wheel again). Due to the changes in procedures (as mentioned above in relations with the company restructuring) the OPM underwent different changes and one should not be surprised if even more changes are made in the near future. The OPM will be delivered before the completion of the inventory stage. The completion of the inventory stage is no prerequisite for the drafting of the OPM because the OPM only requires specific information from the inventory of the LA and can therefore still be completed.

Looking at the CMDB, one can safely say that the CMDB (of all the deliverables in this traineeship) is the single most important tool. The CMDB is a federated repository that is not only the best way to depict the LA infrastructure and all information on the components for IT-Ops Local Apps but is also similarly important for all other departments for the whole of UPC Netherlands. The responsibility this entails, is that the CMDB has to be as complete and as accurate as possible. The information needed to populate the CMDB comes from the inventory and physical audits of all the servers (machines) in the Datacenter (where the servers and systems are housed).

The constant update and inventory of all components (not only of the LA but all assets within UPC Netherlands) is an ever ongoing process. This results in the inventory (physical audits) and the updating of the CMDB to be in tandem.

At the beginning of this traineeship, it was thought that a “new” CMDB had to be built. Because of the rapid changes within UPC Netherlands and the possibility of a new CMDB being implemented in the future, the building of this CMDB was not necessary. Instead, information is delivered to the Configuration Manager who considers it his responsibility to add the information into the existing CMDB.

Besides the responsibilities and procedures used within UPC Netherlands, there was a total freedom in the envisioning and engaging of the initialisation of the 4 stages during this traineeship. This made it possible to do independent work during the realisation of the different tasks. This independence has always been considered a personal challenge to complete the tasks given.





## 5.1. Work Environment

Looking back over the traineeship period until now, I can say that it has been satisfactory. UPC Netherlands gave me adequate support during this whole period. The working environment at UPC Netherlands is stimulating. Communication with my colleagues is easy, because everything all happens in an informal manner. I have been given the opportunity to broaden my knowledge and competencies on a technical as well as on a project- oriented level.

Besides the main tasks for the traineeship, I also worked on a few smaller projects, which consisted of making stationary templates, working with a few of the applications to make login accounts, etc. The average length of such a project was about a day or two. A change in the tasks and work I had to do was always welcome and allowed me to sometimes take a different look at the main task/work (fresh ideas). It also gave me an in-depth insight and experience in the applications of their functioning. I came to understand how they are used and for what purpose they are applied. This came in handy, especially for the Research & Analysis stage during this traineeship.

### My course

The knowledge gained during the Information Engineering course has helped me a lot during the traineeship at UPC Netherlands. With sub-courses, lectures and modules on Databases, Organisation and Information, Information Analysis, ITIL, etc., a remarkable insight is achieved in the available techniques & methods and also in the way they should be utilized best.

The module “Project management” at University gave me a sound basis and enough knowledge to complete this traineeship in a well-structured fashion.

The huge amount of knowledge that I gained at my course at University and at UPC Netherlands has helped me and will keep helping me in further projects I will embark on in the future in the IT –sector.



## 6. Literature (Sources used)

Books and literature:

CGE&Y - Internet berichtgeving: De methode  
Auteur: prof. drs. H. van Nimwegen  
Jaar van uitgave: 2001  
ISBN: 9075498470

Organisatie en informatie  
Auteurs: drs. IR. R.T.M. Bots, dr W Jansen  
Jaar van uitgave: 2001  
ISBN: 9001122000

Internet Links:

<http://www.computerworld.com/managementtopics/management/story/0,10801,101081,00.html?SKC=management-101081>  
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[http://www.studiosus.nl/scripties/00\\_ehbo.php?ln=ned](http://www.studiosus.nl/scripties/00_ehbo.php?ln=ned)  
<http://www.ictforyourbusiness.nl/index.asp?ContentID=1027>  
[www.idef.com](http://www.idef.com)  
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<http://vondrak.cs.vsb.cz/download/13>  
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[http://en.wikipedia.org/wiki/Henry\\_Mintzberg](http://en.wikipedia.org/wiki/Henry_Mintzberg)  
<http://en.wikipedia.org/wiki/ITIL>



7. Illustrations

Figure 1 UPC Netherlands Kabelweg..... XIV

Figure 2 Organisational Structure IT..... XVII

Figure 3 ITIL Delivery/Support..... XXIX



## 8. Glossary

|  |  |
|--|--|
| LA (Local Applications)  | The LA Team uses them and is responsible for them(maintenance)   |
| LA Team (Local Applications Team)  | The team of members (functional application engineers) that make up IT- OPS  |
| IT-Ops (IT Operations)   | IT operations is the IT department at UPC Netherlands  |
| ITIL (Information Technology Infrastructure Library<br>CI (Configuration Item) | Best Practice method used at UPC Netherlands<br>Is a component of an application or server (machine) placed in the CMDB            |
| CM (Configuration Manager)   | Is the manager responsible for the maintenance of the CMDB   |
| CIO (Corporate Information Office)   | Is the office for maintaining the hardware and software platforms of UPC Netherlands   |
| OPM (Operations Procedure Manual)  | Is a support document for the LA Team containing information on the applications and procedures for a successful go-live of the LA |
| CMDB (Configuration Management Database)                                       | Is a central federated repository for all assets of UPC Netherlands  |



## 9. Appendixes

Appendix A: Plan of Approach

Appendix B: Importance of CMDB

Appendix D: Literature study (background information)

Appendix E: Template inventory local applications(temporary local CMDB)

Appendix F: Template Operational Procedures Manual



# Plan of approach



upc

## Research/Analysis Local Applications & Maintenance/Configuration of CMDB IT Operations, UPC Netherlands

*- Drawing a clear picture for the local applications team -*

|   |                         |
|---|-------------------------|
| Version:                                  | 1.0                     |
| Location:                                 | Amsterdam               |
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| Course:                                   | Information Engineering |
| Institution:                              | Hogeschool Utrecht      |



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## Version History

| Version | Date       | By            | Status  | Comment               |
|---------|------------|---------------|---------|-----------------------|
| 0.1     | 05/09/2007 | Terence Kroes | Concept | Feedback/input needed |
| 1.0     | 05/22/2007 | Terence Kroes | Final   | -                     |
|         |            |               |         |                       |

## Distribution list

| Company/Institution | Name           | Function          |
|---------------------|----------------|-------------------|
| Hogeschool Utrecht  | Eelco Tienstra | University mentor |
| UPC Netherlands     | Michael Butler | Company mentor    |





## Chapter 1: Summary

**A**s a 4<sup>th</sup> (final) year student at Hogeschool Utrecht, studying Information Engineering, it is mandatory for me to take a traineeship at a medium-sized to large company. During this traineeship, I have to prove that I can use all the knowledge gained during my studies at University to solve a complex problem at a company in a well structured manner. The length of this traineeship is 6 months.



The company where the traineeship will take place is at UPC Netherlands. The task description given to me by UPC Netherlands is to draft an Operation Procedures Manual and to maintain & configure a Configuration Management Database. These two deliverables will be the round off of the traineeship at this company.

The end product/result for the University will be a Research/Task description paper.



## Chapter 2: Task description

In this Chapter the current situation, the company, the main problem and the objectives of this traineeship are described.

### 2.1 How this traineeship came to be

The task I am entrusted with is to draft an Operations Procedures Manual and to maintain/configure a Configuration Management Database. These two products will give the local applications team a clear view or insight in the local application and processes. They will also provide a view of the infrastructure of the local applications.

At this moment it is not clear to the LA Team what applications and processes there are. This is a result of the acquisition of the company Priority Telecom by UPC Netherlands. All IT-related activity of Priority Telecom have to be integrated into that of UPC Netherlands.

### 2.2 UPC Netherlands

UPC Netherlands, Liberty Global's local affiliate, is the second largest broadband cable operator in the Netherlands and part of the UPC Broadband division in Europe. UPC Netherlands provides video, broadband Internet (chello), traditional, VIOP and mobile telephony services. With 2.3 million customers UPC Netherlands is the leader in advanced media- and telecommunication services in the Netherlands. UPC Netherlands has high grade communication networks in Noord-Holland, Zuid-Holland, Friesland, Gelderland, Flevoland and Noord-Brabant.

With the brand Priority Telecom, UPC Netherlands delivers services for the business market in to helping prestigious hospitals, energy companies and travel agencies to realise their business objectives/goals.



## 2.3 Main problem

**B**ecause of the acquisition of Priority Telecom by UPC Netherlands, all IT-related activity of Priority Telecom will be integrated into that of UPC Netherlands. This creates an unclear picture for the local applications and processes. In order for the LA Team at IT Ops to do their work effectively, this vague picture has to be made clear for them.

To do this, the following main question has to be answered:

- **“How can the local applications team of IT Operations UPC Netherlands get a clear picture of (insight in) the local applications and processes?”**

The following sub-questions are derived from the main question. This allows answering the main-question more easily:

- What information does the local applications team need?
- Where can this information be found?
- How should this information be stored and presented?



## 2.4 Objective

**U**PC Netherlands thinks that by documenting all local applications and processes, the LA Team will get more insight in the local infrastructure of the applications enabling them to do their job better.

The main focus in achieving this objective is to inventory, analyse & process the LA and to document it. The documentations will make it possible to draft the Operations Procedures Manual (OPM) and to maintain & configure the Configuration Management Database (CMDB).



## Chapter 3: Operational aspects

In this Chapter the operational aspects of this traineeship will be described. With the operational aspects one should think of the scope, timeline and available resources. These operational aspects are of great importance, because they enable me to create a view of what can be expected during the initialisation of the different tasks.

### 3.1 Scope

In the following paragraph a description will be given on the scope of this traineeship. What is meant by the scope of this traineeship is the environment and all its aspects concerning the tasks that have to be done during this traineeship.

### 3.2 Project environment

The task that I was entrusted with is to draft an Operations Procedures Manual (OPM) and to configure/maintain a Configuration Management Database. The Operation Procedures Manual will serve as a guideline for the local applications team and will give insight into the local applications and processes. The Configuration Management Database is a database that currently runs on the intranet of UPC Netherlands. This database will create a picture of the infrastructure of the local applications and all its components for the local applications team. The infrastructure of the local applications and all its components are put in a central place on the intranet.



### 3.3 Deliverables

It was decided by my company mentor at UPC Netherlands, Michael Butler, that the following two products have to be delivered by the end of this traineeship.

| Deliverables                      | Description  |
|-----------------------------------|--|
| Operational Procedures Manual     | This OPM will give the local applications team an idea of the available local applications and processes. It will also serve as a guideline for the work that they have to do.             |
| Configuration Management Database | All the local applications and their processes will be put into this database. This will give the local applications team a picture of the total infrastructure of the local applications. |



### 3.4 Activity plan (timeline)

In the figure below, a global plan is made on how to complete the products that have to be delivered and the tasks that have to be done. This plan is a concept, made at the beginning of this traineeship, of how I think I will achieve the things mentioned above.

| Week | Activity  | Milestone                  | Paper            |
|------|---|----------------------------|------------------|
| 1    | Planning & orientation                                  | Plan of approach           | Drafting         |
| 2    | Inventory LA  |                            | Drafting         |
| 3    | Inventory LA  |                            | Drafting         |
| 4    | Inventory LA  |                            | Drafting         |
| 5    | Inventory LA  |                            | Research         |
| 6    | Inventory LA  |                            | Research         |
| 7    | Inventory LA  |                            | Research         |
| 8    | Inventory LA  | Inventory LA (done)        | Research         |
| 9    | Research/Analysis LA                                    |                            | Research         |
| 10   | Research/Analysis LA                                    |                            | Research         |
| 11   | Research/Analysis LA                                    |                            | Research         |
| 12   | Research/Analysis LA Configuration Management CMDB      |                            | Research         |
| 13   | Research/Analysis LA Configuration Management CMDB      |                            | Writing of paper |
| 14   | Research/Analysis LA Configuration Management CMDB      |                            | Writing of paper |
| 15   | Research/Analysis LA Configuration Management CMDB /OPM |                            | Writing of paper |
| 16   | Research/Analysis LA Configuration Management CMDB /OPM | Research/Analysis LA(done) | Hand in          |
| 17   | Maintenance & Configuration CMDB/OPM                    |                            | Finished         |
| 18   | Maintenance & Configuration CMDB/OPM                    |                            | Finished         |
| 19   | Maintenance & Configuration CMDB/OPM                    | CMDB(done)                 | Finished         |
| 20   | OPM   |                            | Finished         |
| 21   | OPM   | OPM(done)                  | Finished         |
| 22   | Finished  |                            | Finished         |



### 3.5 Resource plan

| Resource                   | Description   |
|----------------------------|---|
| LA Team                    | The OPM and CMDB are made for the LA Team of IT-Ops Local Apps at UPC Netherlands. If I need help or information on the LA, they will be of valuable assistance (valuable source of information). |
| Workplace                  | I have been assigned a permanent workplace at IT-Ops Local Apps. Both the LA Team and my mentor are present at this workplace.  |
| Mobile phone/company phone | Both the LA Team and my mentor can be reached on their mobile phone as well as the company phones at the workplace if needed.   |
| Internet                   | All computers at UPC Netherlands have Internet access.  |
| E-mail                     | At UPC Netherlands, I have been given an @upc email address. This email address as well as the @student.hu.nl address will be used for communication during the traineeship.                      |





### 3.6 Organisation

To successfully end this traineeship, it is of the utmost importance to report (document) all aspects of this traineeship, from methods used to tasks done. These reports will be made in the form of documents. These documents/reports will be sent to both the company and the school mentor.

#### Documentation

Everything done during this traineeship will be documented. This information will be stored and can be used as reference material or as back-up. All documentation will be sent to the company mentor.

#### Quality

##### Product quality

To maintain a certain quality for all documents made for and during this traineeship, all documents will be made with the company templates. This will guarantee that all documents have the same style, which makes reading these documents a lot easier.

##### Process quality

In order to identify possible risks or problems in early stages of this traineeship, I will constantly refer to this plan of approach (use this plan of approach as a guideline). This will be a guarantee that everything (tasks, etc) stays on schedule and it will make clear what steps to take should risks/problems occur. If problems do occur, the company mentor as well as the University mentor will be informed.



### 3.7 Plan of Approach

In the concept phase, a global picture is drawn of the tasks that have to be done to successfully complete this traineeship and the deliverables. The work done for this traineeship will be divided into 4 stages:

#### **Inventory Local Applications (1<sup>st</sup> stage)**

At this stage, an inventory will take place on all available local applications.

#### **Research & Analysis (2<sup>nd</sup> stage)**

At this stage all local applications will be analysed. This will make clear what processes there are and also what the relationship is between the different applications. The detailed documentation of these processes will make it possible to draft the Operations Procedures Manual

#### **Maintenance & Configuration CMDB (3<sup>rd</sup> stage)**

At this stage, the current CMDB will be configured and maintained. All the applications from the 1<sup>st</sup> stage, where the inventory took place, will be placed in the CMDB. This database will then contain all the applications and their components, creating a view of the complete infrastructure of those applications. The local applications team can use this database whenever they need information on the applications or one of their components.

#### **OPM (4<sup>th</sup> stage)**

The picture of the local applications infrastructure and the detailed documentation on those local applications will create a solid foundation for the drafting of the Operations Procedures Manual. This manual will provide the local applications team with guidelines to do their job more effectively.

#### **Research paper**

One of the deliverables for the University is to write a paper on the work done during the traineeship at UPC Netherlands. This paper will be used as a reference for this traineeship and will also serve as a closure for the Information Engineering course.

#### **Milestones**

- Milestone 1: Plan of action
- Milestone 2: Inventory LA
- Milestone 3: Research Analysis LA
- Milestone 4: Paper
- Milestone 5: CMDB (Configuration Management Database)
- Milestone 6: OPM (Operations Procedures Manual)



## 4.0 Information

### 4.1 Communications plan

#### *With UPC Netherlands*

The communication with UPC Netherlands will go through Mr. M. Butler. He is the company mentor who has been assigned to me during this traineeship. He also heads the LA Team at IT-Ops Local Apps.

#### *With my mentors*

During this traineeship, I have been assigned 2 mentors. The first mentor is the mentor at UPC Netherlands who will coach me during the tasks that have to be done during my traineeship. The second mentor is the mentor assigned by the University, who will coach me in University-related matters (e.g. the writing of my paper).

My company mentor will be Mr M. Butler. Mr Butler is always present at my assigned workplace at which the LA Team is also present. I can have direct contact with my company mentor, if needed, also by phone or e-mail (if he is not present at that moment).

My mentor from University is Mr. E. Tienstra. Communication with Mr. Tienstra will take place via e-mail or telephone. As has been decided, communication with Mr. Tienstra will be on a "when needed" basis meaning: there will not be a permanent communication schedule.

#### *With external personnel*

Because this traineeship takes place within UPC Netherlands, communication with external personnel might not be needed to obtain information. If such an occasion arises, this will be done via interviews or the use of the company @upc e-mail address. In case of personal contact such as a phone call, both my private mobile and company phone can be used.

#### *Document handling*

On a daily basis, a backup will be made of all documents during this traineeship. This backup will be on the local computer, a USB-stick and on the Internet (online e-mail). This allows access to these documents at any given time (and place).



## 4.2 Use of templates and ICT resources

To ensure a certain consistency within all documents made during this traineeship, the company templates will be used.

### *The use of ICT resources*

With the help of ICT, a lot of different methods and techniques will be used during this traineeship; all documents will be digitally made and stored. Contact with internal as well as external personnel will be via e-mail & telephone and the Internet will be used to search for information. For the drafting of all documents and completion of certain tasks, programs such as MS Office, SQL and others will be used. These programs will all be provided by UPC Netherlands or by myself (programs used at home).



### 4.3 Risks

In this paragraph, possible risks will be discussed. Not only will the possible risks be discussed/ described, but also what appropriate steps can be taken, in case such a risk should occur. This guarantees that this traineeship still can be completed successfully.

| Risk   | Action  |
|--|---|
| No access to workplace                                       | In case there is no access to my workplace, I can use any other available space within UPC Netherlands. All workplaces have computers which are linked to the local network and have Internet access. If there is no access to all workplaces within UPC Netherlands, I can always work at home.  |
| No access to Computer(s) (power outage, breakdowns etc)      | There are a minimal of 6 computers present in my current workplace. Should a problem arise where there is no access to any of these, I can use one of several computers in the whole building that are not used. If there is no computer available to work on at UPC Netherlands; I can always continue my work at home.  |
| In case I am ill   | In case I am ill, the company mentor will be informed immediately aside from the appropriate procedures that have to be followed at UPC Netherlands for these situations.   |
| Loss of documentation  | In case of loss of documentation, I can always refer to the different backups made, or to hardcopies of certain documents.  |
| Failing to achieve a milestone/deadlines                     | Failure to achieve one of the milestones will be immediately informed to both the company mentor and the University mentor. Together with both mentors a decision will be made on how to proceed further in order to achieve the other milestones and successfully complete the traineeship.  |
| Failure of UPC Netherlands to deliver the information needed | In case UPC Netherlands fails to deliver information needed to successfully complete this traineeship (or to achieve one of the milestones), the company mentor will be informed immediately, hoping to still attain the information required. If this does not help, the University mentor will be informed of the situation and he will try to intervene in order to still get the information that is needed as yet. |



## 5.0 Contact information

### Trainee:

Name: Terence Kroes  
Email: [terence.kroes@student.hu.nl](mailto:terence.kroes@student.hu.nl)  
[tkroes@upc.nl](mailto:tkroes@upc.nl)  
Telephone#: 06-14178355

### University Mentor:

Name: Eelco Tienstra  
Email: [eelco.tienstra@thd-c.com](mailto:eelco.tienstra@thd-c.com)  
Telephone#: 06-50214269

### Company Mentor:

Name: Michael Butler  
Email: [mbutler@upc.nl](mailto:mbutler@upc.nl)  
Telephone#: 06-55380598

### Important addresses:

**Hogeschool Utrecht Amersfoort**  
Berkenweg 11  
3800 AM Amersfoort

**UPC Netherlands**  
Kabelweg 51  
1014 BA Amsterdam



## Appendix B: Importance of CMDB

### Pros:

- Provides consistent, current, accurate and secure information
- Provides a single source of accurate information in an IT environment
- Lowers the costs to deploy services and increases the effectiveness of those services
- Gets the maximum advantage out of IT assets and software
- Gives an accurate picture of all available assets and how they are used
- Ensures that IT applications and people are working from a single source of records across an organisation
- Increases information sharing and maintaining accuracy of information across the IT organisation
- When changes are made in configurations it gives some idea of what business processes have been affected
- Improves quality-of-service because all CMDB components and their relationships are clearly understood

### Cons:

- Incorrect information (component descriptions) can have a bad influence on other components
- It is an ongoing process that requires constant monitoring and always requirements to be up-to-date to be accurate
- Time consuming process of clearly describing all components and the relationships with others
- Human error can cause inaccurate input of components into the CMDB



## CMDB

**A** Configuration Database (CMDB) is a unified or federated repository of information related to all the components of an information system. It helps an organisation to understand the relationships between these components and track their configuration. The CMDB is a fundamental component of the ITIL framework's Configuration Management process.

The CMDB records configuration items (CI) and details about the important attributes and relationships between CIs. Configuration Managers usually describe CIs using three configurable attributes:

1. Technical
2. Ownership
3. Relationship

A key success factor in implementing a CMDB is the ability to automatically discover information about the CI's (auto-discovery), and track changes as they happen.

CMDB's contain metadata, and thus the concept overlaps that of a metadata repository—both are used in running large IT organisations. Configuration management addresses how the data is to be kept up to date, which has historically been a weakness of metadata repositories.

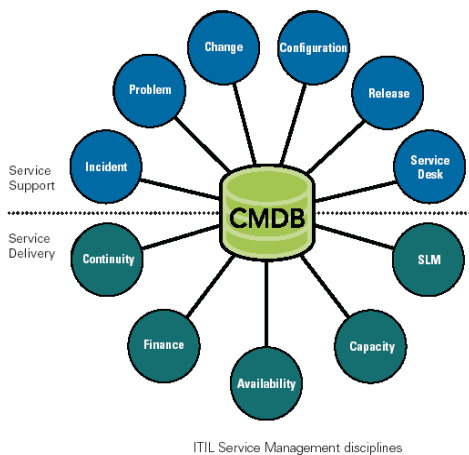


Figure 4: ITIL Service Management disciplines<sup>6</sup>

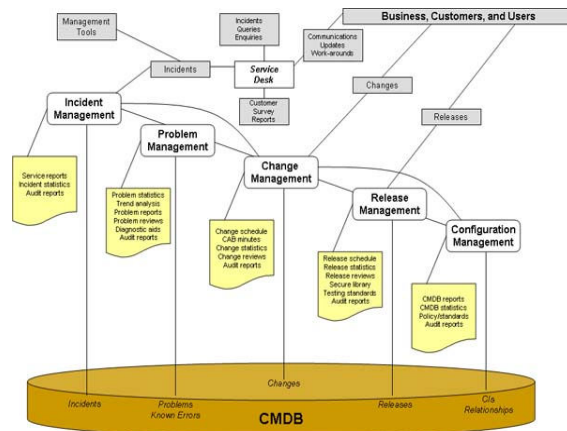


Figure 5: CMDB Business , Customers and users<sup>7</sup>

<sup>6</sup> <http://www.bmc.com/>

<sup>7</sup> CMDB Manual





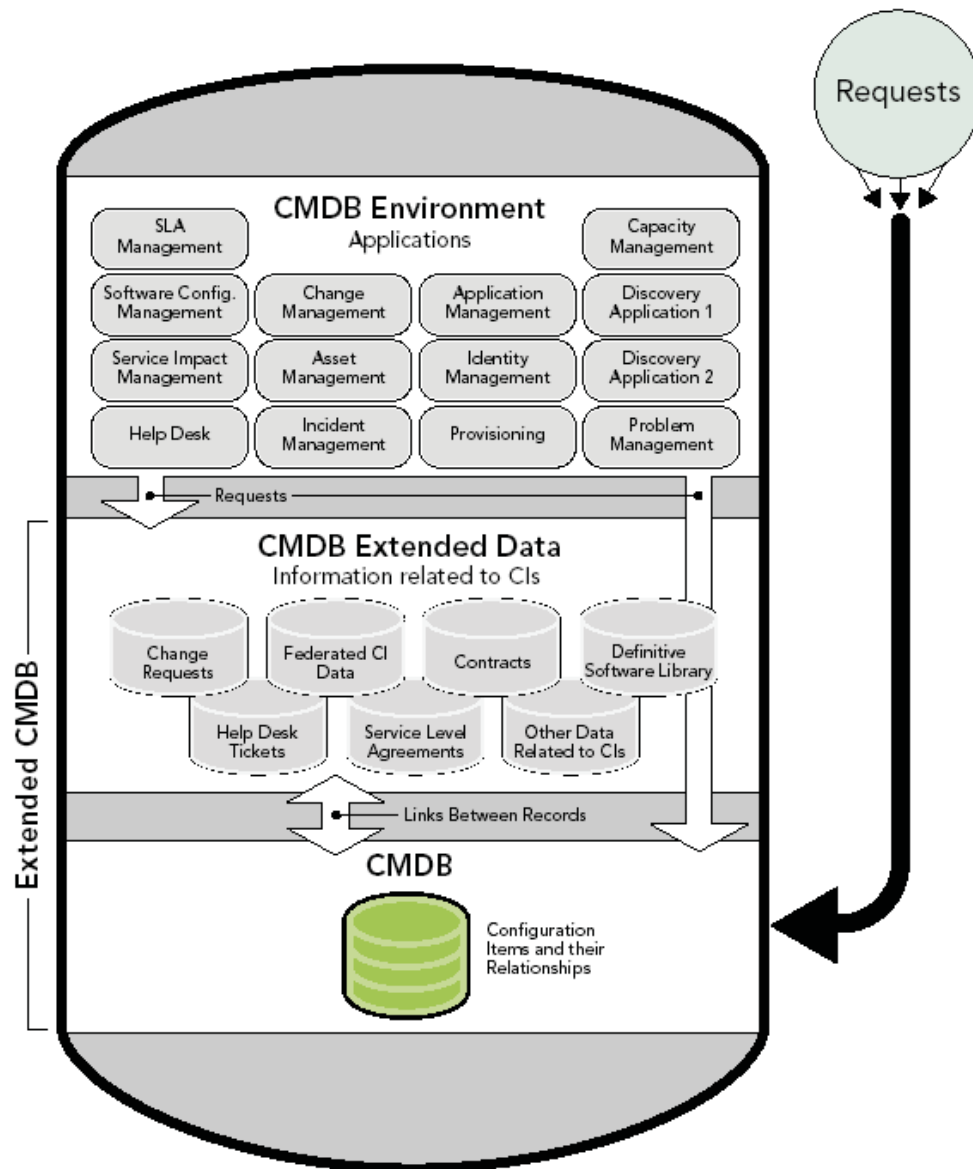


Figure 6 CMDB Environment and Extended CMDB



### Configuration Management

**C**onfiguration Management is the process of registering and maintaining all relevant information on Configuration Items as well as their status and the relationship between them.

The objective of Configuration Management is to account for all the IT assets within an organisation and its services. It also provides accurate information on configurations and their documentation to support all the other Service Management Processes. ITIL provides a sound basis for Incident Management, Problem Management, Change Management, and Release Management and it also provides verification of the configuration records against the infrastructure and corrects any exceptions.

### Configuration Items (CI)

Configuration Items or CIs form the basis for Configuration Management. Configuration Items is (are) component(s) of an infrastructure that is (will be) under the control of Configuration Management. CIs may vary widely in complexity, size, type, from an entire system to a single module.

A configuration item, or CI, is a unit of configuration that can be individually managed and versioned. Typically, a configuration management system will control files, requirements, or another definable unit. These units are managed with a combination of process and tools to avoid the introduction of errors and to maintain high quality results. The units themselves can be considered configuration items, or they may be combined into an overall collection that is managed under the same set of processes and tools.

### Configuration Manager (CM)

The configuration manager defines the processes and procedures that govern management of the CMDB: His tasks are to establish policies and procedures to govern the configuration management process. He determines the scope and granularity of the CIs recorded in the CMDB, performs audits and establishes baselines, conducts organisation-wide awareness campaigns about configuration management policies. He also selects, assigns responsibilities, and trains the configuration management staff, establishes CMDB policies, including CI-naming conventions, automates CMDB updating systems; if possible, produces and distributes management reports, provides change owner with baseline report for assessing the impact of a release, assists in development of the test environment (for changes) to minor target environment, and updates the CMDB with all changes to the target environment when both the pilot and the full release have been completed.

### Configuration Manager Staff

Staff members might each be responsible for managing configuration management tasks for specific areas of the IT environment. Staff members may be assigned any of the following tasks:

- Update the CMDB with new CI information and status information
- Control access to and distribution of documents from document repositories
- Make changes to the CMDB structure
- Prepare management reports
- Conducts audits and reconciles the CMDB



## Appendix E: Template inventory local applications ( Temporary local CMDB)

Application sorted by Business Value

Tablenames with datatype (same as in the CMDB for easy data migration)

| Application   | Type | Techn | LEAD | FBO  | FBS  | Business Value | # PRS | ID | Type | Status | Serial No |
|---------------|------|-------|------|------|------|----------------|-------|----|------|--------|-----------|
| Avaya Agent   | C/S  | HB    | CV   | TN   | High | 5              |       |    |      |        |           |
| Beusen Konned | C/S  | HB    | TN   | High | 5    |                |       |    |      |        |           |
| Dealernet     | Web  | MH    | BH   | High | 5    |                |       |    |      |        |           |
| KMSIaque      | Web  | BH    | CV   | High | 5    |                |       |    |      |        |           |
| FLIP/AD/IFA   | ORA  | CV    | GB   | High | 5    |                |       |    |      |        |           |
| Geoversum     | C/S  | HB    | TN   | High | 5    |                |       |    |      |        |           |
| Mobile        | Web  | MH    | TN   | High | 5    |                |       |    |      |        |           |

Data input field (colours used to highlight important information)





## OPM Go-Live Manual Template

For each application an OPM will be made. Due to the different functionalities of the various systems, no OPM will be the same aside from the layout.

## Layer 1: Quick Summary Application Information (“[Application]”)

| System Info               | IP address  | Hostname            | Location | Description |
|---------------------------|---|---------------------|----------|-------------|
| <b>Servers:</b>           |   |                     |          |             |
| Server 1                  | <server ip>   | <server hostname>   |          | <...>       |
| Server 2                  | <server ip>   | <server hostname>   |          | <...>       |
|                           |   |                     |          |             |
|                           |   |                     |          |             |
|                           |   |                     |          |             |
|                           |   |                     |          |             |
| <b>Database instance:</b> |   |                     |          |             |
| Instance 1                | <database ip>   | <database hostname> |          | <...>       |
| Instance 2                | <database ip>   | <database hostname> |          | <...>       |
| <b>URL:</b>               |   |                     |          |             |
|                           | <Url-link to application (test environment, production environment, development environment)> |                     |          |             |
| <b>Software deposit:</b>  | <Location where software is stored>   |                     |          |             |

**Software purpose/description:**  
<Short description purpose of the applications/system.>

**Ad1:** For most recent information see the Factsheet or CMDb:  
  
Or the fact sheet at:  
<Link to the factsheet of the LA>  
  
System documentation links:  
<Link to the manuals on the SharePoint of this application

| Description                             | Description |
|---|-------------|
| Present status                          | <... >      |
| Environment type                        | <... >      |
| Other applications/ services on server: | <... >      |
| <b>Users:</b>                           |             |
| Number of users                         | <... >      |
| Departments                             | <... >      |
| <b>Key IT/NL/Ext Users:</b>             |             |
| IT                                      | <... >      |
| NL                                      | <... >      |
| External                                | <... >      |
| User Access done by                     | <... >      |
| <b>License Info:</b>                    |             |
| Number of licenses:                     | <... >      |
| License number                          | <... >      |
| Warranty                                | <... >      |

| OS and SW                        | Description |
|----------------------------------|-------------|
| OS                               | <... >      |
| OS version                       | <... >      |
| OS patch level                   | <... >      |
| Veritas Found.                   | <... >      |
| Apache version                   | <... >      |
| Netbackup install. (SAN vs Tape) | <... >      |
| SUN Oem                          | <... >      |
| Oracle installed                 | <... >      |
| Security patch                   | <... >      |
| Firmware                         | <... >      |
| Attached network elements:       | <... >      |

## Layer 2: Procedures and Approvals

- RFC (Request for Change) Workflow  
Workflow of this application for RFC procedures
- RFS (Request for Service) Workflow  
Workflow of this application for RFS procedures



### Layer 3: In-depth look Application (“[Application]”)

- **Interfaces with other systems**  
<Description of the interfaces and dependencies this system has to other systems and link to documentation on these links>
- **Backup**  
<Description of the way a backup is made of this application>
- **Prerequisites**  
<Description of crucial information for the functioning of this application, ranging from client to server requirements>
- **<In-depth item look>**  
<...>
- **<In-depth item look>**  
<...>
- **<In-depth item look>**  
<...>
- **<In-depth item look>**  
<...>
- **<In-depth item look>**  
<...>

