The Planning of a Configuration Management Database for Suomen Erillisverkot Oy

CMDB and Management Model

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Abstract:

In the rapidly evolving field of information technology, organizations face ever increasing difficulties concerning scalability and effectivization. This document explores the planning of a Configuration Management Database (CMDB) as a potential solution for Suomen Erillisverkot Oy, and the challenges they are facing. The aims are to explore CMDB concepts and to generate a management model which will serve as groundwork and depict how the project should be managed going forward. To ensure that the management model and concepts presented align with the company needs, a qualitative research approach is befitting. Interviews and observations were conducted in order to explore the depths of the organization and thus target the main problems while attempting to utilize pre-existing resources for CMDB needs.

The key findings and recommendations of the study are as follow:

- A Configuration Control Board (CCB) must be established. This group serves as the main driving entity for the project.
- The different responsibilities depicted in the management model (demand management, configuration management & planning, configuration control and verification & audit) must be delegated to further increase progress in the planning phase.
- Eventual implementation of a CMDB needs to be done by constructing the database with a horizontal approach. This means that first one service is completely depicted in the CMDB followed by another. Due to the long-term quality of the project and scalability concerns of the company it is vital that the CMDB project stays dynamic.

The significance of this document is that it shines a light on the small niche of a management model within a CMDB application and could serve as a guideline for other similar companies.

Keywords:
CMDB, IT Infrastructure, IT Service Management, Planning, Management Model, State Security Networks Ltd.

Lärdomsprov

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Planering av en Konfigurationshanteringsdatabas för Suomen Erillisverkot Oy. CMDB och Hanteringsmodell.

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Sammandrag:

I den snabbt utvecklande informationsteknikbranschen står organisationer inför allt större svårigheter när det gäller skalbarhet och effektivisering. Detta dokument utforskar planeringen av en konfigurationshanteringsdatabas (Configuration Management Database förkortat CMDB) som en potentiell lösning för utmaningarna som Suomen Erillisverkot Oy har stött på. Syftet med denna studie är att utforska CMDB-koncept och att generera en hanteringsmodell som kommer att fungera som grunden för projektet. Den beskriver hur projektet bör hanteras både i planeringsfasen och vid eventuell integrering. En kvalitativ forskningsmetod tillämpades för att säkerställa att den presenterade hanteringsmodellen överensstämmer med företagets behov. Intervjuer och observationer genomfördes för att utforska djupt i organisationen. Detta underströk de huvudsakliga problemen samt klargjorde hur befintliga resurser kan användas för CMDB-behov. De viktigaste resultaten och rekommendationerna från studien är följande:

- En konfigurationskontrollskommitté (CCB) måste grundas. Denna grupp fungerar som den styrande enheten för projektet. Kommittén kommer att vara ansvarig för olika områden i hanteringsmodellen och därmed CMDB-projektet.
- De olika ansvarsområden som beskrivs i hanteringsmodellen (kravhantering, konfigurationshantering & planering, konfigurationskontroll samt konfigurationsverifiering och revision) måste delegeras för att fortskrida i planeringsfasen.
- Det är avgörande att vid en eventuell implementering av en CMDB måste den konstrueras horisontellt. Det innebär att först beskrivs en tjänst helt och hållet i

databasen varefter en till tjänst kan börja beskrivas. På grund av projektets långsiktiga egenskap och för företagets tillväxt är det avgörande att CMDB-projektet förblir dynamiskt.

Betydelsen av detta dokument är att det belyser den lilla nischen av en hanteringsmodell inom en CMDB-applikation och kan fungera som en riktlinje för andra liknande företag.

Nyckelord:

CMDB, IT-infrastruktur, IT-tjänstehantering, Planering, Hanteringsmodell, Suomen Erillisverkot Oy.

Contents

Abbreviations:

ADDM – Application Discovery and Dependency Mapping

API – Application Programming Interface

CCB – Configuration Control Board

CI(s) – Configuration Item(s)

CM – Configuration Management

CMDB – Configuration Management Database

CMS – Configuration Management System

ISO/IEC – International Organization for Standardization / the International Electrotechnical Commission

IT – Information Technology

ITIL – Information Technology Infrastructure Library

ITSM – Information Technology Service Management

KPI – Key Performance Indicators

KQI – Key Quality Indicators

SACM – Service Asset & Configuration Management

SKMS – Service Knowledge Management System

List of figures:

List of tables:

1. Introduction

Configuration Management (CM) is a broad subject primarily concerned with product life cycles and production-related processes. According to Watts (2015), Configuration Management encompasses engineering documentation and product life cycle management. A Configuration Management Database (CMDB) is a repository that contains information about how different hardware and software are configured within an organization. A CMDB can and should also contain information such as *"applications, middleware, documentation, people, processes, providers and other relevant data"* (Drogseth et al., 2015). The individual Configuration Items (CIs) can be considered as the smallest configurable entities in a CMDB. The CMDB is fundamentally a relational database where the relationships illustrate connections or dependencies between different CIs.

This thesis provides an overview of a CMDB planning project for Suomen Erillisverkot Oy (State Security Networks Ltd). The planning entails the requirements of the CMDB and what benefits the organization expects from such a system. Additionally, the document defines a management model which will help in managing the CMDB project.

1.1 Aims and objectives

The primary aim of this study is to delve into fundamental CMDB-concepts, aiming to pinpoint their potential advantages for Erillisverkot. This investigation encompasses the comprehensive planning process of a CMDB, focusing on the unique challenges of the company. Through this meticulous exploration, the specific needs of Erillisverkot will be identified, guiding the development of tailored recommendations.

Subsequently, a central objective is the design of a bespoke management model that aligns with the company's specific requirements. This model should be more than a theoretical construct; it should be used as a crucial tool in shaping the trajectory of the project's future. It's important to note that given the project's planning-centric nature, the tangible outcomes will primarily manifest in the form of well-researched recommendations.

The main objectives of this study are:

a) **Assess the Current State**: To understand the present situation of Erillisverkot and identify areas of untapped potential.
b) **Data Collection**: To utilize a qualitative approach, specifically through semi-structured interviews and observations, to gather insights from key stakeholders within Erillisverkot.
c) **Synthesis and Recommendations**: To combine the findings to create a foundational management model, and provide recommendations that support future CMDB development, while offering guidance on optimizing pre-existing resources.

1.2 What is a CMDB and a Management Model?

An exemplary definition of a CMDB is as follows:

> An enabling set of software-delivered capabilities to discover, reconcile manage, and optimize critical IT service interdependencies in the face of change. CMDB Systems are multidimensional in benefits that over time can support the full IT organization while providing a foundation for more effective alignment between IT and the business or organization it serves. CMDB Systems generally require attention to process, culture, and communication and technology to achieve their full value. (Drogseth et al., 2015)

The main areas which build up the foundation for a CMDB are the management and data model. The data model serves as a template which illustrates what attributes certain CIs should possess, and the relationships between different CIs. The individual CIs are what make the entire CMDB, so the need for a detailed data model is mandatory. This model, however, is outside of the scope of this study but needs to be mentioned as it is vital concerning the big picture.

The management model, a central topic in this thesis, is a living document which serves as a guideline in the entire scope of CI addition and the CMDB management process. It answers the questions of who? What? When? And where? Do different people or entities interact with the CMDB. The management model is what helps sustain a hierarchy and clearly defines what kinds of tasks different people have in the CMDB process chain, specifically concerning the data processing workflow.

1.3 Background and context

Suomen Erillisverkot Oy is a federal organization dedicated to providing Information Technology (IT) infrastructure and essential services for various government applications including the military, police force, fire department and other government entities. Erillisverkot plays a critical role in safeguarding national security, this means the organization always undergoes a meticulous planning phase for each major project which adds additional value to the thesis. One of Erillisverkot most notable services is the Virve-service which gives the end user a physical device and offers a radio network where the end user can safely and securely communicate. Virve has been in operative use since 2002 and is currently being used by governmental bodies with significant usage numbers. 74 million messages are sent, and 2 million group calls are made every week using the Virve-service ("ERILLISVERKOT- Virve-palvelut," n.d.).

To support the project, Erillisverkot engaged the services of a consulting agency, Justin Group Oy, specializing in CMDB matters. Much of the content in this thesis is derived or adapted from material produced by Justin Group. Their central role is to educate Erillisverkot about CMDB intricacies, initiate critical thinking about the topic, and enhance our comprehension of its scope, challenges, and benefits. Ultimately, Justin Group aims to expand Erillisverkot understanding of the potential offered by a CMDB and to provide independent, third-party recommendations.

1.4 Research problem

According to Erillisverkot, their primary challenge is the lack of standardized and centralized data, which has led to critical information being spread across different platforms. This problem has resulted in operational inefficiencies and hinders efficient decision-making. The research questions are, can a CMDB help solve these issues and what would a Management Model look like for this system?

1.5 Justification and significance of the study

As previously stated, the significance of Erillisverkot and their operations is vast, which requires robust systems and organized manners of conduct. The lack of a CMDB is a clear

chink in the armor which must be filled as efficiently as possible. This study aims to produce two documents:

- Firstly, an internal document which serves as a plan, this will be given to the manager in charge of the CMDB project at Erillisverkot. This document will contain essential information on how Erillisverkot should approach the planning and potential integration of a CMDB. This will primarily be focused on the management model. This document will have a real-life application and serve as a significant help in the planning to integration process. The goal would be for this document to serve as a foundational guideline for the organization.
- Secondly, this thesis, which does not contain sensitive information. This document will adopt a broader approach and will have guidelines which explain the main points and a general takeaway on what an organization could do, should they encounter the need for a CMDB. This will be the document suitable for publication and assessment.

2. Overview of standard concepts and literature review

CMDB fundamentals are deeply rooted in the Information Technology Infrastructure Library (ITIL). IBM, a global leader in IT, defines ITIL in the following way:

> ITIL is a library of best practices for managing IT services and improving IT support and service levels. One of the main goals of ITIL is to ensure that IT services align with business objectives, even as business objectives change. ("What is ITIL?", n.d.).

This is why standard concepts from ITIL play a large role in how an organization should approach the planning, construction, and implementation of a CMDB. By having strong ITIL roots, this also means that the concepts are largely standardized, which means that multiple companies in the world deploy similar processes. ITIL is administered by AXELOS who have recently (2019) published the newest version, ITIL 4. This version focuses more on cloud which is a good transition considering where the field is headed. This is also why the book "CMDB Systems: Making Change Work in the Age of Cloud and Agile" (Drogseth et al., 2015) was chosen as a primary source for this thesis, even though it was written in 2015 before the latest iteration of ITIL. Despite its age in this rapidly evolving field, it manages to solve contemporary issues and discuss relevant concepts. The other source used for this thesis will be the book "ITIL 4: Acquiring and Managing Cloud Services" (AXELOS Limited, 2021).

Additionally, Erillisverkot also follows ISO/IEC 27001 standards concerning information security management. ISO/IEC stands for "International Organization for Standardization / International Electrotechnical Commission". This entity specializes in producing standardization worldwide for different fields and topics. This means that most of the infrastructure and methods practiced by Erillisverkot are compliant with these standards and thus slightly simplify the planning process. ('ISO/IEC 27001:2022(en)', n.d.). Furthermore, Erillisverkot maintains a high level of standardization by also adhering to ISO/IEC 27002, which in short defines a standard and a broad approach to items such as: audio and video recordings, files, emails, messages, and physical documentation or printed materials. (Moeller, 2013)

To plan and eventually integrate a CMDB, a management model is required. This management model will specify the tasks of a person or a group of people managing certain processes and CIs. The model ensures proper management and longevity for the CMDB project. A key term concerning this topic is Service Asset and Configuration Management (SACM). It encompasses the entire process of providing organizational leadership and management with a comprehensive understanding of the organization's assets. This aligns closely with one of the primary purposes a CMDB should be used for.

The following table illustrates different management areas which are relevant to the flow of information within CMDB planning and potential integration process.

Table 1, Different types of management and their respective key roles

Management Areas	**Key Roles in CMDB Planning & Integration**	**Examples**
Demand management	- Data domain owner - SACM process manager - SACM process owner	- Collecting business requirements
Configuration planning and management	- Data domain owner - SACM process manager - SACM process owner - CMDB tool owner	- Configuration process - Budgeting - Roadmap creation - Managing development backlog (a backlog is a list of tasks or items that need to be completed or addressed) - SACM policy/plan
Configuration control	- CMDB tool developer - Configuration analyst	- Data class changing process - Documentation updating process - Data inventory - Reports - CMDB tool configuration
Configuration verification and audit	- Configuration analyst	- Regular CMDB audits - Data auditing - Data verification reports

Note. The specifications of the table are a result of a workshop done with Justin Group

Other noteworthy management areas are IT asset management, incident management, service request management, project management, problem management, change management, and license management. The management model will strive to incorporate the management areas depicted in Table 1. It will also illustrate what tasks need to be done by different areas and how the information will flow between these parties.

Figure 1 depicts the concept of Application Discovery and Dependency Mapping (ADDM), which involves notifying customers about errors in systems or services they are currently using. This notification capability is enabled by a comprehensive understanding of the design and structure of various systems, services, and infrastructure, thereby facilitating an awareness of their interdependencies.

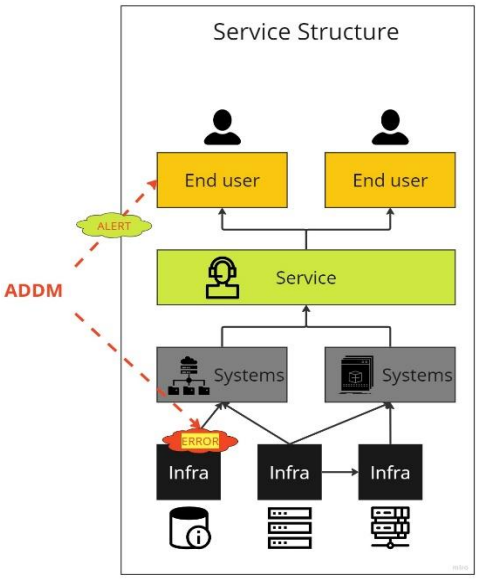
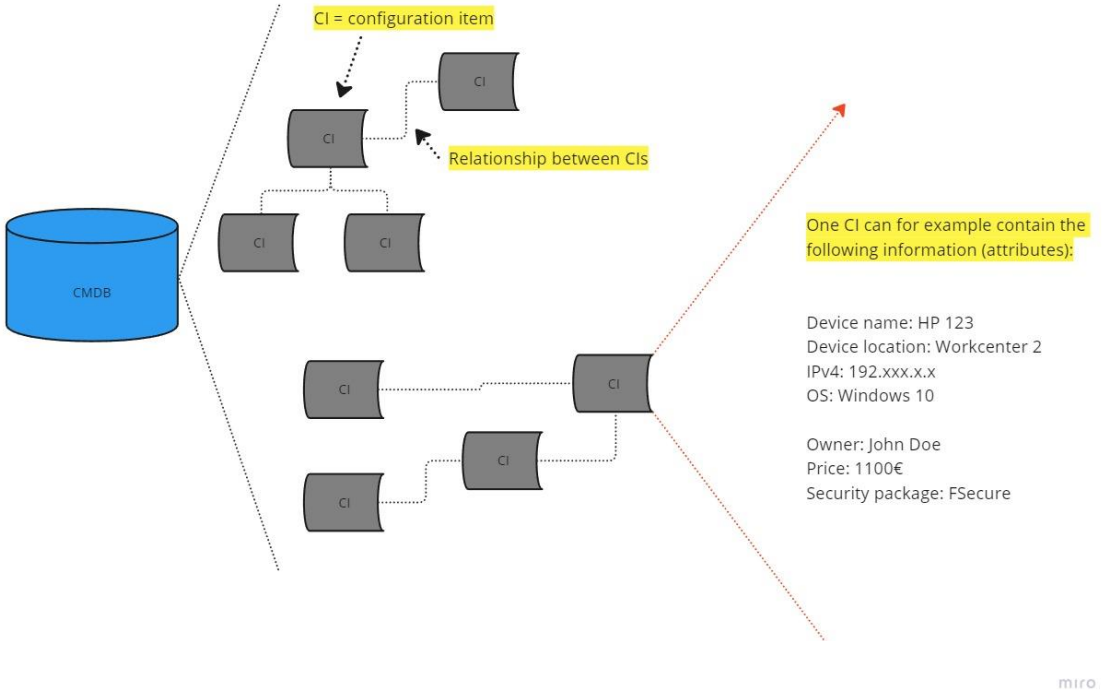


Figure 1, ADDM functionality

2.1 Overview of Configuration Management and CMDB concepts

The planning of a CMDB is no small task, let alone integrating such a system. There is no single CMDB that resolves all potential problems an organization might have, which means it is not a single investment of money, but rather a long-term investment of time and meticulousness. Like any database, it only serves significant value if it is up-to-date. Furthermore, a CMDB is not just a software deployment. While there is software that provides a solid foundation for a CMDB, such as ServiceNow, each organization or company often has its own unique practices and requirements. The unique information or data means that even if the organization's infrastructure and processes are according to international standards, a high level of customization must be done to fit said software. (Drogseth et al., 2015)

The structure of a CMDB can vary depending on the company's needs or assets. Figure 2 illustrates how a configuration structure could look within a CMDB. The figure uses a simple example of a workstation and the data which could be shown for this CI. The connections depicted between CIs come in a variety of relationships, and they could for example represent the bond, effect, or dependencies between one or more CIs.



Closely coupled with the idea of a CMDB is a so-called Data Center Infrastructure Management (DCIM) system. It can be viewed as a piece of the puzzle in the entire architecture of a company. It serves as a database where information concerning infrastructure is stored.

When discussing CMDBs, another essential concept is the Configuration Management System (CMS). The CMS serves as a CMDB itself but functions as a hub for other CMDB applications, essentially forming a centralized CMDB core. This functions with an umbrella-type architecture (see Figure 3) for different CMDB applications. The structure may differ between organizations, but the underlying principle remains the same. A CMS is usually considered more desirable for larger organizations with more complex infrastructure. This is due to the nature of the CMS; it manages to encompass multiple CMDBs which in turn is why it can accommodate larger infrastructure.

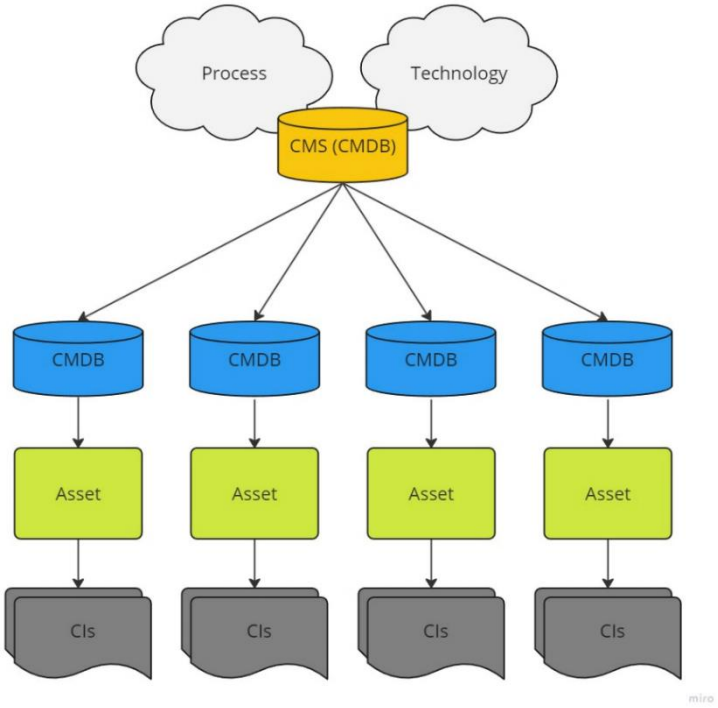


Figure 3, CMS umbrella structure with Process and Technology being the two parents of CMDB Systems (Drogseth et al., 2015).

2.2 Relevant theories, frameworks, and best practices (ITIL) for CMDB planning and management

When planning a CMDB several key factors contribute to success. It is important for the initiatives or commitments to a CMDB to come from the top downwards in an organization. CMDB systems and their updates are largely about process change; this is why the notion of cultural change should originate from senior or executive management (Drogseth et al., 2015). In this context, cultural change encompasses shifts in attitudes, norms, and values. To achieve this, activities such as workshops, schooling, and methodological changes should be done. Other key factors for a successful project include tool development, resources such as funding, monitoring of Key Performance Indicators (KPIs) or Key Quality Indicators (KQIs). This monitoring is required to ensure that the CMDB provides tangible value. However, these metrics are currently unmeasurable until integration of the CMDB, which allows for value assessment.

2.2.1 Service Knowledge Management System

According to ITIL, an all-encompassing system for all organizationally relevant

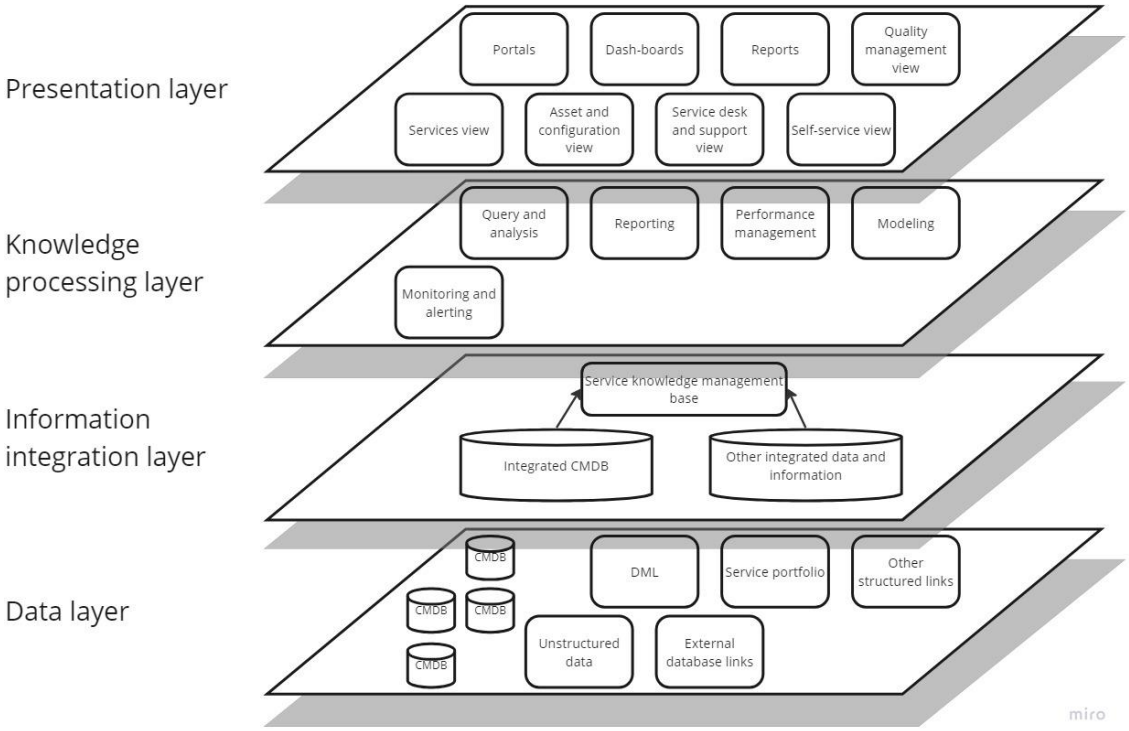


Figure 4, An example of the SKMS structure and content (Adapted from Drogseth et al., 2015).

information and services is known as the Service Knowledge Management System (SKMS). This system manages services, portals, reporting, monitoring, and a Configuration Management System alongside other databases and data sources. It functions as a multi-layered service management system (see Figure 4) and aims to minimize the time required for the discovery of key knowledge, which in turn leads to improved management and decision-making. This directly ties into the idea of SACM, making an SKMS an optimal tool for such tasks.

2.3 Review of literature on CMDB management models and their applications

The pre-existing information on CMDB management models is quite limited, which makes it difficult to find an appropriate model to adapt for Erillisverkot. According to Brenner et al. (2006), there are eight different requirements of a management model that must be met in order to be appropriately applicable in managing additions made to the CMDB or even the CMS.

1. *Adaptability of the model*
    - Continuous improvement and adaptability regarding organizational restructuring, process restructuring and changing of requirements.
2. *Alignment to ITSM information needs*
    - The information required for the organization's services should be well covered, yet still not overwhelming for the user. This is something that management needs to address. Information Technology Service Management (ITSM) is the process of managing services and delivering them to customers. The result of proper ITSM alignment is that only the essential service-related information should be taken into consideration when data is added to the CMDB.
3. *Comprehensive view on infrastructure and component relations*
    - A clear view of infrastructure (CIs) and their relationships, the foundation for a CMDB.
4. *Inclusion of ITSM process artifacts*
    - Deprecated documentation, reporting, and sources (artifacts) created during different processes should be saved and stored on a database for future referencing. These records could be valuable at a later time for incident management analysis or serve as aid for future decision making.
5. *Integration with external databases*
    - All relevant databases should be integrated in to the CMDB in some form.
6. *Integration with (other) network and systems management data stores*
    - Integration with any other types of data stores for example a Definitive Media Library which is a repository or secure storage where *"authorized versions of software package configuration items (CIs) are stored and protected."* ("IBM", n.d. "Definitive Media Library Application").
7. *Support for life cycle status accounting*
    - A determining factor for longevity and steadfastness of the CMDB is the life cycle monitoring, this is also a requirement stated by ITIL.
8. *Catalog of basic CI types*
    - Having established templates or layouts for the CIs decreases the time required for implementing a CMDB.

Note. The specific requirements marked in italic are citations from Brenner et al. (2006); the description for each requirement is my personal interpretation.

2.3.1 Configuration management roles

Without defining and delegating key roles in the management model, the system and hierarchy quickly fails to deliver results efficiently. In courtesy of the material produced by Justin Group, the key roles are as follow:

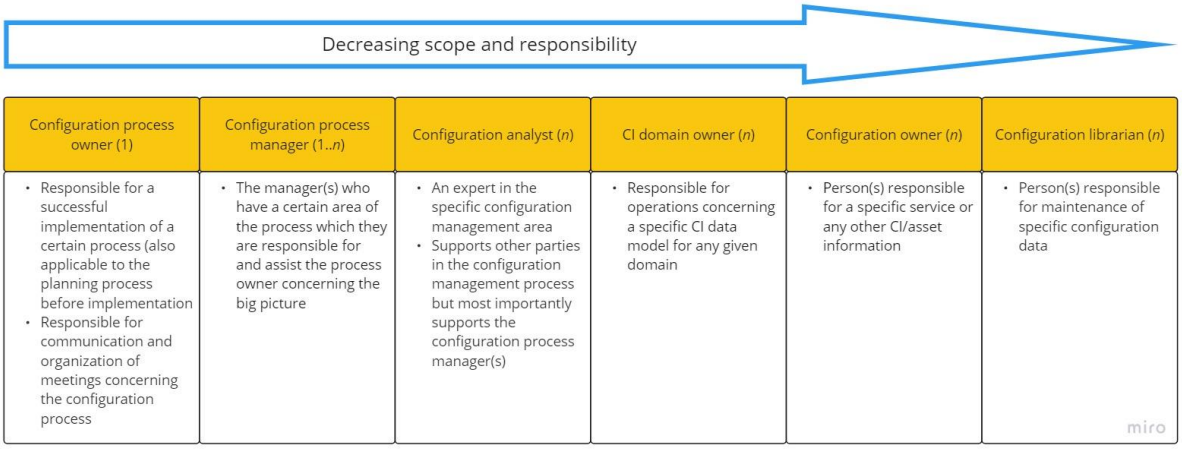


Figure 5, Configuration management roles and their scope (Adapted from Justin Group Oy, 2020)

The roles mentioned are tied into the table made in section 2, which outlines the different management areas targeted in this thesis. The configuration process owner/managers and the CI domain owners have responsibilities in the demand management and configuration management & planning sections. The configuration analyst plays a supporting role in the configuration control and configuration verification & audit sections. The librarians have their responsibility areas in daily matters concerning data flow, for example data maintenance and other operational tasks.

2.3.2 Configuration Control Board

The Configuration Control Board (CCB) is a board of members whose roles are depicted in Figure 5. The CCB consists of a configuration process owner, configuration process managers, CI domain owners and eventual supporting roles which can either be within the CCB or serve as external help (such as configuration analyst, configuration owner and configuration librarian). The CCB plays an important role in the entire CM process as they are the main administrative entity that uphold the CMDB planning, integration, and development.

3. Methodology

3.1 Research approach

To reinstate, the main goals are to assess potential value of a CMDB and to develop a management model. The research approach appropriate for these tasks will be qualitative, as it allows for insights to be made into the different nuances of the company. The planning of a management model for the CMDB requires an in-depth exploration of the organizational structures and different roles found within various departments. To make a customized management model there is a need to define new roles, re-allocate roles or responsibilities to people who are the most fitting. If Erillisverkot currently has pre-existing departments or roles which are similar in nature to those mentioned in the CMDB literature, they could be utilized within the CCB and, therefore, the management process.

To make the most informed and tailored recommendations, small interviews will be conducted. This will determine the most suitable individuals for specific roles within the CMDB management sphere and will identify the requirements of the CMDB and management model. The interviewees will be people whose current expertise is essential concerning the CMDB project.

3.2 Justification for the qualitative research approach

The reasoning for the qualitative approach lies in the very foundation (parents) of a CMDB, depicted in Figure 3, processes and technology. While delving into the process aspect, we understand that processes can be purely mechanical, however, they can also be abstract, for example the process of action from management roles. The steadfastness and reliability of the process is based on the quality of the model. The quality in turn is dependent on how customized the model is for a specific company's needs. This is why the qualitative research approach is the most optimal research method for this study as it allows for the understanding of the specific needs of different teams within the organization. As Fossey et al (2002) descriptively state:

> Qualitative research aims to address questions concerned with developing and understanding of the meaning and experience of dimensions of humans' lives and social worlds.

3.3 Description of data collection methods and participant selection criteria

The data collection for this thesis comprises of semi-structured interviews and observations.

3.3.1 Interview

The interview process was initiated to get a thorough understanding of the requirements that different parties have, and what they would wish for the CMDB to achieve. The interviews were semi-structured, with purposive sampling participant selection. The reasoning for the purposive sampling method is that the relevance of the participants insights and expertise are defining factors in the success rate of the management model and the general CMDB planning process.

To underline the importance of the participants, some of the roles were “Product manager”, “Development manager” and “Systems designer”. The goal was to interview people with differing expertise to get a wider perspective of the requirements of the CMDB. Four of the interviews were conducted via an online meeting platform and two participants answered the questions via email. The total sample was six interviewees.

Due to the semi-structured nature of the interviews, the questions were presented uniformly to all participants; however, there was sufficient leeway for them to express additional wishes, opinions, or concerns.

Interview questions:

The questions were originally presented in Finnish, and they were constructed by Justin Group as preparatory questions for one of our workshops. These are the translated versions:

- *Why do we need Configuration Management?*
- *What problems are we trying to target with Configuration Management?*
- *What kind of information should the CMDB contain from my perspective, my team’s perspective, and the perspective of the whole organization?*
- *Who would be the natural configuration data providers?*
- *What parties or entities would benefit from this data?*

- *Who would best fit the role of configuration process owner?*
- *Where or on which platforms does the current configuration data exist?*

3.3.2 Observations

As previously mentioned, Erillisverkot has hired a consulting agency to assist with the CMDB planning process. The agency are experts in CMDBs both with planning and integrations. The consulting package purchased by Erillisverkot includes material, schooling, and workshops in order to assist with the process. This ties into the observation type data collecting, as the workshops played a critical role in the planning process. Additionally, numerous meetings related to CMDB planning were conducted, which further contributed to the data collection.

4. Interviews

The following is a collection of translated responses from all the interviews conducted. Any quotes are also translated, while maintaining original sentiment and meaning. The participants' specific titles within Erillisverkot are not mentioned in order to ensure anonymity.

Why do we need Configuration Management?

Table 2, Why do we need Configuration Management?

Participant	Answer
1	From the perspective of information management, having information on who possesses which devices such as “workstations, mobile phones and noise-cancelling headphones” would be beneficial.
2	“For production processes, change management, incident management. If a change is made, for example, to device X, one should be able to see clearly what kind of effects it causes, and what kind of dependencies there are”.
3	“To more easily be able to track the lifecycle of different systems.”
4	"It gives us a reliable overall picture of our assets. It also provides an overview of how our infrastructure is built. The amount of change in our operations and the construction of various operational processes. It also provides the conditions to understand the life cycle of our own devices, the economic dimension, an overall picture of everything we have, and also an economic description of how much money is tied up, for example, in licenses and so on."
5	"For product management. It facilitates the development of service quality and efficiency, information quality, and integrity."
6	"To support change management, for the Change Advisory Board (CAB), for example, how the breakdown of a device affects a particular service. Asset functionality to aid in budgeting, management of device life cycles."

What problems are we trying to target with Configuration Management?

Table 3, What problems are we trying to target with Configuration Management?

Participant	Answer
1	The same reasons why we need Configuration Management, to better our understanding of who possesses which devices.
2	"There is not a unified place where information is stored; it's scattered everywhere. There are various places for information, but there is no agreed upon model, for example, for updating."
3	"That the correct information is always available from one place. This speeds up the resolution of faults."
4	"Through Configuration Management, we can better see how our products and services are built, what all things (CIs) are needed for a service or product to function or be maintained." Currently the information we use for solutions is unreliable, this all relates to standardization.
5	"Cost accounting, profitability management, customer management".
6	"We have over 1000 rows of 'life cycle management' and other information in Excel that should be in the CMDB Asset section. In change management there is no system to see what a particular change affects."

What kind of information should the CMDB contain from my perspective, my team's perspective, and the perspective of the whole organization?

Note. The following are answers from the participants and will be presented in the perspective of a whole organizational component to protect sensitive information.

Table 4, What kind of information should the CMDB contain from my perspective, my team's perspective, and the perspective of the whole organization?

Perspective	Answer
Combining order channels	Currently there are multiple order channels, highlighting a need for a centralized database. All preexisting information which currently resides in Excel-file format should be moved to the CMDB.
ITIL Process	The CMDB should contain information on functional connections, devices, and services in accordance with ITIL processes. This will help us to get an overview of different interconnected parts and their costs.
ICT-Infrastructure	"ICT infrastructure information, descriptions of data centers - telecommunications, endpoint devices, interdependencies, specific information on how these mentioned things are related to services."
Services and products	The CMDB should contain information on services, products, plans and active orders.
General	The CMDB is designed to contain only mandatory information that is critical for effective Configuration Management. This approach ensures information remains streamlined and focused. Any additional information still valuable to the organization should be appropriately stored in the master database. The master database serves as a central repository, safeguarding a comprehensive and updated collection of critical data. This includes, for instance, detailed device information such as models, types, IP addresses, software configurations, as well as version control details and specifications related to various telecommunications connections.

Who would be the natural configuration data providers?

Table 5, Who would be the natural configuration data providers?

Participant	Answer
1	Information management or service desk
2	"Virve 1 assets, Virve 2 assets (including virtual ones), telecommunications assets, ICT assets - security cloud configuration producers, server environment, information management (laptops, phones, etc.). Service catalog (services), customer information producers."
3	“Platform managers and team experts”.
4	"Entities that are building something new into our operations, including information management, participants in the change management process."
5	From operational entities such as production. Should not come from entities such as sales.
6	“Information management (all users) or HR”, customer data, DCIM and services.

What parties or entities would benefit from this data?

Table 6, What parties or entities would benefit from this data?

Participant	Answer
1	"Supervisors, service desk", information management especially concerning billing.
2	Entities related to production or production processes, "control center, customer service and expert groups."
3	The staff of the control center.
4	"All entities working in production, service management personnel, and also those working at the customer interface, but in principle everyone."
5	"Almost everyone, production processes, incident management, change management, strategic planning."
6	The Change Advisory Board, telecommunications, data center services, information management and control center.

Who would best fit the role of configuration process owner?

Table 7, Who would best fit the role of configuration process owner?

Participant	Answer
1	Head of information management.
2	Head of production.
3	No comment.
4	Head of production.
5	"Somebody would be good to have."
6	"Somebody from the architect team."

Where or on which platforms does the current configuration data exist?

Table 8, Where or on which platforms does the current configuration data exist?

Participant	Answer
1	"In various emails or nowhere at all."
2	"Vira database (Virve 1 assets + telecommunications assets), Netbox, Confluence (production data, Excel, lists, etc.)"
3	"The details of the Virve network are in Vira. In various management systems. On network drives. In Confluence."
4	"In several places, Confluence, file folders, Netbox."
5	"Monitoring and management system, Vira (administrative system), Confluence, Excel."
6	"DCIM, Confluence, on our own computers, and then there's a lot missing, for example, service descriptions are on the Intranet, but they haven't been specified on a system level."

5. Observations

During this project, observations were made in different areas such as in workshops, meetings, and day-to-day discussions. The following segment will describe different areas and the problems identified within them.

Data uniformity:

One of the clear problems identified is that data currently exist in too many places without significant cohesion. Despite this issue, Erillisverkot still possess a few master databases for example a DCIM and Confluence (software by Atlassian).

Application Discovery and Dependency Mapping (ADDM):

A significant problem at Erillisverkot is the lack of efficient ADDM. Even though there is proper disturbance management which handles issues or errors that might arise, there is yet to be established a streamlined system which can efficiently identify exactly what repercussions may occur to certain customers if a system error occurs. The goal is to prioritize customer notification first, and not vice versa where the customer informs Erillisverkot of an error in their service. This problem is something that the CMDB would

solve or at least improve. According to Drogseth et al. (2015), the implementation of clear dependency mapping (ADDM) makes it easier to see which systems suffer and therefore which customers (or internal systems) are affected by eventual disturbances.

Service Knowledge Management System (SKMS) and Configuration Management System (CMS):

According to Erillisverkot a SKMS is very ambitious. Currently, a SKMS and a CMS is not within the scope of the CMDB project, but they serve as a good reference for long-term planning.

Brenner et al. (2006) requirements:

1. **Adaptability of a management model:**

   One of the identified traits of Erillisverkot is that they are a growing company. This results in a need for adaptability and scalability for different areas. This directly ties into what was mentioned earlier in the thesis, "*Adaptability of the model"* (Brenner et al. 2006). This is worth underlining as it is perhaps the most crucial attribute that the management model should possess.

2. **Integration with external databases:**

   An observation of a decision made during the project, was that Erillisverkot will utilize Application Programming Interfaces (APIs) as a primary method of database integration. This means APIs will be responsible for the cross-communication between different external databases or other resources and the CMDB system. This would include information brought from the Erillisverkot DCIM system which contains a large portion of the infrastructure data.

3. **Catalog of basic CI types:**

   A catalog of basic CI types is currently something Erillisverkot does not possess. This in turn will slow down the implementation process once it has been initiated due to the lack of templates for CI attributes. For example, if a workstation is considered as the CI, attributes would include be information such as the model of the computer, owner etc.

Additionally, the CMDB aims to achieve an abundance of objectives for Erillisverkot. These objectives were stated by Erillisverkot in collaboration with Justin Group in one of the workshops:

- Enabling coherent teamwork
- Information and inventory on purchased goods
- A single source of truth containing only essential information
- Status & life cycle monitoring
- Version control
- Clarification of roles and responsibilities
- Aids for equipment or any other tendering
- Benefits concerning:
    - Vulnerability management
    - Production processes
    - Change-/incident management

The management model is designed to allocate responsibilities which will cover all the above-mentioned objectives. (Justin Group Oy, 2023)

6. CMDB Planning and Management model

The observations outline a clear synthesis of what kind of approach the CMDB planning, and management model requires. Let's break down the key takeaways from the interview to check for alignment and to underline critical pointers.

Key takeaways:

a) A CMDB could offer Erillisverkot an abundance of benefits concerning:
    1. Device monitoring
    2. Infrastructure (servers, routers, switches, and firewalls)
    3. Workstations and other accessories such as mobile phones

b) One of the big benefactors of a CMDB is the depiction of interdependencies and statuses of different devices. This leads to an effectivization of error detection related to different systems or services. Another important part is the organization's ability to track the life cycle of both devices and software. This enables an increased technical and economical understanding of the current state

regarding the organization's infrastructure. This includes both tied capital such as servers, software and technical information such as active licenses.

c) The central takeaway from all the interviews is that the organization's data sources are scattered and need to be coalesced. Currently data exist on different platforms such as Excel, different databases, personal computers, and email. A single source of truth is essential when it comes to scalability and longevity.
d) The natural data providers would be the largest or most important entities of Erillisverkot. This would include, Virve 1 & 2, telecommunications, information management, change management, operative entities like production and customer data.
e) The goal would be for everyone in the organization to somehow benefit from the CMDB. The significance of the data will be mostly shown in change management, budgeting, production, disturbance management (control center, customer notification), customer service and telecommunications.
f) Even with mixed opinions, head of production seems to be a good candidate as configuration process owner.

Now that both interviews and observations have yielded essential takeaways, the direction of the planning phase of both CMDB and the management model has become clearer.

6.1 Introduction to CMDB planning for Suomen Erillisverkot Oy

To understand the planning process, we need to analyse the scope of the entire organization.

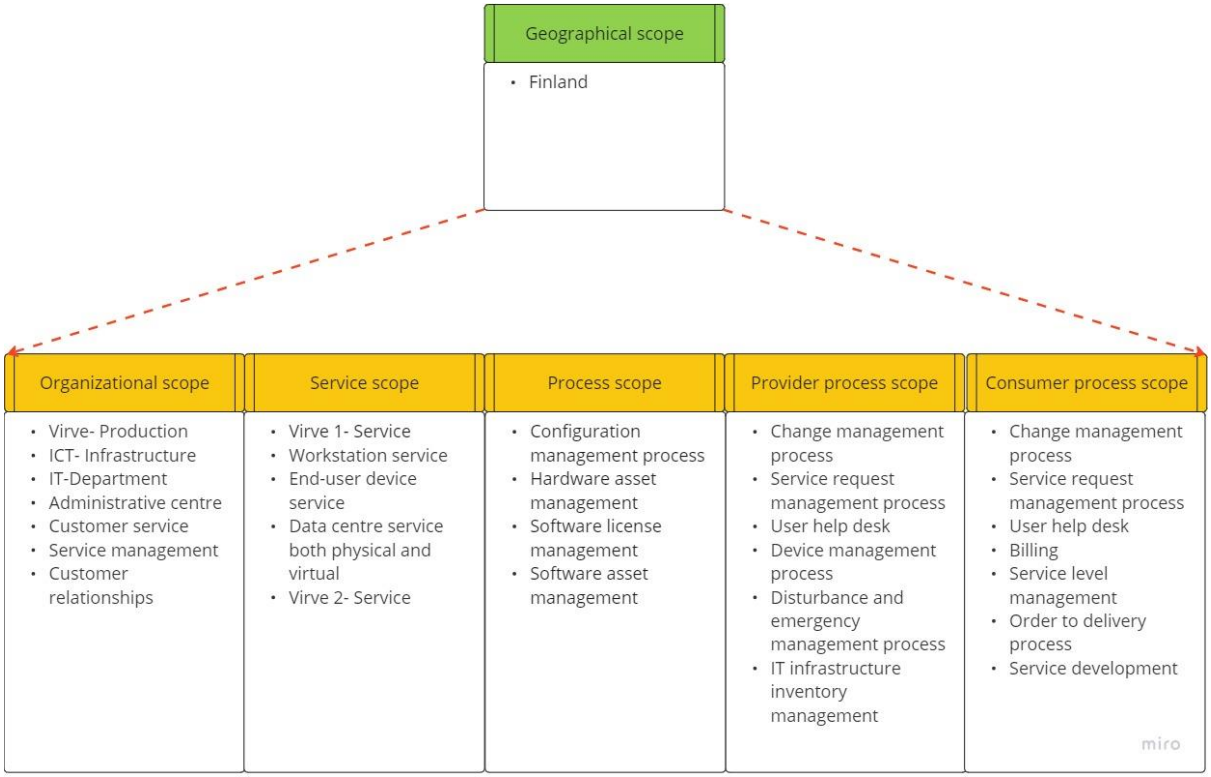
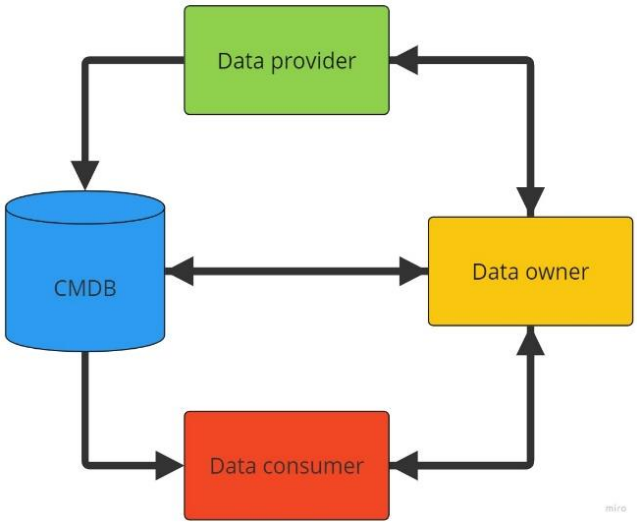


Figure 6, Overview of the scope

The organizational scope shows the main pressure points which must be covered when constructing the CCB (Configuration Control Board). This scope also shows some of the main areas of the company which already have some form of database. Ultimately, as mentioned earlier, the CMDB will serve as a single source of truth. In this data management context, it means a singular or systematic place for critical information to exist, this could mean a CMDB, DCIM system or a master database. The most important databases that Erillisverkot currently have, will most likely stay as the master databases but the essential information from them will be brought into the CMDB via APIs, however I will not cover the APIs further as it is beyond the scope of this thesis.

Figure 7 displays how different entities interact with the CMDB. This can be considered as another point of view of the essential parties within the scope of the CMDB project. Data providers are in this aspect any entity who create essential data which is integrated into the CMDB. Data consumers are the entities which are able to utilize existing data within the CMDB. The data owner is the party or parties who are primarily responsible for this data.



6.2 Overview of the management model

The management model is a living document which consists of multiple avenues. The focus is to illustrate the cohesion between the different concepts presented in the thesis.

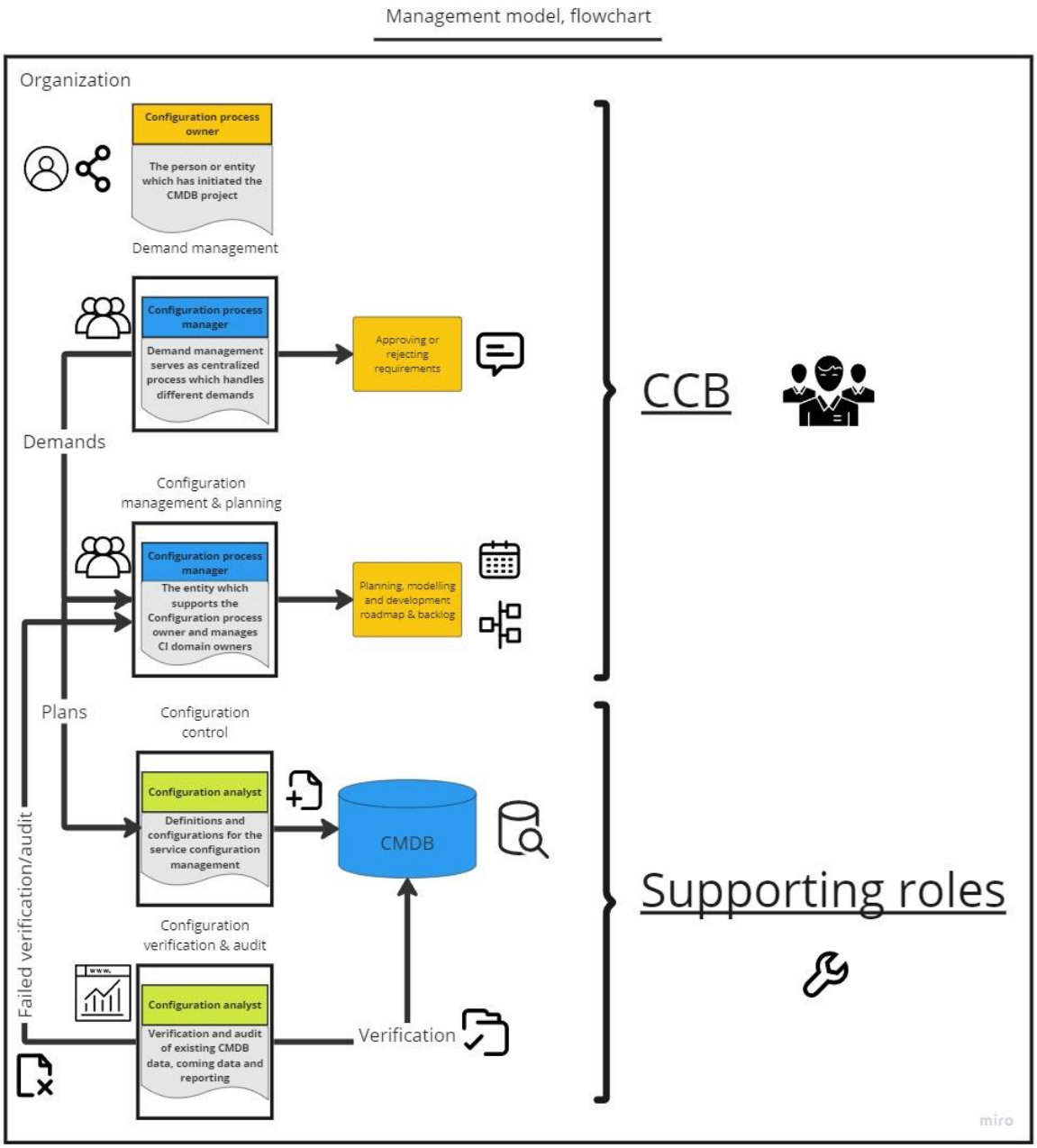


Figure 8, Flowchart between different management areas, CCB and support responsibilities. (Adapted from Justin Group Oy, 2020)

To further explain the flow chart (Figure 8) in action, here is a practical example:
The configuration process manager from Erillisverkot Datacenters & IT-Capacity team, decides in a meeting that the CMDB should have a field (CI record or attribute) for datacenter room names. This requirement brought forth is now something that demand

management must process, they evaluate if this is something worth doing, and either reject or approve the proposition. This information then continues through the chain of configuration process managers and their respective teams, until the demand finally falls upon a configuration analyst to implement into the system.

Practically the implementation could be done with the following steps: First the analyst would inform the DCIM team that a field needs to be added. Once the team adds the field or attribute, an API will pick up the data from the master database (the DCIM system) and import it into the CMDB. Once this has been done, the configuration analyst responsible for verification and audit would verify that the field or attribute has been added or updated and would then inform demand management of a successful implementation.

6.2.1 Demand management

Demand management is an area within the management model which is mainly responsible for gathering and funnelling requirements and thereafter making decisions or approvals.

Table 9, Demand management activities and their descriptions

Activity	**Description**
Submit new requirement	Submitting a new requirement. This requirement (demand) will be forwarded to configuration management & planning.
Reception and analysis	Requirements are received and analysed
Classification	Classification of the CI domain(s) related to the specific requirement. This identification will help clarify what CI domain is essential and therefore minimize risks later down the event chain. Here the status and priority are also set.
Approval & prioritization	Here analysis and approvals/rejections are made, priorities are then set.
Define or update use case	Here new backlog items are created, or existing ones are updated.
Authorization	Management authorization for the backlog items.
Assign to deployment	After the item has been approved, it is sent to configuration management & planning.

Note. The specifications of the table are a result of material produced by Justin Group

6.2.2 Configuration management & planning

Here demands, communication and policies are planned. Roadmapping and other bigger picture items are also handled.

Table 10, Configuration management & planning activities and their descriptions

Activity	**Description**
Communication	Establishing communication between relevant parties.
SACM policy, targets and objectives	Existing targets are analysed to assess validity and to evaluate if new targets need to be set.
SACM planning	Input from demand management is gathered and analysed. Releases & versions as well as tools & integrations are planned. CI lifecycle policy & rules are also planned.
Roadmap planning	Here prioritization and long-term planning is conducted.
Ownership and responsibility planning	Ownership and responsibilities are defined for relevant parties.

Note. The specifications of the table are a result of material produced by Justin Group

6.2.3 Configuration control

Configuration control is primarily concerned with developing and deploying integrations according to SACM plans.

Table 11, Configuration control activities and their descriptions

Activity	**Description**
Tools deployment	Tools are developed and deployed according to SACM plans.
Integrations deployment	Integrations are developed and deployed according to the SACM plan.
Training & communication materials	Here the documentation and other training/communication materials are prepared.
Training & communication	Key parties are trained, and materials are produced and published on company sites (intra).
Process support	This provides support to key parties and supports the SACM core team.

Note. The specifications of the table are a result of material produced by Justin Group

6.2.4 Configuration verification & audit

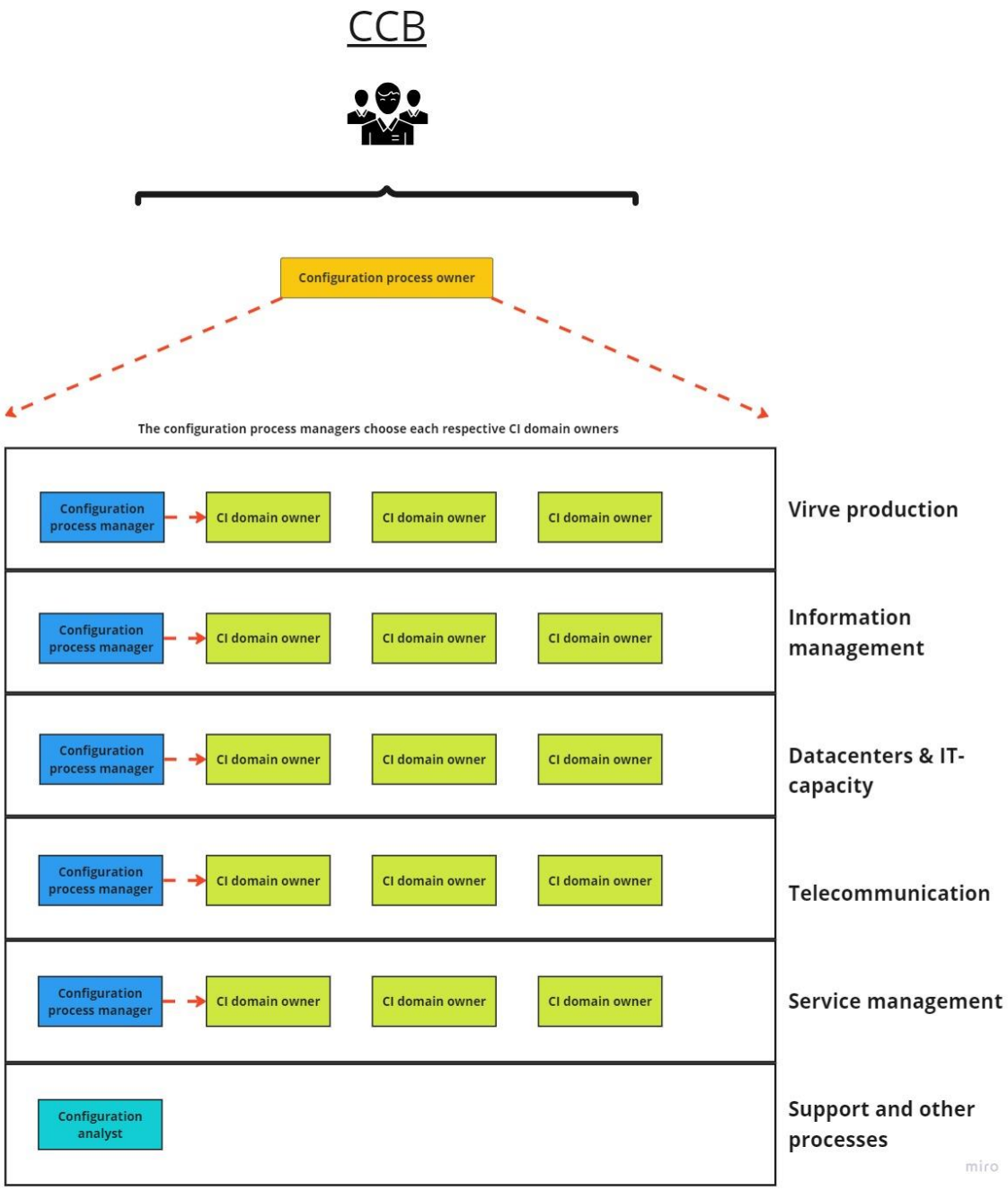
Configuration verification & audit is primarily concerned with auditing existing information in the CMDB and producing reports.

Table 12, Configuration verification & audit activities and their descriptions

Activity	**Description**
Status accounting	Ensures that the status of any given CI is accurate throughout its lifecycle
Discovery	Depending on inventory, the CMDB is continuously checked and updated based on live feed from inventory data
Reporting	The reporting activity covers an arrange of different topics: • SACM process KPIs • SACM data KQIs • SACM tool KPIs • SACM vendor KPIs
Configuration data verification & audit	A monthly report on audit actions.

Note. The specifications of the table are a result of material produced by Justin Group

6.3 CCB outline for Suomen Erillisverkot Oy

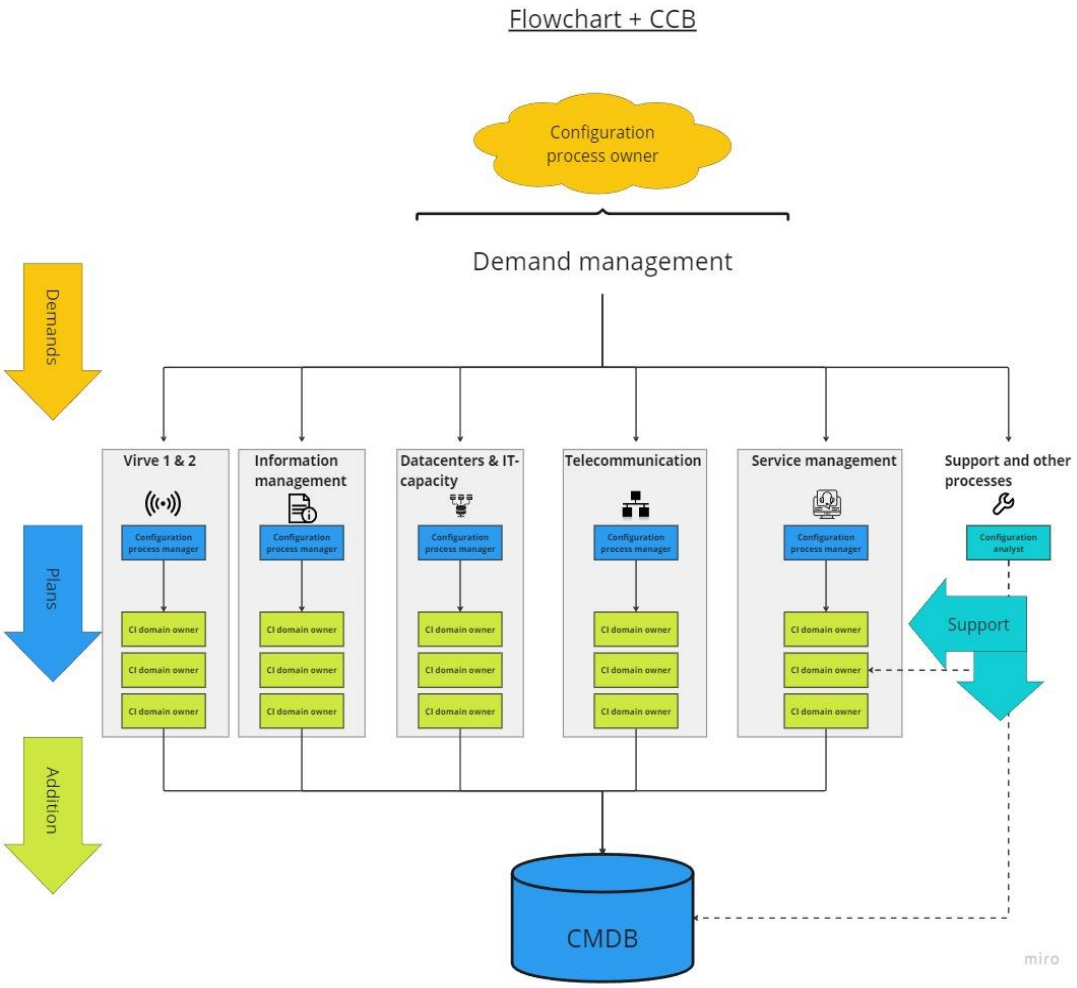


According to the CCB structure depicted in Figure 9, each individual area has its own configuration process managers and their respective CI domain owners. The manager picks out their own domain owners from their teams and gives them orders on how to help with different CMDB-related processes. Each manager can have *n* number of domain owners; there is no set number which is optimal for CMDB processes. This dynamic approach is also sustainable which eases the concerns that come with a growing

organization and requirements for increased capacity. The configuration process owner is the person responsible for the entire process. This person ensures that the managers know their own responsibilities and ensures that domain owners are chosen. The hierarchy always supports upwards, meaning that the domain owners support the managers and in turn the managers support the process owner.

6.4 Explanation of how the management model aligns with the organization's needs and goals

As seen in Figure 10, the model shows the process flow and hierarchy of the entire CMDB team. For a growing organization it is mandatory for the model to have a scaling quality. If there ever is a need to add another domain to the model, it can simply be added horizontally. This is something that was mentioned in previous sections, "*Adaptability of the model"*.



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If the model is not adaptable, it will result in an abundance of resources being wasted on the constant re-defining of the management model. The horizontal approach is also applied in other spaces, for example the entire CMDB planning & implementation process and the data model. Another important part of the model is the CCB with emphasis on the CI domain selecting criteria. Each configuration process manager is responsible for choosing the respective CI domain owners. This ensures that the domain owners are picked by someone who has the expertise to be able to analyse who would be most appropriate for a specific role.

6.5 Presentation of the components and key principles of the management model

The key components of the management model are information flow and hierarchy. An established flow of information is mandatory to ensure efficiency and scalability. The way the information flows from demand management to configuration management and planning is essential when there are tens, hundreds or even thousands of demands being placed on the model. The hierarchy of the management model is there to ensure that responsibilities are clear and that it is clear what person answers to which part of the model. Without an established hierarchy, the system quickly deteriorates when emails or messages are being sent cross-hierarchically. This may initially feel like an over-engineered or overly complicated system, but it has its values placed on the fact that the system must accommodate large volume, which is where Erillisverkot is headed.

The management model is only one part of the CMDB planning process. There is yet to be established a proper foundation for the CMDB, an exemplary data model that can be used for multiple different data structures or entries, to mention a few. The entire implementation of a CMDB system for Erillisverkot could take anywhere from 3 to 5 years, and this is why the robustness of any plans made in this early stage is crucial.

7. Recommendations

The primary concern of such a large-scale project is motivational drop-off in the CMDB development process. To best fight the concern of decreased progression over time is to construct a roadmap with different milestones. The roadmap should contain specifications on what matters or implementations must be made within a certain span of time, the more specific the better. This way the configuration process owner and their superiors know

what to expect from the project and gives the owner a scope in which to make progress. An example of a roadmap adapted from Drogseth et al., (2015) and customized for Erillisverkot could be the following:

6-month milestone:

This is when the planning phase has taken steps forward in the SACM process. In practice, it will be a summary of what has been achieved so far concerning the CMDB initiative. This will also include some form of prototype data and management model (such as this document).

12-month milestone:

A more complete overview of the CMDB systems deployment benefits. From Erillisverkot perspective this would mean a clear mapping of which key areas could see benefits from the CMDB system. For Erillisverkot this also means having some idea of what platform to build the CMDB on, this could be Jira Insight (software by Atlassian), or another premium platform (such as ServiceNow). This milestone should also include some plans for budgeting and if there is a need to hire more employees to work solely on the project.

18-month milestone:

By this point the responsibilities should be clear for the entire team working on the project and even people who are not directly involved. These people might have miscellaneous tasks related to the CMDB and should therefore also be knowing of their responsibilities. A budgeting plan should be established, and all other models (including the management model) should be refined.

24-month milestone:

By this point the fundamentals of the CMDB should be implemented and critical use cases should already be available. By this point Erillisverkot should already see benefits concerning change management, version control and disturbance management. This will already lead to quicker notices being sent to clients due to a clear overview of the organizations different intertwined components.

In this stage of the process the actual implementation of the management model can occur. This is the first time when it can be stress tested to see how it performs under pressure in the form of multiple and perhaps complicated demands. If any faults are discovered the model needs to be re-evaluated.

36-month milestone:

At this stage, the CMDB should already be showing significant benefits in multiple areas. The CCB and other role routines should be regular and integrated part of the workday. Further development should be constantly planned or introduced, for example CMS or SKMS. Necessary APIs should be up and running, and regular audits should be made to ensure maximum efficiency of the CMDB.

7.1 Suggestions for enhancing the management model

We can reliably say that the more specific the model is, the better. Each party should be aware of tasks assigned to them and be able to act when demand management makes a proposition. The processes in the management model should constantly be streamlined and unnecessary parts of the model should be eliminated to increase efficiency. KPIs and KQIs should be defined to be able to analyse the performance metrics of the model and the entire process from demands to implementation. Each addition to the CMDB should never be a one-man task, the work must be collaborative to ensure the integrity parameters mentioned earlier (only necessary data etc.).

8. Discussion and evaluation

The CMDB project is large, which requires significant attention to detail, a broad perspective, and an analysis of different courses of action. The main problems brought to light are the spread-out sources of information and the lack of a coherent system to solve the problems discussed during different parts of the thesis. The CCB in the case of Erillisverkot is established which will lead to a smoother continuation of the project. Even though the CCB shown in this thesis does not contain specifications (names/titles), general applications can be extrapolated from the CCB model. The most critical domains of any organization should have members within the CCB. This ensures that the matters discussed and planned are considered from different perspectives. Therefore, the

information introduced into the CMDB system serves a broad benefit and remains essential.

The limitations of the CMDB project are also apparent. To achieve a smooth planning to integration process, it is important for the organization to build a model of one single component in the organization, this means building a model of an entire service. When a model is built for one component, it is a lot easier to then start implementing other components and constructing the CMDB horizontally instead of trying to construct the entire database at the same time. The outlined approach, emphasizing modelling one organizational component before broad-scale implementation, offers a structured pathway. This stepwise integration reduces initial scope complexities such as scope creep and ensures consistency.

Due to the cultural changes required for the CMDB to work efficiently, it is crucial that awareness campaigns or similar staff training take place. This adds additional value to the SACM process due to the interaction between the other staff and the CCB. As a result, feedback can be given more efficiently, and the quality of the feedback is better due to the high number of people familiar with the system.

The qualitative research approach yielded great results in understanding the nuances of the company’s organizational structure and capturing in-depth insights. By opting for interviews and observations as the data collection methods, the study was able to extract firsthand information, uncovering the challenges and needs directly from those immersed in the organization's day-to-day operations.

While this qualitative method provided depth and detailed perspectives, it's essential to acknowledge its limitations. This approach might have a degree of interpretative biases and might not capture the complete picture of an organization as diverse and extensive as Erillisverkot. This is also why Justin Group played an important role in providing Erillisverkot with a third-party perspective and therefore gave a more mixed approach combining both a qualitative internal view, as well as an expert external view.

Looking ahead, the CMDB’s adaptability will be tested by technological advancements and shifting organizational paradigms. It's essential to remain proactive, anticipate future

challenges, and integrate innovative solutions. The key takeaway is that the CMDB project is meant to last the entirety of the company's lifespan. There is no "one size fits all" approach, therefore it is essential that the CMDB becomes a daily tool for the majority of the staff. This gives the accommodation for the proactive environment an efficient CMDB requires. Additionally, to maintain a high level of data integrity, it is vital that the CMDB only serves as a hub for essential information. There can and should be additional databases which serve as the master databases. This minimizes the chance of unsynchronized parallel data existing in two or more places.

9. Conclusion

Planning and implementing a CMDB system are complex matters that require rigorous planning phases to ensure a smooth journey in Configuration Management. The importance of a well thought out management model, data model, responsibility delegation, milestone planning, and executive motivation cannot be stressed enough. If one or more of these areas fail to deliver or play their part, the repercussions on the timeline will be immense.

9.1 Summary of key findings and their implications

The goal of this type of project is to achieve some form of operational system as fast as possible. This "starter" system should be a slim slice of the entire organization, which ultimately serves as an example to build the rest of the system horizontally. This practically means picking apart a single service, breaking down all the infrastructure, software and systems that are required to keep this service running. Once all the CIs and their dependencies are mapped out, and the data concerning these elements are audited and verified to be essential, other segments of the organization can be implemented.

In Figure 11, the grey square shows how a sector of the organization could be depicted in the CMDB. Once a good template has been established, it is a lot easier to systematically start adding other CIs to the CMDB. Because the management and data models have an active example in use, it also maximizes changes made early on to optimize these models. If the organization would opt to build all services at the same time starting from the

bottom and working upwards, the models wouldn't be as dynamic, this would result in strenuous remodelling and other issues related to a too large of a scope.

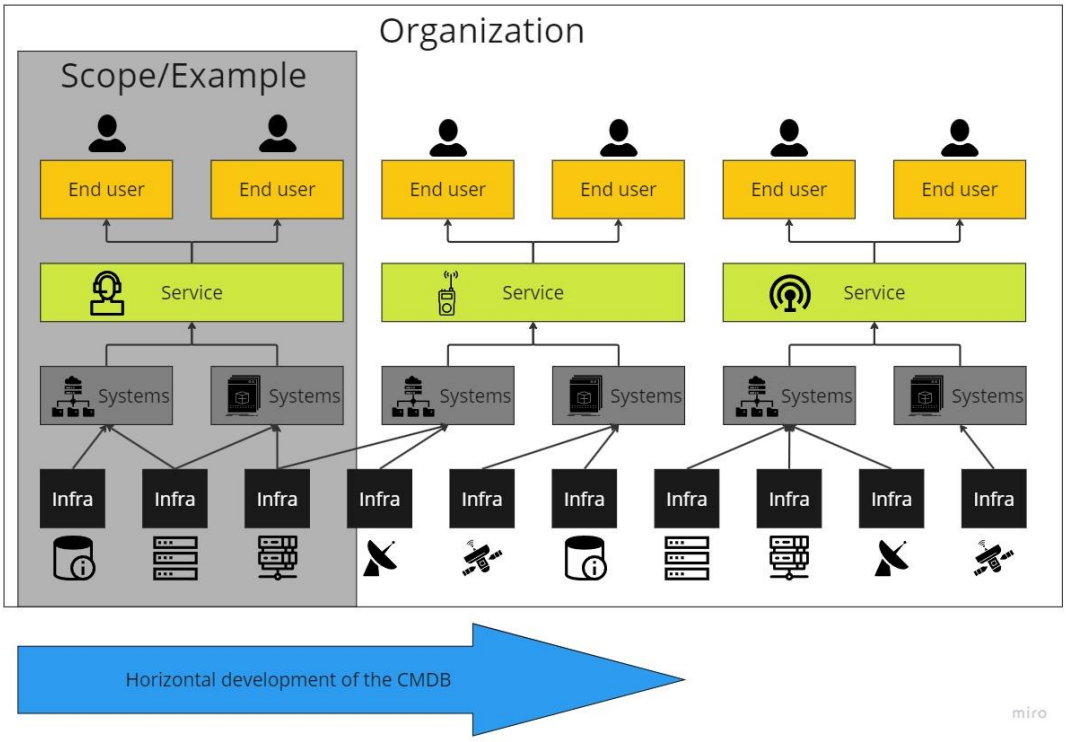

Figure 11, Example of the horizontal progression

9.2 Contribution to the field of CMDB planning and management model

A notable gap exists in research concerning management models, specifically in the field of information technology and CMDB applications. The lack of information on management models, even in books written on ITIL and CMDB is quite surprising considering the massive benefits a proper CMDB can offer. It is understood that organizations are very different, which results in papers and books being published addressing broader concerns or topics related to CMDB. I believe that this thesis can shine a small ray of light on the broad subject of CMDB and offer insights into the application of a management model for such an undertaking. There are lots of theories on different management models which are applicable to other fields but not applicable in this current context. Such management models include: The McKinsey 7-S Model, Lewin's change management model and Kotter's change management theory, to name a few.

To emphasize the document's purpose once again, it is intended to act as a framework or blueprint for organizations currently in the process of planning or implementing a CMDB-like system. This guidance can also extend to smaller entities, such as DCIM implementations, as the information presented here is broadly applicable to various contexts.

9.3 Reflection on the overall research process and potential areas for future research

The research process will prove to hopefully be significant for Erillisverkot and perhaps even other companies. The details in this document are more tailored to Erillisverkot and specifically IT-organizations, however, there still might be some takeaways which other non-IT companies may use. The true benefit of the research will not be shown until later stages of planning and eventually implementation. As long as such a project is done methodically, the end product will provide any organization with immense benefits. Iterations are going to be made, and this continuous development is key to sustaining the system and making sure it provides the same, if not more, benefits in the future as well.

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10. Summary in Swedish

10.1 Introduktion

Konfigurationshantering (CM) är ett brett ämne som främst handlar om produkt-livscykler och produktionsrelaterade processer. Enligt Watts (2015) omfattar konfigurationshantering, dokumentation och hantering av produktlivscykler. En databas för konfigurationshantering (CMDB) är ett register som innehåller information om hur olika hårdvara och mjukvara är konfigurerade inom en organisation. En CMDB kan och bör också innehålla information såsom "applikationer, mellanvara, dokumentation, människor, processer, leverantörer och andra relevanta data" (Drogseth et al., 2015, s. 27, egen översättning). De enskilda konfigurationsobjekten (CIs) kan betraktas som den minsta konfigurerbara enheten i en CMDB. CMDB är i grunden en relationsdatabas där relationerna beskriver förbindelser mellan olika konfigurationsobjekt.

Detta dokument ger en översikt över ett CMDB-planeringsprojekt för Suomen Erillisverkot Oy. Planen innefattar utmaningarna som uppstår under planeringsskedet av en CMDB samt vilka fördelar organisationen får genom en eventuell lyckad planering och senare integrering.

10.2 Bakgrund

Suomen Erillisverkot Oy, är en offentlig organisation som erbjuder essentiell IT-infrastruktur för statliga enheter, såsom militären och polisen. Med en komplex infrastruktur är en CMDB avgörande för att hantera organisationens varierande tillgångar. En av de markanta tjänsterna som Suomen Erillisverkot erbjuder är Virve-tjänsten, som möjliggör säker kommunikation mellan offentliga enheter. Via tjänsten skickas 74 miljoner meddelanden varje vecka, vilket understryker dess signifikanta roll inom nationell säkerhet och kommunikation.

För CMDB-projektet söktes det extern expertis för att hjälpa till med starten. Härmed påbörjades samarbetet med CMDB-konsultföretaget Justin Group Oy. Vissa delar av dokumentets innehåll bygger på workshops gjorda tillsammans med Justin Group. Konsultföretagets viktigaste uppgift är att förse Erillisverkot med fördjupad kunskap för ett CMDB projekt och erbjuda rådgivning från en tredje parts synvinkel.

10.3 Metodologi

10.3.1 Forskningsmetod

De huvudsakliga målen är att undersöka nyttan av en CMDB och skapa en hanteringsmodell för CMDB-projektet. En kvalitativ forskningsmetod lämpar sig bäst för ett sådant arbete eftersom det kräver en djup förståelse om organisationens krav och behov. För att utveckla modellen behövs information om organisationens dynamik, befintliga roller och hur befintliga ansvarsområden kan omjusteras. Eftersom Suomen Erillisverkot blev etablerat 1999, har det redan uppstått roller vars uppgifter kan utnyttjas inom CMDB-projektet. Avsikten är att personerna från tidigare är bekanta med dessa områden och kan därmed förbättra CMDB processen. För att förstå företagets nyanser krävs det intervjuer och observationer för att identifiera optimala kandidater för CMDB-förvaltningsroller, med fokus på deras nuvarande expertis.

10.3.2 Datainsamling och val av intervju deltagare

Data samlas genom semistrukturerade intervjuer och observationer. Genom att använda subjektiv kandidaturval, fokuserade intervjuerna på deltagare vars insikter är avgörande för CMDB-modellens framgång. Fyra personer intervjuades online och två personer svarade på intervjufrågorna via epost.

Erillisverkot anlitade konsultbyrån Justin Group som är specialiserad på konfigurationshanterings databaser. Det köpta paketet från konsultbyrån inkluderade material, utbildning och workshops. Detta material var avgörande för planeringen och möjliggjorde insamlingen av observationsdata.

10.4 CMDB planering och hanteringsmodellen

10.4.1 CMDB planerande för Suomen Erillisverkot Oy

För att skapa en stabil grund för CMDB-projektet måste en konfigurationskontrolls-kommitté (CCB) skapas. CCB är en styrelse med följande roller:

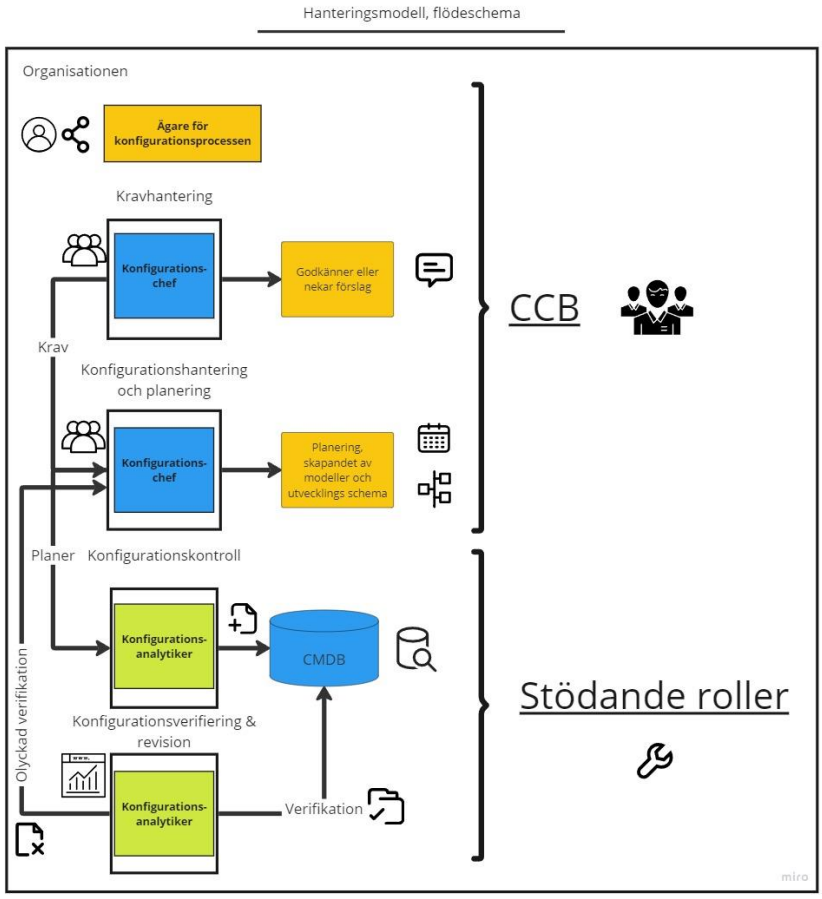
- Ägare av konfigurationsprocessen
- Konfigurationschefer
- CI-domänägare

- Eventuella andra stödroller (till exempel konfigurationsanalytiker)

När kommittén har grundats blir det enklare att fördela ansvarsområden och uppgifter, vilket underlättar strukturen och informationsflödet under planeringsfasen.

10.4.2 Hanteringsmodell för Suomen Erillisverkot Oy

Hanteringsmodellen är ett levande dokument som består av flera handlingsvägar. Fokuset ligger i att illustrera kopplingen mellan de olika ansvarsområden och informationsflödet mellan dem.



Figur 1, Hanteringsmodellen skapad för Suomen Erillisverkot Oy

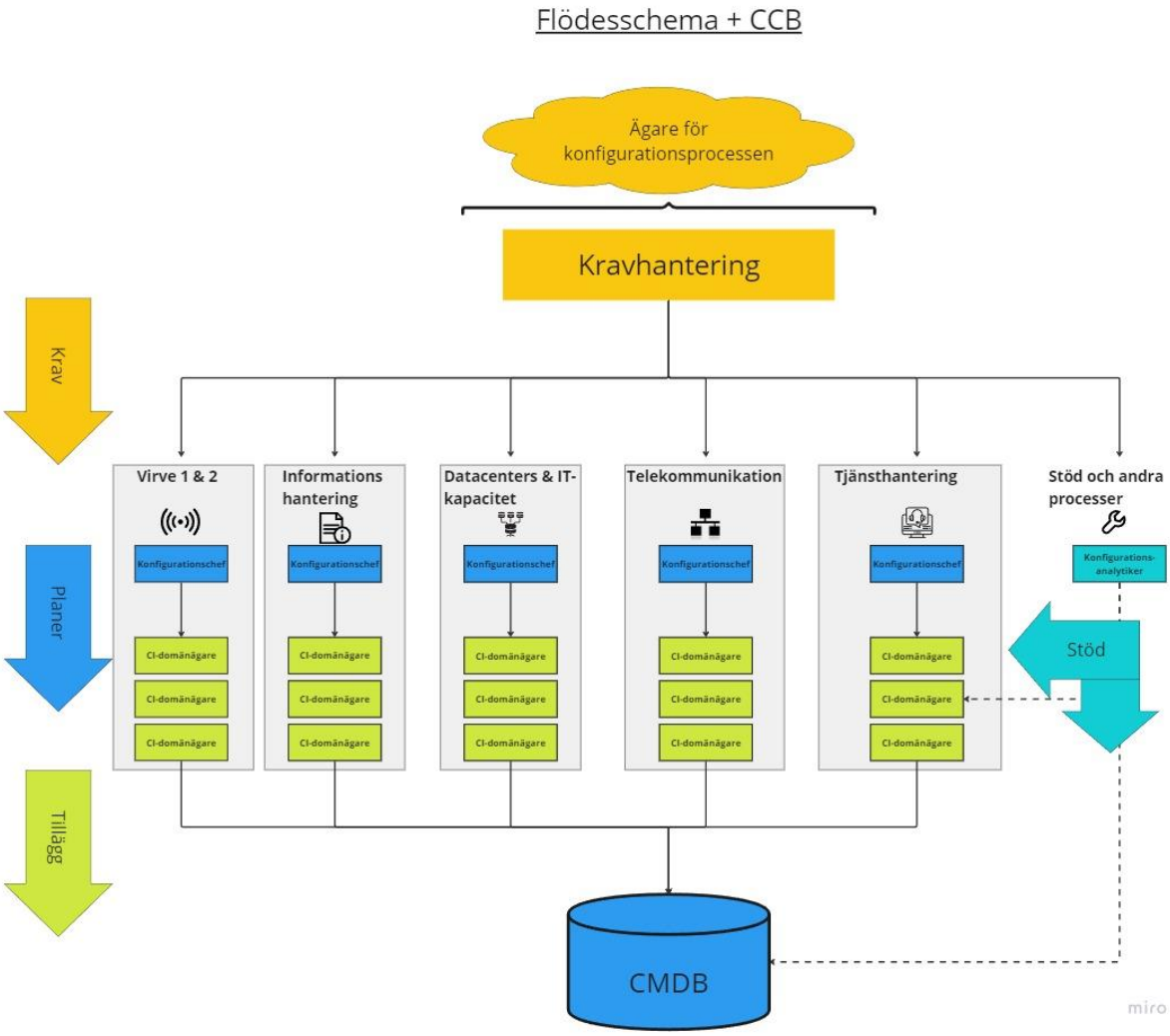
10.4.3 Analys över de olika hanteringsområden

Flera områden i hanteringsmodellen utforskades:

- **Kravhantering**: Samlar krav för beslutsfattande.
- **Konfigurationshantering & Planering**: Hanterar kommunikation, kartläggning och strategisk planering.
- **Konfigurationskontroll**: Hanterar verktyg och utveckling av integreringsprocessen.

- **Konfigurationsverifiering & Revision**: Fokuserar på att verifikation och revision av inlägg i databasen samt rapportgenerering.

10.4.4 Modellens överensstämmelse med organisationens behov



Figur 2, Beskrivning av de olika kritiska ansvarsområdena inom Erillisverkot och hur denna organisationsstruktur kombineras med hanteringsmodellen och konfigurationskontrollskommittén.

Den avbildade modellen, som visas i Figur 2, prioriterar skalbarhet. Ett viktigt attribut av modellen är möjliggörandet av horisontella tillägg, vilket ökar modellens anpassningsförmåga.

Konfigurationscheferna inom varje delområde ansvarar för att välja respektive CI-domänägare, detta säkrar att personer med väsentlig expertis väljs för dessa uppgifter.

10.5 Diskussion och evaluering

Skalan för CMDB-projektet är stort och kräver noggrann analys och åtanke både nu och i framtiden. Tidigt grundande av en CCB effektiviserar projektet markant. Även om den saknar detaljer kan dess fundamentala struktur vägleda projektets fortskridning. Konfigurationskontrollskommittén borde vara mångsidig för att säkerställa att organisationens alla domäner kan utnyttja databasen, vilket också minimerar risken för ensidighet.

För att minimera risken av överbelastning på grund av projektets skala, är det viktigt att göra en grundlig modell av *en* komponent i databasen. Med hjälp av denna modell kan man fortsätta att utveckla databasen horisontellt.

För att effektivisera användningen av databasen samt växelverkan mellan arbetare och konfigurationskontrollskommittén är det viktigt att det sker en kulturförändring inom företaget. Detta innebär kampanjer eller utbildningar, vilket ökar feedback och främjar kvalitén av CMDB:s innehåll.

Intervjuerna och observationerna möjliggjorde en djup förståelse av nyanserna i organisationen och gav insikter från de som är insatta i den dagliga verksamheten. Justin Groups involvering gav ytterligare ett balanserat perspektiv. Genom att kombinera interna insikter och extern expertis lyckades hanteringsmodellen skapas och möjligheterna av en CMDB utforskas.

10.6 Sammanfattning

Planering och implementering av ett CMDB-system är komplext och kräver noggrann planering för att säkerställa en smidig process. Vikten av en väl genomtänkt hanteringsmodell, datamodell, delegering av ansvar, kartläggning och motivation från ledarskapet är väsentligt. Om ett eller flera av dessa områden inte lyckas, kommer konsekvenserna för tidslinjen att vara grova.

10.6.1 Undersökningsresultat

Med att definiera och kartlägga en tjänst inom organisationen går det lättare i framtiden att göra tillägg till databasen. Efter att dessa komponenter och deras väsentliga data verifierats kan organisationen stegvis implementera andra avsnitt vilket utgör grunden för fortskridningen av CMDB-projektet. Allt detta möjliggörs och effektiviseras av en hanteringsmodell som på en praktisk nivå definierar ansvarsområden och utnyttjar befintliga resurser.

10.6.2 Forskningsbidrag

Det finns märkbart lite forskning när det gäller IT-specifika CMDB hanteringsmodeller, vilket är förvånande med tanke på potentiella fördelarna en CMDB kan erbjuda. Orsaken till detta är högst troligen baserad på skillnader mellan organisationer, vilket leder till att litteraturen styr sig mot generella helheter. Trots att det finns många hanteringsmodeller, såsom McKinsey 7-S-Modellen eller Lewis förändringshanteringsmodell, är deras direkta tillämpning till en CMDB väldigt begränsad. Forskningen som presenterades fungerar hoppeligen som en ram som en organisation kan använda vid planering av en CMDB eller ett liknande system.

10.6.3 Reflektioner

Undersökningen har upplyst möjligheten av en CMDB som en lösning för Erillisverkot. Även om detta dokument är skräddarsytt åt Erillisverkot och hanteringsmodellen omfattar specifika områden inom organisationen, kan dess insikter ändå gynna en bredare publik. Forskningens sanna värde kommer först att synas vid senare faser, såsom integrering. Sammanfattningsvis kan det härledas att metodiskt genomförande av planering och med en iterativ utvecklingsmetod kan olika sorters företag utnyttja fördelarna av en CMDB.