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# INTRODUCING ENTERPRISE ARCHITECTURE AT TNT POST

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1022148

Thesis submitted in partial fulfillment of the  
requirement for the degree of Master of Science in  
Computer Science – Information Architecture.

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Faculty of Electrical Engineering, Mathematics and Computer Science  
Section Computer Science

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## EXECUTIVE SUMMARY

Many large organizations encounter great difficulties with the operational implementation of their business strategy. The concept of Enterprise Architecture is a popular means to translate business strategy changes to implications for the operational organization and govern the overall development direction of the organization. Despite the availability of standard Enterprise Architecture methodologies and frameworks, many organizations struggle with the implementation of Enterprise Architecture in their existing organizational processes. The Mail NL business line of TNT Post is faced with the challenge of introducing Enterprise Architecture in its organization. The experiences of TNT Post may be of great value for large and comparable organizations that are also faced with this challenge. This thesis presents the experiences and implementation of the first steps in the introduction of Enterprise Architecture at the Mail NL business line of TNT Post, in order to support the introduction of Enterprise Architecture at other large organizations. This thesis provides (1) an overview of all the organizational characteristics that are at the basis of the Enterprise Architecture function and implementation, (2) an overview of the process in which Enterprise Architecture is introduced in the organization, (3) an extensive description of the process by means of which Enterprise Architecture is developed and applied within the organization and (4) an overview of the lessons that have been learnt from this first step in the introduction of Enterprise Architecture. As such, this thesis provides an interesting overview of a pragmatic implementation of Enterprise Architecture at a large organization.

## ACKNOWLEDGEMENTS

This thesis has been submitted in partial fulfillment of the requirement for the degree of Master of Science in Computer Science, with Information Architecture as specialization track. The Information Architecture track is an interfaculty master that combines courses from the faculty of Electrical Engineering, Mathematics and Computer Science and the faculty of Technology, Policy and Management, both of the Delft University of Technology. The research has been commissioned by Koninklijke TNT Post B.V.

The graduation research that has resulted in this thesis has been an extremely valuable experience for me. It has broadened my horizon and provided me with many additional insights on (Enterprise) Architecture and its application at large organizations. I would like to thank the members of my graduation committee: Jan Dietz, Hans Geers and Marijn Janssen of the Delft University of Technology, and Peter Schoneveld, my daily supervisor at TNT Post. This thesis would not have been possible without the experience and helpful insights of Peter Schoneveld, who has been closely involved during the entire research. It has been a very pleasant collaboration.

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Zoetermeer, June 2009

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## LIST OF ABBREVIATIONS

BPM	Business Process Modeling
BU	Business Unit
CIO	Chief Information Officer
CP	Closing a Project (PRINCE2 term)
CS	Controlling a Stage (PRINCE2 term)
DP	Directing a Project (PRINCE2 term)
DYA	Dynamic Architecture
EA	Enterprise Architecture
EAF	Enterprise Architecture Framework
EBIT	Earnings Before Interest and Tax
EMN	European Mail Networks
ICT	Information and Communication Technologies
IP	Initiating a Project (PRINCE2 term)
IT	Information Technology
KPN	Koninklijke PTT Nederland
Mail NL	Mail Netherlands
MP	Managing Product Delivery (PRINCE2 term)
PA	Project Architecture
PL	Planning (PRINCE2 term)
PSA	Project Start Architecture (DYA term)
PID	Project Initiation Document (PRINCE2 term)
PPM	Project Portfolio Management
PTT	Staatsbedrijf der Posterijen, Telegrafie en Telefonie
RFC	Request For Change
SB	Managing Stage Boundaries (PRINCE2 term)
SOA	Service Oriented Architecture
SU	Starting Up a Project (PRINCE2 term)
TOGAF	The Open Group Architecture Framework
TPG	TNT Post Groep
T&I	Technology & Informatics



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## PART I: INTRODUCTION

---

# 1 INTRODUCTION

## 1.1 BACKGROUND

Many organizations in the private sector operate in a highly dynamic environment. They are being influenced by various external forces, among which market demand, regulatory changes, technical innovations, and their competitors. In order to reinforce, or at least prolong their competitive position, these organizations need to act swiftly and accurately on both changes in their environment and developments within their own organization by adapting their business strategy. In order to become effective, the business strategy needs to be deployed throughout the organization's products and operational processes as well as the IT systems that support these processes. Many large organizations encounter great difficulties with this operational implementation of their business strategy. (Versteeg & Bouwman, 2006)

Enterprise Architecture can be used as a means to translate business strategy changes to implications for the operational organization and govern the overall development direction of the organization. As such, it can help determine and design the required changes across the organization's operational processes and systems. (Ross, Weill, & Robertson, 2006)

Architecture is defined as "the fundamental organization of a system, embodied in its components, their relationships to each other and the environment, and the principles governing its design and evolution". (Maier, Emery, & Hilliard, 2001) Based on this definition of architecture, Enterprise Architecture can be defined as:

*The fundamental organization of the enterprise, embodied in its components, their relationships to each other and the environment, and the principles governing its design and evolution.*

The field of Enterprise Architecture is still relatively new and consequently, most organizations are still struggling with the introduction of Enterprise Architecture and the accompanying processes. Most of the challenges these organizations are faced with arise from political, project managerial and organizational issues and weaknesses. (Kaisler, Armour, & Valivullah, 2005)

Currently, there are numerous architecture frameworks and generic approaches for the introduction of Enterprise Architecture. The most widely known example of an architecture framework is TOGAF, the open framework by the Open Group. (The Open Group, 2009) An example of a generic Enterprise Architecture process approach is the Dynamic Architecture (DYA) approach by Sogeti. (Van Den Berg & Van Steenbergen, 2004).

However, these frameworks and generic approaches are just that; a generic set of tools, processes and/or insights that help organizations with the implementation of their own Enterprise Architecture. The implementation process still introduces new and specific challenges for these organizations. Furthermore, not all companies benefit equally from a full-blown Enterprise Architecture; for some it might suffice to use and develop architecture only for a limited scope of the organization.

The Mail Netherlands (Mail NL) business line of TNT Post, one of the largest private employers in The Netherlands, is currently faced with the many challenges that come with the first attempts at introducing Enterprise Architecture. The Dutch postal company is heading towards several great changes, both internally and externally, and its Information Management department – a staff department that functions as the link between the business and ICT – of the organization has adopted Enterprise Architecture as a means to facilitate the company in coping with these changes.

## 1.2 PROBLEM DEFINITION

### 1.2.1 PROBLEM EXPLORATION: PRELIMINARY RESEARCH

In order to gain a clear understanding of the most common challenges that come with the introduction of Enterprise Architecture at organizations comparable to the organization of Mail NL, a preliminary literature study has been performed ahead of this research. The goal of this literature study was...

*“...to study and arrange the common experience with and knowledge gained from architecting projects within organizations that are comparable to TNT Post, on both an institutional and technical level.” (Smeets, May 2008)*

In the resulting research paper (Smeets, May 2008), many factors, problems and best practices have been summarized. During the search for relevant literature, it became evident that there is an overall absence of case studies on the introduction of Enterprise Architecture at large organizations. The available literature mostly presented aggregated information and conclusions without providing any in-depth information on particular cases.

During the research, there appeared to be two main aspects that play a very important role in almost all literature on critical factors in enterprise architecting: communication and competences.

First of all, an organization should make sure that all critical stakeholders have sufficient competences and awareness to manage and apply the architecture process. Potential lack of awareness or competences might be identified by means of an architecture maturity assessment. Training and education will help to increase the level of awareness and competence within the organization to the required level for each architecture development iteration or life cycle.

Furthermore, without proper communication, the architecture process will eventually lose its power, application and support. The architecture team should keep all stakeholders (particularly the critical ones) actively involved by providing them with all the information they need in the format that best suits their skill levels. In order for this to work in a large organization, the architecture team should design explicit communication protocols, which focus on the many aspects of proper communication.

Lastly, the iterative nature of the architecture process is a very important aspect. Enterprise Architecture facilitates a migration or change and as such it should be subject to change itself. This can only be accomplished if the architecture process incorporates iterative (life) cycles that respond to input from various parts of the architecture process and business requirements.

### 1.2.2 PROBLEM DEFINITION

Especially for large organizations, the introduction of Enterprise Architecture and accompanying processes poses a great challenge, which often brings along many specific problems. Due to an overall absence of extensive case studies on the introduction of Enterprise Architecture at large organizations, organizations challenged with the introduction of Enterprise Architecture are not able to draw from the experiences gained at other organizations.

The Information Management department within the Mail NL business line of TNT Post is now faced with the challenge of introducing Enterprise Architecture in its organization.

## 1.3 RESEARCH OBJECTIVE

The main objective of the research represented in this thesis is ...

*...to extract and document the conclusions and lessons learnt from the introduction and application of Enterprise Architecture at TNT Post, in order to support the introduction of Enterprise Architecture initiatives in other large organizations.*

This research objective is fulfilled by means of a number of research questions (see section 1.5).

## 1.4 RESEARCH SCOPE

The scope of this research and resulting thesis document is limited...

...in terms of subject to:

1. The process of introducing Enterprise Architecture (see section 1.4.1).
2. The (organizational and environmental) factors that influence the process of introducing Enterprise Architecture and the Enterprise Architecture process itself (see section 1.4.2).
3. The resulting Enterprise Architecture process (see section 1.4.3).

...in terms of organizational scope to:

4. The business line Mail NL of TNT Post – the Mail Division of TNT – with exception of the Parcels business unit (see section 1.4.4).

...in terms of time to:

5. The period between January 2008 and March 2009 (see section 1.4.5).

Additionally, the following aspects are not part of the scope of this research:

- The contents of the Enterprise Architecture and documentation that is not considered to be part of the Enterprise Architecture process or function.
- The implementation of the Enterprise Architecture's modeling tools (i.e. ARIS).
- The introduction and implementation of Service Oriented Architecture (SOA).<sup>1</sup>

### 1.4.1 PROCESS OF INTRODUCING ENTERPRISE ARCHITECTURE

The process of introducing Enterprise Architecture relates to the development of the Enterprise Architecture process, the Enterprise Architecture Framework and all other activities that relate to the embedding of the Enterprise Architecture (-process) in the organization and its management processes.

This thus involves all the challenges, problems or considerations that have played an important part in the construction of the organization's Enterprise Architecture process and the experiences and conclusions that have been gained during this development.

---

<sup>1</sup> Although Service Oriented Architecture is an essential part of the Enterprise Architecture of TNT Post and Mail NL it is not part of the scope of this research, because the introduction of Service Oriented Architecture has been limited to the development of a blueprint for this introduction. However, the topic is mentioned in this document to provide some additional context or as an important aspect in the future development of the Enterprise Architecture Process.

### 1.4.2 ORGANIZATIONAL AND ENVIRONMENTAL FACTORS

The process of introducing Enterprise Architecture, the eventual shape of the Enterprise Architecture process and its function within the organization are influenced by various factors. Such factors can encompass characteristics of the organization but also environmental factors such as (external) market developments.

### 1.4.3 ENTERPRISE ARCHITECTURE PROCESS

The term ‘Enterprise Architecture process’ relates to the way the organization (of Mail NL) incorporates the concept of Enterprise Architecture. As such, this comprises the following aspects:

- The definition of the concept of Enterprise Architecture as used within the organization.
- The framework and format in which Enterprise Architecture is documented and presented.
- The process(es) by means of which Enterprise Architecture is developed, maintained and applied.
- Tools used to incorporate the Enterprise Architecture and its processes in the organization’s existing management structures and processes.

As such, this only involves new processes or existing processes that have been heavily changed to incorporate the Enterprise Architecture and aspects that can be related directly to the introduction of Enterprise Architecture. As a result, this does not include any existing (management) processes, tools and development methods (such as a Software Development Process).

Furthermore, the Enterprise Architecture itself (i.e. its content) is also not part of this research.

### 1.4.4 MAIL NETHERLANDS

The research is limited to the introduction of Enterprise Architecture within the organization of the business line Mail NL, with exception of the Parcels business unit. Of course, relevant relations with other architectural developments and initiatives are also included in this context. The organizational scope of this research is illustrated in Figure 1. The two most important external organizational parts, the Mail division and the ICT Mail department, are illustrated by the dotted lines.

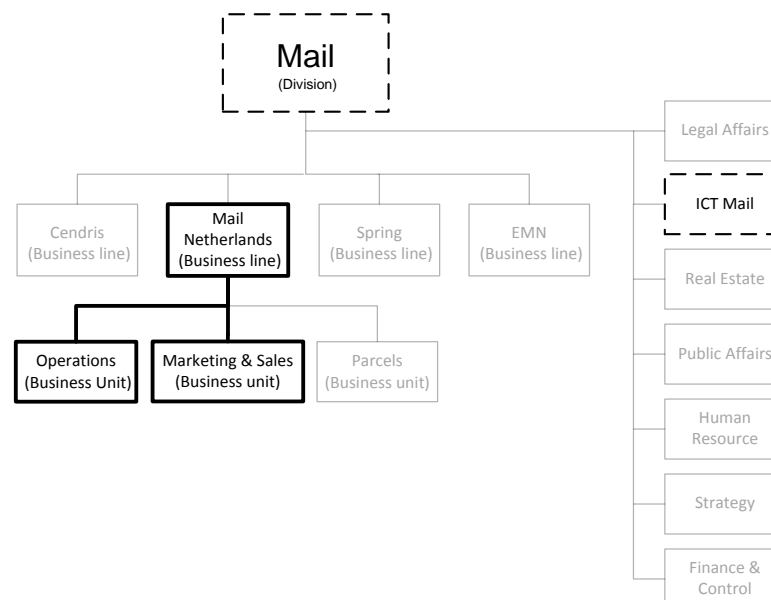


FIGURE 1 ORGANIZATIONAL SCOPE OF THIS RESEARCH

As described in section 2.6, the Parcels business unit has developed its own operational application platform, which also resulted in a separate architecture and architectural approach.

#### 1.4.5 RESEARCHED PERIOD

The start of the introduction of Enterprise Architecture at Mail NL is marked by the appointment of the first Information Architect at the Information Management department of Mail NL; i.e. January 1, 2008. Active research was concluded on March 1, 2009. As a result, this research and thesis only elaborates on the period between January 1, 2008 and March 1, 2009.

As mentioned earlier, any relevant contextual information is also added to the scope of this research. As a result, relevant historical (architectural) developments within the aforementioned organizational scope are incorporated as contextual information.

### 1.5 RESEARCH QUESTIONS

The main research question and subsequent sub-questions can be formulated as follows:

#### **Main research question**

*How is the concept of Enterprise Architecture introduced and employed in the organization of the Mail NL business line of TNT Post?*

#### **Sub-questions**

1. *What (Enterprise) Architecture efforts have already been made at TNT Post?*  
An overview of historical developments is provided.
2. *What organizational and environmental factors or characteristics (have) influence(d) the function and introduction of Enterprise Architecture at Mail NL?*  
An overview of all identified factors and the corresponding implications for the introduction and application of Enterprise Architecture is provided.
3. *What are the main added values of Enterprise Architecture for the organization of Mail NL?*  
An overview of the added values is provided.
4. *How is Enterprise Architecture introduced in the organization of Mail NL and what experiences have been gained during this process?*  
A description of all the activities and corresponding experiences relating to the introduction of Enterprise Architecture is provided.
5. *How will the application of Enterprise Architecture at Mail NL evolve in the near future?*  
A description of the probable development direction is provided.
6. *How is Enterprise Architecture employed in the organization of Mail NL?*  
A detailed description of the Enterprise Architecture process of Mail NL is provided.

### 1.6 RESEARCH METHODOLOGY

The research methodologies of this research can be broken down in the following main approaches:

1. A preliminary literature study.
2. Participation in the organization of TNT Post.
3. Data accumulation through key representatives of TNT Post.

The Preliminary literature study (Smeets, May 2008) was done as a form of problem exploration (see section 1.2.1). The conclusions of the study have been used as a basis for this research. As a result, many of the findings of this study are used throughout this thesis, along with references to the original literature.



The research has been performed from within the Information Management department of the Mail NL business line of TNT Post. This includes active participation in the development of the Enterprise Architecture process and accompanying discussions. Through this participation a lot of first-hand experience has been gained, along with increased affinity with the subject, considerations and challenges that play a part in the development of the Enterprise Architecture process. Furthermore, due to this participation internal documentation could be used as a source for additional factual information. An overview of the internal TNT Post documents that have been used in this research can be found in Appendix A.

A great part of the data used in this research has been accumulated by means of interviews with key representatives and a questionnaire that was distributed among stakeholders in the project organization of the Information Management department of Mail NL. Additionally, an external interview with the CIO of TNT Post (Zijlstra, Rijsenbrij, & Laagland, 2008) has been used for additional background information.

A total of seven interviews have been held. The job titles of the interviewees and the date and time on which these interviews were held are presented in Table 1.

Job title (department)	Date	Time
1. Manager Technology & Information (Technology & Information)	23-01-2009	13:00-14:00
2. Manager Order-to-Cash (Order-to-Cash, Marketing & Sales, Mail NL)	15-02-2009	15:00-17:00
3. Process Manager Order-to-Cash (Order-to-Cash, Marketing & Sales, Mail NL)	17-02-2009	13:00-15:00
4. Information Manager Primary Process (Information Management, Mail NL)	26-02-2009	10:00-11:30
5. Information Manager Planning & Control (Information Management, Mail NL)	26-02-2009	14:00-15:00
6. Information Architect (Technology & Information)	27-02-2009	15:00-16:30
7. Manager Application Services (Application Services, ICT Mail)	06-03-2009	15:00-16:30

TABLE 1 TNT POST INTERVIEWEES

The interviews were partly structured; some questions were formulated upfront to guide the overall direction of the interviews, without restricting the scope of the interview. Each interview addressed multiple (see Table 2) of the following six main topics:

- The architectural or organizational history of TNT Post.
- The ICT or business context of Enterprise Architecture at TNT Post.
- The organizational or environmental factors that influence the Enterprise Architecture (-process).
- The added values of Enterprise Architecture for the organization of Mail NL.
- The Program Primary Process.
- The Project Architecture process.

The seven interviewees were selected, based on their affinity with (one or more of) these six main topics. The representatives of the Order-to-Cash department were of high value for the provision of a business perspective, due to the fact that the department operates on the border between the commercial and operational organization, and collaborates with many stakeholders throughout the organization.

Job title	Topics
1. Manager Technology & Information	ICT context and governance
2. Manager Order-to-Cash	Business context, Factors, Added values
3. Process Manager Order-to-Cash	Business context, Factors, Added values
4. Information Manager Primary Process	Factors, Added values, Program Primary Process
5. Information Manager Planning & Control	History, Project Architecture
6. Information Architect	History, ICT context, Program Primary Process
7. Manager Application Services	History, ICT context

TABLE 2 MAIN INTERVIEW TOPICS

Depending on the interviewee's knowledge of and familiarity with the concept of Enterprise Architecture and the application of the concept at Mail NL, an appropriate introduction on the subject was e-mailed in advance. The audio of the interviews, which were held in Dutch, were recorded and later transcribed in full. Data triangulation (Denzin, 1978) has been performed by sending each of the interviewees the interview transcriptions of the applicable interview, which provided them with the possibility to alter their answers and validate the content of the transcription. The transcriptions have been summarized in the interview abstracts that can be found in Appendix B.

The goal of the questionnaire was threefold: (1) to determine the status and maturity of (the application of) the Enterprise Architecture process, (2) to evaluate the development of the Enterprise Architecture and accompanying processes, and (3) to gain additional input for further development of the Enterprise Architecture and accompanying processes. The questions and results of the questionnaire can be found in Appendix C.

## 1.7 THESIS STRUCTURE

This thesis consists of four main parts, with the appendices as an additional fifth part. Figure 2 describes the relation between the various chapters of this thesis and research questions of this research.

**Part I, Introduction** – The first part of thesis provides an introduction to the research topic and its context. This also includes information on the company and organization of TNT Post.

**Part II, Introducing Enterprise Architecture** – The second part describes the process of introducing Enterprise Architecture in the organization of Mail NL and the organizational and environmental factors or characteristics that have influenced this process and the resulting Enterprise Architecture process.

**Part III, The Enterprise Architecture Process** – The third part provides a detailed description of the Enterprise Architecture process of Mail NL.

**Part IV, Conclusions** – The fourth part presents the general conclusions of this research.

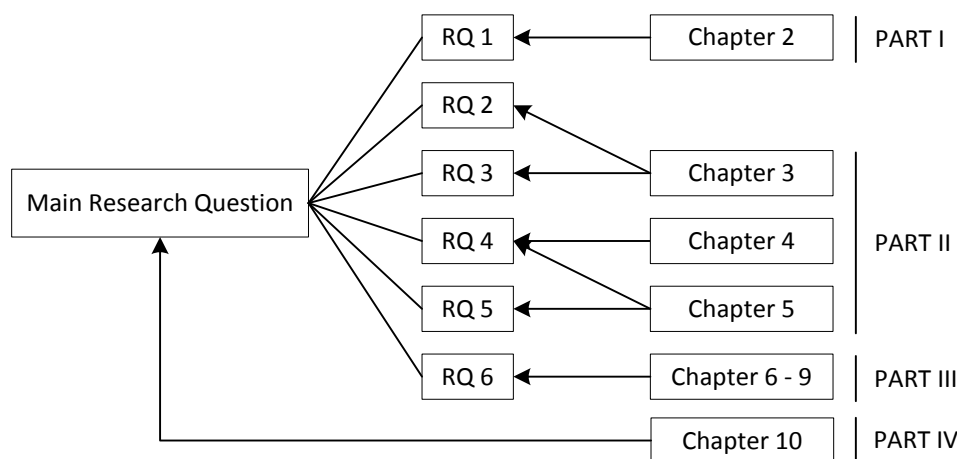


FIGURE 2 THESIS STRUCTURE

## 1.8 READING GUIDE

If you are interested in...

you should read:

...a brief summary of this research and its outcomes,	...Summary.
...the background, objective, scope and approach of this research,	...Chapter 1.
...the organization and (architectural) history of TNT Post and Mail NL,	...Chapter 2.
...the factors that (have) influence(d) the Enterprise Architecture function of Mail NL,	...Chapter 3.
...the process by which Enterprise Architecture is introduced at Mail NL,	...Chapter 4.
...the evaluation and future development of the Enterprise Architecture process of Mail NL,	...Chapter 5.
...the way Enterprise Architecture is developed and applied at Mail NL,	...Chapters 6-9.
...the general conclusions of this research,	...Chapter 10.

## 2 INTRODUCING TNT POST, MAIL NETHERLANDS

This section introduces the organization in which the research has taken place; i.e. the Mail NL business line of TNT Post. The goal of this section is to provide a clear context for the Enterprise Architecture process and function.

This section provides an overview of TNT Post by means of the company profile (see section 2.1), a brief summary of its public history (see section 2.2), an overview of the organizational structure (see section 2.3) and the public strategy of the company (see section 2.4). Additionally, a more thorough historical context is provided by means of the last two subsections, which include an overview of recent organizational developments (see section 2.5) and the architectural history of TNT Post (see section 2.6).

### 2.1 COMPANY PROFILE OF TNT POST

TNT Post B.V. was founded in 1799 and has been the largest postal service in The Netherlands ever since. Every day, the company delivers about 17 million mail items to over seven million locations in The Netherlands.

TNT Post expands its international activities by means of acquisitions in Europe and Asia. Services that migrate electronic data to physical mail are becoming increasingly important to the company.

TNT Post's core business is the collection, sorting, transportation and distribution of national and international mail, which includes letters, parcels, (addressed) direct mail and unaddressed mail. However, since several years, TNT Post is also specialized in data and document management, Direct Mail, e-commerce and international mail; i.e. intelligent management of both physical and electronic information flows.

The company has over 80.000 employees worldwide, of which about 40.000 are responsible for the daily delivery of mail in The Netherlands. About ten percent of TNT Post's employees work at one of the six mail sorting centers in The Netherlands.

In 2004, TNT Post's revenue totaled 3.900 million Euro. Of the average daily volume of 17 million mail items, 94 percent is sent by businesses, the remaining six percent comes from consumers. (TNT Post, 2008).

In terms of Mintzberg's organizational structures (Mintzberg, 2006) the organization of TNT Post can be described as an organization that encompasses (1) a large executive core, (2) medium to large sized middle management, (3) a technostructure and staff departments and (4) a bureaucracy or division structure.

### 2.2 HISTORY OF TNT POST

TNT Post has a history of over 250 years. This history has greatly influenced the company as it is today, along with its organizational structure as well as its cultural values. The most important events from TNT Post's public history are summarized here. (TNT, 2008).

**1799** – The Dutch State postal services ('Statenpost') were transformed into a national organization, which has laid the foundation for the company as it is known today. In 1928 that company was given the official name 'Staatsbedrijf der Posterijen, Telegrafie en Telefonie' (PTT).

In 1807, the first postal law became active. This law regulates and defines the monopoly on the collection, transportation and delivery of letters.

**1930s** – The introduction of the first sorting machine (1931) enabled the company to lower its operational costs, in order to cope with the economic downturn of the 1930s. Meanwhile, mail delivery times were rapidly decreasing and the company provided overnight delivery. During the 1930s, the company became increasingly commercially oriented with the introduction of large marketing campaigns.

- 1946** – In Australia, Ken Thomas started Thomas Nationwide Transport (TNT) with a single truck. In less than half a century, the company expanded rapidly by means of mergers and acquisitions into a worldwide organization with its own air fleet.
- 1960s** – In order to concentrate the labor on larger units, eighteen so-called ‘expedition centers’ were created. These centers processed large quantities of mail with the help of various sorting machines.
- 1977** – PTT introduced the postal code, which made it possible to sort automatically on parts of a city.
- 1989** – The 1980s featured the rapid development of telecommunication technologies as telex, fax and e-mail. Swift and effective action was needed to respond to these market changes. As a result, the organization was privatized in 1989 and took on the name Koninklijke PTT Nederland N.V. (KPN).
- 1990s** – KPN acquired TNT in 1996. The friendly acquisition led to a new era for TNT and PTT Post, the postal department of KPN. Important steps towards the integration of activities were taken and several TNT activities that were not part of the company’s core activities (mail, express and logistics) were rejected. In 1998, the share TNT Post Group (TPG) was split from KPN. That same year, six new sorting centers were opened. The centers replaced the twelve old expedition hubs. Later that year, TPG acquired the French express company Jet Services S.A., which was active in several European countries. In 1999, 200 years after its founding, PTT Post received the predicate ‘royal’, renaming the company to Koninklijke PTT Post.
- 2000s** – One of the main brands of TPG, Koninklijke PTT Post changed its name into Koninklijke TPG Post. Although the strong international brand name TNT continued to exist, this more clearly demonstrated the fact that the company was part of TPG. Many employees were proud of the company’s prolongation of the royal predicate. From the start of 2005, all the worldwide activities of TPG were branded as TNT, in order to increase the recognizability and efficiency of the company’s services. On October 16, 2006, Koninklijke TPG Post was officially renamed to Koninklijke TNT Post. The preparations for the transition were started in September 2005. The liberalization of the Dutch postal market was completed on April 1, 2009.

Since the acquisition of TNT, various other companies were acquisitioned by the resulting TNT Group. These were mainly companies operating in the express and logistics markets in other countries.

## 2.3 ORGANIZATION OF TNT POST

### 2.3.1 ORGANIZATIONAL STRUCTURE

TNT’s activities are divided between two operational divisions; Mail (TNT Post) and Express. Within the organizational structure, TNT Post is also known as the Mail Division of TNT.

The Mail division of TNT consists of four business lines: Mail Netherlands (Mail NL), Cendris, Spring and European Mail Networks (EMN). All four business lines are supported by a number of staff departments and shared service suppliers. The organization of the Mail division is illustrated in Figure 3.

The business line Mail NL – which forms the scope of this research – is responsible for all physical mail activities in The Netherlands. Mail NL is further divided in three business units: Operations, Marketing & Sales and Parcels. The Information Management staff department of Mail NL formally resides within the Marketing & Sales business unit, although it also facilitates the Operations business unit.

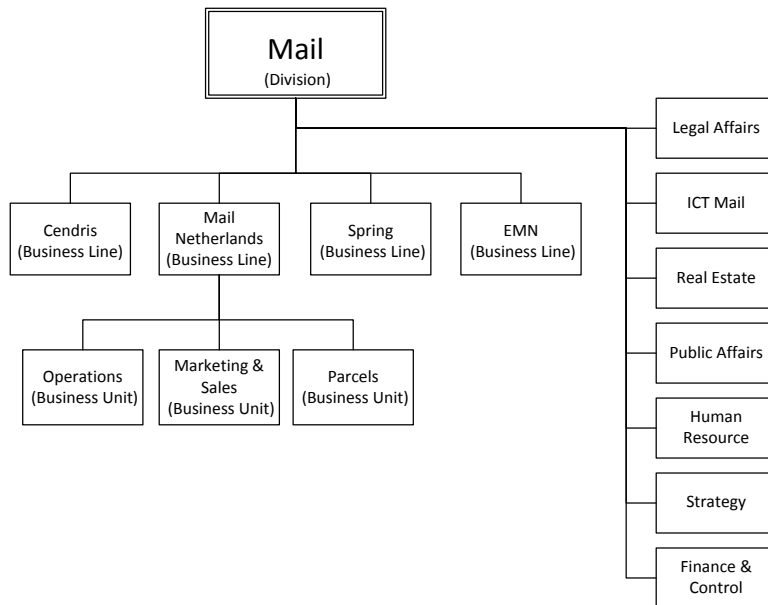


FIGURE 3 THE ORGANIZATIONAL STRUCTURE OF TNT'S MAIL DIVISION

### 2.3.2 GOVERNANCE STRUCTURE

From a governance perspective, the Mail division of TNT operates as a separate company. The governance policy of the Mail division is limited to the use of Shared Services (such as the ICT shared services provided by ICT Mail). As a result, the business lines of the Mail division are highly autonomic in terms of the development of their own governance structure and Enterprise Architecture (-process).

The Mail division uses the Federal Model (Weill & Ross, 2004) for its ICT Governance structure. The T&I department fulfills the role of CIO Office, which involves a control function (by means of Capex evaluation), the management of Shared Service usage and the initiation of technological innovation. In this governance structure, the business lines have a mandate on Project Portfolio Management, processes, application functionality, application services and applications.

All aspects that are not business specific are shared through the ICT Mail department. This involves services such as: hosting, work stations, Intranet, collaboration facilities and application conglomerates like the SAP systems. In the Federal Model, only the implementation of aspects that are being shared by multiple business lines are governed through the Mail division, whereas all other aspects remain the responsibility of the individual business lines. For example, the business lines are responsible for their implementation of non-generic SAP aspects, whereas the SAP systems itself are provided as a shared service by the ICT Mail department.

## 2.4 PUBLIC STRATEGY OF TNT POST

It is TNT Post's ambition to become the market leader in the area of communication, transactions and the delivery of documents and goods, for both business and consumers. (TNT Post, 2008)

The company strives for...

- ...recognition as the main indicator of quality, efficiency and customer support;
- ...the realization of the best results in the market;
- ...the optimal use of new technology and the liberalization of the European postal market.

The three main elements of TNT Post's strategy are:

1. The prolongation of its current market position in The Netherlands by means of flexibilization of costs and quality improvement.
2. The expansion of international activities in mail transport.
3. The development of data and document management services through Cendris and the creation of an accompanying infrastructure for the outsourcing of business processes.

The first of these three strategies applies to the Mail NL business line.

## 2.5 ORGANIZATIONAL HISTORY OF TNT POST AND MAIL NL

The developments the organizations of TNT Post and Mail NL have gone through in (roughly) the last decade are of high importance in the context of this research. It provides an essential understanding of the environment in which Enterprise Architecture is developed and applied.

Due to mergers and acquisitions, the organization of TNT Post consists of multiple business lines. The business line Mail NL – the former PTT Post organization – originally comprised nine business units:

- 4 commercial business units (separated in business and consumer segments),
- 3 operational business units (Expedition, Distribution and Transport),
- 1 international business unit, and
- 1 parcels business unit.

Those highly autonomic business units were responsible for the fulfillment of their own IT demands and each business unit had its own IT section, which were mostly aimed at functional administration. The autonomy of the business units naturally lead to a high diversity in application development. At first, ICT Mail operated as an internal IT supplier for Mail NL (including the provision of business consultants) with T&I functioning as a central CIO Office.

IT budgets resided within the ICT Mail department and the business units were not held accountable for the utilization of this budget. As a result, a reduction of operational IT costs was almost impossible to realize, because the demand for the utilization of ICT Mail organization remained unaffected. Eventually, the ICT budgets were moved to the business units, which led to new problems: an increase of pressure on the ICT Mail organization in terms of quality delivery and the fact that business units started to hire external suppliers.

The operational environment was divided into 26 districts ('rayons'), which were responsible for their own operational processes. This was later reduced to a total of six areas, functionally governed by Process Managers at the Head Office.

An ICT governance structure was introduced in 2003. In this structure, the business lines were made responsible for their own processes and Information Management. The ICT Mail department was migrated to the level of the Mail division and acquired the role of Shared Service provider for the underlying business lines. From that point on, the ICT Mail organization would function as a financially independent organization and the business lines had to hire the ICT Mail organization. This was an attempt to limit the organization's operational IT costs. IT budget thus needed to be arranged by the business lines.

In 2004, the structure of the Mail NL business line was reduced to a structure with only three business units: Marketing & Sales (a merger of the commercial business units), Operations (a merger of all operational business units) and Parcels. Each of the business units incorporated their own Information Management department, which replaced the original IT sections of the previous business units. Unlike the IT sections of the original business units, the newly formed Information Management departments also focused on (strategic and tactical) policies and organizational development.

These Information Management departments were constructed as an interface between the business and IT sector (including ICT Mail). In 2008, the Information Management departments of Marketing & Sales and Operations were merged into a single Information Management Mail NL.

## 2.6 ARCHITECTURAL HISTORY OF TNT POST

### 2.6.1 MAIN ICT HISTORY

The first ICT-oriented efforts at what was then still known as PTT Post date back to the mid eighties. These efforts focused on data management with the main subject being the Corporate Data Model ('bedrijfsgegevensmodel'). In the context of the 3-tier data layers – conceptual, logical and physical – the Corporate Data Model largely focused on the logical layer. The policy relating to the Basic Register System was developed at the beginning of the nineties. This policy states that information is stored only at the source; proprietary system information is stored in the Basic Registers of the system and system-foreign information may be found elsewhere in the Basic Register System. This Basic Register System and accompanying policies are still used today even though the systems itself have changed and developed through time.

The nineties brought another development that may be considered important in the context of architecture; the Technical Facilities Infrastructure (TVI, 'Technische Voorzieningen Infrastructuur') project. The introduction of the Track & Trace service brought about implications for the entire organization, which resulted in the need for a new infrastructure and reference architecture to guide the implementation of the service. At that time, the ITIL process functionality was scattered throughout the organization. The TVI project thus resulted in the first attempt at improving the combination of process, application and infrastructure, by looking at the company's goals and market offerings.

At the beginning of the nineties, the business units Expedition (the current sorting process), Distribution and Transport were the first to incorporate Information Plans as a high-level management tool. While the application of Information Plans was considered successful for the Expedition business unit, the Distribution business unit hardly applied the plans. This led to the individual development of the Expedition Information Plans.

Before the year 2000, specifications were developed for data and functionality, but the latter was not yet linked to processes. Between 2000 and 2003, the so-called Millennium period, there was hardly any progress in terms of organizational and system development. Among other things, this was caused by a high turnover of staff. As a result there was little attention for subjects like the Corporate Data Model.

Until the end of the nineties, the current Mail NL business line was for the most part a Dutch company with a highly heterogeneous character, which is still evident in the collection of its legacy applications. At the end of the nineties, a Steering Committee ICT was introduced, in order to create a shared infrastructure platform for the organization. In 2002, ICT Mail was initiated as a central shared ICT provider for the nine business units of Mail NL. In order to reduce the operational IT costs, the ICT Mail department aimed at standardization of systems and applications. Consequently, this technically-oriented standardization was pushed towards the business.

Meanwhile, the application portfolio of the Mail NL business line was considered to be too expensive for the (at that time) badly performing Parcels business unit. This led to the creation of a separate application platform for the operational processes of the Parcels business unit, with exception of the billing and order processing systems. As a result of this separation, the Parcels business unit is now largely treated as an additional business line in terms of architectural development. Therefore, the Parcels business unit is not included in the scope of the Enterprise Architecture of Mail NL.



In recent years, the business lines Cendris, Spring and EMN developed greatly, which led to changes in the ICT demand organization of the Mail division and the share of ICT Mail in the ICT expenditures decreased. In 2007, an ICT cost reduction program was initiated with the goal of creating a more cost efficient and effective IT organization. This program encompasses a revision of the (ICT) governance structure, the redesign of the demand organization and research on outsourcing of ICT Mail and its shared services. This eventually led to the adoption of the Federal governance model (see 2.3.2).

## 2.6.2 ARCHITECTURAL DEVELOPMENT IN THE MAIL DIVISION

In 2002, a Grand Design on the application of SAP was made by KPMG. This led to the development of SAP roadmaps in 2004, which have formed the basis of the SAP architecture as it is known today.

The first steps towards the current architecture trajectory of ICT Mail were made by the Technology & Informatics (T&I) department of ICT Mail, in the shape of a fundamental set of policy guidelines that focused mostly on security and platform choices. What followed was a major reorganization within the ICT Mail department, which halted further development of the ICT Mail architecture. The actual start of the architecture trajectory occurred in 2005.

In 2005, the DYA method (Wagter, Van Den Berg, Luijpers, & Van Steenberghe, 2005) was chosen as the main architecture process method. Subsequently, ArchiMate (The Open Group, 2008) was chosen as the modeling language. At the end of 2005, a decision was made to use ARIS as the main tool for Business Process Modeling (BPM), which led to the acquisition of the ARIS software package in 2006 and a start was made to use ARIS for BPM. That same year, the Application Architecture of Mail NL was modeled in ARIS by using the ArchiMate modeling language. However, the constructed models turned out to be unusable due to a bad implementation of the underlying structure of the models. It took another two years before the ARIS modeling conventions for the Application Architecture were completed (2008).

Mid 2007, several projects were initiated at the Parcels business unit in collaboration with Verdonck, Klooster & Associates (VKA). During the evaluation of this architecture trajectory, late 2007, the conclusion was drawn that both business commitment and the architectural knowledge in the Parcels business unit was insufficient. Next to that, the architecture efforts focused on segments of the Parcels organization, which had led to a scattered and inconsistent architecture. The first conclusion was clearly demonstrated by the participation in the evaluation sessions: out of the eight attendees there was only one representative of the Parcels business unit; all other attendees were either employees of ICT Mail or T&I.

The construction of a single Information Management department for the Marketing & Sales and Operations business units of the Mail NL business line resulted in a fundament for central architectural development. The merger of the Information Management departments marked the beginning of architectural development at Mail NL, with a clear focus on the Business Architecture layer and the aspect of Application Services.

In 2008, architectures were developed for the Mail NL and Cendris business lines and the Parcels business unit.



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## PART II: INTRODUCING ENTERPRISE ARCHITECTURE

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### 3 CONSIDERATIONS FOR THE ENTERPRISE ARCHITECTURE PROCESS

This chapter describes the most important and fundamental considerations that indirectly shape the Enterprise Architecture process of Mail NL. This includes an overview of the environmental factors (section 3.1), additional considerations and information (section 3.2), and the added values of Enterprise Architecture for the Mail NL organization (section 3.3). This chapter is concluded by means of a short conclusion from these paragraphs (section 3.4).

The information in this chapter has been derived from the interviews that were held with key representatives in the organization of Mail NL (see Appendix B), as well as internal documentation (see Appendix A).

#### 3.1 ENVIRONMENTAL FACTORS

A large number of environmental factors – important aspects of the Mail NL organization and its environment – that have (had) a great influence on the introduction and development of Enterprise Architecture in the Mail NL organization have been identified. These factors indirectly define the construction and embedding of the Enterprise Architecture, as they pose a number of limitations and requirements. The list of factors enumerated below is not considered to be complete. However, these factors clearly relate to the application of Enterprise Architecture.

The following external factors have been identified:

- Market developments
- External connections with clients
- Technological developments
- Financial crisis

The following internal factors have been identified:

- Characteristics of the high-level management process
- Absence of a long-term management focus
- Hierarchical organization
- Organizational developments
- Limited innovative behavior
- Cost of human resources
- Limited IT footprint
- Nature of the IT systems
- General lack of competence
- Alignment of business and IT

All of these factors, along with their implications for the development and application of Enterprise Architecture in the Mail NL organization, are explained further in the following paragraphs.

##### 3.1.1 MARKET DEVELOPMENTS

Uncertainties regarding external market developments, such as the liberalization of the national postal market<sup>2</sup>, have a high impact on the entire organization of TNT Post. Due to these uncertainties, the Marketing & Sales business unit is reluctant in its strategic decision making, as it tries to keep all options open for as long

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<sup>2</sup> At the time of the interviews, the final decision of the Dutch government to liberalize its national postal market had not yet been made. The liberalization of the Dutch postal market was completed on April 1, 2009.

as possible. In addition, it does not want to be limited by its IT systems in any way. This indecisiveness in turn hampers both further architectural development and the alignment between business and IT.

This also relates to the way ICT Mail should communicate with the business; focusing on architectural compliancy is likely to increase business resistance, especially when the business is trying to keep its options open and does not want to be confronted with limitations posed by its IT organization.

General market demands are another important external factor for the organization and supporting systems of TNT Post. An example of such market demands is the fact that some important clients prefer an invoice containing all their business affairs throughout the organization of TNT Post, while other clients prefer to receive multiple invoices. In order to retain its market share, TNT Post attempts to satisfy its clients as much as possible. Such market demands naturally lead to increased complexity in the requirements for supporting IT systems as well as the need for a shared development approach.

### 3.1.2 EXTERNAL CONNECTION WITH CLIENTS

This factor is closely related to the previous factor of market developments. TNT Post is opening up its own network more and more towards suppliers and clients, as both a response to market demands and to create lock-in situations with important clients. These external connections naturally bring about their own architectural implications, as they need to be maintained and administrated, along with the interfaces these external connections share with the internal systems.

For example, if Mail NL decides to provide its clients with information on its current production capacity, the operational environment should be adapted to meet the accompanying requirements. This further limits the design freedom in the operational environment.

Thus, these external connections alone require a centralized architectural way of working for some parts of the organization's IT systems.

### 3.1.3 TECHNOLOGICAL DEVELOPMENTS

External technological developments indirectly lead to changes in the connections and collaborations with other parties as well as the organization's own IT systems. For example, SAP is currently working on a transition towards a Service Oriented Architecture throughout its products (SAP, 2009). As a user of SAP software, TNT Post is faced with the implications of this transition. These implications not only apply to the IT systems; they may have far stretching consequences for the organization of TNT Post.

Technological developments at TNT Post's supplying parties can also result in great implications for TNT Post's own development and accompanying planning. As system suppliers drop support for a system after a certain amount of time, regular upgrades to newer versions are a necessity. These upgrades can vary from small incremental upgrades to upgrades that require great amounts of organizational resources and time. These major upgrades need to be planned carefully, in order to prevent conflicts with the organization's own development.

A recent SAP/R3 upgrade was given as an example of a system upgrade with major business implications. Due to the fact that the SAP/R3 testing environment was unavailable for about three to four months, business development was stalled for the same amount of time. This caused a delay for several important projects and the whole situation eventually lead to a major escalation.

### 3.1.4 FINANCIAL CRISIS

The current financial crisis has great impact on the entire organization of TNT Post. Budgets are being cut and there is little room for large (and thus often expensive) programs and projects. Projects and product releases that do not yield profit on the short-term are being terminated or at least postponed. Consequently, improving and expanding the current environment is being stimulated, as the evolution of the current generation of

systems is less expensive than new development. Short-term oriented as they are, these measures help to keep the organization running. From this point of view, architecture-driven (innovative) programs are thus likely to receive less support in the current financial crisis.

On the other hand, the termination of projects also reduces the number of potential conflicts between the activities and projects of Process Managers. And additionally, the budget cuts may help to persuade the Process Managers to participate in a shared development program. In other words, the financial crisis could also be a valuable opportunity for a centrally governed, architecture-driven program.

### 3.1.5 CHARACTERISTICS OF THE HIGH LEVEL MANAGEMENT PROCESS

One of the major conclusions that were drawn from the interviews was the apparent absence of a structured strategic decision making process; even if the process does exist, it is not visible to the interviewed business representatives. In other cases, the business strategy is said to be confidential, even in discussions on the development of master plans. As one interviewee noted, a strategy that is kept confidential on almost all levels will most likely not be realized. The absence of a (visible) structured strategic process makes it very difficult, if not impossible to integrate the strategic decision making process in the Enterprise Architecture and directly connect the Enterprise Architecture to this process.

One interviewee noted the uncertainty as to whether or not a strategy becomes reality as an important motive to limit the integration of the strategic decision making process in the Enterprise Architecture. It is preferable to be informed on strategic developments early on in the process, in order to determine the impact throughout the organization. However, strategic decisions might get discarded after further analysis and elaboration. Constantly updating the Goal Architecture, based on the input from this strategic decision making process, would thus be inefficient. Instead, the architecture team should just stay informed of all strategic developments, as this helps to provide a more sophisticated frame of reference when a strategy is actually being implemented. Furthermore, this frame of reference could help to improve the application of IT as a business enabler. Lastly, it can help to create an overview of areas throughout the organization in which the most change-related activities are to be expected.

The organic (and often unpredictable) behavior of the strategic decision making process, which occurs mostly in the Marketing & Sales business line, has a negative impact on the alignment between the business and IT. The business seems to be unaware of the implications this behavior poses on the IT organization. This once more stresses the need for the ICT Mail organization to express oneself adequately towards the business.

Multiple interviewees mentioned the fact that programs and projects often help to enforce decision making on a strategic level. Integration of architecture in the decision making process in programs and projects is therefore much more valuable than the integration with the strategic decision making process itself. Furthermore, many future developments are highly predictable, as TNT Post's market and business model is not extremely complicated or translucent. Therefore, it is possible to work out scenarios and development directions within the context of programs or projects and deliver the results to the key decision makers for validation and final decision making.

The absence of strong and persuasive individuals in the corporate management layer is brought up as another important factor. Such individuals can ensure alignment throughout the corporate management layer and lay out a common overall strategic course. Without such a 'dictatorship' it is difficult to establish a top-down Enterprise Architecture approach throughout the organization. It should be noted that this also relates to TNT Post's corporate culture, in which departments have always been highly autonomic.

### 3.1.6 ABSENCE OF A LONG-TERM MANAGEMENT FOCUS

As with many other stock market listed companies and despite of its size, TNT Post is relatively short-term oriented. On a managerial level, the long-term focus of TNT Post does not stretch far beyond the time-span of a

year. Multiple interviewees agreed with the statement that “80 percent of the organization’s energy is put in operational activities and only 20 percent in future development”. Especially the process owners and managers throughout the country are mostly dealing with day-to-day activities and issues. As a consequence, in case of major (commercially-driven) reorganizations that have great impact on the operational environment it will require a lot of effort to bend the overall focus of the operational organization towards the long-term implications of these changes.

Especially in the case of supporting IT systems, this short-term orientation is very inconvenient as it can take some time to adapt the IT systems to support new business strategies. Architecture can be used to centrally signal such strategic developments as soon as possible, while also providing a non-financial view on future developments. The latter helps to argument how strategic directions should be implemented in small steps. By splitting the big strategic picture in smaller, more controllable development steps it also becomes easier to govern and guide the operational activities and developments.

The absence of a long-term management focus is mostly caused by the operational character of Mail NL’s main business activities and the fact that ongoing cost reductions force people to optimize these operational activities, which further reduces the attention for the long-term. This bottom-up characteristic of Mail NL’s organization makes it hard to shift the management focus towards a more long-term oriented and architectural way of working on a management level, as this requires change through a broad spectrum of the organization. Currently, the absence of a long-term management focus makes it less interesting to enforce a top-down architectural way of working. Furthermore, multiple interviewees emphasize the need to keep the Enterprise Architecture and accompanying process as pragmatic as possible, due to the operational character of the organization. In order to maintain the valuable connection with the operational organization, a strict top-down approach is not favorable.

### 3.1.7 HIERARCHICAL ORGANIZATION

One interviewee adds that the organization of TNT Post is a very hierarchical organization in which it is commonly not accepted to surpass one’s own manager or management level. This makes it hard to communicate signaled developments, ideas or visions through multiple management levels; the management organization acts as a large filter. This increases the need for a central body that takes on a facilitating role towards the corporate management and uses the entire organization as a means of input for architectural development.

### 3.1.8 ORGANIZATIONAL DEVELOPMENTS

Currently, a strong minimization of (operational) costs is one of the main business drivers, as is the reduction of the *time-to-market* of products and services. The latter implicates that the business does not want to be hampered by the complexity of its supporting IT systems. On the other hand, the earlier noted market demands force the organization to incorporate a certain amount of variety in its collection of products and services. Additionally, the business wants to have an integral overview of its clients, which is currently a very complex endeavor. Altogether, this creates the need for a generic order and invoice system, which is able to offer a certain variety in relation to market demands, while also meeting requirements posed by the existing and future organization and its elements. Therefore, the development of such a single platform requires a shared approach and Enterprise Architecture. Furthermore, the organization incorporates a large amount of applications and systems with various interfaces to one another. The pressure on the organization’s exploitation costs leads to the need to lower the costs these systems inflict by dramatically reducing the footprint of the application landscape. As such, some form of architecture is needed to create a shared application framework that can be used to guide the development towards a smaller application landscape.

One of the measures to ensure ongoing cost reductions, the introduction of *sub-contracting* and *self-billing*, also requires some sort of central approach to coordinate and govern this way of working throughout the

organization. Furthermore, attempts to improve the organization's cost efficiency also stretch to discussions on whether or not certain parts of the organization should be outsourced in the future. In case a decision is made to outsource certain activities, a central architectural way of working can help to identify the interdependencies of these activities throughout the organization as well as determine how this decoupling could be realized.

The recent transition from traditional business silos (Ross J. W., 2003) to process chains is considered to be an important motive for an architectural way of working. In the case of process chains, a department might hold the ownership of (a collection of) processes, but additionally required budgets might reside elsewhere in the organization. Therefore, a high level of collaboration is required and the management focus has to shift to a higher level of abstraction, in order to establish a shared development direction. This leads to an increased need for an overview on the context and interrelations of business processes and supporting systems.

The aspect of outsourcing was mentioned by various interviewees. As a means to accomplish higher operational efficiency, TNT Post is increasingly interested in the possibilities of outsourcing. However, according to one of the interviewees, the actual application of outsourcing by TNT Post is limited. Often, a much too detailed level of abstraction is used to write down specifications. In order to accomplish true outsourcing, a higher level of abstraction should be used. Architecture can help to increase this level of abstraction, as the structured overview that is provided by the architecture can make it easier to determine the most efficient decoupling strategy and the proper abstraction level of the specifications.

Market prospects and the liberalization of the postal market are likely to force Mail NL to greatly reduce the footprint of its operational organization. In that case, the current organizational structure and operational processes will be too large and expensive for the new organization. The organization and processes will have to be redesigned completely and such a development process will require a higher level of abstraction than is currently the case. One interviewee adds that this prospect of far-going reorganizations, in which about 25 to 50 percent of the current staff might have to leave, poses additional challenges on the architecture function of TNT Post. It might be difficult to maintain the architecture function throughout such reorganizations, unless its added value can be made clear. On the other hand, such organizational shrinkage also provides an opportunity for the Enterprise Architecture, as this will most likely lead to situations in which things need to be realized on a higher level of abstraction than is currently the case.

### 3.1.9 LIMITED INNOVATIVE BEHAVIOR

Highly innovative (and constantly changing) companies benefit more from concepts like Business Process Modeling (BPM) and Business Process Reengineering (BPR) than do companies that operate in the so-called 'factory-mode' (Hamlett, 2007), in which operational reliability is more important than technology-based innovation. The last time Mail NL's operational processes were reengineered was approximately ten years ago. After that, the processes have merely been optimized, without any major changes. In other words, the organization of Mail NL does not need to be very agile. For example, the current liberalization of the postal market is pushing the Mail NL organization into a commodity market, which implies its processes should be set up as *lean and mean* as possible. This forces the organization into great reorganizations (including substantial process reengineering), after which the resulting organization will probably remain the same for another decade.

The use of a broad collection of architectural tools that can help to realize these changes would not be very efficient, as the repositories of these tools need to be constantly maintained, while the actual application of the tools is limited. Consequently, there is no need to pursue an architectural way of working at the corporate management level; the business does not need to use architectural tools or be actively involved in the Enterprise Architecture process in order to effectively determine its business strategy.



### 3.1.10 COST OF HUMAN RESOURCES

The largest part of the operational costs of Mail NL's organization is the result of human activities. Therefore, the greatest amount of cost reduction can be accomplished by optimizing and redesigning processes as well as rationalizing the collection of products. Conversely, this human aspect of the Mail NL organization is also an important hurdle in the realization of such a cost reduction, because the people that need to realize this transition might also be the people that become a victim of the transition. This relates to the organizational developments as presented in section 3.1.8. It is extremely hard to gain support for this kind of rigorous developments and organizational transitions.

### 3.1.11 LIMITED IT FOOTPRINT

The operational IT span of TNT Post (and Mail NL) only accounts for a few (seven to eight) percent of the organization's total operational costs. This is clearly illustrated by the ratio of employees and work stations in the organization: TNT Post has over 60.000 employees, but as less as 15.000 work stations. IT is not the organization's core business and should thus only function as an enabler towards the business.

Due to this limited IT/ICT footprint, cuts on the ICT costs will have a very limited effect on the organization's total costs. As a result, IT does not receive any attention of the corporate management boards. This, and the fact that IT is not the organization's core business makes it hard, or even impossible, to enforce an architectural way of working (i.e. architectural development of products and processes) on a corporate management level. For the higher management, there is no clear business case or added value for this approach. However, such a business case and added value does exist for the IT sector, which is why architecture is (or should be) used as a means to fulfill the business' needs: a cost efficient IT landscape, good business-IT alignment and predictable IT in terms of costs and application. For all these aspects, architecture is one of the means to accomplish this. Therefore, at TNT Post, architecture should mainly function as an enabler to fulfill the business' needs in terms of supporting IT systems.

### 3.1.12 NATURE OF IT SYSTEMS

TNT Post has several policies that direct the use of standard (software) solutions for its IT systems. A major example is the so-called 'SAP-unless...' policy. Buying and incorporating a standard software package also leads to the incorporation of that software's architecture in one's own architecture. As a result, TNT Post's (IT) architecture is in many ways not unique. Software architectures such as those of SAP pose great restrictions on the development of TNT Post's own architecture. As a result, a top-down architectural approach, in which the business would govern the development of the underlying architecture(s), would also be limited by these (more or less) 'acquired' architectures. This further diminishes the added value of using a strict top-down architectural approach.

### 3.1.13 GENERAL LACK OF COMPETENCE

According to multiple interviewees, a general lack of competence throughout the entire organization also greatly influences the introduction of Enterprise Architecture at TNT Post.

In the IT sector, this lack of competence is caused by the constant turnover of staff. Many IT experts leave TNT Post for another employer as the job opportunities at TNT Post are fairly limited, due to the company's small IT footprint. This turnover of IT staff makes it difficult to maintain the level of knowledge and gained experiences.

The lack of competence also manifests itself in the alignment between business and IT; i.e. the translation of business requirements into implications for processes and IT systems. Especially the lack of competence on

process development, specification and modeling is a much-heard complaint<sup>3</sup> within the organization of TNT Post. Additionally, the amount of Information Analysts throughout the organization is also considered to be insufficient.

The role of the Information Management department of Mail NL plays an important part in discussions on this subject. The Information Management department was originally deployed as an interface between the business and the ICT Mail department. However, multiple interviewees indicate that it is doubtful whether or not this is still the case, because:

1. the department's process knowledge appears to be insufficient,
2. the department does not have any dedicated Information Analysts,
3. the role of Information Managers seems to involve mostly (line) management activities, resulting in less attention for the 'information' aspect, and
4. Project Managers are mostly involved with technical aspects.

One of the first actions during the start of a project is the consultation of a process owner (or manager) in order to acquire the needed process knowledge, after which process coordination and integration is accomplished by the business itself.<sup>4</sup> Drawing up (functional) requirements is often performed by the assigned Project Manager, instead of a more specialized Information Analyst. Consequently, the Information Management department of Mail NL is also seen as a (mostly technical oriented) project factory and an extension of the ICT Mail department, rather than the Business-IT interface it was originally intended to be.

On a management level, a lack of competence is witnessed on several aspects. First of all, whether or not someone is able to benefit personally from a certain decision greatly influences their role in the decision making process. This is even more so in times of uncertainty (e.g. due to reorganizations), in which people will try even harder to reinforce their own position in the organization. It is important to understand and acknowledge this behavior when dealing with decision making on architectural aspects. Architects that are aware of this may be more successful in their attempts to enforce decision making.

Secondly, the decision making on the corporate management level seems to have the wrong focus. Instead of focusing on a high-level business strategy, the focus often lies on the actual (technical) implementation of the business strategy. In other words: the business uses the wrong language for decision making and should disassociate oneself with the technical realization of its processes and products.

Other occurrences of this lack of competence are closely related to the characteristics of the high level management process, which are explained in section 3.1.5.

Positioning the architecture team and architecture functions within the Information Management department might help to reinforce the department's role and position between the business and ICT, as the Enterprise Architecture provides a holistic view of the organization, which also implies the availability of process expertise. This also creates a single platform that contains all process knowledge, which makes it possible to accomplish process coordination and integration in a more pro-active manner.

#### 3.1.14 ALIGNMENT OF BUSINESS AND IT

A much-heard complaint is the bad alignment of the business and the ICT Mail organization. According to the interviewees, bad communication on behalf of the ICT Mail organization is one of the causes for this

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<sup>3</sup> This has been stated during both the interviews and the architecture sessions of the Information Management department (see section 4.2).

<sup>4</sup> At TNT Post, Process Managers are part of the business organization. It is questionable whether or not these functions should be moved to the Information Management department. However, this discussion extends beyond the scope of this research and is therefore not treated further in this thesis.

misalignment. The ICT Mail organization is lined up too closed and hardly communicates on the developments and related consequences within their area of responsibility. This also applies to ICT Mail's communication on the architecture subject. In order to receive more information on ICT Mail's architectural development and the resulting business implications, the business needs to hire a representative of the ICT Mail department. Furthermore, ICT Mail focuses too much on architectural compliancy, with which it positions itself as a bureaucracy and creates business resistance.

Similarly, the business is also being accused of insufficient and bad communication, which manifests itself primarily in the formulation of business requirements and specifications, and in the negotiations with supplying parties. Again, the absence of Information Analysts might be an important part of this problem.

Another issue that was mentioned by multiple interviewees is the constantly reviving discussions on previously determined policies. The 'SAP, unless...' policy is an example of a policy that remains the subject of ongoing discussions.<sup>5</sup> The decisions for these long-term policies have been made many years ago. The current generation of managers is not familiar with the decision making process and the considerations that played a part during that process. Documenting decision making processes for future reference might prevent or at least reduce such problems. Such a central repository could be a part of the Enterprise Architecture.

It is essential that the communication between the IT sector and the business is improved. By using Enterprise Architecture, a central repository containing all the organization's developments is created. However, this does not yet ensure proper communication between the business and IT. First of all, the architecture itself should function as a *black box* towards the business; its tools (such as the ARIS repository) are solely meant to be used by the architecture team and all communication towards the business should therefore be filtered and adapted to suit the target audience. Secondly, this communication should be split up in such a way that briefings are both manageable and meaningful for the business.

One of the interviewees summarizes this approach as creating an environment with *deciders*, *designers* and *reformers*, in which the designers draw up and implement the deciders' decisions and the reformers take care of the translation between the architecture and the business (the deciders).

In the interviews, one business representative stated that the black box approach should also be used in the case of SOA for two reasons. First of all, it is extremely hard to clearly demonstrate the added value of SOA for the business. And secondly, the concept of SOA and all accompanying implications will be very hard to understand for the business. Consequently, the business is likely to lose its interest and discard SOA as yet another IT hype.

## 3.2 ADDITIONAL CONSIDERATIONS

During the previously mentioned interviews, a number of additional subjects were mentioned. These subjects could not be classified as influential factors for the development of the Enterprise Architecture, but were merely general ideas or thoughts on the subject of Enterprise Architecture in relation to TNT Post and Mail NL.

**Connection with existing management entities** – In the interviews, one business representative mentioned the possibility of using the existing committees and Management Boards<sup>6</sup> as a means of connecting the Enterprise

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<sup>5</sup> One of the interviewees also added that the 'SAP, unless...' policy was also a highly politically loaded decision. The current organization feels it was forced to commit to this decision, which inherently causes a lot of resistance towards the policy.

<sup>6</sup> The Management Boards and committees that were mentioned were the Mail Board (Mail NL's upper management board), the two Management Teams of the two business units (Marketing & Sales and

Architecture on the level of corporate decision making. These committees and Management Boards could then be used to validate architectural development and communicate (architectural) issues. It is important to use these boards and committees as a last resort to resolve architectural issues. The architecture team should put its Enterprise Architecture topics that require business attention on the agenda of the relevant board or committee. The use of such an escalation platform should be controlled by the architecture team to prevent unneeded discussions. Furthermore, these architecture briefings should not contain any value judgment. Instead, the architecture team should restrict itself to an advisory role and leave the actual decision making to the board or committee. As such, the architecture team takes on a facilitating role towards the corporate management level.

As already mentioned in paragraph 3.1.8, the transition towards process chains is considered to be an important motive to incorporate a more collaborative way of working. As a response to the separation of process ownership and the availability of financial resources for further development of these process chains, departments have already established process chain committees, which include all involved parties along a certain process chain. These committees could be a valuable starting point to establish a connection with the business.

**Financial support for architectural development** – It is considered to be very difficult to find appropriate financial support by a business party for the realization of an Enterprise Architecture and the initial development of a shared infrastructure. As a result, there might be a need for a general Enterprise Architecture budget.

**Organizational positioning of the Enterprise Architecture** – The positioning of the architecture team in the organization of TNT Post and Mail NL is an important aspect in the realization of the Enterprise Architecture. One interviewee noted that the Enterprise Architecture will probably be experienced as a control-like entity when positioned and organized at division level. At times, it will be necessary to deviate from the Enterprise Architecture in order to realize added value for the business and the Enterprise Architecture should accommodate for such scenarios. In order to use Enterprise Architecture in a more facilitative and supportive way, the Enterprise Architecture and its process should be positioned close to the operational business.

### 3.3 ADDED VALUE OF ENTERPRISE ARCHITECTURE

This subsection provides an overview of the most important added values of Enterprise Architecture for the organization of Mail NL. The added values have been derived directly and indirectly from the earlier mentioned interviews (indirectly by means of abstraction from the previous paragraphs and directly from internal TNT Post documentation).

The following main and aggregated added values have been identified<sup>7</sup>:

- Improved insight and overview of the organization and its parts
- Improved communication
- Fundament for shared development

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Operations), a Development Committee that operates on the interface between these two business units and a committee that is restricted to users of SAP systems.

<sup>7</sup> It should be noted that these added values indirectly lead to additional operational benefits. For example, the incorporation of Enterprise Architecture can lead to increased process integration and the re-use of application services, which in turn may lead to an overall cost reduction. However, such operational benefits have not been included in this overview, because they are not considered to be an added value for the *organization* of Mail NL, but instead a result of an improved (organizational) way of working.

- Centrally available process knowledge
- Increased long-term awareness

These added values are explained further in the following paragraphs.

### 3.3.1 IMPROVED INSIGHT AND OVERVIEW OF THE ORGANIZATION AND ITS PARTS

Enterprise Architecture makes it possible to structure a lot of information that would otherwise be scattered across the organization. By assigning a central body with the task of collecting all this information, maintaining a central repository and providing access to this repository (or its derivatives), this knowledge can be made available to the entire organization in a fairly cost efficient manner. Such a central information body can provide a better insight on and overview of the Mail NL organization; its parts and systems as well as their development (directions). This also enables the strategic management to include a non-financial way of assessing the organization's development in its strategic decision making and planning processes.

In case of outsourcing questions, such a structured overview can help to determine (1) the best decoupling strategy, (2) the resulting implications and (3) the process needed to realize the outsourcing (as mentioned in paragraph 3.1.8). Another example would be the availability of mappings that display the anticipated changes and developments (or conflicts of such developments) throughout the organization, which helps to concentrate resources and development efforts on the parts of the organization where they are needed the most. One of the interviewees added that thorough insight in the organization's parts, supporting systems and their dependencies makes it easier to determine the source of (for example) an issue and restrict resources and efforts to a contained part of the organization or systems.

### 3.3.2 IMPROVED COMMUNICATION

The Enterprise Architecture and the architecture team can function as a translation instance between the business and IT (and vice versa). A central architectural body can help to collect information from all the relevant parts of the organization, analyze it and translate it into an appropriate format for further use by either part of the organization, when necessary.

By using such a central architectural body, the competence to translate IT aspects into valuable business implications and vice versa only needs to be concentrated in one place, whereas without such a body, this kind of competence would be required throughout the entire organization.

### 3.3.3 FUNDAMENT FOR SHARED DEVELOPMENT

Enterprise Architecture can be used as a basis for organizational development by taking on a shared development approach. By monitoring the development of various parts of the organization, these developments can be coordinated in relation to each other as well as the overall strategic development direction. As such, Enterprise Architecture can help to prevent the separation of systems and applications, and lower system complexity; i.e. control (technical) diversity.

### 3.3.4 CENTRALLY AVAILABLE PROCESS KNOWLEDGE

As mentioned in paragraph 3.1.13, Enterprise Architecture provides a holistic view of the organization, which also implies the availability of process expertise. The architecture team can provide a single platform with a sufficient level of process knowledge to improve process coordination and integration.

### 3.3.5 INCREASED LONG-TERM AWARENESS

As mentioned before, the organization of Mail NL is very short-term oriented. Multiple interviewees mentioned the shift towards a more long-term focus as commencing very slowly and requiring a lot of effort. Enterprise Architecture can help to increase the awareness on the long-term development direction of Mail NL, as

departments and management teams will be confronted more with long-term oriented aspects, the involved decision making and the implications of the resulting decisions.

### 3.4 CONCLUSION

Various environmental developments have increased the need for an architectural way of working within the organization of Mail NL and, as can be seen in the previous paragraph, the introduction of Enterprise Architecture has a number of clear added values for the organization of Mail NL. Therefore, it is sensible to incorporate Enterprise Architecture in the organization of Mail NL.

One of the major conclusions from the previously presented paragraphs is the need to install the Enterprise Architecture process as a facilitative and supporting entity throughout the entire organization of Mail NL. Due to the absence of a structured strategic decision making process and the strong operational character of the organization, there is no need to maintain a strict top-down architectural way of working. Instead, the architecture team should stay closely involved with developments throughout the organization and provide the corporate management (the relevant Management Boards and committees) with aggregated information in order to support strategic decision making and accomplish alignment between all individual developments.

Due to the operational character of the Mail NL organization and the fact that programs and projects are often used to enforce decision making on a strategic and tactical level, architectural development should be concentrated in the context of programs and projects.

The lack of proper communication between various parts of the organization, and especially the business and ICT sector, seems to be a recurring problem. Enterprise Architecture and the involved architecture team can help to improve the communication throughout the organization by incorporating the competence needed to provide a proper (business-ICT) translation service and maintaining a central position. The latter makes it possible to collect information from a variety of channels throughout the organization, process this information, and make it available to all the relevant stakeholders. From a business perspective, the Enterprise Architecture itself should function as a *black box*. All communication to business representatives should be translated to suit the information needs of those business representatives.

Due to the fact that human resources contribute to the majority of the organization's operational costs, optimization and redesign of processes, and rationalizing (the collection of) products are likely to be the best approaches for the realization of cost reduction and the mentioned internal and external developments. In combination with the organization's limited IT footprint, this leads to the conclusion that process- and product-driven development should be the main focus of the Enterprise Architecture process.

Finally, there is an increasing need for process expertise and Information Analysts. The architecture function and architecture team of Mail NL might be a good and logical place to organize this kind of expertise and competence.

## 4 INTRODUCING ENTERPRISE ARCHITECTURE AT MAIL NL

This section describes the development and evolution of the Enterprise Architecture and accompanying processes within the Mail NL business line. Previous architectural efforts at TNT Post, including the development of architecture at the ICT Mail department are described in section 2.6.

The information in this section is not presented chronologically. Instead, the entire development has been split up in the following subjects:

- The Enterprise Architecture development plan (see section 4.1).
- The Information Management architecture sessions (see section 4.2).
- The Enterprise Architecture vision (see section 4.3).
- The Project Architecture process (see section 4.4).
- The Enterprise Architecture Framework (see section 4.5).
- The Enterprise Architecture process (see section 4.6).
- The Program Primary Process (see section 4.7).

### 4.1 THE ENTERPRISE ARCHITECTURE DEVELOPMENT PLAN

Until mid 2008, TNT Post's architecture activities were mostly coordinated and executed by the ICT Mail department. The responsible architect of Mail NL represented Mail NL in the ICT Mail architecture committee<sup>8</sup> (and relating activities), with which ICT Mail strived to accomplish alignment in terms of architectural development between all involved parties. However, the scope of this committee was limited to ICT Mail's services and development, and as such there was a need to expand Mail NL's architectural efforts. This was further emphasized by the outcome of an Architecture Maturity Scan (see Appendix E) that was performed by the architecture committee; the scan showed a clear lack of business support and attention for (the development of) architecture.

In an attempt to develop the Enterprise Architecture (-process) of Mail NL, a migration plan was drafted in June 2008. This plan proposed a collection of activities that could help to migrate Mail NL's architecture function from an ICT Mail driven entity towards the business of Mail NL. The following problem definition was used as the basis for the migration plan:

*How to design the architecture process of Mail NL in such a way that it ensures consistency between all individual architecture trajectories and processes as well as business support within Mail NL?*

The following subjects were discussed in the migration plan:

1. The position of architecture in the organization of Mail NL.
2. Improvement of architectural competence and awareness throughout Mail NL.
3. Regulation of architectural documentation and communication.
4. Development of the Enterprise Architecture.
5. Development of the Enterprise Architecture process.

The first subject discussed the position of Mail NL's architecture function. For the most part, this section of the migration plan mentioned the same factors as presented in section 3 of this thesis. Combined with the facilitative function of the Information Management department towards the business as well as the fact that

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<sup>8</sup> This architecture committee is known as 'Generiek Spoor'.

program and project activities are concentrated around this department, the (rather trivial) conclusion was drawn to position the Enterprise Architecture in the Information Management department of Mail NL.

The second subject discussed the proposed activities to realize a sufficient level of competence and awareness on the aspect of architecting among all the actors that would be involved with the Enterprise Architecture. According to the preliminary literature research, a sufficient level of competence and awareness is a prerequisite for proper application of the Enterprise Architecture and thus a basis for the success of the Enterprise Architecture itself. In accordance with one of the conclusions from the previous section, the application and development of the Enterprise Architecture would be concentrated in the context of programs and projects. Therefore, the initial efforts for the improvement of architecture awareness and competence were concentrated on the project organization by means of a number of educational sessions on the subject of Enterprise Architecture. More information on these sessions is given in the next paragraph.

The third subject focused on means to improve the internal communication on the subject of Enterprise Architecture. This involved the construction of an architecture portal framework and the introduction of a number of document conventions. Both the communication framework and the document conventions have been developed from July 2008. The resulting framework and document conventions that were agreed upon in January 2009 are presented in Appendix D.

The fourth subject of the migration plan focused on the development of the Enterprise Architecture of Mail NL, which was split in three main subjects:

1. Validation and transformation of existing architectures.
2. Development of new Domain Architectures.
3. Relation between architectures.

The third item (relation between architectures) was derived from the June 2008 Architecture Maturity Scan, in which it became clear that it was insufficiently clear how the individual architectures related to each other. Each of these three subjects resulted in a number of questions and concerns that would need to be resolved (such as the lack of conventions and procedures) in order to be able to develop the Enterprise Architecture.

The last subject of the migration plan focused on the development of the Enterprise Architecture process, i.e. the processes that would be used throughout the organization to develop, maintain and apply the Enterprise Architecture. This mostly incorporated questions regarding three items: (1) the application of the DYA method in the project organization, (2) frequent architecture assessments and (3) a collection of governance concerns.

The migration plan consisted largely of questions that needed answering in order to further develop the Enterprise Architecture process in the organization of Mail NL. Many (but not all) of these questions had been answered by February 2009. The subjects of frequent architecture assessments and the mentioned governance concerns still demand additional attention.

## 4.2 THE INFORMATION MANAGEMENT ARCHITECTURE SESSIONS

In order to establish a sufficient level of competence and awareness on the concept of architecting within the project organization of Mail NL, a number of 'architecture sessions' were held. These information sessions were addressed to the Information Management department of Mail NL. In order to keep the groups small and allow for discussions, each subject was treated in a number of (identical) sessions. Between July 2008 and January 2009, the following four subjects were covered:

1. The essence of architecture.
2. Architecture & Information Management.
3. Introduction to Service Oriented Architecture.
4. Service Oriented Architecture & SAP.



The first subject featured a general introduction to architecture and the architecture vision of Mail NL. The second subject focused on the implications of the Enterprise Architecture process for the Information Management department, especially the project organization. This also incorporated the introduction of the Project Architecture concept. The third subject was a general introduction to the concept of Service Oriented Architecture (SOA) and its anticipated implications for the organization and systems of Mail NL. The last subject treated the relation between Service Oriented Architecture and SAP, which merely focused on the development direction of SAP itself and the resulting SAP architecture.

### 4.3 THE ENTERPRISE ARCHITECTURE VISION

The preliminary research showed that a common understanding of the field of Enterprise Architecture greatly helps organizations in the development of their own Enterprise Architecture and accompanying process(es), as problems can occur when stakeholders do not speak in the same language or have a different understanding of what 'architecture' means. (Janssen & Hjort-Madsen, 2007) Research has shown that organizations that did not create a shared vision on the concept were unsuccessful in their architecture efforts. (Jörg, Mettau, & Van Der Zee, 2004) It would not be required for all stakeholders to have the same definition or understanding of architecture, but instead, they must consent with the definition or understanding that will be used within their organization. (Wagter, Van Den Berg, Luijpers, & Van Steenberghe, 2005) The outcome of this preliminary research and the fact that the DYA method prescribes the use of an Enterprise Architecture vision has led to the development of such a vision at Mail NL.

Due to the choice to adopt the DYA method for the Enterprise Architecture process, the architecture vision concept of DYA was used as the basis for Mail NL's vision. The first version was developed in July 2008.

The 2008 Information Plan of the Information Management department already contained a section on the development and application of architecture at Mail NL, which was already agreed upon by the business. For the most part, this section was adopted in the Enterprise Architecture vision and expanded with additional information from other already existing architecture-related documentation, including concepts that had already been developed at the ICT Mail department. As there were no conflicts between the created vision and the notion of the concept(s) of any of the involved parties, the final version of the Enterprise Architecture vision for Mail NL did not take long to develop. This vision has been made publicly available within the Mail NL organization, with the intention to expand or adapt the vision in case of any changes in the Enterprise Architecture function of Mail NL.

The Enterprise Architecture Vision of Mail NL is presented in section 6.<sup>9</sup>

### 4.4 THE PROJECT ARCHITECTURE PROCESS

The Project Architecture<sup>10</sup> concept can be considered as one of the main elements of the DYA method by Sogeti. As a result of the decision to adopt the DYA method for ICT Mail's architecture process, the Project Architecture naturally became part of the (yet to be developed) process. The architectural foundation that had

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<sup>9</sup> The original document has been translated, expanded (to make up for the lack of context) and verified by the responsible architect.

<sup>10</sup> Within TNT Post, the name 'Project Start Architecture' (PSA) is used, in accordance with the designation of the concept in the DYA method. However, in the final process the term 'Start' was considered to be misleading, as the Project Architecture is constantly being updated during the project. Due to the organization's familiarity with the PSA designation, it remained unchanged.

already been laid out by ICT Mail was used as the basis for the introduction of Enterprise Architecture at Mail NL, which also led to the adoption of the Project Architecture concept.

A Sogeti White Paper on the Project Architecture concept (Luijpers, Joost; Sogeti Nederland BV, 2007) was used as the basis<sup>11</sup> for the incorporation of the concept at Mail NL. As a first step, the concept was translated into implications for the organization of Mail NL. The White Paper also incorporated a brief section on the inclusion of the Project Architecture in the context of the PRINCE2 Project Management methodology (Office of Government Commerce, 2005), which is used by the Information Management department of Mail NL. The relations between the Project Architecture (-process) and the PRINCE2 methodology have been adapted and expanded into a more explicit process, which is presented in section 9.

In the second architecture session (see section 4.2), the concept was presented for the first time. During the architecture sessions and after the completion of the Project Architecture process, several discussions have led to further development of the process. In the following subparagraphs, several subjects (including involved discussions) are summarized along with their considerations and the eventual outcome.

#### 4.4.1 RELATION OF THE PROJECT ARCHITECTURE WITH PRINCE2

The relation between the Project Architecture (-process) and PRINCE2 as illustrated by Sogeti in Figure 4, was one of the subjects of discussion during the second architecture session. Although this figure illustrates the Project Architecture as a document, it was considered to be misleading as it could also be interpreted as an additional PRINCE2 process. In collaboration with a PRINCE2 expert, the Project Architecture process was analyzed and placed in the context of the individual PRINCE2 processes. This led to a process overview in which the PRINCE2 processes were left unchanged and the Project Architecture process was illustrated as a separate collection of activities, which for the most part are to be performed by the Project Architect. The resulting process overviews are presented in section 9.3.

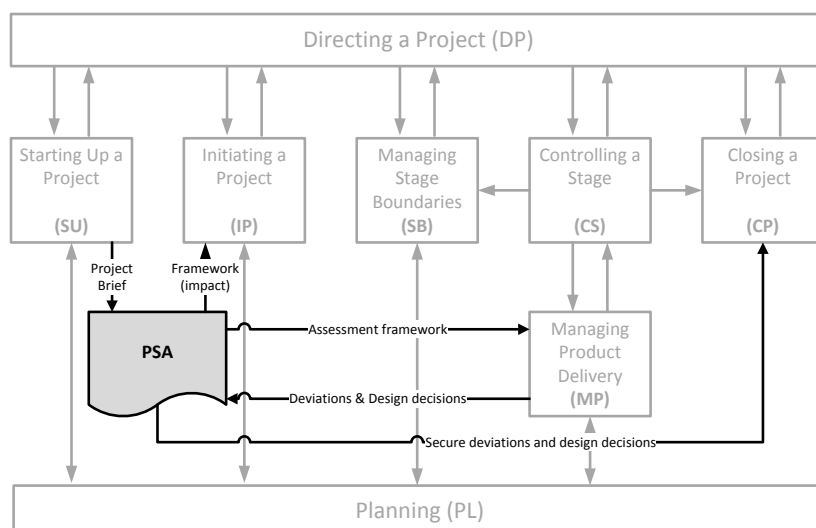


FIGURE 4 PROJECT (START) ARCHITECTURE IN THE PRINCE2 FRAMEWORK (LUIJPERS, JOOST; SOGETI NEDERLAND BV, 2007)

<sup>11</sup> It should be noted that the contents of the White Paper do not correspond entirely with the architectural way of working within Mail NL. Therefore, the paper itself can be used as background information but its contents should not be considered representative for the Enterprise Architecture (-process) of Mail NL.

#### 4.4.2 GOVERNANCE AND THE PROJECT ORGANIZATION

Other discussions on the Project Architecture process mostly involved governance issues. One of the main concerns was the lack of a project exceeding authoritative architecture board, in which case actual decision making power would still entirely reside within the project organization. Naturally, a Project Board will always be inclined to make decisions that are favored in the context of the project instead of the entire organization. Eventually, it was decided to incorporate the Project Architecture process as a purely facilitative process – just like the overall Enterprise Architecture process – and utilize the existing escalation paths for architectural governance purposes.

The first version of the Project Architecture process was made available in November 2008. This led to a new discussion on the organization of the Project Team and the role of architects within this context. Figure 5 illustrates the project organization as incorporated in the first version of the Project Architecture process, which involved the use of an Architecture Board. The Architecture Board would be composed at the start of a project and consist of both business representatives and sufficient members with architectural knowledge in the context of the project.

One of the Information Managers of the Information Management department stated a number of objections to this construction.<sup>12</sup> First of all, the concept of an Architecture Board was considered to be too large for regular projects. And more importantly, the fact that the Architecture Board was illustrated as a part of the Project Management Team implied it would not be an independent committee. This eventually led to a new construction (see Figure 17), in which a Controlling Architect would take on the role of an independent reviewer for the Project Architecture related activities, products and decisions.

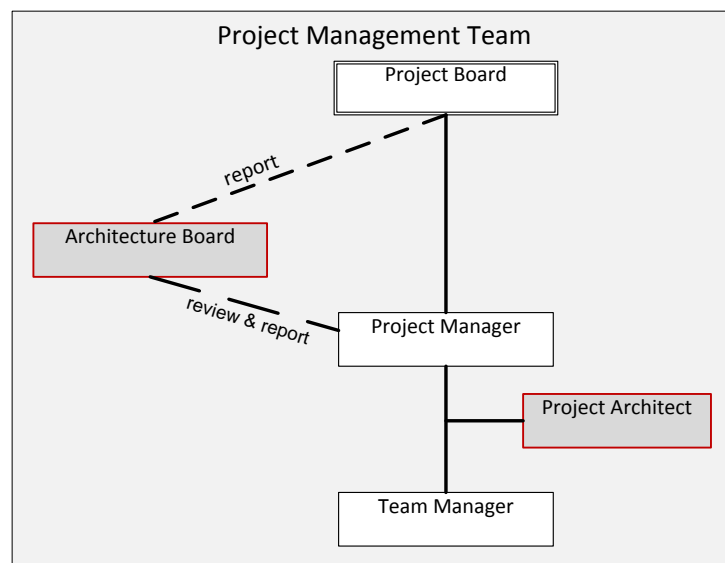


FIGURE 5 INITIAL VERSION OF THE PROJECT ORGANIZATION

#### 4.4.3 PRINCIPLES AND GUIDELINES

The Project Architecture process was based on a number of implicit principles. In order to govern the application of the Project Architecture in the project activities, these principles and guidelines were made explicit and agreed upon in February 2009 by all involved parties (i.e. representatives of the Information Management department, the ICT Mail department and the Mail NL architecture team).

<sup>12</sup> These objections were stated in one of the interviews with key business representatives, which can be found in Appendix B.

#### 4.4.4 PROJECT ARCHITECTURE FRAMEWORK

Instead of using the concept of an additional architecture framework for the Project Architecture (Foorthuis & Brinkkemper, 2008), Mail NL developed the Project Architecture as a conceptual way of working to incorporate the Enterprise Architecture in the context of projects. As a document, the Project Architecture is a vehicle to incorporate and communicate on the relevant parts of the Enterprise Architecture. This conceptual way of working is formalized in the Project Architecture process.

The Project Architecture document uses references to include the Enterprise Architecture entities (models, principles, guidelines, etc.). As a result, new entities are developed and stored directly in the standard Enterprise Architecture repository. This helps to maintain the usability of the Enterprise Architecture repository as well as prevent the creation of secondary (non-standard) models that need to be translated and transferred back into the Enterprise Architecture after completion of the project.

#### 4.5 ENTERPRISE ARCHITECTURE FRAMEWORK

The Enterprise Architecture Framework (EAF) of Mail NL – a mixture of the DYA method (Wagter, Van Den Berg, Luijpers, & Van Steenberghe, 2005), ArchiMate modeling language (The Open Group, 2008) and TOGAF concepts (The Open Group, 2009) – was already developed in the context of the architecture of the ICT Mail department. However, most of these initial development efforts focused on the Application Architecture layer, as this was considered to be the context in which an architectural way of working would yield the most benefits for the ICT Mail department (see section 2.6.2).

The development of the Enterprise Architecture Framework of Mail NL did not result in any major difficulties, as the basis for the framework had already been developed by ICT Mail in the previous years. Three aspects that did require additional attention were the use and definition of Business Goals and Requirements, the concept of Domain Architectures, and the relation of Mail NL's Enterprise Architecture with other TNT Post architectures. These aspects are discussed in the following subparagraphs.

##### 4.5.1 BUSINESS GOALS AND REQUIREMENTS

The preliminary literature research showed that “...consultants and architects found it difficult to design domain or system level solutions if the larger context was not defined.” (Pulkkinen & Hirvonen, 2005) The business strategy should be the driver behind architectural development and the business vision should be made explicit in clear Business Goals and Business Requirements, in order for the Enterprise Architecture to be aligned to the business strategy (Kaisler, Armour, & Valivullah, 2005). The Enterprise Architecture Framework as presented in the DYA method positions the term ‘Business Goals & Requirements’ on top of the framework, to indicate that the underlying Enterprise Architecture is based (and directly or indirectly derived) from these goals and requirements. Due to the lack of a central overview of all valid Business Goals and Requirements for the organization of TNT Post and Mail NL, these goals and requirements would need to be maintained within the Enterprise Architecture of Mail NL in order to be used as a basis for the Enterprise Architecture itself.

It was also decided to split the concept into ‘Business Goals’ and ‘Business Requirements’, as Business Goals were considered to have a long-term orientation, whereas Business Requirements were considered to be more short-term oriented as well as a slight operationalization of the Business Goals. This resulted in the definitions as presented in section 7.1.1 and the framework as presented in Figure 11.

##### 4.5.2 DOMAIN ARCHITECTURES

(Enterprise) Architectures can occur at multiple organizational levels and the architectures may vary from each other (Ross, Weill, & Robertson, 2006). This is incorporated in the Enterprise Architecture Framework of Mail NL by means of the concept of Domain Architectures, which has been the subject of various discussions. Although the DYA method acknowledges the concept, it does not provide an explicit definition for a Domain

Architecture. The resulting question was whether or not the Enterprise Architecture should consist of a number of predefined domains, for which Domain Architectures are to be maintained. The common understanding at TNT Post was that domains were defined by the areas that received the most attention at a certain time. And as such, domains would be temporal. However, this conflicted with the desire to split the organization of Mail NL into five separate domains, in accordance with the five clusters of the Information Management department of Mail NL.

Eventually, the notion of dynamic Domain Architectures was chosen, as this also provided the possibility to maintain more permanent Domain Architectures for each of the Information Management clusters. The use of Domain Architectures is presented in section 7.2.

#### 4.5.3 RELATION WITH OTHER TNT POST ARCHITECTURES

Initially, the common understanding was that ICT Mail would be responsible for the Application Architecture and Technical Architecture of Mail NL's Enterprise Architecture, thus leaving Mail NL responsible for the remaining architecture layer, the Business Architecture, and the administration of Business Goals and Business Requirements. Both parties would share the responsibility of the architecture aspects 'Application services' (part of the Application Architecture) and 'Information' (part of the Business Architecture), which illustrates the need for increased collaboration on this border section.

However, after careful consideration of the governance policy of the Mail division, the ICT Mail architecture only applies to the organization of Mail NL in case of the (enforced) application of the Shared Services provided by ICT Mail. As a result, the abovementioned understanding of the architectural responsibilities only applies to the domain(s) of such Shared Services. Naturally, the separation of responsibilities not only applies to the application of the Shared Services provided by ICT Mail, but also the other Shared Services of the Mail division. An example of this separation of responsibilities is illustrated in Figure 6.

	Business Goals									
	Business Requirements									
	Business Architecture				Application Architecture			Technical Architecture		
	...	...	...	Information	Application services	...	...	...	...	...
<b>Principles</b>										
<b>Guidelines</b>										
<b>Models</b>										

Responsibility:  Mail NL  ICT Mail  Shared

**FIGURE 6 SEPARATION OF RESPONSIBILITIES FOR THE ICT MAIL SHARED SERVICES**

The concept of these Shared Service architectures is included in the Enterprise Architecture Framework of Mail NL as an additional type of Domain Architectures: Remote Architectures; i.e. Domain Architectures that are considered to be developed and maintained remotely and which thus cannot be influenced directly by the organization of Mail NL. The relation between the Enterprise Architecture of Mail NL, its Domain Architectures, Remote Architectures and Reference Architectures is illustrated in Figure 12.

## 4.6 ENTERPRISE ARCHITECTURE PROCESS

The development of Enterprise Architecture process has been one of the major challenges in the introduction of Enterprise Architecture at Mail NL. Besides the concept of the Project Architecture, an actual process in

which the Enterprise Architecture would be developed, maintained and applied had yet to be developed when Mail NL adopted most of the Enterprise Architecture concepts and processes of ICT Mail.

#### 4.6.1 HIGH LEVEL ENTERPRISE ARCHITECTURE PROCESS

The initial ambition was to maintain a top-down architectural approach by making the Enterprise Architecture an integral part of the high level (strategic) decision making processes of Mail NL. As a first step towards this ultimate goal, the organization's (ICT) planning processes were illustrated and described in an architectural context. However, due to the factors presented in section 3, the ambition to root the Enterprise Architecture process in the organization's strategic decision making processes turned out to be unrealistic for the near future. Therefore, the Enterprise Architecture process has been developed as a facilitative process, in which the architecture team aggregates architectural and contextual information from various sources throughout the organization and use this information to support the business' management processes.

As mentioned in section 3, many tactical (and even strategic) decisions are made within the context of projects and programs. This, and the fact that the Project Architecture concept makes it possible to gradually introduce and develop the Enterprise Architecture in the organization of Mail NL, resulted in the Project Architecture (process) taking on a central role in the Enterprise Architecture process.

#### 4.6.2 ENTERPRISE ARCHITECTURE MECHANISMS

The idea to involve Mail NL's higher management in the Enterprise Architecture process by providing them with regular architecture briefings, the so-called Architecture Direction Statements (see section 8.3.1), was first mentioned at the end of 2008 and again extensively in one of the interviews that were held for this research (see Appendix B). The concept of Architecture Direction Statements has been formalized in March 2009.

The introduction of Project Portfolio Management was mentioned by multiple interviewees as a pragmatic means of governing the organization's collection of projects from an architectural point of view. Although Project Portfolio Management activities have been conducted implicitly by the Information Management department, the concept has yet to be introduced formally in the organization of Mail NL. The detailed implementation of Project Portfolio Management in combination with the Enterprise Architecture (-process) is yet to be determined. More information on the anticipated role of Project Portfolio Management in the context of the Enterprise Architecture process of Mail NL is provided in section 8.3.2.

#### 4.6.3 INTRODUCTION OF ARCHITECTURE STAGES

The DYA method incorporates the time aspect by stating that principles and (in lesser degree) guidelines are used for the migration of the organization and its parts from the current to the future situation. Guidelines and models can be used to describe both the current and future situation (Luijpers, Joost; Sogeti Nederland BV, 2007). This time aspect is illustrated in Figure 7.

	Business Goals							
	Business Architecture			Information Architecture		Technical Architecture		
Principles	MIGRATION							
Guidelines								
Models	CURRENT / FUTURE							

FIGURE 7 TIME ASPECT IN THE DYA EAF FRAMEWORK (LUIJPERS, JOOST; SOGETI NEDERLAND BV, 2007)

The Enterprise Architecture Framework of Mail NL adopts this view on the time aspect of the Enterprise Architecture, with addition of so-called ‘architecture stages’. These stages represent the development of the Enterprise Architecture by means of the Budgeted Architecture stage and provide a clear differentiation between the Current Architecture and the Goal Architecture; the current situation and (anticipated) future situation. The goal of this separation of concerns is to simplify the relation between Enterprise Architecture development and various management processes, and to support the application of the Project Architecture.

The concept of architecture stages is explained thoroughly in section 8.1.

#### 4.6.4 ENTERPRISE ARCHITECTURE AND OPERATIONAL MAINTENANCE

The set of guidelines that govern operational maintenance in relation to the Enterprise Architecture (see section 8.5) are based on existing guidelines and procedures regarding Change Management and Incident Management during operational maintenance. The guidelines were finalized at the beginning of 2008, but are not yet used due to the absence of sufficient Enterprise Architecture contents.

### 4.7 PROGRAM PRIMARY PROCESS

A major milestone in the development of the Enterprise Architecture of Mail NL is the ‘Program Primary Process’. This program focuses on the development of a new shared infrastructure for Mail NL’s main operational processes and is considered to be a major example of the application of (Enterprise) Architecture within the organization of Mail NL. The following information on the evolution of the program has been deducted from the results of the before mentioned interviews, which can be found in Appendix B.

As mentioned in section 2.5, the merger of multiple business units into the business units Operations and Marketing & Sales resulted in a central governance structure, which naturally led to the desire to standardize the collection of processes and systems in the organization’s main process chain. Parallel to the search for alternatives to accomplish this standardization, the involved process managers brought about additional desires and requirements for their processes and supporting systems. This gave rise to the idea to manage the anticipated developments in a single program with a strong architectural character.

The first efforts towards such an architectural approach date back to approximately 2006. Those efforts were mainly initiated by ICT Mail and T&I and lacked the involvement of business representatives (such as Process Managers). As a result, the business did not acknowledge these efforts. This eventually led to a more business-driven development approach: the Program Primary Process. The first development step was made at the end of 2007 as a response to high exploitation costs in the operational environment. The Design Charter Program Primary Process – the Goal Architecture for the Primary Process – was completed mid 2008. The Design Charter included the process model, the underlying application functionality and the projects in which the Goal Architecture would be realized. It was well received, but its realization would require a lot of resources, which eventually caused the plan to shrink to a level that could be realized with the available amount of resources.

Originally, the Program Primary Process was initiated from what used to be the ICT Operations department. However, the business developments of the Operations business unit are mostly driven by developments at the Marketing & Sales business unit. For example, the liberalization of the postal market may have big implications for Mail NL’s product propositions and the operational processes. The short-term management focus of the operational organization (see section 3.1.6) has great impact on major organizational transitions like the one initiated in the Program Primary Process. The process of transforming the overall management focus to the long-term – which is required to determine the impact of developments on all processes and supporting systems – results in additional delays. This is one of the main reasons the Program Primary Process has progressed slowly since the initial completion of the Design Charter. On the other hand, innovation in terms of operational optimization is still possible without being dependent on commercial developments and their implications.

An operational architecture team was installed in August 2008, after which Project Architectures for the Program Primary Process were developed and important projects were started. These projects involved capital expenditures with a running time of three years. The program halted in November 2008, due to the lack of business attention and the insight that the operational processes were likely to see a major transition within one year and a half, in which scenario the initiated projects would not yield any profit. The newly acquired insights led to the development of a new Goal Architecture. Now, the new Core Design Team (a team of business representatives of the Marketing & Sales and Operations business units and the architecture team of Mail NL) focuses on the development of this new Goal Architecture. The original Design Charter Program Primary Process only serves as a source for the new Goal Architecture.

The financial crisis has resulted in budget cuts throughout the organization. In order to tackle this problem, a Project Portfolio Management process has been put in place. This process involves the following assessments:

- A quick-scan to determine the project's contribution to the business strategy and the Return-on-Investment, performed by the business owner.
- A design check (including a validation of the project in the context of the Enterprise Architecture), performed by the Core Design Team.
- A future-proof assessment to determine the project's compatibility with the long-term vision (the so-called 'plateau planning'), performed by the Marketing and Logistics departments.

The aggregated advice is delivered to the Management Teams of the Marketing & Sales and Operations business units, who will then be able to consider the alternatives and decide on the allocation of resources. However, as a result of the financial crisis, projects are currently mostly being terminated instead of initiated.



## 5 EVALUATION & FUTURE DEVELOPMENT

Since the start of the introduction of Enterprise Architecture on the 1<sup>st</sup> of January, 2008, many actions have been taken to increase and improve the application of Enterprise Architecture in the organization of Mail NL. During that time, the Enterprise Architecture process as presented in the sections 6 to 9 has been developed. This process provides a fundamental basis for further development of the organization's Enterprise Architecture, accompanying processes and its function within the organization of Mail NL. Besides the development of this Enterprise Architecture process, a lot of effort has been put in the 'education' of the most important stakeholders.

This process of introducing Enterprise Architecting at Mail NL has been evaluated during the last month of the active research period (i.e. February 2009), by means of a questionnaire that was sent out to all the stakeholders in the project organization of the Information Management department of Mail NL. The choice to address the questionnaire to this group was based on the fact that the Enterprise Architecture process is mostly aimed at projects and programs. Furthermore, the majority of the Enterprise Architecture efforts of the past year were carried out within this project organization.

The goal of this questionnaire was threefold: (1) to determine the status and maturity of (the application of) Enterprise Architecture, (2) to evaluate the activities of the last year and the resulting Enterprise Architecture process, and (3) to gain input for the further development of the Enterprise Architecture process. The questions and results of the questionnaire are presented in Appendix C.

Additionally, the interviews of this research (see Appendix B) were also used to gain some evaluative statements and information on the possible further development of the Enterprise Architecture process.

In the next three paragraphs, the outcomes of the questionnaire and interviews are used to evaluate the introduction of the Enterprise Architecture (section 5.1), determine the maturity of the Enterprise Architecture process (section 5.2) and provide an overview of the future development of the Enterprise Architecture process (section 5.3).

### 5.1 EVALUATION

The following aspects were evaluated by means of the questionnaire and the interviews:

- Information Management architecture sessions.
- Project Architecture process.
- Program Primary Process.
- Enterprise Architecture function.

Due to the immaturity of the Enterprise Architecture process (see section 5.2), other aspects could not yet be evaluated.

#### 5.1.1 INFORMATION MANAGEMENT ARCHITECTURE SESSIONS

The architecture sessions that were provided to the Information Management department of Mail NL were aimed at increasing the general awareness on and knowledge of the Enterprise Architecture concept (see section 4.2).

Considering the answers that were given on the second and third question of the questionnaire, the sessions improved the participants' understanding of the concept of Enterprise Architecture and its application within Mail NL. This was also confirmed by the discussions during the sessions and the increased amount of questions that were issued after the sessions.

Although many of the participants of the questionnaire stated to be interested in a continuation of these educational sessions, the application of the sessions was also said to be limited in terms of information

exchange. The use of recurring feedback sessions on Enterprise Architecture activities and procedures was a much-heard request. These feedback sessions could be used to gradually improve the general awareness of the participants and the application of Enterprise Architecture.

The Information Sessions could be improved by providing more real-life examples – both from within TNT Post and other organizations – and adjusting the sessions to the activities of the Information Management clusters. The topic of Service Oriented Architecture (and accompanying challenges) was mentioned multiple times as a recommendation for future Architecture Sessions. A more thorough session on the Project Architecture process and the relation of architecture with administration and maintenance activities were the two other topics.

### 5.1.2 ENTERPRISE ARCHITECTURE FUNCTION

Most (20 out of 23) of the participants of the questionnaire answered to be familiar with Mail NL's Enterprise Architecture function (i.e. the role of Enterprise Architecture within Mail NL). The exact same results applied to the familiarity with the representatives of Mail NL's Enterprise Architecture. Conclusively, the project organization of the Information Management department is familiar with the organization's Enterprise Architecture. However, the question whether or not other parts of the business of Mail NL are familiar with the Enterprise Architecture function is much more interesting. Due to the earlier noted immaturity of the Enterprise Architecture process, this question has not been issued to other business representatives. Instead, a part of the DYA Architecture Maturity Scan (Van Den Berg & Van Steenberg, 2004) has been incorporated in the questionnaire for this purpose. The answers to this question clearly indicate a lack of business involvement and familiarity with the Enterprise Architecture process throughout the organization; the majority of the participants answered 'no' on the statements "the business has the feeling to be involved in the architecture process" and "the organization is familiar with the architecture process".

Once the Enterprise Architecture process will be applied on a corporate management level, the Enterprise Architecture vision should be communicated and validated with the newly involved stakeholders. Additionally, these stakeholders should also be educated on the Enterprise Architecture and accompanying processes, in order to create a sufficient level of awareness.

Currently, the Enterprise Architecture Function of Mail NL is heavily geared towards the organization's IT function. This is obvious when looking at the organization of the architecture team, which consists of only two architects, who collaborate closely with a team of architects of the ICT Mail department. As noted in section 3.1, Mail NL is most of all a physical organization with a limited IT footprint and the necessary major transition towards a more cost efficient organization needs to be process-driven. As this requires increased availability of process knowledge, the architecture team of Mail NL will have to be expanded with additional architects and Information Analysts. Eventually, the Enterprise Architecture could also include a human perspective; in addition to process models, it could also describe (implicit and explicit) relationships between employees, organizational tasks and resources (Zacarias, Caetano, Magalhães, Pinto, & Tribolet, 2007). Such a perspective could help to identify political relations and potential conflicts or difficulties in the realization of the impending major organizational transitions.

### 5.1.3 PROJECT ARCHITECTURE PROCESS

The answers on the questions relating to the Project Architecture process once more illustrated the immaturity of the Enterprise Architecture process. Out of the total of 23 participants, only seven participants indicated to have been involved in a project that incorporated a Project Architecture.

The answers on question 17 of the questionnaire showed that the participants that had been involved in a project that incorporated a Project Architecture were mostly positive on the application of the Project Architecture. The number of answers to this question is insufficient to draw any definitive conclusions, but it

does look like the Project Architecture (1) provides useful additional insights, (2) helps the Project Manager and (3) eventually saves time.

The answers on question 18 of the questionnaire provide some valuable input for improvements in the application of the Project Architecture, although it should be noted that out of the 21 people who answered this question, 14 people have not yet been involved in a project that incorporated a Project Architecture.

First of all, the expectations and goal of the Project Architecture should be agreed upon in the project organization at the start of the project. Secondly, the time needed to develop the first version of the Project Architecture document should be limited to three days. Thirdly, the availability of a Goal Architecture for the project's domain is preferred. Naturally, the application of the Project Architecture becomes easier once more architecture material is available. Improving the general knowledge of architecture in the project organization is also expected to result in an improved application of the Project Architecture. One participant also added the availability of architecture-related budget for the development of a Project Architecture in projects that do not (yet) have any approved financing as an important factor.

Increasing the number of Domain Architects and treating the Project Architecture in every meeting of the Project Team was considered to be of less influence on the application of the Project Architecture.

In order to confirm all of these findings, additional research is needed. Once the Project Architecture process has been applied more often, these questions could be posed again. It might also be interesting to research whether or not the use of a Project Architecture results in improvements such as shortened turnaround times, decreased project costs and fewer Change Requests after project completion.<sup>13</sup>

#### 5.1.4 PROGRAM PRIMARY PROCESS

As described in section 4.7, the Program Primary Process was initiated with the intention to centrally govern the developments around the Primary Process, in the light of the merged business units and impending process changes. The creation of such a shared development platform was considered to be successful, even though the program itself did not yet yield any significant results in terms of the development of the Primary Process.

The following five major challenges and problems the program has been faced with during its short existence were mentioned during the interviews that were held as a part of this research:

1. **Resource constraints** – Although the initial Design Charter Primary Process received support of all involved stakeholders, the allocation of resources to realize these plans turned out to be more difficult, which led to cut-backs in these plans.
2. **Financial crisis** – The current financial crisis has resulted in a (temporary) change of the development focus towards the short-term, due to the lack of financial resources. As a result, there is little financial support for innovative initiatives such as the Program Primary Process.
3. **Business involvement** – Involving the right business representatives, in order to ensure alignment with the business and its developments, remains to be a great challenge. Lack of business involvement was one of the main reasons for the program's (temporary) cancellation midway 2008.
4. **Overall support** – Besides financial resources, it turned out to be difficult to gain support for the program from crucial stakeholders, such as Process Managers. These stakeholders need to take on a more long-term orientation in order to actively participate in the program. Although this transition does take place, it has led to additional delays for the program.

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<sup>13</sup> For such a research a great amount of projects and resulting products will need to be monitored and reviewed for an extensive period of time, both in the situation with and without the application of a Project Architecture.

5. **Redistribution of responsibilities and collaborative structures** – The introduction of a new architecture for the Primary Process will lead to a change of responsibilities in which people need to collaborate with each other. This is even more so with the introduction of Service Oriented Architecture. For example, the concept of functional ownership needs to be dropped.

As a response to these problems, the overall plateau planning has been split up in multiple plateaus that align with individual business developments, in order to gain sufficient support and involvement as well as financial resources.

As mentioned by one of the interviewees, these kind of architecture efforts are also valuable for the organization in terms of gaining experience with an architectural way of working. The program itself has been a valuable means to (1) create overall awareness on the future development of the organization and its processes, (2) realize the transition towards a more long-term oriented management focus, (3) improve the collaboration between the operational and commercial organization of Mail NL, (4) force strategic and tactical decision making on crucial aspects and (5) visualize the most important challenges the organization will be faced with in the (near) future.

Regarding the third aspect: the program has helped to develop and adopt a more collaborative way of working between the two business units as well as all other involved stakeholders. This improved collaborative way of working involves the plateau planning, the Core Design Team, Project Portfolio Management and various project assessments (as mentioned in section 4.7).

One of the interviewees also noted that the financial crisis could also be an opportunity for initiatives like the Program Primary Process, as this limits the disturbance from other activities and developments, which are reduced as the result of budget cuts.

Due to the fact that (as of the end of the research period) the program has not yet led to any actual architectural development, other than the plateau planning and a very high level Goal Architecture, there is no information on the effectiveness of the approach in terms of organizational development. The same applies to the effectiveness of the recently developed processes and management approach (such as the plateau planning, Core Design Team and Project Portfolio Management) of the Program Primary Process; these processes have also not yet led to any concrete and tangible results.

Although the respondents of the questionnaire do not consider the availability of a Goal Architecture to be crucial for the application of Enterprise Architecture in the project organization of Mail NL, it is commonly agreed upon that the availability of a Goal Architecture will improve the application of Enterprise Architecture in the context of projects and programs and simplify the introduction of Service Oriented Architecture.

Within the Program Primary Process, multiple attempts have been made to develop a Goal Architecture for Mail NL's primary process, all of which appeared to be unsustainable. Each of the developed Goal Architectures were either dropped, postponed or heavily altered due to a lack of (business) support. The developments within the Program Primary Process have been highly technology-driven, especially in the first attempts. In combination with the physical character of Mail NL, this is likely to be one of the reasons for the lack of business support. The latest development iterations of the program are focusing more and more on process-driven development. However, the absence of process knowledge (i.e. information analysts) within the Information Management department introduces new difficulties for such developments.

## 5.2 ENTERPRISE ARCHITECTURE MATURITY

Since the start of ICT Mail's architecture efforts, two Enterprise Architecture maturity scans have been performed for the scope of TNT Post; the first in October 2007 and the second in July 2008. These scans used the DYA Architecture Maturity Model (Van Den Berg & Van Steenberg, 2004). The scans were performed by the architecture committee of the ICT Mail department, in which most of the participants are representatives

of ICT Mail itself. Therefore, the results of the scans may not be representative for the organization of Mail NL, even though the scans itself were performed for the scope of TNT Post.

Whereas the scan of October 2007 showed a maturity level of 0 or 1 for most areas of attention, the results of the second scan (see Appendix E) showed a great improvement on most areas. For many areas, the goal to reach a maturity level of 3 in July 2008 was accomplished. However, a number of areas were still falling behind; the areas 'application of architecture' and 'adjustment with business' scored a maturity level of only 0 and the aspect of 'governance' scored a maturity level of 1. At the same time, some areas scored an exceptionally high maturity level in comparison with the overall maturity level; the areas 'architecture functions and -training' and 'architecture tools' scored a level of 9 and 11, respectively.

The outcome of this maturity scan of July 2008 corresponds to the findings of the questionnaire in this research and the general development of the Enterprise Architecture process in the past year. As mentioned in section 5.1, the Project Architecture process is yet to be applied in all projects. Furthermore, as of March 2009, Architecture Direction Statements have not yet been applied and Information Planning is yet to be performed by architects.

Conclusively, the developed Enterprise Architecture process and tools are ahead of the actual application of Enterprise Architecture in the organization of Mail NL in terms of their maturity level. This is further emphasized by the fact that a sustainable Goal Architecture is yet to be developed. Therefore, the application and development of the Enterprise Architecture and business involvement (i.e. a more process-driven development approach) should be the main focus of further development of the organization's Enterprise Architecture function.

### 5.3 FUTURE DEVELOPMENT

The development the Enterprise Architecture process of Mail NL went through in the past year is just the first step in an ongoing development. The Enterprise Architecture and its implementation in the organization should be assessed and updated often, in order to maintain its value in a changing environment (Rehkopf & Wybolt, 2003). This subsection presents the expected future development of the Enterprise Architecture (-process), which is based on the interviews that were held during this research, the developed Enterprise Architecture process and the results of the Enterprise Architecture maturity scans.

As mentioned in section 4.6, some parts of the current Enterprise Architecture process (see section 8) are not yet (fully) applied in practice. Therefore, the application of these elements of the process are likely to be the first steps in the development of the Enterprise Architecture. This involves the use of Architecture Direction Statements and the annual development of the Information Plan.

The Mail division will proceed with the adoption of the Federal Model as its new governance structure. As a consequence, the business lines will receive a mandate on Project Portfolio Management, application functionality, application services, applications and processes. All aspects that are not business-specific will be shared. The ICT Governance of this new governance structure is aimed at these Shared Services and the Information Management department will have a leading role in the development of a detailed governance structure and policy for the Mail NL business line.

The introduction of Service Oriented Architecture will be one of the major challenges for the Enterprise Architecture of Mail NL in the near future. One of the first challenges will be to determine which (collections of) services are considered to be part of the Shared Services of the ICT Mail department. Additionally, a governance policy will need to be developed, which focuses (among others) on the following aspects:

- Criteria to determine whether or not to implement certain functionality as a service.
- Criteria to determine whether or not an existing service should be adapted.
- Quality requirements for the Service Oriented Architecture of Mail NL and its implementation.

- How to deal with the consequences of Service Oriented Architecture throughout the organization of Mail NL, such as: increased turn-around times of projects, effects on long-term contracts with suppliers and the required level of knowledge and experience.

The consensus is that the Enterprise Architecture process of Mail NL should remain as pragmatic as possible and that there is no need to attach the process to existing high level management processes, other than the integration as presented in section 8. In other words, the organization's strategic management is not expected to use Enterprise Architecture as an explicit basis for decision making in the near future. This is mostly due to the operational character of Mail NL.

The architecture team will need to be reinforced with additional architects, in order to be able to perform all the activities the Enterprise Architecture process encompasses and take on a more process-driven development approach. The common expectation is that the architecture team of the Information Management department will grow towards a structure with multiple Domain Architects. In that case, the architecture team will be organized as described in section 6.6, with the roles of Domain Architect, Project Architect, Controlling Architect and one architect fulfilling the function of Lead Architect. The main domains of the Domain Architects could be linked to the five clusters of the Information Management department. Additionally, the department could be reinforced with Information Analysts to facilitate the various clusters in the translation between business requirements and IT implications, by means of the development of functional specifications and the documentation of process information.

Such a reinforced architecture team will become responsible for the development of the department's Information Plan, in close collaboration with the Information Managers, as described in section 8.2.2. Furthermore, the architects are expected to take on a more pro-active role within the organization.

Project Portfolio Management is expected to take on a more prominent role in the organization's management processes. This process will then be the main tool to control the initiation of architecture-driven projects, which are also likely to increase in number. The Design Checks on architectural compliancy, as introduced in the Program Primary Process, will become a part of this Project Portfolio Management process.

The development of the Enterprise Architecture (-process) might be difficult in the near future, due to the effects of the financial crisis. Therefore, the architecture team will need to keep on promoting its services and increasing the awareness of the major stakeholders throughout the organization, in order to strengthen the position of the Enterprise Architecture within the organization. The overall consensus of the interviewees was that Enterprise Architecture is a valuable means to support and facilitate the business in various ways, but this does not automatically imply that Enterprise Architecture is accepted as such throughout the organization.







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## PART III: THE ENTERPRISE ARCHITECTURE PROCESS

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## 6 ENTERPRISE ARCHITECTURE VISION

As the preliminary research (see section 1.2.1) has shown, one of the critical factors in introducing Enterprise Architecture is the availability of a shared Enterprise Architecture Vision. It is not required for all stakeholders to have the same definition or understanding of Enterprise Architecture. Instead, they must consent with the definition or understanding that will be used throughout the Enterprise Architecture and its processes (Wagter, Van Den Berg, Luijpers, & Van Steenberghe, 2005). For this purpose, an architecture vision document is created, which forms the basis for TNT Post – Mail NL’s Enterprise Architecture and accompanying processes. The Enterprise Architecture vision of TNT Post – Mail NL is based on the architecture vision elements of the DYA approach (Van Den Berg & Van Steenberghe, 2004), which are illustrated in Figure 8.

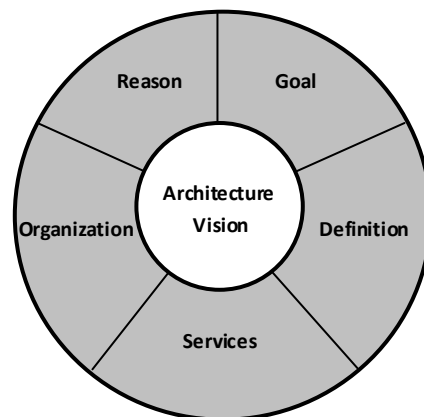


FIGURE 8 THE ELEMENTS OF ARCHITECTURE VISION IN THE DYA APPROACH

The five elements of the architecture vision have the following meaning:

- **Reason** – The reason(s) that led to the initiation of the architecture program (see section 6.1).
- **Goal** – The goal (and benefits) of the enterprise architecture for the organization (see section 6.2).
- **Definition** – The adopted definition of architecture that will be used throughout the (Enterprise) Architecture process and the organizational parts that will work with it (see section 6.3 and 6.4).
- **Services** – The services the architecture team will provide to the organization (see section 6.5).
- **Organization** – The organization of the architecture team and the roles and responsibilities of the architect(s). This should also include the position of the architecture team in the organization, as well as the formalization of decisional power and governance roles (see section 6.6).

### 6.1 REASON

The main motive for the incorporation of Enterprise Architecture at Mail NL can be derived directly from two of TNT Post’s public strategies (TNT Post, 2008): quality improvement and flexibilization of costs. These two strategies can be further expanded with TNT’s public financial strategy: “driving business performance by using value-based performance measures and standardization of business processes” (TNT, 2008).

Both strategies mainly originate from the increase in market competition and the focus on maintaining market share and business competitiveness. Naturally, quality improvement aims at improving the company’s visible performance, whereas flexibilization of costs aims at improving the company’s operational processes. As such, there is a differentiation of strategy between the company’s commercial and operational departments. However, the operational department needs to be able to support the activities and developments within the commercial department.

In order to realize flexibilization of costs, the operational environment needs to be set up as *lean and mean* as possible. This implies standardization of processes, increased (re-)use of shared components and increased

scalability of processes, systems and production capacity. Quality improvement implies an increased focus on market demands and the development of products to meet these demands.

Both goals require a shared vision on the organization, its operational processes and systems, as well as the development direction of the entire organization, albeit in different ways. Besides such a shared vision, the development direction itself should be realized in a consistent manner by the entire organization. However, due to the organization's current governance approach – in which individual departments, programs and projects are assessed and controlled based on their own expenditures and added value – this shared vision and development direction can not be guaranteed without some central authority that governs the organization's development.

The use of Enterprise Architecture makes it possible to create a shared vision and strategy on the organization and its development and to use this shared vision and strategy to monitor the development of the organization and its parts. A centralized Enterprise Architecture authority is able to collect and monitor all individual developments and able to place them in a broader perspective (i.e. the overall strategic development direction of the organization). Furthermore, a central authority is able to facilitate existing management authorities and structures with the governance on the strategic development direction by providing them with valuable information, knowledge and insight that is gathered within the Enterprise Architecture. Lastly, the resulting overall overview of the organization, its parts and development direction improves the quality of decision making on numerous aspects and developments. For example, Enterprise Architecture can help to identify which of the organization's processes are most likely to change in the (near) future and where the development focus will be, or it can help to identify which processes are affected by systems that are reaching the end of their life cycle. By providing such additional information, the required resources to deal with these developments can be allocated in advance.

## 6.2 GOAL

The inclusion of Enterprise Architecture in the organization of Mail NL is aimed at fulfilling the following goals:

1. Creating and maintaining a shared vision on Mail NL and its development, based on the overall strategic development direction.
2. Providing a consistent and valid translation of the overall strategic development direction into operational implications and developments for the entire organization, thus creating a better overview and insight of the current and future situation on all levels of the operational organization: products and services, processes, applications, supporting systems and infrastructure.
3. Governing developments within parts of the organization, programs and projects, in accordance with the strategic development direction and each other.
4. Creating a bridge between business and ICT.

## 6.3 DEFINITION

Mail NL uses the following definition of architecture, which is based upon the definition of architecture as used within the Mail division of TNT:

*A consistent set of principles, guidelines and models that guide the design and realization of the processes, organizational structure, information systems and technical infrastructure of an organization.*

Architecture is used in both a prescriptive and descriptive manner; prescriptive to guide further development of the organization and its parts, and descriptive to provide insight in the current and future situation of these parts. The descriptive function of the Enterprise Architecture is mainly used to support the prescriptive

function; i.e. the description of the as-is and the envisioned to-be situation of the organization and its parts is used as a foundation to guide further development from the as-is to the envisioned to-be situation.

As already pointed out, the Enterprise Architecture incorporates both the as-is and (the envisioned) to-be situation of the organization and its parts. The to-be situation is based on the development direction of the business goals of Mail NL. Consecutively, the Enterprise Architecture needs to be developed in collaboration with and validated by the management of Mail NL that is considered to be responsible for a specific Enterprise Architecture subject.

To include this time aspect in the Enterprise Architecture, three so-called Enterprise Architecture stages are used:

1. **Current Architecture** – Used to describe the as-is situation, including the current set of prescriptive statements that guide new design and development.
2. **Budgeted Architecture** – Used to hold the architecture that is about to be realized as a part of the migration towards the to-be situation, i.e. in the context of all currently active projects and programs.
3. **Goal Architecture** – Used to describe the envisioned to-be situation.

These Enterprise Architecture stages are further explained in section 8.1.

Naturally, not all principles, guidelines and models within the Enterprise Architecture are applicable to all parts of the organization; there might even be exceptions for a limited (organizational, system, technological, etc.) scope. In order to keep the Enterprise Architecture as comprehensible as possible, the Enterprise Architecture features so-called Domain Architectures. Domain Architectures have a different, more delimited scope than the entire Enterprise Architecture.

The scope of a Domain Architecture can be anything from an organizational demarcation or a collection of processes to a certain type of technology. The application of Domain Architectures is not mutual exclusive; i.e. the content of multiple Domain Architectures can apply to the scope of a single project (or program, product, etc.). On top of the Domain Architectures rest the architectural elements that are valid throughout the entire scope of the Enterprise Architecture. More information on Domain Architectures can be found in section 7.2.

## 6.4 SCOPE

The word 'Enterprise' in Enterprise Architecture refers to the organization of Mail NL with the exclusion of the business unit Parcels. Within the Enterprise Architecture of Mail NL, 'the organization' refers to this organizational scope.

The organization of Mail NL is governed through the corporate policy guidelines of the Mail division. The application of these guidelines is guarded by the Technology & Informatics (T&I) department, part of the CIO Office of the Mail division. The policy guidelines of the Mail division are an integral part of the Enterprise Architecture of Mail NL.

The policy guidelines of the Mail division also govern the use of the Shared Service facilities by the business lines. In case of directed use of a Shared Service, the architecture of the Shared Service becomes an integral part of the Enterprise Architecture of Mail NL; i.e. these 'Shared Service architectures' can be seen as remote Domain Architectures. The Shared ICT services, as provided by the ICT Mail department are an example of a major Shared Service with its own architecture(s).

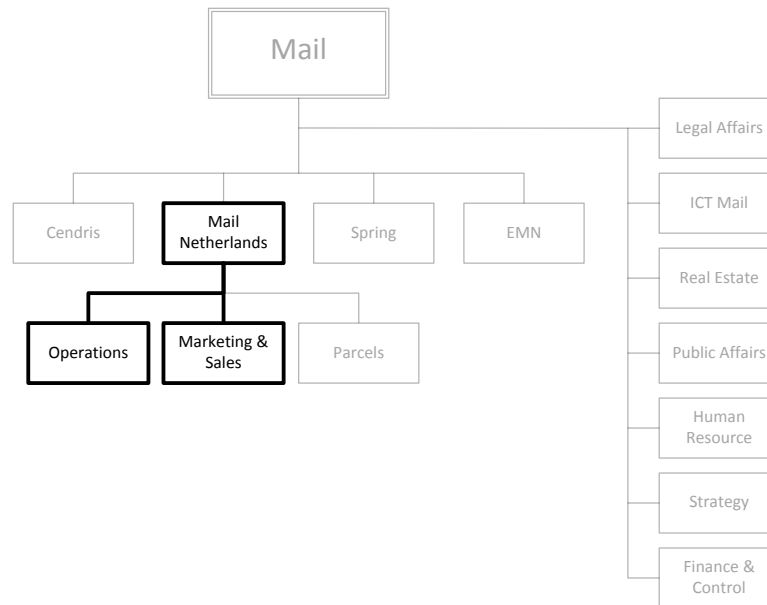


FIGURE 9 THE ORGANIZATIONAL SCOPE OF THE ENTERPRISE ARCHITECTURE OF TNT POST - MAIL NL

The Enterprise Architecture contains the architecture for the entire organization as presented above. Parts within this organization may have their own Domain Architecture, with exceptions on and additions to the upper architectural level.

## 6.5 SERVICES

As can be concluded from the goals in section 6.2, the Enterprise Architecture of Mail NL mainly functions as a facility and communication means for the entire (management) organization. It helps the upper management to ensure that the development of the operational organization is done in conformity with the strategic development direction. It also helps the program and project organization in the realization of projects in conformity with that strategic development direction as well as the decision making on and justification of deliberate deviations from this strategic development direction.

The architecture team has no formal decision making power, but it can inform and advise the appropriate management authorities on issues that have been identified within the Enterprise Architecture.

The Enterprise Architecture and the architecture team of Mail NL provide the following services:

- **Central disclosure of information** – The architecture team provides central disclosure of all Enterprise Architecture documentation and materials in standardized form to all involved stakeholders.
- **Education** – The architecture team provides the necessary education to all participants and stakeholders, in order to ensure they have a sufficient level of awareness and knowledge of the Enterprise Architecture and its processes to properly use the services of the Enterprise Architecture in their daily activities.
- **Process development** – Development of processes, conventions and frameworks needed to create a standardized way of working with Enterprise Architecture.
- **Enterprise Architecture development** – Development of the content of the Enterprise Architecture at all three architecture stages, including Domain Architectures and Project Architectures.
- **Enterprise Architecture maintenance** – Maintenance of all elements of the Enterprise Architecture (including its processes, conventions and frameworks) to ensure the Enterprise Architecture remains up-to-date and as valuable to the organization as possible.

- **Facilitation of management authorities** – The architecture team provides all relevant management authorities with specifically tuned information to facilitate decision making on and the governance of the organization's operational and tactical development.

## 6.6 ORGANIZATION

The architecture team of Mail NL is part of the Information Management department – a staff department of Mail NL – which corresponds to the central function of the architecture team within the organization of Mail NL.

The architecture team features the following roles:

- **Lead Architect** – Responsible for the overall management of the architecture team and its activities and the high-level development of the Enterprise Architecture. The Lead Architect keeps an overview of the entire Enterprise Architecture and maintains contact with the primary management authorities.
- **Domain Architect** – Responsible for the development and maintenance of a Domain Architecture and related Reference Architecture(s).
- **Project Architect** – Responsible for the development of the Project Architecture and other architecture related activities during a project.
- **Controlling Architect** – Responsible for the validation of the Project Architect's activities during a project.

The architecture roles are not mutually exclusive: a person can take on multiple roles and even fulfill these roles simultaneously. There is one exception to this mutual exclusivity: a person can not fulfill both the roles of Project Architect and Controlling Architect in the same project.

The roles of the Project Architect and Controlling Architect are further explained in section 9.

## 7 ENTERPRISE ARCHITECTURE FRAMEWORK

The Enterprise Architecture Framework of Mail NL is based on a mixture of the DYA methodology (Van Den Berg & Van Steenbergen, 2004), TOGAF (The Open Group, 2009) and ArchiMate (The Open Group, 2008).

The DYA approach and methodology is used as the basis for the organizational deployment of the architecture process, as it provides organizations with a large number of tools and concepts to embed Enterprise Architecture in standard organizational processes. However, the DYA methodology does not provide any concrete tools for the documentation and modeling of the Enterprise Architecture. For this purpose, TOGAF and ArchiMate are used. The constructed Enterprise Architecture Framework results in a clear and very useful separation between the business and ICT domain, which is also very helpful for the incorporation of Service Oriented Architecture.

### 7.1 HIGH LEVEL STRUCTURE

The high level structure of the Enterprise Architecture Framework of Mail NL is derived from the standard architecture framework structure of DYA. The structure has been adapted to accommodate the architecture modeling concepts and components of ArchiMate, which are shown in Figure 10. The resulting structure is shown in Figure 11.

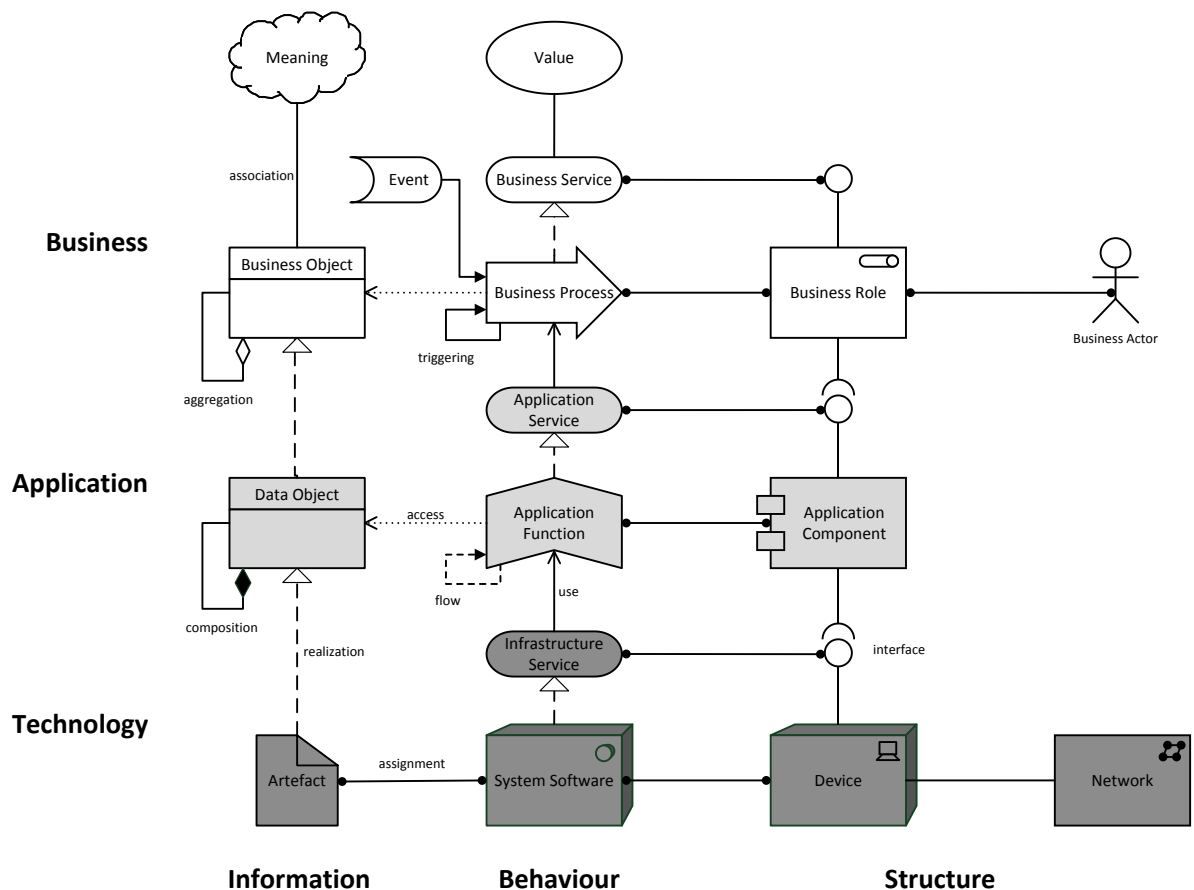


FIGURE 10 ARCHIMATE MODELING CONCEPTS (THE OPEN GROUP, 2008)

Figure 10 clearly demonstrates the separation between the Business and Application layer and the advantages of such a breakdown in relation with Service Oriented Architecture. For example, the separation between

Application Services and the Business Processes helps the ICT domain develop Application Services that support the organization's Business Processes. The Application Service aspect is situated at the border between the Application Architecture and the Business Architecture. It is considered to be part of the Application Architecture, but its strong relation and integration with the Business Process aspect may lead to situations in which the business is also closely involved in the decision making on the aspect.

The DYA structure has been adapted on the following aspects:

- A distinction has been made between Business Goals and Business Requirements.
- 'Information Architecture' has been changed into 'Application Architecture', in accordance with the ArchiMate architecture layers.
- Several architecture aspects have been added to the three architecture layers (Business-, Application- and Technical Architecture) in accordance with the architecture concepts of ArchiMate.
- There is no strict hierarchy in the architecture aspects of the three architecture layers.

	Business Goals									
	Business Requirements									
	Business Architecture				Application Architecture			Technical Architecture		
	Organization	Product / Service	Process	Information	Application service	Data	Application	Platform	Middleware	Network
Principles										
Guidelines										
Models										

FIGURE 11 HIGH LEVEL OVERVIEW OF THE ENTERPRISE ARCHITECTURE FRAMEWORK OF TNT POST - MAIL NL

All elements of the Enterprise Architecture Framework structure from Figure 11 are described in the following paragraphs.

### 7.1.1 BUSINESS GOALS & BUSINESS REQUIREMENTS

Both Business Goals and Business Requirements are determined by the business. Essentially, the Enterprise Architecture has to support and help to fulfill these goals and requirements. Therefore, both can be seen as the basis for further architectural development and the justification of architecture entities (such as principles and guidelines).

Business Goals (or Business Objectives) are a projected state of affairs the organization wants to achieve. A Business Goal is not necessarily bounded to a deadline. Business Goals can be *Big Hairy Audacious Goals* (Collins & Porras, 1996) and even small, more short-term oriented goals.

Business Goals are developed further into Business Requirements. These requirements are a means for the business to govern the development direction of programs and projects, in order to contribute to the Business Goals and the organization's strategy.

Business Requirements are much more short-term oriented and have a more limited scope than Business Goals; the requirements may have a limited application (e.g. individual projects, services or products) or apply to entire programs and parts of the organization. Due to this limited scope and short-term orientation, Business Requirements are greatly influenced by many internal and external factors, including environmental developments. As a result, the requirements itself can be highly variable. In order to be effective, Business



Requirements should only be determined – or at least validated – when such directional statements are needed (i.e. within programs and individual projects).

The Business Goals and Business Requirements are the contextual foundation of the Enterprise Architecture. Although the development of Business Goals and Business Requirements is not an element of the Enterprise Architecture process, both the goals and requirements are documented as a part of the Enterprise Architecture in order to increase the overall overview of strategic and tactical developments as well as the justifiability of the Enterprise Architecture itself.

The Business Goals and Business Requirements are documented as the collection of all business drivers that are relevant for the development of Mail NL and its architecture in the years to come.

It should be noted that an Enterprise Architecture will most likely not be able to address all Business Requirements at the same time. Therefore, all requirements are prioritized by indicating how much they contribute to the realization of the Business Goals (high, medium or low).

### 7.1.2 BUSINESS ARCHITECTURE, APPLICATION ARCHITECTURE & TECHNICAL ARCHITECTURE

In the Business Architecture, the business' strategy, goals and requirements are translated into the following four aspects:

- **Organization** – The business roles and their responsibilities.
- **Product / Service** – The products and services provided by the business, that ultimately lead to added value for business execution.
- **Process** – The business processes and process chains.
- **Information** – Information objects or business objects that have a business meaning. This not only includes the basic registers but also the physical appearance of transaction data such as orders and invoices.

The Application Architecture supports the elements of the Business Architecture by means of applications and application services, which in turn handle data objects. As such, the Application Architecture aims at creating an IT environment that functions as a business enabler. The Application Architecture layer contains the following three aspects:

- **Application service** – Application functionality made available through a service.
- **Data** – Data entities and their underlying (logical) connection.
- **Application** – Applications and application components.

The Technical Architecture supports the Application Architecture by governing the development and construction of the technical infrastructure used by the application layer. The Technical Architecture contains the following three aspects:

- **Platform** – The technical platform in terms of hardware and system software.
- **Middleware** – The software components used to realize universal data exchange and the disclosure of legacy systems. This aspect is also known as infrastructural services in the ArchiMate modeling language.
- **Network** – The infrastructure used for data exchange.

Within each architecture layer, elements of the various aspects naturally relate to and interact with each other. These relations do not end at the border of an architecture layer, but instead relations between elements of multiple architecture layers can occur. This is evident, as the elements of two architecture layers can support each other. These relations may lead to so-called grey areas, in which the applicable architecture aspect might not be perfectly clear. Therefore, a single principle or guideline can apply to multiple architecture layers or aspects.

### 7.1.3 PRINCIPLES, GUIDELINES & MODELS

The essential architecture elements are documented in principles, guidelines and models. Principles and guidelines are used to guide the design and development of the organization and its parts. As such, principles and guidelines have a prescriptive nature, whereas models have a more descriptive nature; they describe the current or future arrangement of elements and relations within a system.

The Enterprise Architecture process of Mail NL partially adopts the TOGAF notion and format of principles. Additionally, a distinction is made between principles and guidelines, which TOGAF does not. This distinction is made to increase the practicality of architecture entities in project environments. TOGAF uses the following definition of principles:

*“Principles are general rules and guidelines, intended to be enduring and seldom amended, that inform and support the way in which an organization sets about fulfilling its mission.”*  
(The Open Group, 2007)

The Enterprise Architecture process of Mail NL establishes the following notions for principles and guidelines:

*Principles are guiding statements and rules on behalf of fundamental decision making; an elementary idea to fulfill a general (business) requirement. They are intended to be enduring and seldom amended and they inform and support the way in which an organization sets about fulfilling its mission.*

*A guideline is a tangible derivative of one or more principles on a single architecture aspect and a limited (organizational, technical, etc.) scope. Guidelines are therefore less sustainable and more influenced by short term developments than principles.*

Both principles and guidelines are documented by means of TOGAF's format for defining principles (see Table 3).

<b>Name</b>	Should both represent the essence of the rule as well as be easy to remember. Specific technology platforms should not be mentioned in the name or statement of a principle. Avoid ambiguous words in the Name and in the Statement such as: "support", "open", "consider", and for lack of good measure the word "avoid", itself, be careful with "manage(ment)", and look for unnecessary adjectives and adverbs (fluff).
<b>Statement</b>	Should succinctly and unambiguously communicate the fundamental rule. For the most part, the principles statements for managing information are similar from one organization to the next. It is vital that the principles statement be unambiguous.
<b>Rationale</b>	Should highlight the business benefits of adhering to the principle, using business terminology. Point to the similarity of information and technology principles to the principles governing business operations. Also describe the relationship to other principles, and the intentions regarding a balanced interpretation. Describe situations where one principle would be given precedence or carry more weight than another for making a decision.
<b>Implications</b>	Should highlight the requirements, both for the business and IT, for carrying out the principle - in terms of resources, costs, and activities/tasks. It will often be apparent that current systems, standards, or practices would be incongruent with the principle upon adoption. The impact to the business and consequences of adopting a principle should be clearly stated. The reader should readily discern the answer to: "How does this affect me?" It is important not to oversimplify, trivialize, or judge the merit of the impact. Some of the implications will be identified as potential impacts only, and may be speculative rather than fully analyzed.

**TABLE 3 FORMAT FOR DEFINING PRINCIPLES AND GUIDELINES (THE OPEN GROUP, 2007)**

Models are used to describe the Current Architecture, Budgeted Architecture and Goal Architecture. The Current Architecture is described in detail, whereas the Goal Architecture uses a higher level of abstraction. Models are used to present the relations and dependencies of the entities within the Enterprise Architecture. Models can also be used to provide different viewpoints for different users, thus making it easier to disclose the Enterprise Architecture to a wide variety of potential users.

The Enterprise Architecture of Mail NL uses the ArchiMate modeling language (The Open Group, 2008).

## 7.2 DOMAIN ARCHITECTURES

Within the scope of the Enterprise Architecture of Mail NL, there are multiple departments that, at least in some aspects, greatly differ from each other. The best examples of such diversification are the business units Operations and Marketing & Sales. These departments do not always use the same systems and procedures and their tactical development might also be different from each other's. It would not be very efficient and effective if the architecture of such differing departments would be combined into a single architecture, as this would require a lot more labor to determine whether or not a statement applies to a certain scope. This not only goes for organizational departments, but also collections of processes or distinct technologies. To improve the effectiveness, comprehensiveness and maintainability of the Enterprise Architecture, Domain Architectures are used to create this contextual diversification.

A Domain Architecture uses the same high level structure as presented in the previous paragraph. As a result, a Domain Architecture can (but is not required to) span all the architecture aspects of the framework. The scope of a Domain Architecture can be anything from an organizational demarcation or a collection of processes to a certain type of technology.

The Enterprise Architecture contains a single collection of architecture entities considered valid for the entire scope of the Enterprise Architecture; i.e. Mail NL. This collection should be seen as the Domain Architecture of Mail NL. All other Domain Architectures within the Enterprise Architecture are an addition to this set for a specific domain. The application of Domain Architectures is not mutual exclusive; i.e. the content of multiple Domain Architectures can apply to the scope of a single project (or program, product, etc.). They can also be used in a hierarchical sense, but this is not required.

Furthermore, a Domain Architecture does not necessarily need to be developed or maintained within the Enterprise Architecture of Mail NL. The domain might correspond to a (business line-exceeding) Shared Service, in which case the architecture would be owned by the Shared Service suppliers. When applicable, this architecture becomes an additional Domain Architecture of the Enterprise Architecture of Mail NL.

The Enterprise Architecture of Mail NL is defined by the sum of all Domain Architectures (including the upper domain, 'Mail NL') and the Architecture Direction Statements. The latter are further explained in section 8.3.1.

Domain Architectures can correspond to areas that receive substantial management attention. The scope of a program, for example, can result in a Domain Architecture. Although this focus tends to change through time, the Domain Architecture itself remains in use as long as its contents are valid. The Domain Architecture needs to be maintained, just like any other part of the Enterprise Architecture, in order to remain useful.

After a while, the scope of the Domain Architecture might become obsolete or inefficient within the new environment. In that case, the elements of the Domain Architecture are migrated to other Domain Architectures, after which the original scope can be discarded as a Domain Architecture.

A Domain Architecture is developed and maintained by one or more architects in the role of Domain Architect. These architects are specialized on the scope of the Domain Architecture (the domain) and the architecture created within that domain. Their knowledge extends beyond the architecture within the domain and includes the context of the Domain Architecture; the domain itself. Domain Architects are considered to have more in-depth knowledge of the involved architecture and its context than other architects. Hence, in case of any information needs on the architectural subjects that fall within the scope of one or more Domain Architectures, the associated Domain Architects are consulted. As such, they are the primary contact persons for in-depth architectural subjects.

## 7.3 REFERENCE ARCHITECTURES

Like almost any major company, TNT Post maintains a list of preferred suppliers and makes use of standard solutions in its ICT domain. These suppliers and solutions all bring along their own architectural consequences

for the Enterprise Architecture. Furthermore, many large suppliers develop and maintain their own architectures as template solutions for specific domains. Additionally, architectures can also be composed of other external developments, such as market standards and best practices. Such external architectures are called ‘Reference Architectures’. Although these architectures are external and thus largely independent from the Enterprise Architecture of a single organization, they should be incorporated within the Enterprise Architecture, as their impact on the development of an organization’s Enterprise Architecture can be very high. In the context of the Enterprise Architecture of Mail NL, all relevant Reference Architectures are inventoried and their development is constantly monitored in relation with the developments within the Enterprise Architecture.

In most cases, a Reference Architecture will apply to a single (or small group of) domain(s) of the Enterprise Architecture. Therefore, the use of a Reference Architecture is often limited to the scope of a single Domain Architecture. As a result, Domain Architects are responsible for monitoring the development of all relevant Reference Architectures. This makes sense, as the Domain Architect is most likely to be the person with the greatest affinity with and detailed knowledge of the Reference Architecture’s scope and relation with the Enterprise Architecture.

Figure 12 illustrates the relation between the Enterprise Architecture and its Domain Architectures, Reference Architectures and the Remote Architectures. The Domain Architectures are placed within the boundaries of the Enterprise Architecture, in such a way that they both illustrate their hierarchical behavior, varying scopes and mutual exclusivity. The parent organization’s Architecture has been placed on the same level as the Enterprise Architecture, as this architecture also applies to the entire scope of the Enterprise Architecture. The applicability of the Shared Service Architectures within the scope of the Enterprise Architecture is governed through the parent organization’s Architecture.

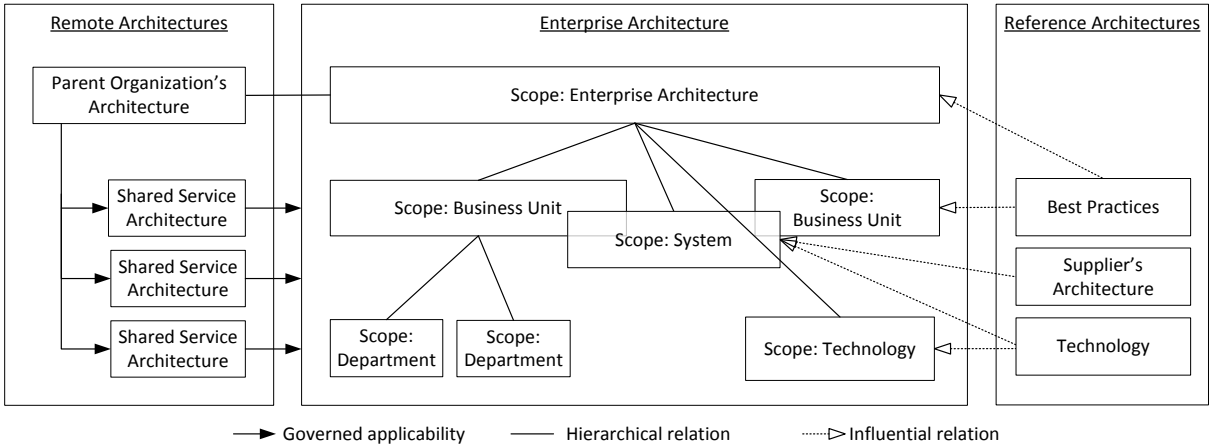


FIGURE 12 THE RELATION BETWEEN THE EA, DOMAIN-, REMOTE- AND REFERENCE ARCHITECTURES

## 8 ENTERPRISE ARCHITECTURE PROCESS

This section describes the way in which the Enterprise Architecture is embedded in the organization's (planning) processes and decision making as well as the processes used within the Enterprise Architecture to develop and maintain the Enterprise Architecture.

The Enterprise Architecture of Mail NL is not positioned as an additional management authority, due to the fact that there is no need for a strict architectural way of working at the corporate management level. Enterprise Architecture mainly needs to facilitate the organization in realizing its Business Goals and strategy and help to make the operational organization an enabler for the company's commercial activities. Mail NL's business model and activities do not require the operational organization to be extremely agile in terms of supporting change. Furthermore, TNT Post is not characterized as a highly innovative company, which also reduces the need for the incorporation of the Enterprise Architecture process at all organizational levels; i.e. there is no need to use the architecture for strategic decision making at the corporate management level. As a result, the Enterprise Architecture processes are integrated in existing processes, which are modified as little as possible.

### 8.1 ENTERPRISE ARCHITECTURE PLANNING

The Enterprise Architecture of Mail NL has three main architecture stages:

<b>Architecture Stage:</b>	<b>Level of decision making:</b>	<b>Planning horizon:</b>
1. Current Architecture	Operational	None / Present
2. Budgeted Architecture	Tactical	5 quarters
3. Goal Architecture	Strategic	5 years

Naturally, the Current Architecture describes the current operational processes, applications, information flows, etc. Furthermore, the current architecture also presents principles and guidelines that govern the development of new entities (e.g. products, applications and processes) in order to ensure the correct integration of these entities in the current operational processes, applications, information flows, etc.

The Goal Architecture reflects the organization's strategy and ambitioned state in three to five years. It describes the lay-out of entities (e.g. products, processes and information systems) that is necessary to support this strategy and governs the design decisions that need to be taken to be able to eventually create this lay-out of entities. The lay-out itself may not even be realized, as the Goal Architecture is constantly influenced by corporate policy and strategy changes, resulting in changes in the envisioned architecture itself.

In between the Current Architecture and the Goal Architecture lies the Budgeted Architecture. This architecture stage focuses on the tactical decision making; the transformation of the current strategic direction into more short-term decision governing the development of the operational business of the near future. This kind of decision making mostly takes place in the context of projects and programs. The Budgeted Architecture is created as a part of these projects and programs. After completion of a project or program, the accompanying parts of the Budgeted Architecture migrate into the Current Architecture.

The entire Budgeted Architecture is therefore composed out of the architectural development in all the active projects and programs that are using architecture.

Naturally, the Goal Architecture uses a higher level of abstraction than the Current Architecture, due to the fact that the strategic decisions are yet to be translated into tactical and operational decisions and implications (as is done in the Budgeted Architecture stage).

## 8.2 RELATION WITH THE ICT PLANNING PROCESSES

The role of Enterprise Architecture is best described in relation to the ICT planning processes, in which technological innovation and ICT renewal is planned for the mid- to long-term. This ICT planning cycle consists of the following six processes:

**Strategic Planning TNT Post** – This process is used to determine the development goals on a corporate level, which results in a prioritized list of Business Goals. The planning horizon of this process is three to five years and the planning cycle occurs on a yearly basis (between January and June). For more information on this process, see section 8.2.1.

**Strategic Planning ICT** – This process focuses on the potential renewal of ICT entities, based on the Business Goals of the Strategic Planning process and technological developments. The planning horizon of this process is three to five years and the planning cycle occurs on a yearly basis (between January and June). For more information on this process, see section 8.2.1.

**Information Planning** – This process focuses on the entire portfolio of processes, information and application services on landscape level. This results in an architecture with an accompanying Release Calendar and Roadmap. The planning horizon of this process is one year for the short term and three to five years for the long term. The planning cycle occurs quarterly for the short term and yearly (between January and June) for the long term. For more information on this process, see section 8.2.2.

**Application Life Cycle Management** – This process relates to a cluster of interconnected applications, resulting in a Release Calendar for every object in this cluster of applications. The process has a planning horizon of five quarters and a planning cycle that occurs quarterly. For more information on this process, see section 8.2.3.

**Department Planning** – This process focuses on the consolidation of (financial) resources and results in an annual plan for the department. The process has a planning horizon of one year and the planning cycle occurs yearly, between October and December. For more information on this process, see section 8.2.4.

**Feasibility Studies** – This process involves planning on the level of Business Goals with a business case or project plan as a result. The process has a planning horizon of three to five years and a variable planning cycle, which is based on input from the Strategic Planning process. For more information on this process, see section 8.2.5.

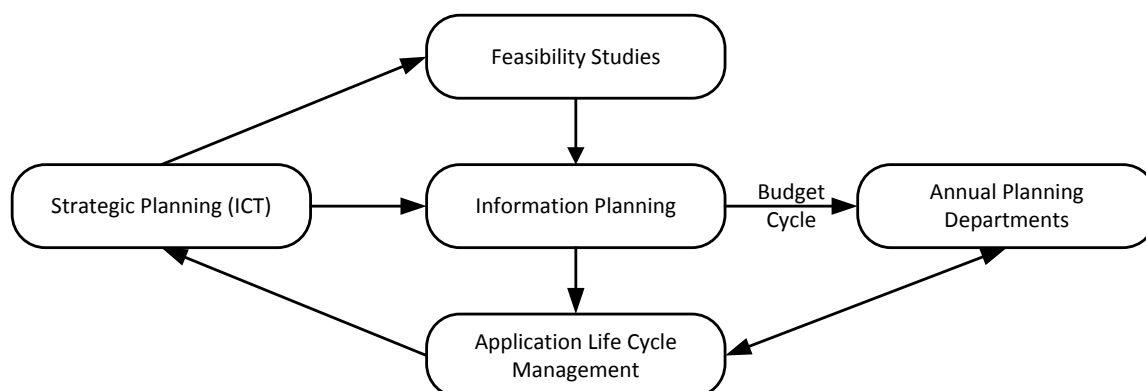


FIGURE 13 ICT PLANNING PROCESSES

These processes are interrelated, as illustrated by Figure 13. The processes do not occur in a sequential order, but independent from each other. For example, an object's Release Calendar may be developed as a result of Application Life Cycle Management without the object being mentioned in the Information Plans. If the object

is incorporated in the Information Plans, the Release Calendar will have to take this into account. Before being finalized, plans are adjusted to each other.

The Budget Cycle functions as the transition point between the long and short term. This process takes place between June and September. In this process, the Strategic Plans and Information Plans are used as input for decisions on the allocation of budgets for the upcoming year. The outcome of the Budget Cycle is used as input for the Annual Plans of departments.

The Enterprise Architecture plays various roles in these planning processes:

- **Strategic Planning (ICT)** – The Enterprise Architecture delivers organization-wide input by means of principles and guidelines, which are justified by the related Business Goals & Requirements.
- **Information Planning** – This process is for the most part performed by architects. As such, the resulting Information Plan is a product of the Enterprise Architecture.
- **Feasibility Studies** – Enterprise Architecture is used for the construction of a Goal Architecture and the corresponding gap analysis.
- **Application Life Cycle Management** – Enterprise Architecture provides a context and an evaluative framework for Application Life Cycle Management.

The following principles are used in these planning processes:

- Principle 1. During the selection and prioritization of development alternatives, business managers and ICT managers collaborate closely; both business drivers and technological developments are of high importance in this process.
- Principle 2. During the Information Planning, all planned developments are consolidated in a single overview: the Roadmap, which is then used to adjust all development plans to each other.
- Principle 3. Models of the Current Architecture are kept up-to-date within the operational processes (i.e. projects and maintenance).
- Principle 4. The Goal Architecture is developed gradually by maintaining a connection with the organization's major transitions.

### 8.2.1 STRATEGIC PLANNING

The goal of this process is to determine which Business Goals will be the main business drivers for the upcoming three to five years. Potential development directions are based on input from four basic areas: (1) business developments, (2) process chain developments, (3) technological developments and (4) architectural developments. The input itself can originate from various parts of the organization and its products; the business strategy, Annual Plans of departments, governmental institutions and so on.

All these ideas are then prioritized and documented in a list of prioritized Business Goals. This process leads to three plans: the Strategic Plan TNT Post, the Strategic Plan ICT and the Multiannual Plan ICT (a specification of the development of generic ICT components and services that will be initiated and performed by the T&I department in the next few years).

The output of this process is used as input for Feasibility Studies on Business Goals and the construction of a Roadmap (as part of Information Planning), in which the Business Goals are translated into architectural developments and principles.

### 8.2.2 INFORMATION PLANNING

The goal of this process is to consolidate all development plans (concerning process, information and application services aspects) within a single business unit into one overview: a Goal Architecture and associated Roadmap. These entities can then be used to adjust the goals and dependencies of development plans to each other.

The Information Planning process is triggered by the availability of new (prioritized) Business Goals and after a Feasibility Study has been completed, the associated future development direction is incorporated in this process. As such, Information Planning is a continuous process, which is constantly influenced by Feasibility Studies. Additionally, once a year in the period between January and June, a major update is performed by updating the Information Plan with (the implications of) the new Business Goals. This update also includes an update of the Goal Architecture and architecture principles, along with the implications for the Roadmap and (eventually) the Release Calendar.

The output of this process is used for Application Life Cycle Management and the Annual Plans of departments.

### 8.2.3 APPLICATION LIFE CYCLE MANAGEMENT

The goal of this process is to construct the Release Calendars and Roadmap for a cluster of interconnected applications. The process is triggered by the combination of a Roadmap and time; the Roadmap contains a number of predefined 'release slots' in which the plans for certain objects are allowed to be realized. Additionally, each object has its own Release Calendar, even without the availability of a Roadmap for the cluster of applications the object belongs to.

During the Application Life Cycle Management process, a Release Calendar (for the upcoming year) for a single object is created, while taking into account the limitations that are posed by the Roadmap and the available resources. In case the resulting Release Calendar diverges from the boundaries posed by the Enterprise Architecture and Roadmap, a dispensation request should be issued. Depending on the outcome of this request, the Release Calendar is updated.

The Release Calendar is used as input for the Annual Planning process of departments.

### 8.2.4 ANNUAL PLANNING OF DEPARTMENTS

The goal of this planning process is to determine the distribution of work load within the department and the justification of the department's expenditures. The process is executed yearly between October and December.

During the Annual Planning process of a department, all of the department's planned activities (project plans and release plans) and expenditures for the upcoming year are consolidated and assessed in terms of the available resources, after which the plans might need to be adjusted. In this case, the Roadmap is used to verify whether or not the renewed plans will not lead to any conflicts with other developments. Subsequently, all annual plans are adjusted to each other, with the Roadmap functioning both as input and output. After this synchronization step, the Annual Plans and the Roadmap are released.

### 8.2.5 FEASIBILITY STUDIES

The goal of this process is to assess a selected Business Goal (i.e. one of the development concepts in the Strategic Planning process) in terms of technical and financial feasibility as well as the compatibility with other (organizational) developments. The process is triggered by the creation of a project team.

The project team, which consists of business consultants and architects, performs the following actions:

- **Project Architecture** – A global process design is made, along with the implications for the Information and Application Services aspects. This is based on the Business Requirements and existing Enterprise Architecture. For more information on the Project Architecture process, see section 9.
- **Gap analysis** – During an impact analysis, the difference between the existing situation (Current Architecture) and the future situation (Goal Architecture) is determined. The desired application services are then plotted on the Current Architecture, after which the implications of the required development can be determined.
- **Business case** – A cost-benefit analysis is performed with a time horizon of five years.



- **Project Proposals** – A business case can result in multiple (related) projects.

The results of this process can be used as input for (1) a new project, (2) the Release Calendar of involved applications and (3) the Information Planning process.

### 8.2.6 ROADMAPS AND RELEASE CALENDARS

The three architecture stages (see section 8.1) strongly interrelate with the following two planning tools:

1. Release Calendars
2. Roadmaps

A Release Calendar presents all the planned software or product releases for a single object for the upcoming five quarters. These releases can result from projects or programs, but also from regularly planned maintenance on existing systems. A Release Calendar should thus also contain releases forced by the supplying party, as they may have a great impact on the timing of other releases and projects. As such, the Release Calendar can be seen as a technology-driven planning entity that can be utilized to inventorize the implications for the organization's further (tactical) development and planning. As a business concept, the Release Calendar is used to coordinate and control organizational development by providing time slots for specific releases. These time slots are specified in the Roadmap of the cluster of applications the object belongs to. Release Calendars are made tangible in the organization's financial budget as well as in the Annual Plans of individual departments.

A Roadmap is a multiannual plan that presents the development of a cluster of applications in the years beyond the planning horizon of the Release Calendars. A Roadmap has a high level of abstraction and is not made tangible. It is mostly used as a business tool for further development of the system (and application) landscape, based on the strategic development direction. A Roadmap thus influences the Release Calendars of the objects it comprises. Furthermore, Roadmaps need to be adjusted to each other.

With the inclusion of an Enterprise Architecture process, the Roadmaps influence the development of the Goal Architecture and the Release Calendars influence the development of the Budgeted Architecture. The relations between the architecture stages, the Roadmaps and the Release Calendars are illustrated in Figure 14.

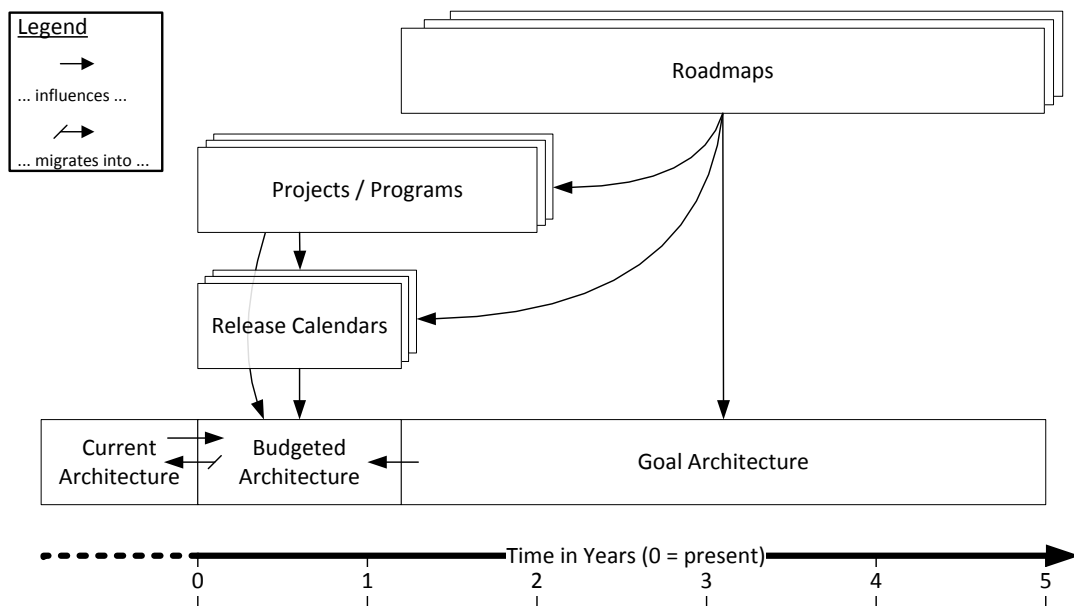


FIGURE 14 ARCHITECTURE STAGES IN RELATION TO ROADMAPS, PROJECTS AND THE RELEASE CALENDAR

The timescale is used to show which timeframe the elements apply to. The timescale is thus not moving and the elements will always maintain this position in time; only the content of these elements changes as time goes by.

As can be seen, the Roadmaps influence the development of the Goal Architecture (which also applies to the same timeframe), the projects and programs that are to be started and eventually the Release Calendars. The latter relation can be both direct and indirect; releases may be both the result of a project and the planning in a Roadmap. The Budgeted Architecture is influenced by (1) the Release Calendars, (2) the development within projects and programs, and (3) the constraints that are posed by the Current Architecture. As time shifts, parts of the Budgeted Architecture are being realized and subsequently migrated into the Current Architecture.

## 8.3 ENTERPRISE ARCHITECTURE PROCESS MECHANISMS

Without the incorporation of an Enterprise Architecture process, the migration from the overall strategic development direction and the Roadmap(s) to Release Calendars would be governed by various (mostly decentralized) management processes, thus making it difficult to guard the compliance of individual developments with the overall strategic development direction.

In order to use the Enterprise Architecture to structure and guide the organizational development in accordance with the organization's strategic direction, the Enterprise Architecture process should incorporate mechanisms that help to accomplish this.

The Enterprise Architecture process of Mail NL introduces the following three main mechanisms:

- Architecture Direction Statements
- Project Portfolio Management
- Project Architecture

### 8.3.1 ARCHITECTURE DIRECTION STATEMENTS

Architecture Direction Statements are essentially regular briefings, addressed to the appropriate management team. These briefings present the newly aggregated architectural information that requires additional business validation. The focus of the briefings lies on conflicting or questionable architectural developments and decisions, as well as the combined architectural development direction. Both these issues and the signaled development direction are accumulated since the last briefing.

The goal of Architecture Direction Statements is twofold:

1. To guard and validate the (architectural) developments within the organization in relation to the overall strategic development direction that is considered to be leading within the organization.
2. To guard and validate the architectural development within individual projects and programs in relation to the overall architectural development direction and each other.

The basic input for the Architecture Direction Statements is gathered from all possible channels in the Enterprise Architecture process, such as: strategic decisions, tactical decisions and Roadmaps, but also external developments (e.g. changes in the supply chain, or developments at software suppliers) and technological developments.

This input is constantly analyzed in relation to all other developments and the overall strategic direction that is considered to be leading. In case of any conflicts or questions, the involved architects should first try to solve the issues through the channel the input came from. If the issues can not be solved through standard consultation with the involved parties, the architects can utilize the available escalation paths. If that does not lead to any acceptable results, an Architecture Direction Statement can be used to put the issue(s) on the agenda of a Management Team.

Besides conflicts and questionable developments and decisions, Architecture Direction Statements are also used to summarize the combination of architectural developments that have been made since the last briefing.

This information may then be used by the management team to validate the organizational development in relation to the overall strategic development direction.

Lastly, the architecture team may also suggest extending the scope of certain principles and guidelines in a Domain Architecture, by using Architecture Direction Statements, as such proposals should be decided upon by the appropriate management team.

In order to be effective, the Architecture Direction Statements must be understandable for the business representatives that need to work with the statements. Therefore, all architectural information should be translated into the appropriate business language and implications as well as be precise and succinct.

The basis for the use of Architecture Direction Statements is laid down in the following three principles.

- Principle 1. Architecture Direction Statements contain only information that is believed to be essential for the management team the statement is addressed to, to ensure proper validation of and decision making on the architectural direction in relation to the overall strategic development direction.
- Principle 2. Architecture Direction Statements are used in such a way that issues can be resolved in an unambiguous manner.
- Principle 3. Architecture Direction Statements are a last resort within the Enterprise Architecture process to ensure the conformity of individual projects, programs and other developments to the Enterprise Architecture. They are only used for this purpose if the signaled issues are relevant for the management team the statement is addressed to.

The following guidelines are derived from and based on these principles. Guidelines 1 to 4 are based on the first principle, guidelines 5 and 6 are based on the second principle, and guidelines 7 and 8 are based on the third principle.

- Guideline 1. The architect(s) formulates the Architecture Direction Statement in terms of business implications that are both meaningful and understandable for the business representatives that process them.
- Guideline 2. The Architecture Direction Statements are succinct and as brief as possible, while remaining precise and unambiguous.
- Guideline 3. The Architecture Direction Statements only address issues that can eventually provide added value on the managerial level that the business representatives that process them are responsible for.
- Guideline 4. The content of an Architecture Direction Statement is specifically tailored for a single management team.
- Guideline 5. An Architecture Direction Statement is not addressed to more than one management team.
- Guideline 6. Issues are added to no more than one Architecture Direction Statement to prevent abundant or conflicting decisions.
- Guideline 7. Architecture Direction Statements are not used to address issues unless every standard alternative to resolve these issues has been utilized and the issues are appropriate to be treated by a Management Team.
- Guideline 8. Architecture Direction Statements are not to be used as an escalation method.

The incorporation of Architecture Direction Statements is a very pragmatic way of implementing the facilitating function of the Enterprise Architecture process in existing management processes, without the need to extensively alter existing processes or to add any extensive new processes.

### 8.3.2 PROJECT PORTFOLIO MANAGEMENT

Project Portfolio Management is a management approach to rank, select and execute projects based on various factors, in such a way that the organization can gain the most benefit from the collection of projects.

Although Project Portfolio Management is actually an ongoing management activity performed by the Project Management Office and thus not an Enterprise Architecture tool, it can be of great value in the context of Enterprise Architecture.

The entire concept and process of Project Portfolio Management exceeds the scope of this thesis and will therefore not be treated in this section.<sup>14</sup> However, the basic knowledge needed to have a fundamental understanding of Project Portfolio Management is summarized in the next paragraphs, followed by the integration of Enterprise Architecture with Project Portfolio Management.

The term Project Portfolio Management is fairly self-descriptive: the management of a portfolio of projects. The management aspect of Project Portfolio Management is aimed at the higher levels of Project Management and their context. It is a management means to guard the (collection of) projects' added-value, progress and the alignment with the organization's strategy and each other. The following are examples of Project Portfolio Management activities:

- Determining the value and benefit of projects for the organization.
- Inventorizing the resource requirements of projects.
- Inventorizing the dependencies between projects.
- Inventorizing redundancies and gaps within the project pipeline.
- Tracking the progress of projects and determining the impact of eventual delays on other projects.

With Project Portfolio Management, the Project Management Office can oversee all projects along with their progress, which makes it possible to constantly optimize the execution of the managed collection of projects. The following are examples of Project Portfolio Management measures that can be taken on the (collection of) projects:

- Changing the planning and/or timing of a project, including its start.
- Ending of unsuccessful or redundant projects.
- Changing the order in which projects are executed.
- Adding projects to fill gaps in the project portfolio.
- Selecting projects and discarding others.
- Reserving resources for projects.
- Performing additional Risk Management in a project-exceeding context.

As mentioned earlier, Project Portfolio Management is also a means to guard the alignment between a project and the organization's business strategy or the portfolio strategy. The Enterprise Architecture contains valuable information on the organization's development direction and the way in which individual projects are supposed to contribute (and actually contribute) to this development. For example, the Project Management Office can use the knowledge within the Enterprise Architecture to determine the value of individual projects for the realization of the before mentioned strategy.

Due to its very nature, the Enterprise Architecture can provide the Project Management Office with a lot of information for Project Portfolio Management:

- The value of projects in terms of their contribution to the portfolio strategy.
- Interdependencies within the Project Portfolio.
- Dependencies of projects on other developments and the resulting impact of issues.
- Redundancy in projects.

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<sup>14</sup> The book 'Project Portfolio Management - A Practical Guide To Selecting Projects, Managing Portfolios, And Maximizing Benefits' by Harvey A. Levine (2005) is a great place to start for anyone who wants to learn more about Project Portfolio Management.

- Progress of projects in terms of architectural development.

The architecture team might signal that some projects require the development of a shared platform or (in order for the organization's strategy to be realized) there should be some sort of architectural development before proceeding with other projects. The architecture team then proposes its own programs and/or projects to fill these architectural 'gaps'. These architecture-driven programs and projects are then added to the Project Portfolio. These programs or projects are initiated as a result of Project Portfolio Management within the Project Management Office.

### 8.3.3 PROJECT ARCHITECTURE

The Project Architecture is a means to (1) translate the Enterprise Architecture into project specific implications<sup>15</sup>, (2) guide the (architectural) decision making within a project, (3) validate the end result of a project against the Enterprise Architecture and (4) transfer the architectural developments back into the Enterprise Architecture.

At the start of a project, the Project Architecture is used to inventorize all relevant architecture entities from the Current, Budgeted and Goal Architecture stages of the Enterprise Architecture. This helps to determine the project approach and resources required to fulfill the project in conformity to the Enterprise Architecture. During the project, the Budgeted Architecture of the project is developed further, all decisions are documented in the Project Architecture document for later use and the Project Architecture is used to review project deliverables. After the delivery of the project's end result, the Project Architecture helps to transfer the Project Architecture back into the Enterprise Architecture.

The Project Architecture process fully integrates with the existing Project Management method of Mail NL, PRINCE2 (Office of Government Commerce, 2005). An extensive description of the Project Architecture process can be found in section 9.

In the context of the Enterprise Architecture process, the Project Architecture makes it possible to:

1. Govern and control the project's (or program's) architectural compliancy.
2. Document the decision making on architectural aspects for future reference and monitor the project in relation to the overall architectural development direction.
3. Transfer the project's architectural developments back into the Enterprise Architecture.

## 8.4 HIGH LEVEL ENTERPRISE ARCHITECTURE PROCESS

In Figure 15 a high level overview of the integration of the Enterprise Architecture process with other organizational processes is given. This figure illustrates the various interfaces and relations step-by-step. It should be noted that, with the exception of programs and projects, all processes and activities are actually ongoing processes.

The processes and interactions are illustrated in a cyclic way, to demonstrate the reoccurring behavior of the interactions. For additional clarification purposes, the interactions are spread out over the right half of the circle and every interaction is shown only once. As a result, the actual interactions between these processes may occur less structured, at different intervals and even simultaneously.

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<sup>15</sup> The Project Architecture can also be used for programs. More information on the scalability of the Project Architecture and accompanying process can be found in section 9.4.

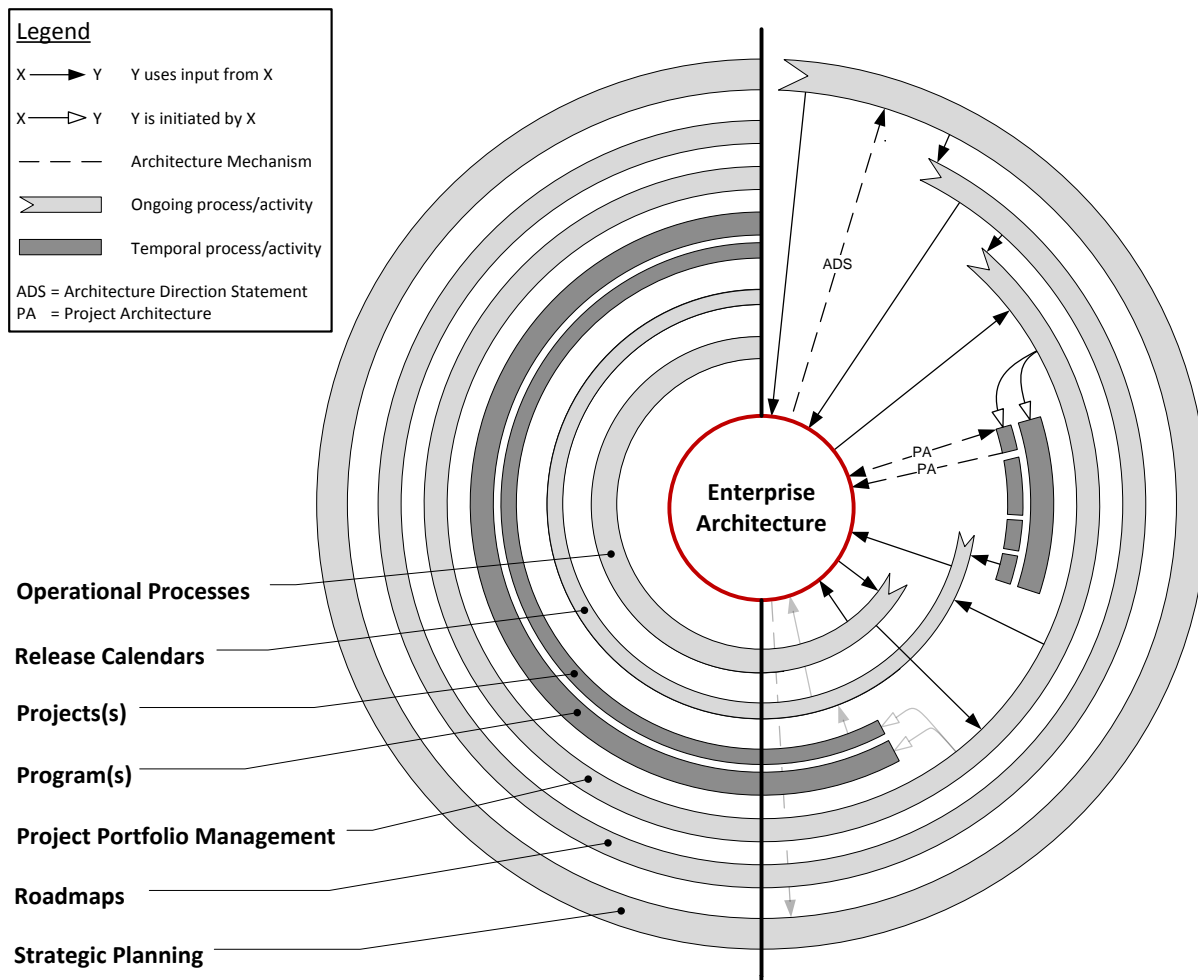


FIGURE 15 A HIGH LEVEL OVERVIEW OF THE INTEGRATION OF THE EA PROCESS IN THE ORGANIZATION

As can be seen in the figure, the Enterprise Architecture receives input from the following processes, activities or entities:

1. Strategic Planning.
2. Roadmaps.
3. Programs and projects.
4. Release Calendars.
5. Operational processes.

The first two items are mainly used as input for the Goal Architecture, the second two items are used as input for the Budgeted Architecture and the last item is used as input for the Current Architecture.

The Enterprise Architecture provides input and information for the following process, activities or entities:

1. Strategic Planning.
2. Project Portfolio Management.
3. Programs and projects.
4. Operational processes.

The processes, activities and entities as well as their interactions (as illustrated in the high level overview of the Enterprise Architecture process) are described below.

**Strategic Planning** – The strategic planning process should be seen as the combination of all processes and activities that contribute to the business strategy on a corporate or business unit level. This thus also includes

the planning processes that have been described in section 8.2. The strategic developments that result from these processes are communicated through various channels, such as corporate business meetings, Management Teams, the Work Council and internal management magazines. The Enterprise Architecture team therefore monitors all these channels and extracts any new strategic information from them.

Architecture Direction Statements are used to validate the signaled architectural development direction(s) or resolve architectural issues on the level of Management Teams. The statements are delivered to the appropriate Management Team as a briefing and only when necessary. As a result, such briefings mostly occur after new input for the Enterprise Architecture or as a result of decision making within projects and programs. This recurring behavior has not been illustrated in Figure 15.

As mentioned earlier, the Information Plan that results from the Information Planning process (see section 8.2.2) could also be seen as a large Architecture Direction Statement. Therefore, the Information Plan has not been made explicit in this overview. More information on Architecture Direction Statements can be found in section 8.3.1.

**Roadmaps** – Roadmaps are created as output of the strategic planning process. They might be the result of Information Planning (an architectural Roadmap), Application Life Cycle Management or the long-term development plans of individual departments. As described in section 8.2.6, Roadmaps are also used as input for the Enterprise Architecture.

**Project Portfolio Management** – Both the Roadmaps as the Enterprise Architecture are used as input for the Project Portfolio Management process, as described in section 8.3.2. The Project Portfolio Management process is the main process that initiates programs and/or projects. It helps to ensure that the organization's resources are applied to the total collection of proposed or required programs and projects as efficiently and effectively as possible. Programs and projects can be either initiated as a result of a business demand, or as a requirement to enable the initiation of other programs, projects or developments. The latter also features architecture-driven development; i.e. programs or projects that need to be performed to be able to support the development direction of (a part of) the organization.

**Programs and Projects** – Programs and projects are initiated by the Project Portfolio Management process. During projects, the Project Architecture is used to incorporate the Enterprise Architecture process in the context of programs and projects. The Project Architecture process is described extensively in section 9.

**Release Calendars** – Projects result in product and software releases, which thus become part of their respective Release Calendars. These Release Calendars are carefully monitored as input for the Enterprise Architecture, because it describes the milestones in the realization of the Budgeted Architecture, which in turn have a great effect on the development within projects that depend on the realization of the Budgeted Architecture. More information on the relation between Release Calendars and the Enterprise Architecture can be found in section 8.2.6.

**Operational Processes** – Operational Processes involve daily labor on the operational environment of the organization. This includes maintenance on software and systems (such as bug fixes and hardware replacements) and the adaptation of operational processes to resolve issues in the operational environment. Maintenance on systems and software that features major changes or upgrades naturally results in releases, which become part of the Release Calendar.

During the maintenance of systems, the Current Architecture is used as a basis to determine whether or not the maintenance has consequences for the Current Architecture, which helps to determine whether or not a Change Request (Request for Change, RFC) should be issued. A Change Request is guided through the Project Portfolio Management process and may eventually lead to a project or program.

Lastly, the Enterprise Architecture may receive input from the operational processes regarding issues or developments that may have implications for the Current Architecture or result in requests for the further development of the Enterprise Architecture.

## 8.5 ENTERPRISE ARCHITECTURE AND OPERATIONAL MAINTENANCE

Daily maintenance to the operational environment could introduce small changes to the operational environment. Without incorporation of the Enterprise Architecture process in the operational maintenance processes, the Current Architecture might no longer be representative for the operational environment. Therefore, the existing maintenance processes are slightly modified to accommodate the Enterprise Architecture process.

The Current Architecture is subject to changes by:

1. Daily maintenance,
2. Planned maintenance, and
3. New development.

During operational maintenance, the Current Architecture is used to gain insight in the current situation, and the Budgeted Architecture and Goal Architecture are considered to be leading in case of any changes.

The basis for the incorporation of Enterprise Architecture in the operational maintenance processes is laid down in the following four principles:

Principle 1. The Current Architecture is being updated as a part of the process in which the change has been performed.

Principle 2. If a planned change does not meet the requirements posed by the Current Architecture and Budgeted Architecture, dispensation needs to be requested beforehand.

*Exception:* Only when the dispensation request poses a threat to business continuity, the request can be done afterwards.

Principle 3. Granted dispensation is either (1) temporary, in which case a Change Request is made to reestablish the conformity of the operational situation in accordance with the Enterprise Architecture, or (2) definitive, in which case the Current Architecture is updated.

Principle 4. If necessary, the Budgeted Architecture and Goal Architecture also need to be updated to reflect the changes in the Current Architecture.

### 8.5.1 DAILY MAINTENANCE

Most activities in the context of daily maintenance will have little impact on the Enterprise Architecture. However, incidentally maintenance may have an impact on the Enterprise Architecture. Especially changes that need be performed immediately (e.g. due to issues that threaten the business continuity) and can not be withheld until the next release will have impact on the Current Architecture.

These changes can be any of the following:

- **Process** – A procedural workaround is used to get round an issue or incident. The new procedure has to be documented in the corresponding Enterprise Architecture models.
- **Incident Management of Application Services** – A patch or fix is applied as a part of Incident Management. If the change has functional implications, it has to be documented in the corresponding Enterprise Architecture models.
- **Service Level of Application Services** – The Service Level of an Application Service is changed as a result of Continuity Management, Availability Management, Capacity Management, or patches and fixes. The change must be documented in the Enterprise Architecture.

All other maintenance activities in which no Change Requests are issued do not have any implications for the Enterprise Architecture.



As can be seen in the exception on Principle 2, business continuity has a higher priority than conformity to the Enterprise Architecture. As a result, short-term solutions that conflict with the Enterprise Architecture are allowed under the following conditions:

1. The Enterprise Architecture needs to be updated with the temporary change as part of the maintenance process.
2. A request for dispensation needs to be issued afterwards, which either leads to change becoming permanent, or a Change Request in which the deviation from the Enterprise Architecture will be made undone.

A central authority will not be able to monitor and check all the maintenance activities in order to identify the activities that will have implications for the Current Architecture. Therefore, the responsibility to identify these architectural implications lies within the operational processes and the involved administrators.

However, decentralizing this responsibility is only possible if (1) all relevant architecture principles, guidelines and models are available to the administrators and (2) the administrators are able to interpret these principles, guidelines and models correctly within their field of activity.

A regularly performed Architecture Audit remains necessary to ensure the validity of the Enterprise Architecture in relation to the actual real-life situation.

### 8.5.2 PLANNED MAINTENANCE

In order to be planned as project orders or releases, all Change Requests on the information services and the applications are collected, prioritized and merged during the Change Management sub process.

Change Requests can result from the following changes:

- **Adaptive maintenance of applications** – Maintenance based on user requirements.
- **Adaptive maintenance of the infrastructure** – Changes to hardware, network elements or system software.
- **Corrective maintenance** – Maintenance due to non-critical disturbances and structural solutions for short-term corrections made during daily maintenance.

The assessment of Change Requests also includes an assessment on the architectural compliancy of the solution(s). If the solution does not comply with the Enterprise Architecture, dispensation needs to be requested beforehand. If the dispensation is granted, the Change Request is added to a release project. Otherwise, a new Change Request needs to be issued. This new Change Request should be faithful to the architecture principles and guidelines.

The selected Change Requests are performed in a release project. If the impact analysis or the design phase shows that the chosen solution has a greater impact on the Enterprise Architecture than was anticipated, the Change Request is relayed back to Change Management with the newly gained information.

During the final phase of the release project (the implementation phase), the Current Architecture is updated in accordance with the situation that is about to be realized.

### 8.5.3 NEW DEVELOPMENT

During Change Management, the proposed changes might be of such a nature that it is more efficient to initiate a project of new development, instead of applying maintenance to the current processes, software systems, infrastructure, etc.

During new development, the Enterprise Architecture is updated as a part of the project in which the new development takes place. In this case, the Project Architecture process is used. This process is extensively described in section 9.

## 9 PROJECT ARCHITECTURE PROCESS

The Project Architecture and its accompanying process are based on the Project Start Architecture of the DYA approach (Van Den Berg & Van Steenberghe, 2004). The Project Architecture process is implemented in the PRINCE2 methodology (Office of Government Commerce, 2005); the existing project methodology of Mail NL.

### 9.1 INTRODUCTION

The Project Architecture is a reflection of the Enterprise Architecture for the specific scope of a single project or program and a means to document architectural decision making within this project or program, in order to secure these decisions for later use in the project or other projects and the Enterprise Architecture. The Project Architecture makes it possible to validate, evaluate and control the project's design direction in a broader scope; the scope of the Enterprise Architecture. The Project Architecture is represented by means of a document, of which a template is given in Appendix F.

At the initiation of a project (or program), the Project Architecture is used to create an overview of all the relevant architecture entities: principles, guidelines and models, as well as the scope of the project and architectural 'blank spots'; empty parts of the Budgeted Architecture or Goal Architecture that need to be filled in to successfully complete the project.

During the project, the Project Architecture will be expanded with documentation on the architectural decision making within the project and new architectural information.

Furthermore, the Project Architecture helps the Project Manager with the calculation of the required resources for the execution of the project, as the Project Architecture helps to identify architectural conflicts and blank spots that need to be resolved during the project. With a Project Architecture, these additional project activities can be identified early on in the project, after which the Project Manager will be able to reserve the necessary resources for them. As such, the Project Architecture could also reduce project risks.

Additionally, the Project Architecture also helps the Project Manager with the following aspects:

- Creating an overview of the relevant parts of the budgeted architecture.
- Creating a clear project scope in terms of dependencies with other entities outside the project scope.
- Internal and external communication.
- Identifying blank spots in the Budgeted Architecture or Goal Architecture.
- Identifying conflicts with the Enterprise Architecture.
- Ensuring proper integration with the Enterprise Architecture.
- Creating an overview of the future situation.
- Documenting project-exceeding design choices.
- Documenting deliberate deviations from the Enterprise Architecture.
- Validating, justifying and evaluating (intermediary) project results.

The Project Architecture helps to...

- ...guide the migration from the as-is to the to-be situation within the project scope.
- ...create a more explicit context and scope for the project.
- ...lower project risks.
- ...keep the Enterprise Architecture and Domain Architectures up-to-date.
- ...decrease a project's dependency on team members.
- ...decrease a project's (implicit) costs, especially in future releases and projects.

## 9.2 PROJECT ARCHITECTURE IN THE PRINCE2 METHODOLOGY

The Project Architecture process is embedded in four processes of the PRINCE2 methodology. These four processes are highlighted in Figure 16.

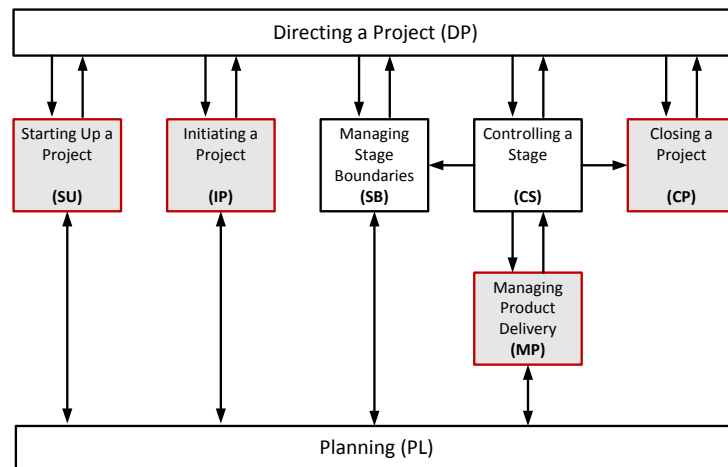


FIGURE 16 THE PRINCE2 PROCESS MODEL (OFFICE OF GOVERNMENT COMMERCE, 2005)

A first version of the Project Architecture document is developed in the process Starting Up a Project (SU). This first version contains all architecture entities that, either directly or indirectly, pose requirements or constraints on the Project Approach.

In the Initiating a Project (IP) process, the Project Architecture is developed further by collecting all relevant entities from the Current-, Budgeted- and Goal Architecture and by identifying all (architectural) design issues that might need to be resolved during the project.

During the instances of the Managing Product Delivery (MP) process, the Project Architecture is developed further in accordance with the agreements made in the IP process. The Project Architecture activities in the MP process mainly focus on the development of the Budgeted Architecture and Goal architecture for the project's scope.

Lastly, in the Closing a Project (CP) process, the Project Architecture is finalized with the end results from the project and the enterprise and/or domain architectures are updated to contain all the project's architectural changes.

The other four main PRINCE2 processes remain unaltered with the addition of the Project Architecture process:

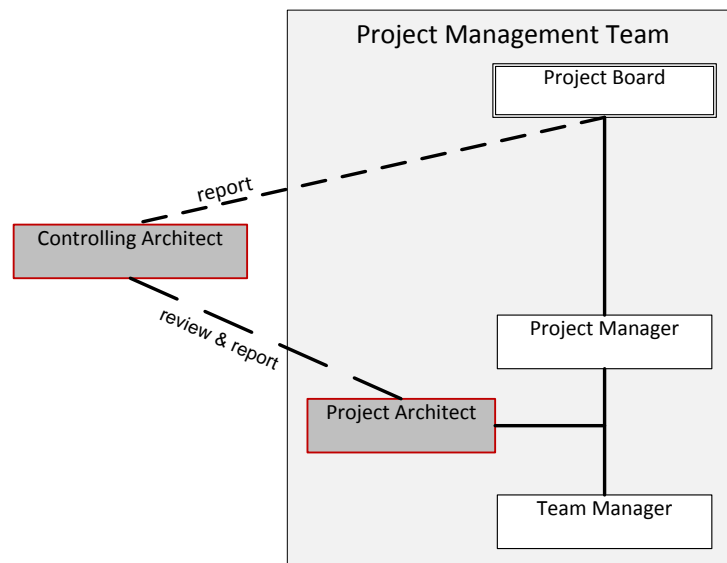
- Directing a Project (DP); this process is aimed at the Project Board, which performs *management by exception*. As can be seen in the processes that are presented later on in this section, all Project Architecture related management exceptions are delivered by the Project Manager, after which the Project Board can handle these issues and aspects through the standard PRINCE2 DP processes.
- Managing Stage Boundaries (SB); in this process, the Project Manager continually ensures that the project delivers business benefit and keeps the correct focus. This process is mainly triggered by the Controlling a Stage (CS) process and the existing processes are sufficient to facilitate the inclusion of Project Architecture process and activities.
- Controlling a Stage (CS); in this process the Project Manager deals with day-to-day management of the stage. This process mainly drives the MP process. As the Project Architecture activities are integrated in the MP process, the CS process is unchanged.
- Planning (PL); through this process all project team members are informed of project requirements, how and by whom these will be achieved and when events will take place. The process interacts with many sub processes from other PRINCE2 processes. Although the Project Architecture related

activities are an integral part of the project planning, the inclusion of these activities has no implications for the PL process.

Section 9.3 elaborates further on the integration of the Project Architecture activities in these PRINCE2 processes.

### 9.2.1 PROJECT MANAGEMENT STRUCTURE

Two additional roles are introduced in the PRINCE2 project management structure; the Project Architect and Controlling Architect. The positioning of these two roles is presented in Figure 17. It should be noted that even though the PRINCE2 roles Project Assurance, Project Support and Corporate or Program Management have been omitted from this figure, they still exist in the Project Management structure.



**FIGURE 17 PROJECT ARCHITECT AND CONTROLLING ARCHITECT IN THE PROJECT MANAGEMENT STRUCTURE**

The Project Architect is a member of the Project Management Team. This implies that the Project Architect always acts in favor of the project's goals and objectives. The Project Architect's objective is to support the Project Manager by translating the architectural direction into project implications and facilitating decision making on architectural aspects within the scope of the project.

The Controlling Architect is not a member of the Project Management Team. As a result, the Controlling Architect acts in favor of the (Domain or Enterprise) Architecture and guard the project's quality in terms of its compliance with the respective Budgeted- or Goal Architecture. The Controlling Architect formally reviews the work of the Project Architect at given stages in the project processes and reports back to the Project Architect and, if necessary, the Project Board. As a consequence, the roles of Project Architect and Controlling Architect may not be fulfilled by the same person within one project.

### 9.2.2 PROJECT ARCHITECTURE PRINCIPLES AND GUIDELINES

The basis for the incorporation of the Project Architecture process is laid down in the following two principles.

**Principle 1.** The Project Architecture is derived from the budgeted Domain Architectures and is regularly validated by architects. For this purpose, the architects can take on different roles and responsibilities.

**Principle 2.** The supplier is responsible for assessing whether or not the project's Budgeted Architecture can be realized.

The following guidelines are derived from and based on these principles; guidelines 1 to 13 are based on the first principle and guideline 14 is based on the second principle.

- Guideline 1. The (to-be realized) Budgeted Architecture is documented in the Project Architecture, under responsibility of the Project Architect, and expanded with models.
- Guideline 2. In order to ensure business leverage, the client (or his representative) should (1) be able to understand the Project Architecture and (2) be able to fully understand the consequences and implications of the alternatives, as proposed by the architect, to choose between one of these alternatives.
- Guideline 3. Within a project, only one Project Architect is responsible for the Project Architecture.
- Guideline 4. It is the Project Manager's responsibility to incorporate the actions required for the realization of the project's Budgeted Architecture in the project plans.
- Guideline 5. The Project Architect's main project responsibility is the development of the architecture in accordance with the agreements documented in the Project Architecture version 1.0. The Project Manager might broaden the scope of the architecture that needs to be developed, after a decision to do so by the Project Board.
- Guideline 6. The Project Architect is responsible for organizing a collegial review of his own work.
- Guideline 7. The Project Architecture is validated after (1) the end of the Starting Up a project phase, (2) the completion of a Project Architecture deliverable and (3) the delivery of the project's end result.
- Guideline 8. The formal review of the various Project Architecture versions is performed by other architects than the Project Architect. These architects then take on the role of Controlling Architect.
- Guideline 9. The formal review of Project Architecture version 1.0 by the Controlling Architect focuses on the following aspects: (1) Are the decisions, which are based on the Budgeted and/or Goal Architecture, correct in terms of content and scope? (2) Are the identified blank spots justified? (3) Are the proposals for the resolving of the blank spots correct in terms of the considerations and assumptions that have been made? (4) Are the decisions regarding whether or not the blank spots will be resolved in a project specific or project exceeding manner justified?
- Guideline 10. The second formal review of the Project Architecture (after completion of a Project Architecture deliverable) focuses on the following aspects: (1) Are all the relevant Business Goals, Business Requirements, principles and guidelines taken into account in the development of the Project Architecture? (2) Is the Project Architecture developed in accordance with Project Architecture version 1.0? (3) Are the proposals justified?
- Guideline 11. The third formal review of the Project Architecture (after delivery of the project's end result) focuses on the following aspects: (1) Are all the relevant Business Goals, Business Requirements, principles and guidelines taken into account in the development of the Project Architecture? (2) Is the Project Architecture developed in accordance with Project Architecture version 1.0?
- Guideline 12. As soon as the Project Architecture has been approved in the Closing a Project phase, the Project Architect migrates the status of the applicable models and objects from Budgeted Architecture to Current Architecture.
- Guideline 13. The Project Architect reviews all of the project's deliverables. Identified deviations from the Project Architecture are reported to the Project Manager and Controlling Architect. After consultation between the Project Manager, Project Architect and Domain Architect, a decision is made whether the project board will be advised to alter the Project Architecture, or alter the project deliverables.
- Guideline 14. The supplier is responsible for assessing whether or not the Project Architecture can be realized. The supplier can report its findings of this assessment to the Project Manager and the Project Architect.

These principles and guidelines are reflected in the way the Project Architecture process is embedded in the PRINCE2 processes, as illustrated in the next subsection.

### 9.3 PROJECT ARCHITECTURE PROCESS IN DETAIL

In the following paragraphs, the Project Architecture process is illustrated in the context of four PRINCE2 processes. The last paragraph describes the escalation solutions for the Project Architecture activities.

#### 9.3.1 STARTING UP A PROJECT (SU)

SU is the first process within PRINCE2. The process leads to Authorizing Initiation (DP1) by the Project Board. After approval from the Project Board, the project actually starts off in the IP stage. The objective of the SU stage is “to enable a controlled start of the project”. (Office of Government Commerce, 2005). This includes designing and appointing the Project Management Team, establishing the Project Approach and creating an outline Business Case.

In Figure 18, the first Project Architecture activities are illustrated in the context of the SU processes. Three of these processes have been omitted from this figure, as these processes are not affected by the addition of the Project Architecture process:

- SU1; Appointing an Executive and a Project Manager.
- SU2; Designing a Project Management Team.
- SU3; Appointing a Project Management Team.<sup>16</sup>

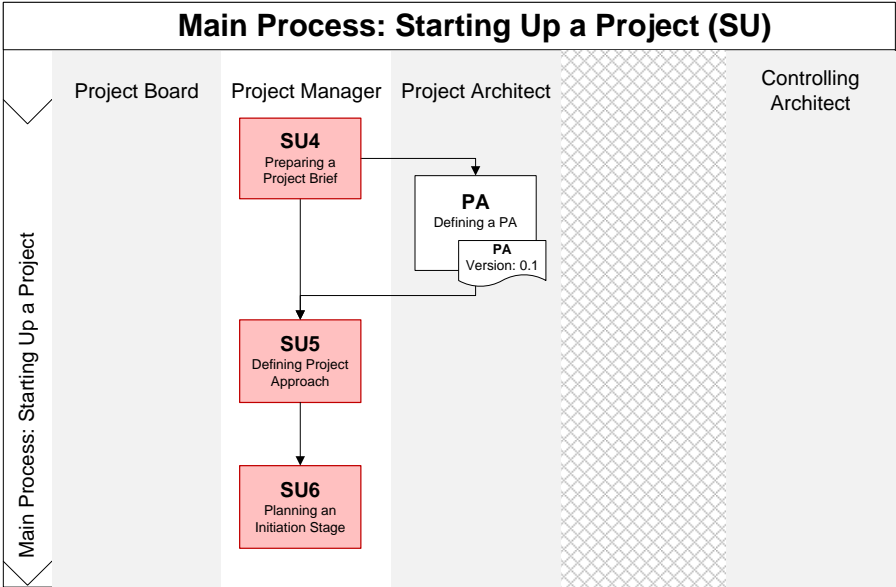


FIGURE 18 THE PA PROCESS IN THE PRINCE2 PROCESS STARTING UP A PROJECT

In SU4 (Preparing a Project Brief), a reliable statement of requirements and expectations is formed to ensure the project is based on consistent and adequate information. The Project Manager is responsible for the creation of the Project Brief. However, in case of a program, the Project Brief might be created by the program, after which it should be validated and, if needed, expanded by the project team.

Conclusively, architecture-driven programs also follow the standard PRINCE2 procedures by creating the various Project Briefs within the program itself.

After the creation of the Project Brief, the Project Architect will compose the first version of the Project Architecture by making an inventory of all the principles and guidelines that, either directly or indirectly,

<sup>16</sup> It should be noted that the role of Project Architect will need to be fulfilled in the sub processes SU2 and SU3. However, this fits within the activities of these processes, so no further explanation is given.

govern the Project Approach for the project. These principles and guidelines thus largely cover the aspects of the process Defining Project Approach (SU5) of PRINCE2. Examples of such aspects are the following:

- *Make or Buy* statements.
- Supplier constraints that apply to the project's products or activities.
- Related work or corporate initiatives that affect the project's context and/or outcome.
- The overall business criticality of the project's outcome.

After defining the Project Approach, the Project Manager will start the planning for the Initiation Stage (SU6). In this sub process, the Project Manager determines the effort required to create the Project Initiation Document (PID). As can be seen in the next subsection, the PID also relies on input from the Project Architecture. Therefore, the Project Manager must also allocate resources for further development of the Project Architecture in the IP stage of PRINCE2.

### 9.3.2 INITIATING A PROJECT (IP)

The goal of the IP process, is to draw up the PID. This document ensures there is a common understanding between the Project Board and Project Manager on multiple project aspects, among which:

- The reasons for doing the project.
- The key products the project will deliver.
- The project's scope.
- Constraints that apply to the project and the project's deliverables.

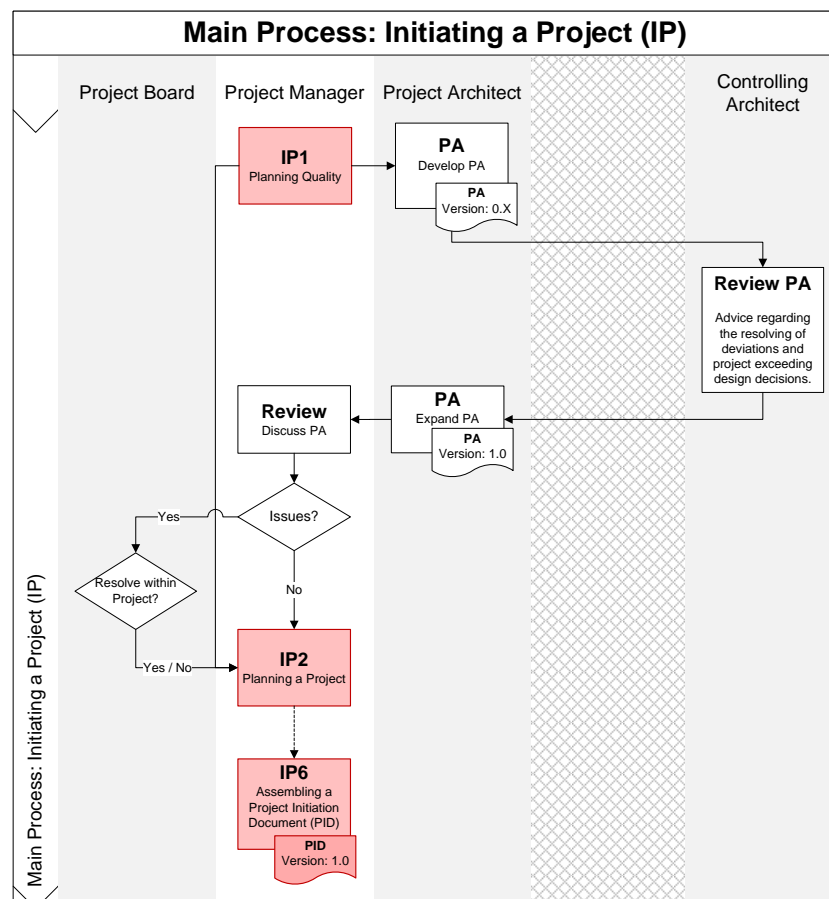


FIGURE 19 THE PA PROCESS IN THE PRINCE2 PROCESS INITIATING A PROJECT

In Figure 19, the Project Architecture activities are illustrated in the context of the IP processes. Again, three of these processes have been omitted from this figure, as these processes are not affected by the addition of the Project Architecture process:

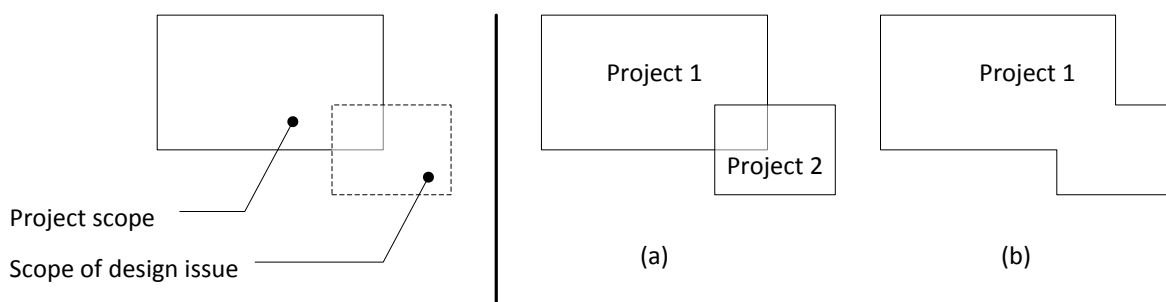
- IP3; Refining the Business Case and Risks.
- IP4; Setting up Project Controls.
- IP5; Setting up Project Files.

In IP1, Planning Quality, the agreed quality expectations are formalized, along with the quality regime, Project Assurance arrangements and the project's Acceptance Criteria. Additionally, the quality expectations regarding the project's conformity to the Enterprise Architecture (or domain architecture) and the quality expectations of the Project Architecture are included in IP1.

The outcome of IP1 is used as a starting point for the further development of the Project Architecture, because the quality expectations of the Project Architecture define the amount of thoroughness that is expected from the Project Architect and the ambitioned compliance with the Enterprise Architecture or Domain Architecture defines the way the Project Architecture will be used throughout the project. The creed 'Just-enough, Just-in-time' applies to the development of the Project Architecture; the content and quality of the Project Architecture should not exceed the project's needs.

With the input from IP1, the Project Architect will expand the Project Architecture with the following information:

- Architectural context and scope of the project.
- Relevant principles, guidelines and models from the Current-, Budgeted- and Goal Architecture.
- Project specific implications of principles and guidelines.
- Identified design issues, which either (1) involve a scope that exceeds the project's scope or (2) involve a conflict with the current or goal architecture.
- Blank spots in the Budgeted Architecture and/or Goal Architecture that need to be resolved, in order for the project to be completed properly.
- Proposals regarding the way the project should deal with the identified design issues or blank spots.



**FIGURE 20 DEALING WITH PROJECT EXCEEDING DESIGN ISSUES**

The two main options for dealing with project exceeding design issues are illustrated in Figure 20: (a) maintaining the standard scope of the project and neglecting the project exceeding issue or (b) expanding the scope of the project with the project exceeding issue.

The Project Architect delivers one or more concept versions of the Project Architecture (version 0.x). The Controlling Architect then formally reviews the Project Architecture on the following aspects:

1. Are the decisions, which are based on the Budgeted- and/or Goal Architecture, correct in terms of content, quality and scope?
2. Are the identified blank spots and design issues justified?



3. Are the proposals for the resolving of the blank spots and design issues correct in terms of the considerations and assumptions that have been made?
4. Are the decisions regarding whether or not the blank spots will be resolved in a project specific or project exceeding manner justified?

The Controlling Architect reports its findings to the Project Architect, who then updates the Project Architecture in accordance with the Controlling Architect's report. This results in Project Architecture version 1.0.

The Project Manager now reviews the Project Architecture and determines the project implications. The Project Manager might signal the existence of design issues for which a decision should be made whether they will be resolved within the project or not. The Project Manager then informs the Project Board of these issues, along with the advice provided by the Controlling Architect. The Project Board decides whether or not the issues are resolved within the project. The scope of the project can only be expanded by the Project Manager after a decision of the Project Board to do so.

The Project Architecture and the outcome of the decisions made by the Project Board are then used in IP2, Planning a Project, to determine the timescale and resource requirements for the project. Additional resources are required to work out the identified blank spots, resolve the design issues and ensure the architectural compliancy of the project's end-result. The Project Manager might consult the Project Architect to determine the amount of resources needed to perform these activities.

In IP6, Assembling a PID, the Project Manager gathers all the information from the previous IP processes in the PID, which functions as an information base for everyone who needs to know about the project. The Project Architecture version 1.0 is also added to the PID.

If the project is part of a program, the PID might also already be created by the program. In such a case, the Project Manager still has the responsibility to ensure that the provided documentation is complete and correct. In that scenario, the Project Architect has to develop the Project Architecture (or validate the provided Project Architecture), after which the Project Manager can use the Project Architecture as input for the validation of the PID.

### 9.3.3 MANAGING PRODUCT DELIVERY (MP)

In the MP process, a Work Package is being carried out and delivered to the Project Manager after completion. A project is composed of multiple Work Packages.

In Figure 21, the Project Architecture activities are illustrated in the context of the MP processes. At this stage, the Project Architecture activities are treated as additional Work Packages.

The process starts with MP1, Accepting a Work Package, of which the goal is to realize agreement on the content and scope of the Work Package between the Project Manager and the Team Manager. In the case of Project Architecture activities, there should be agreement between the Project Manager and the Project Architect. The Project Manager and Project Architect should reach agreement on the same aspects as the Project Manager and Team Manager would in the regular MP1 process, among which: deliverables of the Work Package, the constraints within which the work is to be done, the reporting requirements, the way the Project Manager is informed of completion of the Work Package and a plan for the completion of the Work Package within the posed constraints.

After reaching consensus on the Work Package, it is being carried out in MP2, Executing a Work Package. In case of Project Architecture activities, most of the work in MP2 is performed (or delegated) by the Project

Architect.<sup>17</sup> Most Project Architecture activities will consist of the (further) development of new (or existing) architecture entities or resolve the design issues that have been included in the project's scope.

The Project Architect starts by making a proposal for the Work Package. The Controlling Architect then performs a formal review of this proposal on the following aspects:

- Are the relevant Business Goals, Business Requirements, principles and guidelines taken into account in the further development of the Project Architecture?
- Is the Project Architecture developed compliant with the Project Architecture version 1.0?
- Are the proposals justified?

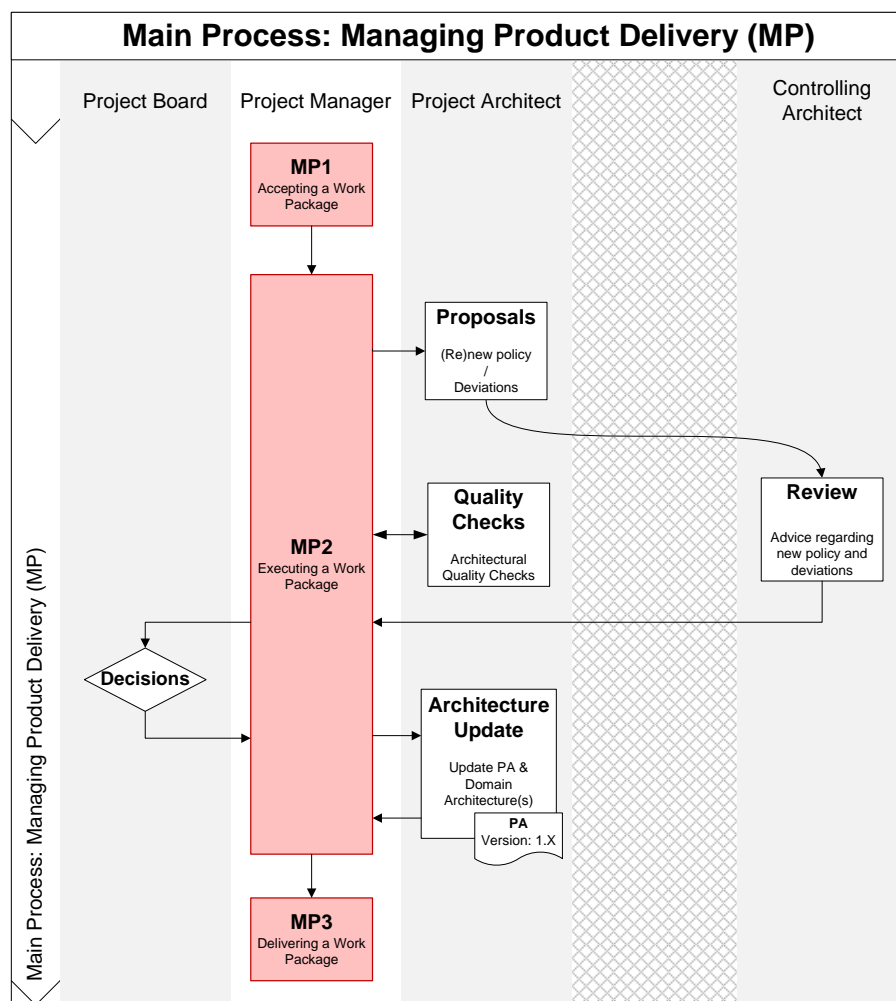


FIGURE 21 THE PA PROCESS IN THE PRINCE2 PROCESS MANAGING PRODUCT DELIVERY

The Controlling Architect again reports back to the Project Architect, who in turn delivers the results to the Project Manager. The Project Manager then informs the Project Board of the proposal(s). The Project Board decides on the actual solution and implementation. When a decision is made, it is reported back to the Project

<sup>17</sup> The MP2 process is a responsibility of the team or person executing the Work Package. However, in Figure 21, the process is illustrated as a task of the Project Manager. This is done because (1) the figure illustrates two different instances of the MP2 process with different actors responsible for the execution of the process, (2) the Project Manager still performs a central role in these MP2 processes and (3) this more clearly demonstrates the way in which the Project Architecture activities are embedded in the MP process. Therefore, the MP2 process is illustrated as a Project Management Team responsibility by displaying it as a responsibility of the Project Manager.

Architect by the Project Manager. The Project Architect now has to update the Domain Architecture(s) with the resulting new architecture entities and provide a new version of the Project Architecture.

Within MP2, the Project Architecture can also be used to perform architectural Quality Checks on deliverables of other Work Packages if architectural compliancy has been added as a constraint for these Work Packages in MP1. The Project Architect then checks the architectural compliancy of the deliverables and reports the findings back to the Project Manager.

In MP3, the Project Manager is notified of the completion of the Work Package and the result is delivered to the project. Any additional activities for MP3 have been defined during MP1.

### 9.3.4 CLOSING A PROJECT (CP)

In PRINCE2, one of the defining features of a project is the fact that it is finite. The goal of the CP process is to bring the project to a controlled end.

In Figure 22, the Project Architecture activities are illustrated in the context of the CP process. Two PRINCE2 sub processes have been omitted from this figure:

- CP2; Identifying Follow-on Actions.
- CP3; Evaluating a Project.

These two processes also involve interaction with and input from the Project Architect. However, the addition of the Project Architecture process does not lead to any major changes or additions to these processes. In CP2, the Project Architect might identify some architecture related follow-on actions, such as further development of a Domain Architecture. In CP3, the Project Manager should also evaluate the architecture related activities of the project with the Project Architect.

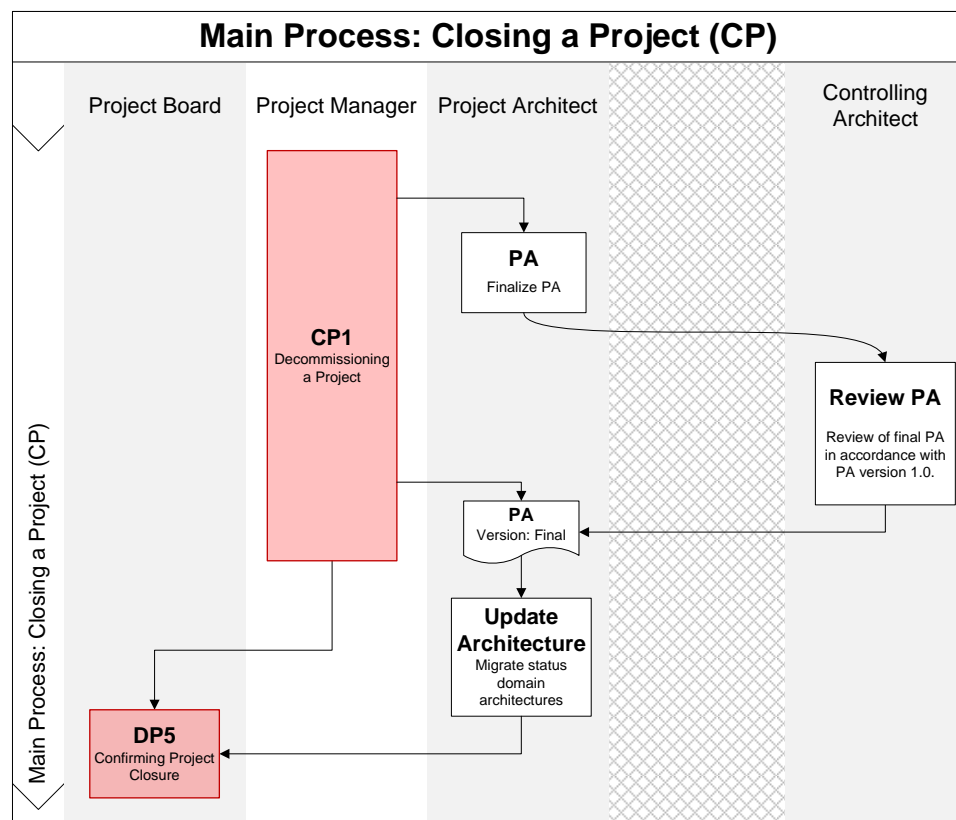


FIGURE 22 THE PA PROCESS IN THE PRINCE2 PROCESS CLOSING A PROJECT

In CP1, Decommissioning a Project, the Project Manager should ensure that all the project's products have been approved and handed over to the customer and that they meet all previously defined requirements. Furthermore, all project information should be completed and stored.

This also implies that the Project Architect should complete the Project Architecture with all information that became available in the last phase of the project. The Controlling Architect performs a last formal review of the Project Architecture on the following aspects:

1. Are all the relevant Business Goals, Business Requirements, principles and guidelines taken into account in the final version of the Project Architecture?
2. Is the final Project Architecture in accordance with Project Architecture version 1.0?

The results from this formal review are processed by the Project Architect, resulting in the final version of the Project Architecture. Finally, the Project Architect has the responsibility to migrate the status of the architecture entities that were added or changed during the project from Budgeted Architecture to Current Architecture.

Before the Project Board can decide to formally end the project in process DP5, Confirming Project Closure, the Project Architect's activities in the CP process need to be completed. This is an additional requirement for the execution of PRINCE2 process DP5.

### 9.3.5 ESCALATION PATHS

The Project Architecture process leads to decision making on architectural aspects that are likely to introduce implications for other projects or initiatives within the organization. By incorporating a Project Architecture process in the project activities, a certain amount of compliancy with the architectural development direction might be automatically achieved. However, it is still possible that solutions that result in project specific benefits are favored by the Project Board, even after a negative advice to do so by the Controlling Architect because they have a negative organization-wide effect. This implies there should be some mechanism outside the project to guard the project's implications on the Enterprise Architecture and represent the Enterprise Architecture within the scope of the project. This is accomplished by providing some escalation options for the Controlling Architect.

First of all, the Project Architecture process uses the standard PRINCE2 escalation paths. As a result, all Project Architecture related escalations within the Project Management Team are handled by the Project Manager through the PRINCE2 process CS8; Escalating Project Issues.

As mentioned earlier, the Project Architect always acts in favor of the project. As a result, the Project Architect is not supposed to escalate on architectural issues beyond the project's scope; this is one of the responsibilities of the Controlling Architect. Unlike the Project Architect, the Controlling Architect has the right to bypass the Project Manager and communicate with the Project Board directly.

In case of any issues, the Controlling Architect should first report these issues to the Project Architect, in order to look for a solution. At this stage, the Project Architect may decide to inform the Project Manager of the issue, which may then use the CS8 process of PRINCE2. If the Project Architect and Controlling Architect fail to reach consensus on a solution, the Controlling Architect has two escalation paths at his disposal: (1) the project's Project Board and (2) the line manager of the Controlling Architect.

The Controlling Architect should first escalate the issues to the project's Project Board. Only when this escalation fails and the issues remain, the Controlling Architect can escalate through the line manager, who moves the discussion on the issues outside of the Project Management Team.

## 9.4 SCALABILITY OF THE PROJECT ARCHITECTURE PROCESS

One of the major advantages of the Project Architecture process as described in this section is scalability: the process can be used for small projects as well as large projects and programs.

As described earlier, the IP process is also used to plan the quality and requirements for the Project Architecture and its application throughout the project. As a result, in the case of small, less demanding projects, the Project Architecture document could be made as *lean and mean* as possible. It might even be possible to decide to skip most of the Project Architecture activities, due to the nature of the project. Nevertheless, architectural changes should always be documented in the project's Budgeted Architecture (and thus eventually in the Current Architecture). During a large project, the Project Architecture activities are likely to be more thorough. However, a single Project Architect will remain responsible for the Project Architecture activities, but additional architects (e.g. Domain Architects) may be consulted to divide the amount of labor. When needed, additional Controlling Architects may be involved during the project.

In case of a program, the Project Architecture process becomes a little more complicated. First of all, a program contains multiple projects, which may all have their own Project Architecture. Naturally, these architectures need to be developed in accordance and harmony with each other. This development is guarded within the architecture team by means of the involved Controlling Architects. However, the program's projects are now also governed by an additional management level – the Program Management – and the role of Controlling Architects is not sufficient to guard and monitor the decision making on this managerial level. Therefore, an additional Architecture Board is installed in the program organization.

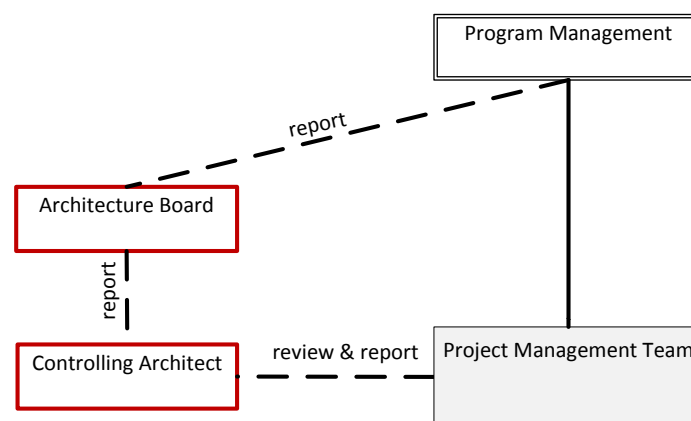


FIGURE 23 ARCHITECTURE BOARD IN THE PROGRAM ORGANIZATION

The Architecture Board can include persons from the Program Management, Corporate Management and Architecture Team. The Architecture Board's function is to facilitate the Program Management with the decision making on architectural subjects. The Architecture Board can receive input from the Controlling Architects as well as directly from the Enterprise Architecture. The composition and exact role of the Architecture Board should be defined at the start of the program. Its composition should reflect the scope, domain and subjects of the program. Some programs might have different needs than others. Programs that are largely architecture-driven are likely to have different needs than programs that are initiated as the result of a business demand.

Programs are large organizational undertakings that often require a (slightly) unique approach for every instance. Therefore, it is not useful to provide a highly standardized approach for incorporating the Project Architecture process in the context of a program. However, the program's projects can still use the Project Architecture process, which (by means of all the involved architects and the Architecture Board) provide the Program Management with valuable architectural information.



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## PART IV: CONCLUSION

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## 10 CONCLUSION

The objective of this research was to extract and document the conclusions and lessons learnt from the introduction and application of Enterprise Architecture at TNT Post, in order to support the introduction of Enterprise Architecture initiatives in other large organizations. This was done by answering the main research question: “How is the concept of Enterprise Architecture introduced and employed in the organization of the Mail NL business line of TNT Post?”

The research was performed by means of close participation in the development of Mail NL’s Enterprise Architecture process and function, a number of interviews with key representatives and stakeholders of the Enterprise Architecture process, and a questionnaire that was distributed among the stakeholders in the project organization of Mail NL. This has led to the conclusions and information as presented in this thesis.

This research (1) created an overview of the environmental factors and added values of Enterprise Architecture that influenced the introduction, function and application of Enterprise Architecture at Mail NL (see section 10.1), (2) provided an extensive overview of the implementation of the Enterprise Architecture process of Mail NL (see section 10.2), (3) described the process of introducing Enterprise Architecture at Mail NL (see section 10.3) and (4) presented an evaluation of the development and function of Enterprise Architecture at Mail NL (see section 10.2 and 10.3). Furthermore, this section also provides some additional general conclusions (see section 10.4), the research limitations (see section 10.5) and recommendations for future research (see section 10.6).

### 10.1 FACTORS AND ADDED VALUES OF ENTERPRISE ARCHITECTURE

By means of the interviews, a number of factors that are considered to be influential for the introduction and function of Enterprise Architecture at Mail NL have been identified.

First of all, various environmental and organizational developments have increased the need for an architectural way of working: changing market demands, the increased use of external connections with clients, technological developments (e.g. the adoption of Service Oriented Architecture by SAP), but also internal developments such as ongoing cost reductions and the transition towards process chains. These developments increase the need for a shared development approach in which decisions and corresponding implications are to be made explicit by means of a central repository.

Secondly, as a result of the unstructured behavior of the strategic decision making process, the absence of a long-term management focus and the operational character of the organization of Mail NL, the Enterprise Architecture process should be kept as pragmatic as possible. This is further emphasized by the fact that Mail NL exhibits limited innovative behavior. As a result, there is no need to enforce a strict top-down architectural way of working on a strategic decision making level. Instead, the Enterprise Architecture process should just support these strategic decision making processes, with the architecture team staying informed of and involved with developments throughout the organization.

Due to the operational character of Mail NL’s organization and the fact that projects and programs are often used to enforce strategic and tactical decision making, the Enterprise Architecture process should be concentrated in the context of projects and programs.

Thirdly, because of the organization’s limited IT footprint and the fact that human resources contribute to the majority of the organization’s operational costs, optimization and redesign of processes and rationalizing (the collection of) products is likely to be the best approach for the realization of a more cost efficient organization, rather than optimizing the IT function. As a result, process- and product-driven development should be the main focus of the Enterprise Architecture process.



Finally, there is a clear role for Enterprise Architecture as a means of improving communication within the organization, especially between the business and the ICT sector. Enterprise Architecture and the involved architecture team can help to improve the communication throughout the organization by incorporating the competence needed to provide a proper (business-ICT) translation service and maintaining a central position. A central position makes it possible to collect information from a variety of channels throughout the organization, process this information, and make it available to all the relevant stakeholders. From a business perspective, the Enterprise Architecture itself should function as a black box. All communication to business representatives should be translated to suit the information needs of those business representatives.

The interviews were also used to identify the main added values of Enterprise Architecture for the organization of Mail NL. Besides the operational benefits of an architectural way of working, five main added values for the organization's decision making and development processes have been identified. Enterprise Architecture could (1) provide improved insight and overview of the organization and its parts, (2) improve communication, especially between business and ICT, (3) create a fundament for shared development, (4) improve the availability of process knowledge and (5) increase overall long-term awareness.

## 10.2 THE ENTERPRISE ARCHITECTURE PROCESS

The Enterprise Architecture process of Mail NL is based on the DYA methodology, with incorporation of the ArchiMate modeling language and various TOGAF concepts. As a result, the created Enterprise Architecture Framework is a mixture of the DYA framework, ArchiMate and TOGAF. The framework also incorporates the concepts of Domain Architectures and Reference Architectures.

Although the organization of Mail NL has adopted several standard methodologies and frameworks as the basis for its Enterprise Architecture and accompanying processes, the implementation of the Enterprise Architecture process is explicitly adjusted to the organization's key characteristics and as such, unique. As a result, the Enterprise Architecture process is above all a facilitative process towards various existing management processes and a vehicle to support organizational change, on both an operational and management level.

The Enterprise Architecture process is kept highly pragmatic and the integration of the process with the organization's strategic planning processes is limited. Instead, it merely facilitates these processes. The ICT planning process 'Information Planning' is performed by architects and in order to guard and validate the development of the Enterprise Architecture, the concept of Architecture Direction Statements is introduced. These statements are specifically tuned briefings, addressed to the appropriate management committee(s), with architectural information that needs to be validated or issues that need to be resolved.

In accordance with the organization's strong operational character and the fact that many strategic and tactical decisions are made in the context of projects and programs, the Project Architecture concept takes on a central role in the Enterprise Architecture process. This concept makes it possible to both facilitate projects in their pursuit for architectural compliancy and guard the development of individual projects in relation to the overall development direction and other developments throughout the organization. The Project Architecture process fully integrates with the PRINCE2 Project Management methodology.

Due to the fact that some elements of the Enterprise Architecture process are not yet (frequently) applied in practice, no definitive conclusions can be given on the effectiveness of these elements. However, stakeholders in the project organization have indicated to believe the Project Architecture concept to be a valuable means to improve both the process of realizing architectural compliant end-products and the execution of the project itself.

Until now, all efforts to create a Goal Architecture for (parts of) the Mail NL organization have failed, mostly due to the lack of a process-driven approach. The next development iteration of the Enterprise Architecture process should focus on the process aspect as the primary starting point for organizational development, in line

with the organization's physical character and substantial human factor. Furthermore, in order to perform all the activities of the Enterprise Architecture process and shift towards a more process-driven development approach, the architecture team of Mail NL will need to be expanded with additional architects. The architects of Mail NL should also take on a more pro-active role in the organization, in order to improve the visibility of the Enterprise Architecture and increase its (perceived and actual) added value.

Finally, the integration of the Enterprise Architecture process with the organization's strategic planning processes is likely to increase. Due to an increasing need for shared, coordinated and more cost efficient development, Project Portfolio Management and the included architectural design checks are expected to take on a more central position in the organization's management processes in the near future.

### 10.3 PROCESS OF INTRODUCING ENTERPRISE ARCHITECTURE

The development of an Enterprise Architecture vision – one of the concepts in the DYA methodology – has been one of the first steps in the creation of the Enterprise Architecture process. The development of this vision has helped to determine the function and added value of the Enterprise Architecture (-process).

With the project organization being the central part of the organization in terms of Enterprise Architecture application and development, these stakeholders were the first to be prepared for the introduction of Enterprise Architecture at Mail NL. In order to create sufficient awareness on and knowledge of the concept of Enterprise Architecture, a number of information sessions were held. These sessions clearly improved the knowledge of the participants on the subject and increased overall attention for the Enterprise Architecture (-process) and its organization.

As already mentioned, the project organization is at the core of the Enterprise Architecture process and much effort has gone into the implementation of the Project Architecture concept; another DYA concept. The integration of the Project Architecture concept with the PRINCE2 Project Management methodology as provided in the DYA methodology appeared insufficient. Therefore, an extensive Project Architecture process has been created, without changing any existing PRINCE2 processes or responsibilities in the project organization. The separation of project responsibilities and the representation of the Enterprise Architecture was another challenge in the implementation of the Project Architecture concept. The separation of responsibilities was accomplished by introducing two architect roles: the Project Architect and the Controlling Architect, of which the latter could make use of existing escalation paths to enforce architectural compliance within the project.

The future development of the Enterprise Architecture will bring about new challenges for the architecture team of Mail NL, among which the introduction of Service Oriented Architecture and the development of a governance structure for the organization of Mail NL.

### 10.4 GENERAL CONCLUSIONS

The process in which the Enterprise Architecture function of Mail NL has been developed and introduced in its organization showed that these kind of endeavors progress slowly and require a great amount of time. This is mostly caused by (1) the complex (political) environment in which Enterprise Architecture is deployed, (2) an initial lack of awareness and sufficient knowledge on the subject among its stakeholders and (3) the operational character of the organization, which conflicts with the (more long-term oriented) architectural way of working.

The high maturity level of the Enterprise Architecture process (and the involved tools) strongly contrasts with the business involvement (or the lack thereof), which is one of the most critical factors in the application of Enterprise Architecture at TNT Post and Mail NL. It has proven to be very difficult to ensure proper business involvement in architecture initiatives, which is necessary in order for these initiatives to be useful and receive

financial support from the business. As mentioned earlier, in order to provide true added value for the business organization of Mail NL, the Enterprise Architecture process and the involved architecture team should take on a more process-driven development approach.

Although the application of Enterprise Architecture at Mail NL has not yet been very successful in terms of architectural development, it has helped to increase the overall awareness on the organization's future development and the impending organizational transition.

The financial crisis has had a great impact on the development of the Enterprise Architecture process and the Enterprise Architecture initiatives within the organization of Mail NL. In the near future, the consequences of the crisis are expected to continue to pose a great challenge on the application of Enterprise Architecture at Mail NL. Therefore, it will be important to strengthen and maintain the image of Mail NL's Enterprise Architecture function.

## 10.5 RESEARCH LIMITATIONS

It should be noted that the research and its outcome is limited by both the scope of the research and the developments at TNT Post and Mail NL during the research period.

First of all, the scope of this research has been limited in terms of the research subject, the applicable organization and the research period. This research only covers the introduction of Enterprise Architecture at the Mail NL business line of TNT Post and the results of this research may not be applicable to other organizations. Furthermore, the research period is limited and only covers a single development iteration of the Enterprise Architecture process. As a consequence, the process is likely to develop further, which may eventually lead to different conclusions than the ones presented in this thesis.

Secondly, due to the limited pace of developments within the research period, the actual application of the developed Enterprise Architecture process and some of its elements has been limited. Although thorough considerations are at the basis of the Enterprise Architecture process as described in this thesis, the future application of the process (and its elements) may also lead to different conclusions than the ones presented in this thesis.

## 10.6 RECOMMENDATIONS FOR FUTURE RESEARCH

This research only covers the first iteration of the introduction of Enterprise Architecture at the organization of Mail NL and does therefore not provide a definitive overview of these developments. Research on the further development of the Enterprise Architecture process of Mail NL could provide valuable additional insights on the topic of this thesis. Additionally, similar research on the introduction of Enterprise Architecture at organizations comparable to Mail NL may also be of great value.

Various elements of the Enterprise Architecture process of Mail NL – such as the Project Architecture process and Architecture Direction Statements – may also be of value for other organizations. Their effectiveness and applicability at other organizations could be determined by means of case studies. It might be interesting to research whether or not the use of a Project Architecture results in a shortened project turnaround time, reduced project costs and/or less Change Requests after project completion.

TNT Post and Mail NL are currently faced with the challenge of introducing Service Oriented Architecture in their organization. This provides an opportunity for research on the introduction of Service Oriented Architecture at a non-technology oriented organization.

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## PART V: APPENDICES

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## APPENDIX A – OVERVIEW OF INTERNAL DOCUMENTATION

The following internal TNT Post documentation has been used as a source for this thesis.

Document title	Author	Version	Date
Applicatieplanning onder Architectuur	H. Willemse	1.7	03/12/2008
Architectuur Maturity Scan Juli 2008	M. Hunsche	0.1	06/16/2008
Architectuurproces Mail NL	M. Smeets	0.9	01/20/2009
Architectuurvisie Mail NL	M. Smeets	1.4	11/27/2008
Blauwdruk invoering service oriëntatie	H. Willemse	1.0	05/23/2008
Informatieplan Mail NL	IM Mail NL	1.0	03/14/2008
Proces ProjectStart Architectuur	M. Smeets	1.0	11/27/2008
Proces ProjectStart Architectuur	P. Schoneveld	1.1	02/26/2009
Proces ProjectStart Architectuur	P. Schoneveld	1.2	03/04/2009
SharePoint Architectuurportal Mail NL	M. Smeets	1.1	03/02/2009
Verzamelstaat Volwassenheidsmatrix TNT Post	M. Hunsche	n/a	07/04/2008

**TABLE 4 OVERVIEW OF USED INTERNAL DOCUMENTATION**



## APPENDIX B – INTERVIEW ABSTRACTS

### INTERVIEW I

Interviewee: Gert-Jan Balster, Manager T&I

Department: T&I

Date: January 23, 2009

**As the manager of the T&I department, you are closely involved with the organization's governance structure. Can you elaborate on the (IT) governance structures that apply to the organization of Mail NL?**

There are hardly any descriptions of Business governance within TNT. TNT is split in two divisions and those divisions make their own independent business decisions. We do have some clients that trade with both divisions and hence there is a dialogue between the divisions at the head office, in order to adjust the affairs with these clients to each other.

The division Mail should be seen as a separate company with its own Governance. To some extent, this also applies to the four business lines of the Mail division: Mail NL, Spring, Cendris and EMN. The Mail NL business unit is formally divided into three business units: Marketing & Sales, Operations and Parcels. However, the Parcels business unit behaves and operates mostly as a separate business line.

The ICT Mail and Administration Mail departments are formally part of the Mail division, and not the Mail NL business line. However, the activities of ICT Mail are greatly related to Mail NL.

Until about seven years ago, Mail NL consisted of a cluster of nine business units, among which: Sales, Marketing (Consumer and Business) and three operational business units. This structure has been simplified by means of the transition towards the three business units we have today.

A few years back, T&I performed a research on the ICT governance model of the Mail division. This led to the conclusion that this division incorporated the so-called Multi-Local Model; a multi-local orientation in which every business line has a high level of local autonomy.

**What are TNT's plans for the business lines?**

That is mostly unclear. The company is trying to increase the collaboration between the business lines, but this has been unsuccessful so far. Among other things, this is caused by the great differences between the business lines, which have been acquired and thus do not resemble the organically formed organization of the Mail NL business line. The same can be witnessed at the business line EMN, which consists of parties from different countries. The postal markets between these countries can vary greatly, which implies the existence of differences in business operation and this naturally leads to high level of autonomy on many aspects.

In short, there is no global business governance within TNT and the Mail division; every business line will have to develop its own business governance. In order to make the leap to IT Governance, we first need to travel a few years back in time.

Until the end of the nineties, this company was for the most part a Dutch company. The current business line Mail NL was then still known as PTT Post. The heterogeneous character of the former postal company can still be recognized in the applications from that era, such as Harmony. At the end of the nineties, the Steering Committee ICT was introduced. The goal of this committee was to create a shared infrastructure platform for PTT Post. In 2002, ICT Mail was initiated as a Shared ICT Provider for the business units. Until that time, every business unit had its own IT section. Therefore, the ICT Mail department was installed in the Mail division of TNT.

In 2003, an ICT Governance Structure was introduced. In this governance structure the business lines were made responsible for their own processes and information management. The technical realization of these

aspects was a part of ICT Mail's Shared Service. The 'ICT Mail, unless...' principle is an example of one of the governance principles. The last few years showed great development at the other three business lines (Cendris, Spring and EMN), which led to great changes in the demand organization. The usage of ICT Mail in the ICT expenditures of the various business lines decreased further and further, despite the 'ICT Mail, unless...' policy.

In 2007, an ICT cost reduction program was initiated ('ICT Besparingsprogramma'), with the goal of creating a more cost efficient and effective ICT organization. This program consists of the following three parts:

1. Revision of the governance structure
2. Redesign of the demand organization.
3. New (out)sourcing research on ICT Mail and other Shared Services.

The Federal Model (Weill & Ross, 2004) has been chosen as the new governance structure. In this new structure, the application responsibility is brought back to the business lines. The business lines will have a mandate on:

- Project Portfolio Management,
- Application functionality,
- Applications, and
- Processes.

All aspects that are not considered to be business-specific will be shared: Hosting, management of work stations, Intranet, collaboration facilities and application conglomerates (e.g. SAP).

The scope of the ICT Governance concerns the Shared Services; these should in principle be performed by ICT Mail. The new governance structure has a number of implications for the Information Management department. As a result of this development, the Information Management department of Mail NL will become responsible for Application Portfolio Management, Project Portfolio Management and the Application Architecture. As a result, the Information Management department is considered to be leading in the development of a detailed governance structure.

**What about the governance on specific and essential subjects like basic registrations? How does one determine the manner in which a client is recorded?**

That is a difficult issue, because it immediately involves a lot of additional questions, such as the definition of a client and whether or not it concerns a shared client or a client of a single business line. Considering the type of questions, this was agreed upon to be a business item. However, the business has not (yet) picked up the subject, so a shared vision has not been developed.

**What will be the function of the CIO Office in this new governance structure?**

The CIO Office will get three main tasks. The CIO Office...

1. ...will take on a control function with CAPEX evaluation.
2. ...will be involved with more rigid management at the business lines, due to the tightened Shared Service approach.
3. ...will be involved with technological innovation; i.e. determining TNT's commercial opportunities from a technological perspective.

**How does this governance development relate to the introduction of Service Oriented Architecture?**

That strongly depends on what will become part of the Shared Services. Think about the services of the SAP system. The exact policy still needs to be determined, but the scope will be limited to the Shared Services that have already been defined. The same goes for the Application Architecture: some applications have an infrastructural nature, which means they will be treated as Shared Services. This applies to the SAP systems, for instance. However, the arranging within the SAP system is a business responsibility; different business lines could apply the SAP systems in completely different ways.

**What are the consequences of this governance structure for the Enterprise Architecture process of Mail NL?**

The new model ends with the Shared Services and the business lines, which means that every business line will have to develop their own Enterprise Architecture process. Until now, architecture came into existence at the ICT Mail department. The role of architecture is still greatly evolving.

Lastly, we expect each business line to incorporate an Information Plan, which has to be updated on a yearly basis. However, this is currently not the case; currently, Mail NL is the only business line with an Information Plan, which originated from 2007.

**INTERVIEW II**

Interviewee: Jo Smeets, Manager Order-to-Cash (O2C)  
 Department: Order-to-Cash, Marketing & Sales, Mail NL  
 Date: February 15, 2009

**Can you reflect on the concept of (Enterprise) Architecture in the context of Mail NL's business organization and its potential added values?**

In order to reflect on the concept of architecture and its added values in the context of the organization of Mail NL, it is important to understand the position the business of Mail NL is in at the moment. First of all, a strong reduction of costs is of great importance, in addition to a shortened time-to-market of products and services. In other words, the business does not want to experience any inconvenience from the complexity of its systems.

The fact that some large clients demand all their business with TNT Post to be stated on a single invoice, whereas other clients prefer to receive multiple invoices, is another important development in the course of Mail NL's ambition to maintain its market share. Additionally, business units put forward different demands and requirements on the development of such a system. This results in a desire for a generic order and billing system, which can handle a high amount of variability; a single platform that offers multiple flavors. A similar development can be witnessed in the client's desire to establish a digital connection for order placements: while some clients prefer a fully automated connection, others prefer the use of webservices.

At last, the business wants to create a central image of each of its clients, in order to determine each client's business activities within TNT Post, and preferably even within TNT. This is a very complex endeavor in the current situation.

I can provide an example of the inconvenience the business experiences from the complexity of its systems. In order to facilitate future business development, a major SAP/R3 system upgrade was needed. The preparations for this release started in September and October 2008 and the operation resulted in the absence of a test environment for a period of three to four months, after which several business developments experienced similar delays. However, these consequences were not communicated on a corporate level and the preparations for the liberalization of the national postal market eventually conflicted with the timing of the release. This led to a major escalation and many heated discussions, as a postponement of the release would cause delays for two other projects, while a great amount of already spent resources would be wasted. Furthermore, such a release requires a significant amount of system down-time during which no operational activities are possible. This naturally requires careful planning and only a limited number of release slots are available for such releases.

The Parcels business unit is not considered to be part of the scope of the architecture of Mail NL. This is probably due to the fact that Parcels has developed its own application platform, because Mail NL's applications were too expensive. Parcels' operational systems are therefore considered to be a separate platform. However, billing and order processing of the Parcels business unit coincides with the rest of Mail NL. This is not a problem if these systems are part of the Shared Services of the Mail division; in that case the Parcels business unit does function as a separate business line in terms of its architectural platform.

In response to the original question: the development of various separate architectures would definitely obstruct the development of the organization. This implies the need for a clear overview of the organizational development direction, a means to prevent such a separation and ordered (and accepted) governance from within the architecture authority. The latter may help to prevent initiatives from wandering off and provide the ICT and business domains with information on previously made decisions.

Secondly, architecture may also help to improve the communication towards the business, by communicating in terms of functionality and processes. As such, architecture could be used as a bridge between the wishes and requirements of the business and the resulting implications for both the business and ICT sector.

Lastly, there is an increasing need for insight in what activities or parts of the organization may be considered for outsourcing. Such a research has already been performed for the organization's administrative services. Before the year 2005, a similar research was done for the (at that time badly performing) Parcels business unit, which eventually also led to separate development of the application platform. Due to various reasons, the Parcels business unit has not been discarded. TNT Post features more of such outsourcing cases, but these are troublesome due to the lack of a clear policy on what should be considered to be the core of TNT Post's and Mail NL's business.

**Currently, the architectural process has been integrated with decision making processes by means of the Project Architecture. What is your vision on the integration of Mail NL's Enterprise Architecture process with the organization's strategic and tactical decision making processes?**

The organization's development is mostly dictated by external (market) developments. The Marketing department should identify these developments, after which they should be worked out (with the Strategy department) in business goals for the next few years, the corporate strategy. The strategy department also responds to signals it receives from within the organization itself. The Key Account Management department should identify the demands of Mail NL's (major) clients. In the subsequent strategy development, the Operations business unit mostly follows the Marketing & Sales business unit. Ideally, developments at the Marketing and Strategy departments should then trigger the organization's architecture function, after which the architecture team could monitor the resulting processes and their outcome. This should be a structural way of working; a one-time effort would instantly diminish the added value of such an architectural way of working. However, due to the apparent absence of such a structural strategy-forming process it will be difficult to establish such a top-down architecture process.

First of all, a universal understanding of architecture and its application is a prerequisite and this should be acknowledged by everyone on key positions in the organization. The existing Enterprise Architecture Vision of Mail NL should be validated with key business representatives, perhaps even frequently. In my opinion, the business considers architecture to be a technical affair.

Secondly, introducing architecture at a strategic and tactical level also demands a central authority that maintains an overview and guards the developments of Mail NL. Developments that deviate from the course that has been set out should be halted by such an authority.

Thirdly, it might be a good idea to accommodate the Process Managers in the Information Management department. Instead of functioning as a bridge between the ICT and business, the Information Management department seems to reside too close to the ICT Mail department. Currently, the consultation of a Process Manager of the business is one of the first steps in the initiation phase of a project, which implies insufficient knowledge of the business' processes. Accommodating the Process Managers in the Information Management department could be beneficial from an architectural point of view, as it could result in a central process-exceeding platform, thus simplifying the realization of process integration and coordination.

Lastly, in my opinion, integration of the Enterprise Architecture process with the organization's strategic and tactical management can only be realized by using existing consultative committees, such as the 'Mailboard', the Management Teams of the two business units and the Development Committee that operates on the

border line between the two business units. Architectural input should be put on the agenda of these committees. Besides reporting architectural issues, the architecture team should also use these committees for the validation of architecture material. It is important to make sure these committees are only used as a last resort and a central authority should therefore guard and coordinate the use of these committees. Moreover, the architecture team should maintain an independent position in its communication towards these management committees; it may provide the committees with advice but should avoid interference with the actual decision making process.

**What do you believe to be important factors that influence the introduction of Enterprise Architecture at Mail NL?**

The absence of an up-to-date and maintained business vision seems to be a major deficiency, and not just from an architectural point of view. Even if such a business vision exists, it is not explicitly communicated and governed. On the other hand, strictly governing a business vision and strategy introduces the risk of discarding good and valuable ideas. However, I believe this to be a risk worth taking. An architectural authority should provide clarity on which activities are subject to architecture, and which are not.

The current financial crisis has a great impact on initiatives like these. It is evident that the overall development direction and the realization pace are influenced by the crisis. There are currently no financial resources available, because lending is considered to be too expensive and the dependence on external sponsors might become too big. Previously, projects were assessed on their EBIT value, whereas currently direct profits are considered to be more important. This is summarized by the statement “EBIT is an idea, cash is a fact”.

## INTERVIEW III

Interviewee: Adrie Kaljee, Process Manager Order-to-Cash (O2C)

Department: Order-to-Cash, Marketing & Sales, Mail NL

Date: February 17, 2009

**You have been working at TNT Post for both ICT Mail as the business of Mail NL. Can you reflect on the differences between these two perspectives and the subject of (Enterprise) Architecture?**

I have previously worked in the ICT Mail department and, for half a year, in the Information Management department of Mail NL. At present, I am working as a Process Manager for a few years already. This has allowed me to experience various aspects from multiple perspectives.

When I was working at ICT Mail, the business was complaining a lot about the ICT Mail organization; it was considered to be inflexible, too passive and lacking in terms of quality. This conflicted with the experiences of ICT Mail, which led to a mutual lack of understanding. Since I started working at the business, I am experiencing these issues myself. In my opinion, these problems do not originate solely from the ICT Mail organization. The ICT Mail organization seems to be better organized than the Marketing & Sales business unit and the unpredictable behavior of the commercial organization seems to play a more important part in the misalignment of the business and IT. There is an apparent lack of vision in the business organization.

ICT Mail's biggest flaw is its communication, or lack thereof; it does not communicate on the developments within its own area of responsibility and the resulting business implications. Furthermore, the organization has created a big threshold by becoming a financially independent organization. The business needs to hire ICT Mail, which uses similar tariffs as external parties. In combination with the apparent lack of quality of ICT Mail's services, this increases the desire to involve external parties. This also applies to the way ICT Mail deals with the concept of architecting; in order to receive information on ICT Mail's architecture, the business needs to hire an ICT Mail representative. Furthermore, the ICT Mail department focuses too much on architectural compliance, which only increases business resistance. It should provide the business with more usable information, instead of positioning itself as a bureaucracy.

The Information Management department of Mail NL was originally intended as the solution to the misalignment of the business and ICT Mail. Now, a couple of years later, that mission seems to have failed. Information Management now appears to be nothing more than an extension of the ICT Mail organization; it operates as a technically-oriented project factory. The Information Management department also lacks process knowledge. Consequently, process integration and coordination must be realized by the business. It should be noted that this appears to be more so on the Marketing & Sales side, than on the Operations side. Our department actually has a good relation with the Information Management department.

During my time at ICT Mail, I have always stated that “we do not develop architecture, we acquire architecture” and I still believe this to be the case. TNT Post does not have a proprietary and unique architecture; the decision to use standard software solutions (like SAP) results in the acquisition and use of that software’s architecture. Of course, the Enterprise Architecture itself is not limited to these IT-architectures, but it does have a big impact on various elements of the organization and its architecture.

From a business perspective, the term ‘architecture’ does not have any business meaning; it is not understood and believed to be a technical affair and too complicated. The business does not want to be bothered with such a concept; it just wants to be facilitated by its IT systems. Of course, architecture can be a means to improve the alignment between the business (strategy) and IT. However, the business only thinks in terms of business goals and requirements and is not interested in the means that are used to realize these goals and requirements.

This also applies to the subject of Service Oriented Architecture (SOA). I believe it to be the IT sector’s responsibility to coordinate the introduction and development of SOA throughout the Mail NL business line. In my opinion, SOA should be a ‘black-box’ from a business point of view. This will be a major challenge for the architecture function, but I am confident that pushing these problems to a higher organizational level will introduce more problems than it solves. For one, it will be very hard to demonstrate the added value of SOA, which will cause the business to lose its interest in the concept.

#### **What do you consider to be the added value of (Enterprise) Architecture for Mail NL?**

Architecture is needed to reduce the diversity in system and process development, as well as to ensure a common and acknowledged overall development direction.

It may also help to reduce the organization’s system complexity. For example: our core business is the collection and distribution of mail, but we manage to offer a collection of over a thousand products. Although this may help to serve the market well, it also leads to a lot of difficulties.

Architecture can help to create an overview of the organization’s underlying structure and improve it by aligning it to the business strategy. As such it can also improve the alignment of the business and ICT sectors. However, architecture should always remain a facilitative process; it should support the business, no more and no less.

One could also question what kind of added value would be key for an organization like Mail NL. Many of today’s successful companies (like Dell, Apple and IBM) did not use any standard software in their start-up phase, because this diminishes one’s ability to differentiate oneself from similar companies. Deliberately seeking a role as a (technological) frontrunner pays off for such technologically oriented companies. However, it is highly questionable whether or not this would be the case for a company like TNT Post / Mail NL. The business of Mail NL will most likely believe this to not be the case, which is another reason to use SOA as a black-box approach towards the business.

#### **What do you believe to be important factors that influence the introduction of Enterprise Architecture at Mail NL?**

I previously mentioned the apparent lack of business vision. Although there may be such a business vision, it is surely not visible in the organization’s policy discussions and decision making processes. In our efforts to create support for the Roadmap Order-to-Cash, we experienced a strong lack of a long-term orientation throughout

the management organization. It seems that 80 percent of the organization's energy is put in operational activities, whereas only 20 percent is put into future development. Current market developments, such as the liberalization of the postal market, are the basis of this behavior. The commercial organization tries to keep its options open as much as possible; it does not want to be limited in any way but fails to acknowledge the fact that eventual decisions or directions also need to be realizable in terms of supporting systems.

As a result of the apparent absence of a business vision, many previously made (and accepted) decisions are the subject of revived discussions. The 'SAP, unless...' policy is an example of such a long-term commitment that is now questioned again. The decision for this policy was made in 2000, which has led to one complex SAP environment. As a result of this complexity, SAP releases are now restricted to the second and fourth quarters, with major consequences for the business. Also, the considerations that played a part in the original decision making process on the policy have faded. Such information should be documented and made available when necessary. It may be an option to assign this task to a central architecture authority.

Furthermore, the lack of a dictatorial management approach within the corporate management layer makes it difficult to establish a (shared and accepted) overall development direction. It should be noted that this is also part of TNT Post's corporate culture; its business units have always been highly autonomic and it requires a great amount of time to change this.

The strategic decision making process of Mail NL is highly invisible, which makes it difficult to align internal developments to this high level decision making. It might even be impossible on a strategic level. The Information Management department should ensure the rooting of the ICT Mail organization in the business' strategic and tactical developments, but this is currently not the case and has to be improved.

Additionally, in the Order-to-Cash department, process chains are of high importance. Whereas we do have the ownership and responsibility of the process chains, we do not have the entire budget related to these process chains. In order to tackle this, we introduced an additional committee in which all stakeholders are involved.

## INTERVIEW IV

Interviewee: Henno van Maanen, Information Manager Planning & Control  
 Department: Information Management, Mail NL  
 Date: February 26, 2009

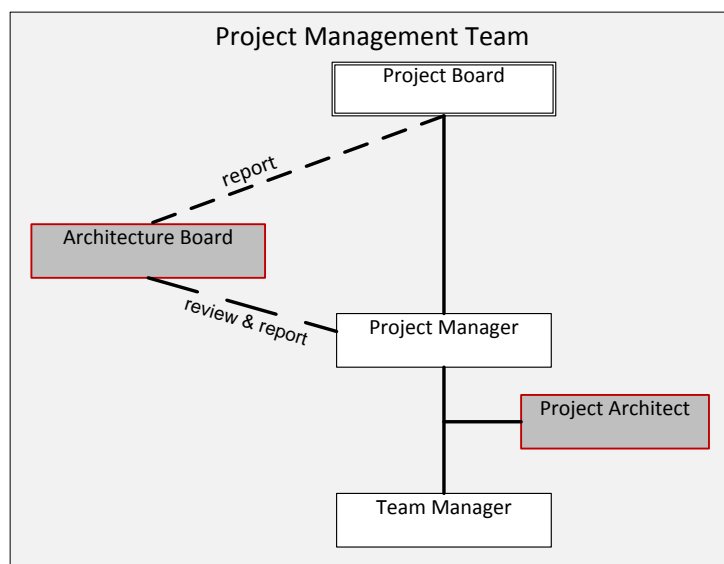
### **You are closely involved in the discussion on the Project Architecture process. Can you elaborate on this?**

The role of the Project Architecture Board is one of the topics of recent discussions. I question the existence of such a board in regular projects. We – the architects of Mail NL, an architect of ICT Mail and myself as representative of the Information Management department – believe the role of Controlling Architect to be more important and relevant. The Controlling Architect should perform a formal review of the Project Architecture, instead of a collegial review (as is currently the case). Furthermore, the question remains who should take place in the Project Architecture Board – as the members should be able to elaborate on architectural aspects.

At this time, we expect the need for two types of Controlling Architects: a business oriented architect and a technically (IT) oriented architect. These architects could then assess the Project Architecture on completeness and correctness. They could also take on the role of consultant in case of decision making on architectural deviations. If the Project Architect manages to reach consensus with the Controlling Architect(s), there is no need to perform an escalation. Otherwise, it is the Controlling Architect's responsibility to initiate the escalation. The Project Architect is a member of the Project Organization, which means he should always act in favor of the project. Adding an architectural responsibility to the Project Architect's project responsibilities can result in conflicts for the Project Architect.

Conclusively, the architecture should be represented by the Controlling Architect, who is allowed to escalate issues to a higher level. The first option would be to inform the Project Board. If that does not help, the line organization may be used. The Project Board is responsible for project-related decision making. However, in case of project-exceeding subjects, it is legitimate to involve higher authorities. An example would be the fulfillment of so-called 'blank spots' in the (goal) architecture. This creates a clear boundary between the project responsibilities and the representation of the Enterprise Architecture.

Another topic was the Project Architecture Board and the related illustration (see the figure below). In that case, the Project Architecture Board would consist of members of the Project Board, the Project Architect and various business and architecture representatives. I can imagine such a structure in case of major projects, but for the majority of projects, this will most likely not be the case. The use of one or two Controlling Architects is much more likely. In that case, the Controlling Architects should report to the Project Architect, instead of the Project Manager. If they can not work things out, the Controlling Architect can use the escalation paths (the Project Board and the line organization). The Project Architect should never bypass the Project Manager, something the Controlling Architect is allowed to do, not being a member of the Project Organization.



**FIGURE 24 INITIAL STRUCTURE OF THE PROJECT MANAGEMENT TEAM**

Another subject of discussions is the timing of the Project Architecture version 0.1 and 1.0. I believe the current process to be correct, whereas one of the architects thinks the first version of the Project Architecture should be developed before the Project Brief. He believes the Domain Architect to be the one who provides a framework and context for the project. I believe this to be incorrect, as the Information Managers will continue to receive business requirements and demands and construct a Project Brief as a response to this demand. Of course, there will be occurrences in which an architectural program puts forth a number of projects, but I believe this to be exceptions.

**In previous meetings, you stated not to prefer an architectural approach in which the Enterprise Architecture process is used on a corporate management level. What are your thoughts on the alignment of Mail NL's architecture function to the high level management processes?**

First of all, a program always intersects with a part of the business organization, the enterprise. As such it focuses on a domain and the resulting architecture is therefore a Domain Architecture. On top of that, I believe there to be some room for an Enterprise Architecture, which spans the various domains and thus connects these domains by means of an overall context. It will probably never be an absolute Enterprise Architecture in terms of its scope.



Some principles and guidelines may be considered important enough to increase their scope to the level of Mail NL. This would be an important subset with a broad scope, but a limited depth; i.e. not everything is developed extensively. These principles, guidelines and models may be developed within projects and programs and may be migrated in terms of scope later on.

The manager of the Information Management department would like to have an overall map of Mail NL and its parts, as a means to visualize and communicate architectural developments. Such an overview can be used to visualize aspects in the current situation, such as which products or processes are supported by outdated applications. In combination with expected developments, this may be used as a basis to allocate resources for architectural development in advance. Parts of the organization that are not expected to change in the short term can be disregarded (in terms of architectural development and according resource allocation) for the time-being.

**Besides the development of such high level architectural mappings, can you think of additional opportunities to align the architecture function to Mail NL's strategic management processes?**

It is important to understand that architecture has mostly been an affair of the organization's IT chain. We primarily focus on the development of Information and Application Architecture. Business Architecture is used to determine the impact of certain decisions or directions on the other architecture layers. I do not think we can motivate the business into developing its processes and products by using architecture. The fact that our Operational IT Span is limited to about seven to eight percent of our operational expenditures indicates that this is not our core business. As a result, it is not possible to enforce an architectural way of working throughout the organization. From a business perspective, there is no added value to such a way of working. We use architecture as a means to realize a cost-efficient IT landscape, proper alignment of business and IT and a predictable IT organization in terms of costs and application. As such, architecture is used as a business enabler.

It is quite difficult to incorporate the use of Enterprise Architecture on a strategic level. First of all, there is an apparent absence of an actual strategic decision making process. And secondly, there remains a high uncertainty regarding the realization of individual strategies. From the perspective of the Information Management department, it is preferable to be informed of discussions and decisions regarding the long-term development of the organization. However, uncertainty is inherent to that strategic level of decision making; many strategic decisions are discarded later on due to various reasons. Developing a Goal Architecture for each strategic direction could be very inefficient in terms of resources.

The architecture function should probably restrict its involvement by determining the anticipated impact of strategic decisions and refrain from the development of the Goal Architecture. However, by keeping oneself informed on the strategic developments, the context of decisions will be known in case a strategy is realized. This relates to my previous use of architecture: creating mappings of anticipated change and developments.

**The last few years, you have been closely involved with the development of architecture and an architecture process within Mail NL. Could you elaborate on the history of these developments?**

The organization of Mail NL originated from several business units; the resulting organization is still fairly young. It is important to understand the development the Information Management department has gone through in that context. Originally, the business line of Mail NL consisted of nine business units; four on the side of Marketing & Sales, three on the side of Operations and the business units International and Parcels. At that time, the ICT Mail department operated as a central IT supplier, with T&I as CIO Office.

All discussions on standardization took place within the ICT Mail department. These standardizations were eventually pushed through the entire organization by ICT Mail. At the same time, T&I developed a corporate (technological and informational) policy, which focused primarily on security aspects and platform choices; the content of the application layer remained scarce. Those T&I guidelines also featured a guideline that dictated the development of an Information Plan for each business unit, but the business units hardly complied with this

guideline. On a side note, I still believe the set of guidelines that have been produced in that period to be disappointing in terms of quantity.

At that time there was a lot of diversity between the various business units. For example, the International business unit acted highly independent and it even featured a separate ICT department. I experienced all these developments from the perspective of the business units Distribution and Sorting. An Information Management department did not exist at that time. Instead, the business unit Sorting incorporated an Information Systems section, and Distribution incorporated an ICT section. For the most part, those sections consisted of an Information Manager with a number of functional administrators. Those sections did not make use of architecture. The Information Manager would develop the Information Plan, after which the realization would be done by the ICT Mail department, which also offered a number of consultants.

When I started to work for the Distribution business unit, I was the first Project Manager, after which the ICT section increasingly started to focus on development. This also led to the increased use of Information Managers, which further increased the development of strategic and tactical policies.

The introduction of the Information Management department improved the overall structure of such developments. The final step in this transition has been made by the merger of the Information Management departments of Marketing & Sales and Operations. The creation of a single department has made it possible to initiate central architectural development, with a focus on the Business Architecture and the Application-services aspect of the Application Architecture layer.

We have been searching for a way to incorporate an architecture function in Mail NL's organization for about two years now. During that time, several initiatives have been started, among which a Goal Architecture for Operations (which was done in consultation with Logica CMG). This initiative eventually ended due to typical architecture-related problems, such as a wrong level of abstraction. Other examples of such initiatives are the development of an Internet Architecture, the Program Primary Process and the current Core Design Team. Although these initiatives have not been successful in terms of content-delivery and their application, a lot of experience has been gained from these efforts. As a result, there is increased attention for the embedding and application of Enterprise Architecture in the organization of Mail NL.

It may be quite difficult to keep on developing the Enterprise Architecture and its processes in the near future, due to the lack of budget (as a consequence of the financial crisis). However, I am confident that architecture is the best way to realize the business' demands. Especially in the current situation, one should focus on the functionality that should be supported by the IT systems. The question where efforts and resources should be allocated – and where they should not be allocated, in order to avoid wasting them – is very important.

## INTERVIEW V

Interviewee: Mario Suykerbuyk, Information Manager Primary Process

Department: Information Management, Mail NL

Date: February 26, 2009

### **You have been involved with the Program Primary Process, since its start. Can you elaborate on the history and evolution of this architecture-driven program?**

About a year ago we started to inventorize the collection of projects throughout the entire process chain, both on the side of Marketing & Sales and Operations. The trigger for this activity had been the merger of a number of business units into the business units Marketing & Sales and Operations.

Previously, every business unit had been responsible for its own IT-fulfillment, which naturally led to a diversification of systems. The operational environment used to comprise 26 districts, which were later reduced to a total of six areas. After the merger, the combined business units were controlled by Process Managers at the TNT Post head office, which led to the desire to standardize all processes. The first step was to

identify how things were done at the various locations, in order to determine the best approach for standardization. This was done for all kinds of registrations and primary processes. Parallel to these activities, a lot of requirements and desires were put forward by the involved Process Managers. This resulted in the idea to manage the entire collection of activities and developments as a program, with the ambition to solve all issues at once. This automatically created the need for an architectural approach, which led to the creation of the Program Primary Process, mid 2008. The program was initiated by what used to be the ICT department of the Operations business unit.

We then introduced our vision of the Primary Process by means of the Design Charter Primary Process, which was basically a Goal Architecture. This was received very well by all involved parties. However, a lot of resources would be required for the realization of the plans, which caused some conflicts. The plan was then reduced to proportions that could be realized with the resources that would be available. The financial crisis has created new problems for the program. Due to the lack of resources, evolutionary development of the current environment is stimulated at this time, as this requires fewer resources and will ensure organizational development for the short-term. As a result, there is currently a clear lack of support for innovational programs, such as the Program Primary Process. That is a phase we are currently going through.

On the other hand, the financial crisis also provides an opportunity for the Program Primary Process. Previously, it would take a lot of effort to align all Process Managers; in the organization of Mail NL there are about 10 to 15 Process Managers that will proceed with their own activities during such a program, which can result in conflicts. A lot of such projects have been cancelled as a result of the recent budget cuts, which created room for a central and shared approach, initiated by Information Management.

The current developments in the operational environment are mostly driven by developments at the Marketing & Sales business unit. For example, the consequences of the impending liberalization (of the postal market) and the implications for Mail NL's product propositions are important questions in this context. On the other hand, operational optimization is still possible within the Operations business unit and this still offers possibilities for innovation.

We acknowledged the fact that most developments are initiated by the Marketing & Sales business unit. We identified some changes in the product propositions, which would have a great impact on the operational process. However, the Operations and Marketing & Sales department do not communicate that well. Especially the managers throughout the country are mostly concerned with daily activities. We have always been very good in optimization of the current environment. About 10 to 12 years ago, we introduced a nice concept, which has been expanded and improved ever since. The current major commercial transition requires a change of focus to the long-term, in order to determine the impact of the transition on the operational and IT environment. The process of changing this focus and acquiring the necessary competences requires a lot of time.

The IT organization is often ahead of such changes, because most commercial developments can easily be translated into implications for the organization's supporting IT systems and Mail NL features a standard supply-chain, which makes it possible to use existing cases from other companies. Nonetheless, Process Managers still want to be able to incorporate their own activities within these overall developments and this makes it difficult to gain sufficient support. This has resulted in additional delays, but I do notice a recent change of attitude. People are realizing a high level of collaboration is needed between the Marketing, Order-to-Cash and Operations process chains, in order to realize the anticipated development direction. The resulting 'plateau planning' is supported by both the Marketing & Sales and Operations business units.

Before the start of the financial crisis, the business had a lot of important projects, which incorporated a CAPEX that was based on a period of three years. Combined with the fact that major changes were expected to occur within one and a half year, this led to the realization that these projects were likely to not yield any return on

investment. In order to solve this problem, a portfolio management process was constructed. In this process the business owner determines (by means of a quick-scan) the project's contribution to the applicable strategy and the expected return on investment. The future-proof assessment, which is performed by the Marketing and Logistic Strategy department, is another part of this portfolio management process. This assessment determines whether or not a project fits in the long-term vision, the plateau planning. These assessments lead to a combined, qualitative advice, which is delivered to the Management Teams of Marketing & Sales and Operations, who are then able to make a decision between the short and long term, and the utilization of resources. However, due to the financial crisis, projects are mostly cancelled instead of initiated.

The design check, as a part of the quick-scan, is a very interesting development. The scan is performed by the Core Design Team, which consists of representative of the Marketing & Sales and Operations business units, as well as the architecture team. I am responsible for assessing the project's compliance with the Enterprise Architecture.

#### **What does the organization of the Program Primary Process look like?**

The program is directed by a Program Board, which is led by the manager of the Development department. Other members of the Program Board are representatives of the Marketing, Operations, ICT Mail and Information Management departments. Within the Program Board aspects are processed, after which they are delivered to the various Management Teams in the context of Portfolio Management. The individual projects of the program use a standard project structure.

Within the Program Primary Process, architects take on a facilitating and advising role. They are also involved in the Future Proof checks of the Core Design Team, in which they assess business development in relation to the Enterprise Architecture and determine if a solution already exists or if additional development is required. And, of course, they are responsible for the development of the architecture itself.

#### **What are the organizational consequences and effects of the Program Primary Process?**

One of the consequences of an architecture program like the Program Primary Process is the fact that you encounter various kinds of questions and challenges, like: "Where should I deploy Master Data Management?" and "Where should I perform certain registrations?" In order to answer these questions, you also need to determine who will be responsible for certain aspects, such as an Enterprise Service Bus in the case of Service Oriented Architecture. This will require dropping the concept of functional ownership. This naturally results in many additional discussions on the redistribution of responsibilities and development methods. Furthermore, there is a difference between a person being responsible and whether or not that person has the feeling to be responsible for something.

The redistribution of responsibilities throughout the application landscape causes people to exhibit strategic behavior in order to protect their competitive position within the organization. One should always be apprehensive for this kind of behavior in case of major transitions.

The program also has an impact on the collaboration between people. Previously, Process (Chain) Managers only needed to deal with the systems within those processes, but with the introduction of an Enterprise Service Bus a large number of additional stakeholders are added to the picture. As a result, changes will need to be added to a release planning. Instead of just assigning a Project Manager and collaborating with ICT Mail, various business developments need to be taken into account and additional stakeholders need to be involved. A more long-term vision is a prerequisite for this kind of collaborative development. Portfolio management can be helpful for additional prioritization on top of the various process chains.

#### **Can you elaborate on the relation between Enterprise Architecture, in the context of the Program Primary Process, and the overall business vision and strategy?**

First off, it is important to understand that the business' management teams or committees do not speak in terms of architecture. They are working with concepts like a plateau planning and the IT implications of such a planning. Enterprise Architecture is no more than a business enabler and should thus not become a goal itself.

We start off by mapping out the strategy. What this company will look like in about five years is one of the key questions in those discussions. The development steps needed to realize this strategy are presented in business terms, as part of the plateau planning. The implications of those steps for the commercial and operational organization are – at least to certain extent – part of the plateau planning. The actual timing of these steps is yet unknown for various reasons, among which uncertainty regarding the timing of the liberalization (of the postal market).

Behind every plateau there is a Go/No-Go decisions to be made. The Program Primary Process was originally intended as a single program, but we are currently splitting it up in multiple plateaus. Items such as Induction Management, Human Resource Management and Event Management are now associated with the appropriate business developments. Of course, there is still a need for a basic (shared) infrastructure like the Enterprise Service Bus, which will thus also require investments.

Projects and programs are a valuable means of enforcing decisions regarding the organization's strategic and tactical development. This also applies to the Program Primary Process.

Another strong point of the Program Primary Process is that it helps to visualize the current challenges. Both the operational and commercial organizations now realize they need to collaborate, and the Program Primary Process has helped to accomplish this.

Everything is documented inside ARIS; all the current processes are already part of the repository. We are making sure all undocumented processes and future changes will be documented inside ARIS as part of the program activities. A second step would be the validation and assessment of these processes by the business. However, I am not sure if this will ever happen, because the information in ARIS is limited to architectural information, and thus not documented in a business language. Furthermore, a highly innovative company that goes through a lot of changes will benefit more from concepts as Business Process Modeling and Business Process Reengineering than a company like TNT Post. As mentioned earlier, about 10 years ago, we developed and introduced a new process, which has only been optimized since then. It is highly questionable whether or not a broad collection of architectural tools is needed in such an organization. This can also be seen with the impending liberalization of the postal market; Mail NL will be active in a commodity market, which results in the need to set up the operational processes as lean and mean as possible. Once that is accomplished, the organization will probably move on for another decade. There is no need for this organization to be very agile as a whole. The organization's architecture function should be in line with this kind of developments; it does not yield much added value to realize a structured and controlled alignment of the architecture function and the business.

However, Enterprise Architecture may be very valuable in case of outsourcing questions. Although we have not outsourced anything yet, there are a number of developments in this area. A company will always want to maintain its controlling function in case of subcontracting and the differentiation of sorting and distribution networks. An Enterprise Architecture function should be able to support these developments, although it should be noted that such endeavors are not a matter of months. The Current Architecture can be used to identify and visualize the dependencies throughout the organization with the to-be outsourced parts.

At Mail NL, Enterprise Architecture will be used mostly in the context of projects and programs. In case of smaller, secondary developments, the Enterprise Architecture is used as a 'mirror' for the business; i.e. to identify conflicts relating to the overall strategic development direction. Conclusively, architecture primarily has a facilitating function.

#### **What are your thoughts on the development of Mail NL's architecture function?**

I expect us to be moving towards a construction with Domain Architectures, in which we would have a separate Domain Architect for each domain in Information Management. Those domains could be based on the

organization's process chains such as the Primary Process, Order-to-Cash and Human Resource chains. That would result in five domain architects, with an additional Lead Architect. The latter would be responsible for the governance on the Enterprise Architecture level and the consultation with the T&I department, where policy that exceeds the divisions is being developed.

Additionally, I believe there to be a role for Information Analysts, which we do not have at this time. The organization that was constructed about ten years ago incorporated a broad selection of applications and this organization thus focused on functional administration. With the anticipated transition, there is an increased need for Information Analysts and architects, and less need for functional administrators.

I am not sure if the Enterprise Architecture function should be organized at division level, or as close to the business as possible. In the first case, the Enterprise Architecture might take on a control-like role, instead of a facilitating role. There might always be a reason to deviate from the Enterprise Architecture: it might be cheaper or faster, or the business value of certain developments is not determined yet, which asks for a more experimental approach.

**You already mentioned the financial crisis as an influential factor for the introduction of Enterprise Architecture at Mail NL. Can you think of any other factors?**

First of all, the transition from traditional business silos to thinking in process chains naturally leads to a desire for an increased overview and insight in the relationships within the organization.

The pressure on exploitation costs is a second factor. The development of the application landscape has also led to a great amount of interfaces that need to be maintained. In such a case, the need arises to lower these costs, which requires some sort of framework – an architecture – for the creation of a smaller application landscape.

The connections with our suppliers and clients are opened further and further. Specific examples of this development are: automated order-landing, quality feedback, but also aspects such as sub-contracting and self-billing. Some sort of architecture is needed to coordinate and govern this kind of development. These developments could even be taken a step further, by providing clients insight in the current operational capacity and using capacity-dependent product pricing. In order to accomplish this, the operational process (Primary Process) would also need to be developed with a certain architecture in mind.

As mentioned before, these developments are for the most part commercially driven. Previously, Enterprise Architecture mostly came from the IT-sector and involved a technical approach. We have been working on the introduction of Enterprise Architecture for about two to three years now. Most of these efforts were technology-driven and performed in collaboration with ICT Mail and T&I. Due to the technological character of these efforts and the lack of business involvement, the business did not consent with these efforts. From a SAP perspective, this technological approach was valid, but in case of the organization's core business processes, the availability of process knowledge is a must. Due to the current business developments and the fact that Enterprise Architecture methodologies are slowly transforming into a standard and open method with a less significant focus on IT, architecting is no longer considered to be purely an IT affair and also introduces added value for the business.

However, there is still hardly any business budget available for the development of (a part of) an Enterprise Architecture. It is still extremely hard to find a business sponsor for the initial development of architecture and the aforementioned fundamental infrastructure. For now, financing should thus be arranged by the Information Management department.

## INTERVIEW VI

Interviewee: Henk Willemse, Information Architect  
 Department: Technology & Information  
 Date: February 27, 2009

**You have been working for TNT Post for quite some time now. Can you elaborate on the organization's history in relation to architectural development?**

I started working for TNT Post in 1989 at the department Automation Mail ('Automatisering Post'). Just around 1992, this department was outsourced to the Telecommunication department, where the involved activities were phased out slowly.

Data management was one of this organization's first architectural activities (although it was not mentioned as such). It involved aspects such as the Corporate Data Model. This development took place in the mid eighties and about 10 people were involved. These activities were mostly concentrated on the logical layer of the three (conceptual, logical and physical) data layers. The policy regarding the basic registrations has been developed at the start of the nineties. This policy states that system proprietary information is maintained in the basic registration, whereas non-system-proprietary information is maintained elsewhere in the Corporate Data Model.

At the beginning of the nineties, the business units Expedition, Distribution and Transport developed their first Information Plans. The application of these Information Plans was most successful for the Expedition business unit, whereas they were hardly used at the Distribution business unit. This led to individual development of the Information Plan(s) of Expedition.

Before the year 2000, functional and data specifications were already developed, but in the case of functional specifications there was not yet any relation with processes.

The early nineties brought about another important development in the context of architecture: the Technical Facilities Infrastructure project ('Technische Voorzieningen Infrastructuur', TVI). The introduction of the Track & Trace service had an impact on the entire organization, which raised the desire for a new infrastructure and a Reference Architecture that could be used to implement this infrastructure. At that time, ITIL process functionality was heavily scattered throughout the organization. This was the first time the aspects process, application and infrastructure were looked upon with the main questions "What does this company demand?" and "What has the market to offer?"

The ICT Mail department was formed roughly around 1996, together with the original business units. At that time, the IT budget resided at the ICT Mail department. This made a reduction of IT costs almost impossible, because the demand for ICT Mail's services would remain unchanged. Therefore, the IT budgets were moved to the business units. However, this created new problems: there was an increased pressure on the ICT Mail department in terms of quality delivery and business units started to hire external suppliers to fulfill their IT demands.

The period between 2000 and 2003, the so-called Millennium period, did not bring along any new developments and there was little to no attention for aspects like the data model. One of the causes was a high turnover of staff.

In 2002, KPMG developed a Grand Design on the utilization of SAP at TNT Post. This eventually led to the development of the SAP Roadmaps in 2004, which have created the foundation for the current SAP architecture.

After the T&I department already did some architectural work by means of the T&I policy guidelines, the actual start of the current ICT Mail architecture trajectory can be traced back to the arrival of the current Manager Application Services at the ICT Mail department, in 2005. Due to a major reorganization of the ICT Mail

department, further development of the architecture was stalled until 2006. Also, in 2005, the decision to use the DYA process methodology was made. The choice to use ARIS for Business Process Modeling was made by the end of 2005, after which the ARIS software was acquired in 2006.

In 2006 we started using ARIS for Business Process Modeling. The Application Architecture of Mail NL was added to the ARIS repository, early 2006. Although the Application Architecture appeared to be ArchiMate, the underlying structure was badly implemented, which made the models unusable. The conventions for the models of the Application Architecture were finally completed in 2008.

In 2007 the CEO of the Mail division issued a decree on the IT expenditures. As a result, the CAPEX procedures were tightened. However, this did not lead to improvements in terms of collaboration.

Mid 2007, the Parcels business unit did some architecture projects in collaboration with VKA (Verdonck, Klooster & Associates). These architecture efforts were evaluated at the end of 2007. During that evaluation, there were about eight participants, of which only one representative of the Parcels business unit. All other participants were either representatives of ICT Mail or T&I. The natural conclusion was that there was a lack of business involvement from the Parcels business unit and a lack of architectural knowledge. Furthermore, the architecture efforts were mostly aimed at segments, which resulted in an inconsistent collection of architectures.

During the past year, Mail NL, Cendris and the Parcels business unit have developed and delivered architectures.

**The Program Primary Process is the first major architectural operation of Mail NL. Where did this program originate from and how did it evolve?**

The program can be traced back to December 2007. The large application landscape resulted in enormous exploitation costs and integration problems, which in turn led to an increase in the duration of development projects. Surprisingly, a great amount of applications also appeared to be inactive. A lot of these applications originate from business discussions on new tools for relatively unimportant activities. Often, an existing application is circumvented with a slightly differing alternative. There are too many discussions on subjects that do not relate to the organization's core business.

At the end of 2007, the first development step for the Program Primary Process was taken. This eventually led to the delivery of the Design Charter Program Primary Process, about half a year later (mid 2008). The Design Charter was basically a Goal Architecture for the Primary Process; it contained the process model, but also the underlying application functionality and the projects that would be needed to realize the design.

In August 2008, an operational architecture team was formed within the Program Primary Process. This team was responsible for the development of Project Architectures and discussed various architecture related topics.

The program was halted in November 2008, due to a lack of business attention. Additionally, people became aware of the fact that the organization's process model was going to change drastically within the next five years. By means of information that was provided in staff and management magazines, a draft of the organization's potential development direction was made. This fundamental map was then used to gain business support.

Currently, the Information Management department is ready to work out the outcome of this iteration. However, the current involvement of the Logistic Strategy department and the Marketing & Sales business unit is still limited. Furthermore, there is a lack of resources to initiate the program or the individual projects. The lack of budget has been one of the main reasons for the development of the Project Portfolio and the related management process(es).



The newly formed Core Design Team focuses on the redesign of the Primary Process. Naturally, future market developments are taken into account in this redesign. The original Design Charter now only serves as a source document. The occupation of the Core Design Team will be broadened, compared to the original occupation in the Program Primary Process. However, the actual fulfillment of the Core Design Team is yet to be completed.

**Can you state some factors, internal or external, that influence the process of introducing Enterprise Architecture and accompanying processes at Mail NL as well as the Enterprise Architecture process itself?**

It should be noted that this company has a very small IT footprint; its operational ICT expenditures only account for a few percent of the organization's turnover. This is illustrated by the fact that TNT Post has over 60.000 employees and only about 15.000 work stations. Thus, the overall effects of cost-cutting in the ICT-sector are very small and consequently, IT does not have any management focus on a corporate level in this organization. Therefore, the IT-sector has to communicate well towards the business.

There is an evident communicational gap between both parties. For example, when the business wants to have a new application and it specifies that this application would be business critical, this has major implications for the required service levels and resulting costs. Once the business is finally informed of these consequences, it turns out the business had different expectations.

There is a strong competence problem within TNT Post, which manifests itself through the entire organization. It used to be worse than it is now. I do not believe this has anything to do with TNT Post's history as a governmental organization. Instead, the high turnover of IT staff – many employees move to another company within about three years – makes it difficult to maintain gained knowledge and experience. For example, the introduction of ARIS has taken about four years now and we are finally creating some content in the repository. This is mostly caused by a general lack of competence to develop these kinds of things fast and properly.

It is not so much a factor, as it is a general decision making characteristic, but on a management level, people often tend to act in favor of their own gain. This should be taken into account, in order to prevent it from becoming an obstacle at the moment of decision making.

**Can you elaborate on the application of Enterprise Architecture towards the business and high level management processes?**

First of all, I believe it to be a very interesting time for the application of architecture, now projects are being cancelled due to the recent budget cuts. The reduction of activities creates a less complex and more controllable environment for the introduction and application of Enterprise Architecture. However, this is not automatically the case.

It is very important to improve the communication towards the business. In that context, I should note that I believe ARIS to be no more than a modeling toolkit for the architects. As such, it should not be used in any communication towards the business, not even for validation purposes. ARIS should just be used as a central architecture repository, to store business developments and decisions as well as corresponding consequences and implications, which should also be stored and communicated with the business.

The communication towards the business should take on the form of brief memos, in which large problems are split up into several small steps that are comprehensible and practical for the business. For example, once in every two weeks, the Enterprise Architecture – by means of the architecture team – could issue an Architecture Direction Statement in which the aggregated architectural developments are translated into usable business information.

Additionally, I believe architecture can be used to control technical diversity, in order to prevent new diversification of applications.

**How do you think the Enterprise Architecture process and function of Mail NL will evolve in the near future?**

I expect the design check – in which projects are assessed in terms of long-term architectural compliance – to become an integral part of the Portfolio Management process. I also expect there will be an increase in architecture-driven projects, i.e. projects that are initiated by the Enterprise Architecture.

I think our architects will have to become more pro-active towards the business. Architecture should have both a fetch and supply function; i.e. architects should not only supply the organization with architectural information, they should also actively try to get information from the organization and the business in particular.

The current Information Managers are too occupied with the line organization, which creates a demand for additional architects. I believe there were plans to move towards a situation with about eight architects within the Information Management department.

Lastly, the Information Plan will become a major Architecture Direction Statement; an informative document with ARIS as a modeling basis.

## INTERVIEW VII

Interviewee: Wim Reedijk, Manager Application Services

Department: ICT Mail

Date: March 6, 2009

**You stated earlier that you do not believe in a strict top-down architectural approach at TNT Post, but instead favor a facilitative architecture function. Can you elaborate on this?**

In my opinion, it will become increasingly difficult when the architecture function is imbedded higher in the organization. The process that results in the development of corporate strategy is very organic and I am not able to recognize such a process in the organization. In the context of master plan discussions and the Program Primary Process, I am seeking a framework that depicts the organization's goals and the overall development direction for the next few years, and this often leads to a level at which the strategy is said to be classified. In my opinion, something that is kept secret will not be realized.

In terms of management structures on a strategic level we do have a very vague process and every once in a while I notice some governance practices, but I am not able to witness any consistency in these processes. I have never witnessed this in such an extreme manner.

I have performed some studies on the Application Architectures of the Parcels business unit and the EMN business line, with resulting application landscape designs. At the Parcels business unit this has led to an entire program, which has now been finished. At this point, a new development cycle should be initiated. Although the continuation of this development is the subject of many discussions, the concept of architecture is employed once more to structure further development. However, the amount of effort it takes to accomplish this is a bit disappointing and it is only done when necessary; i.e. in the context of programs and projects. I have been doing similar architecture projects at other organizations and it always took a lot of time to make people aware of the added value of such a structured way of working and thinking. It takes a lot of time to reach a situation in which people automatically use an architectural map to determine the best solution and approach for a problem. I should also note that this does not fit in this organization's corporate culture, which has always relied on the fact that we are processing mail in a highly visual and autonomic process. This is a very operational organization and as such it is very similar to the production of newspapers – I have previously worked at a publisher – where tomorrow's newspaper always has the top priority.

I have worked for multiple stock market-listed companies and at every single one of those companies the long-term focus was limited to a period of five quarters. As far as that goes, TNT Post is no exception. This is very disturbing and frustrating for the organization's long-term development as well as its supporting (IT) systems. This increases the need for an architectural approach, because this provides a non-financial way of looking at

future developments. It can help to determine the sequence of small development iterations in the big picture, i.e. the overall development direction of the organization and the operational activities. This makes it possible to somewhat control the development of the operational activities.

**How did the application of (Enterprise) Architecture at TNT Post evolve in recent years?**

I have started working at TNT Post in August 2005, so I am currently in my fourth year. When I started working here, I immediately noticed that the term 'architecture' was mostly used in the context of infrastructures. The infrastructure and the consolidation of the infrastructure has been ICT Mail's success story since its founding; the stories about ICT Mail's cost reduction can all be related to the infrastructure. The infrastructure has always been the property of ICT Mail and T&I, and the clients were charged for the exploitation of this infrastructure. ICT Mail thus had complete autonomy in the decision making relating to the infrastructure.

At that time there was hardly any form of Application Architecture, as the applications were not property of ICT Mail. The applications and accompanying budgets were scattered throughout the entire organization and there was no incentive to perform some kind of application consolidation. This was one of the first things I noticed when I started working here, because I have been active in projects and programs aimed at application consolidation. That kind of development was not picked up by this organization, not only due to the scattered budgets, but also due to the fact that the organization's governance was highly segmented. Departments – and even certain topics within departments – have always been highly autonomic and there has been little integration in terms of applications as well as organizational governance. Even though there has been a consolidation of business units within Mail NL, this has not resulted in a single organizational entity; the Parcels business unit still functions as a highly autonomic business unit.

**The focus had to shift from the infrastructure towards application. How did this commence?**

When I started working here, I created three themes: (1) a more process-driven way of working at ICT Mail Application Services, (2) the distribution of responsibilities within the ICT chain and (3) Application Architecture.

The first theme concentrated on the Application Services department of ICT Mail. At that time, one could still recognize the five departments ICT Mail originated from. I wanted to divide all activities in three aspects: renewal, maintenance and awareness on the goal and future development of applications. In order to accomplish this, I needed to split activities. In some cases a single person was responsible for all these aspects. I believe application renewal to be a completely different competence than application administration and maintenance. This also applies to thinking about the future and strategy of the application portfolio. These are all different competences, which therefore need to be performed by different persons. This theme was based on the Application Services Library, a framework for application management. (Van Der Hagen, Hinley, Meijer, Van Der Pols, & Ruijgrok, 2001)

The second theme concerned the distribution of responsibilities within the ICT chain. In the past, I used to negotiate directly with the business, but nowadays there are three instances sitting between me and the business. The current ICT chain involves the business, Information Management, Functional Administration, ICT Mail Application Services, ICT Mail Infrastructure Services and a number of external parties. This could result in a total five Project Managers on a single subject. These additional layers act as a filter between the client (the business) and the supplier (ICT Mail). Besides being inefficient this also results in obscure communication and lower quality.

The third theme focused on Application Architecture and application landscapes. From my personal perspective, this means trying to persuade Information Management to think about this topic. The only way to optimize Application Management and Application Services – while still only operating as a supplier with financial resources and application property residing elsewhere – is to become a super influencer. We have tried to design an application landscape for the Operations business unit of Mail NL, which eventually failed due to a lack of business attention and the involvement of the wrong consultants.

We did the same for EMN and the developed corporate structure is still in use. The Parcels business unit got stuck in a program, after which an architecture study and several efforts towards application consolidation were initiated. All applications in the logistics chain were decomposed and this functional decomposition was then redefined into services, which offered a lot of opportunities to reduce the number of application components. At that time, the management got involved and further development was transferred back to the organization itself, but unfortunately, this was not carried out well.

Conclusively, we are performing studies on the level of processes and applications for various domains, such as the Primary Process of Mail NL, Corporate at EMN and the Internet Architecture of Marketing & Sales at Mail NL. Unfortunately, these initiatives mostly fail due to a lack of business interest or the involvement of the wrong business representatives.

Another recurring problem is the fact that either the business considers itself to be the main decision maker, or it postpones discussions until it has formed its own opinion. This problem is illustrated by a discussion on the application of Internet I once had with the Marketing & Sales department of Mail NL. I asked about the multi-channel strategy: What kind of service will be provided to which type of clients? The subject of the discussion was a project proposal to develop a universal Internet shop for the whole spectrum of clients, which I considered to be impossible, but more importantly, the wrong question also. The decision to develop one or ten Internet shops should be made by the ICT sector. Instead, the business should state a number of (functional) requirements, after which we should determine the most efficient technical solution. The business was making choices on the wrong level of abstraction.

During the Program Primary Process we had a similar experience. The Logistics Strategy was classified to us, after which we decided to determine the most probable strategy by means of analysis and best practices in the field of logistics. The involved choices appeared to be fairly straightforward. There is really no need for a complicated strategic approach. The same applies to the commercial strategy. We already know mail will eventually disappear, it just takes extremely long. We will have to develop new products and new structures in order to survive in the long run. However, this organization really lacks such a structured way of working.

**Can you elaborate on the introduction of such a more structured way of working at the business?**

TNT Post has a bottom-up organization with a strong operational character. In order to establish an architectural way of working, one has to involve a very broad spectrum of the organization. The ongoing cost reductions are not helping either; people are forced to focus on the short-term, which reduces the possibilities of developing a long-term strategy. It is really difficult to promote an architectural way of working within this organization. That also applies to the communication on the subject: this organization has insufficient charismatic and powerful people who are able to 'sell' the concept of Enterprise Architecture. Furthermore, TNT Post is a very hierarchical organization in which it is considered to be inappropriate to raise your voice or surpass your manager. As a result, it is extremely difficult to get enough attention for an architectural way of working, let alone to make people understand the concept of Enterprise Architecture.

We are currently working with master plans, such as the Master Plan ICT, with a number of data models. I believe there to be an increasingly important role for the incorporation of architecture. Due to the liberalization of the postal market, the organization will have to shrink significantly; i.e. about 30 to 50 percent. We will not be able to carry on with our current way of working, because our process' has a certain level of cost and requires an organization that will not be compatible with the expected size of our future activities. As a result, it is no longer possible to optimize the existing operational process. Instead, a structural transformation will be needed.

At one of my previous employers, Kluwer, we discovered that about 80 percent of the resources were spent on a collection of products that contributed to only 20 percent of the annual turnover. Eventually, about 10.000 of the original 15.000 products were discarded. The situation at Mail NL is similar; we have a lot of products with high exploitation costs due to related activities and order processing. An analysis of the value for every order

line showed that 20 percent of the order lines contribute to 80 percent of the total turnover. The other 80 percent of the order lines thus only contribute to 20 percent of the total turnover. Each order line has a fixed amount of costs.

I think architecture will become more and more important in this context, because a new structure needs to be developed. However, this is currently almost impossible considering the operational character of the organization and I suspect it will take some time for the organization to act upon this.

Architecture can also help to maintain calmness within the organization. Once problems occur, an architectural overview can be used to determine the exact location of the problem(s) and the (encapsulated) measures needed to solve them. Without such an overview, the organization will be less efficient in its efforts to solve the problems. Architecture can thus help to encapsulate problems and according measures.

**Another interviewee mentioned the ‘SAP, unless...’ policy as an example of a discussion that could be prevented with the use of improved communication and, possibly, architecture. What are your thoughts on this topic?**

The ‘SAP, unless...’ policy has been a very politically-loaded decision. The organization feels to be forced into this policy. The Marketing & Sales business unit feels to be hampered by this policy and thus puts the item on the management agenda. Furthermore, people that came from a smaller organization consider the SAP system to be too expensive, but they seem to be unaware of the organization’s size. And last but not least, the SAP system has been introduced bottom-up (by ICT Mail), while SAP actually requires a top-down approach because it connects all parts of the organization. Forcing such a policy and way of working onto an organically formed organization naturally leads to discussions. The increased efficiency – an order only needs to be recorded once – of such a system is often taken for granted.

By means of SAP, we are trying to structure aspects that have been unstructured from an organizational point of view. Furthermore, SAP seems expensive because it makes certain already existing costs explicit, such as staff and administration tasks. This also forces the organization to think about the collection of products on a strategic level. Although there are only seven to ten differing actions in the operational process, we provide over 1.000 products. Instead, we should have about 10 different products with a number of additional parameters. Additionally, there are still a lot of opportunities to lower operational IT costs, by further reducing the size of the application landscape. For example, a system with almost the same size of SAP is used for the input of orders at the Business Counters, whereas the order processing is done in SAP. By using a single order input interface for SAP, this system would become redundant.

**What is your opinion on the development of the Enterprise Architecture in the next few years?**

First of all, the architecture function will need to remain as pragmatic as possible and should not be attached too high in the organization. TNT Post will always stay an operational oriented company and the architecture function should maintain a connection with the operational part of the organization. The architecture team could eventually take on the form of a staff department, but I do not expect this to operate on a purely strategic level.

Additionally, there is a discussion on the location of process knowledge. One of the considerations in the overall IT arrangement of the master plan is the expansion of the Information Management department with process knowledge. This does not imply that Information Management will become the key decision maker for these processes, but it could offer the facilities that are required to maintain them. This would also make it easier to respond to (changing) information needs. Currently, the first step in a process is to map out the current process. The business is asked to describe the process(es) and sometimes we even ask them to write this down, but these are not the kind of competences and skills you can expect at that part of the organization. There is a general lack of skills to document and model processes. The same goes for Information Analysts; our Information Managers are more Managers than they are Information Analysts. There is a strong need for

people that are able to write down functional requirements, something that is now a secondary activity of Project Managers. The essence of an Information Management department is thus not available.

**You already mentioned a number of added values of Enterprise Architecture for the organization of TNT Post and Mail NL, can you think of any additional added values?**

The most important added value of Enterprise Architecture is the fact that it can be used to structure (the development of) the organization and its parts, and thus provides an increased overview in various situations. This should be the primary function of the Enterprise Architecture. This added value has many advantages, such as the ability to partition the organization and its supporting systems, while still maintaining the correlations between these parts, which makes it easier to encapsulate developments.

Outsourcing is a much-heard topic, but we – TNT Post – are often providing very detailed specifications. We consider ourselves to be quite large and force certain decisions upon our suppliers or partners. We are basically writing specifications on such a detailed level of abstraction that we could as well implement the solution ourselves. If we really want to outsource, we should govern these developments on a higher level of abstraction. Enterprise Architecture might help to increase this level of abstraction and I thus consider this to be an important added value. On a side note, TNT Post is transforming more and more from a performer into an organizer; we will increasingly use services from partners instead of performing them ourselves, with the goal of cost flexibilization. Architecture may help to determine the optimal points for organizational or service decoupling. Also, it can help to create the instruction and contextual specifications for the supplying party.

**Can you think of any internal or external factors that influence the introduction of Enterprise Architecture and the resulting Enterprise Architecture process at Mail NL?**

The financial crisis is an important factor. The challenge of finding people with the required competences (Architects, Information Analysts and Program Managers) is another one. It is a major challenge to get business attention for the concept of Enterprise Architecture, and communicating on the concept in such a way that it is not too abstract and considered to be unimportant by the business.

Lastly, considering the fact that about 25 to 50 percent of the current staff will have to disappear in the next couple of years, it might be difficult to find enough people for an architectural way of working in the future. On the other hand, this might also be an opportunity, as it will result in situations in which a different level of abstraction is required.

## ADDITIONAL NOTES

Respondent: Peter Schoneveld, Information Architect  
Department: Information Management, Mail NL  
Date: June 8, 2009

All the initiatives to determine a Goal Architecture within the scope of TNT Post that I have witnessed so far have failed. This might be caused by the high amount of uncertainty the organization is faced with, which is (among others) caused by substantial decrease of mail volume, necessary cost reduction and failed collective labor agreement negotiations. In my opinion, the incorrect organization of the Enterprise Architecture function is another cause for the failing of these efforts.

The people that are responsible for the communication between business and IT and the people that are responsible for the IT itself are not able to determine a Goal Architecture. TNT Post is primarily a company with a substantial human factor in terms of operational costs. When looking for more efficient ways of working, it becomes obvious there is much more to gain by optimizing and redesigning processes and rationalizing products than there will ever be by improving our IT. On the other hand, the biggest hurdle for the realization of this increase in efficiency resides in the same human factor, and not the IT sector. It is a great challenge to gain support for an organizational transition, when this transition will result in a large amount of organization-

wide discharges. For example, centralizing the preparation of mail for distribution yields an efficiency improvement of over 10.000 FTE equivalents. Also, in consultation with the biggest and most important clients, the products and services of TNT Post could be redefined in such a way that mail delivery could be outsourced during multiple days of the week.

The difficulties surrounding these kind of changes and the involved interests make it almost impossible to develop a Goal Architecture with the approach we have used so far. In my opinion, Enterprise Architecture at TNT Post should mostly involve the human aspect – i.e. processes – and as long as this has no prominent role in the development of the Enterprise Architecture, the resulting Goal Architectures will most likely not be very long-lasting.

The most important added values of TNT Post's Enterprise Architecture are (1) the definition of principles and guidelines for the Goal Architecture of the Application Architecture and Technical Architecture, (2) the development of the Budgeted Architecture (and additional support) in the context of programs and projects, and (3) the documentation of the Current Architecture.

## APPENDIX C – QUESTIONNAIRE PROJECTS INFORMATION MANAGEMENT

Below are the results of a questionnaire that was sent out to all employees of the Information Management department of Mail NL involved in projects, on February 5<sup>th</sup> 2009. A total of 43 persons were addressed, of which 23 persons answered and returned the questionnaire.

The Information Management department consists of five clusters, which belong to two business units. The following list provides an overview of the business units, clusters and the functions of the 23 respondents:

### **Marketing & Sales - Client Systems**

Program Manager, Technical Product Manager, Project Manager (x3)

### **Marketing & Sales - Inquiry to Cash**

Information Manager, Program Manager, Team Manager, Functional Administrator (x2), Project Manager (x3)

### **Operations - VIP**

Functional Administrator

### **Operations - Primary Process**

Information Manager, Program Manager, Functional Administrator (x3), Project Manager (x2)

### **Operations - Planning & Control**

Program Manager, Functional Administrator

A few questions of the original questionnaire have been removed from the results as presented below. These questions were mainly used to evaluate the individual architecture sessions. As such, the results are not relevant for this research.

## INFORMATION MANAGEMENT ARCHITECTURE SESSIONS

*The first few questions apply to the four Information Management architecture sessions:*

1. *Architecture basics ("De essentie van architectuur")*
2. *Architecture & Information Management*
3. *Introduction to SOA*
4. *SOA & SAP*

1. *Did you attend one of the four Information Management architecture sessions?*

No: 2 persons      Yes: 21 persons

2. *Did these architecture sessions improve your understanding of the general notion of 'Architecture'?*

No: 3 persons      Yes: 18 persons

3. *Did these architecture sessions improve your understanding of the (current and future) application of 'Architecture' within Mail NL?*

No: 2 persons      Yes: 19 persons

4. *Would you like to add any additional comments on these architecture sessions?*

The architecture sessions were well received, but the comments indicate that the knowledge exchange by these sessions is limited. Nonetheless, there is a strong need for the continuation of such sessions. The respondents added the following requests:

- The sessions should incorporate more real life examples.
- The content of the sessions should be adjusted to suit the activities of the various clusters.
- The goal of the sessions should be made clearer.



5. *What subjects would you like to recommend for additional architecture sessions?*

The following subjects were mentioned:

- Regular feedback sessions on the status of architecture initiatives and procedures, active projects, real life cases, and the evaluation of the organization's architectural developments.
- Additional sessions on the SOA topic, especially after new development iterations.
- Service design and decomposition as a result of (changing) processes, including the development of new services, the alteration of existing services, built-to-order options, etc. This could be a session for Information Analysts and consultants.
- Real world cases of other Dutch organizations.
- A more thorough session on the use of architecture in the context of projects.
- Architecture in relation to functional administration and maintenance.

## ARCHITECTURE FUNCTION MAIL NL

*The following questions relate to the incorporation of architecture in the organization of Mail NL.*

6. *Do you believe architecture to be important?*

No: 0 persons      Yes: 23 persons

7. *Is it clear to you what Mail NL wants to achieve with the incorporation of architecture?*

No: 3 persons<sup>18</sup>      Yes: 20 persons

8. *Is it clear to you who you should turn to for more information on the architecture of Mail?*

No: 3 persons<sup>18</sup>      Yes: 20 persons

*Currently, several questions are being treated as a part of the introduction of SOA and accompanying (application) services within Mail NL. Examples of such questions are the following:*

- *How to deal with the resulting shift of responsibilities?*
- *How to arrange the administration and management of services?*
- *How to determine and divide the development and exploitation costs of services?*

9. *What additional questions would you like to add to the abovementioned issues?*

The respondents answered with the following additional questions:

- What are the consequences of SOA in terms of the organization, its functions and the required (level of) education?
- How to determine in advance whether or not an activity should be implemented as a service? Who should make such decisions? Additionally: if an available service does not provide the required service level, who decides what to do?
- Is SOA just a matter of faith or is it possible to make the integral revenue from SOA tangible?
- What will be the added value of SOA for the organization of Mail NL?
- When will SOA provide which flexibilities and, more importantly, when will it not?
- What kind of projects will incorporate (Service Oriented-) architecture and which will not?
- How and when will the implementation of SOA be evaluated and, if needed, adapted?
- What quality requirements will be maintained for the introduction of SOA?
- How to deal with the turn-around time of projects? Projects may be delayed due to the introduction of SOA and due to the dependencies between projects other projects may be greatly

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<sup>18</sup> It should be noted that one of the persons who responded with "No" to this question did not attend any of the Information Management architecture sessions.

influenced. What will happen if project A is developing a service, which will be used by project B, but project A is being delayed or even cancelled? This could dramatically change the turnaround time, business case and Capex of project B. Especially in the context of important projects, this risk will not be taken.

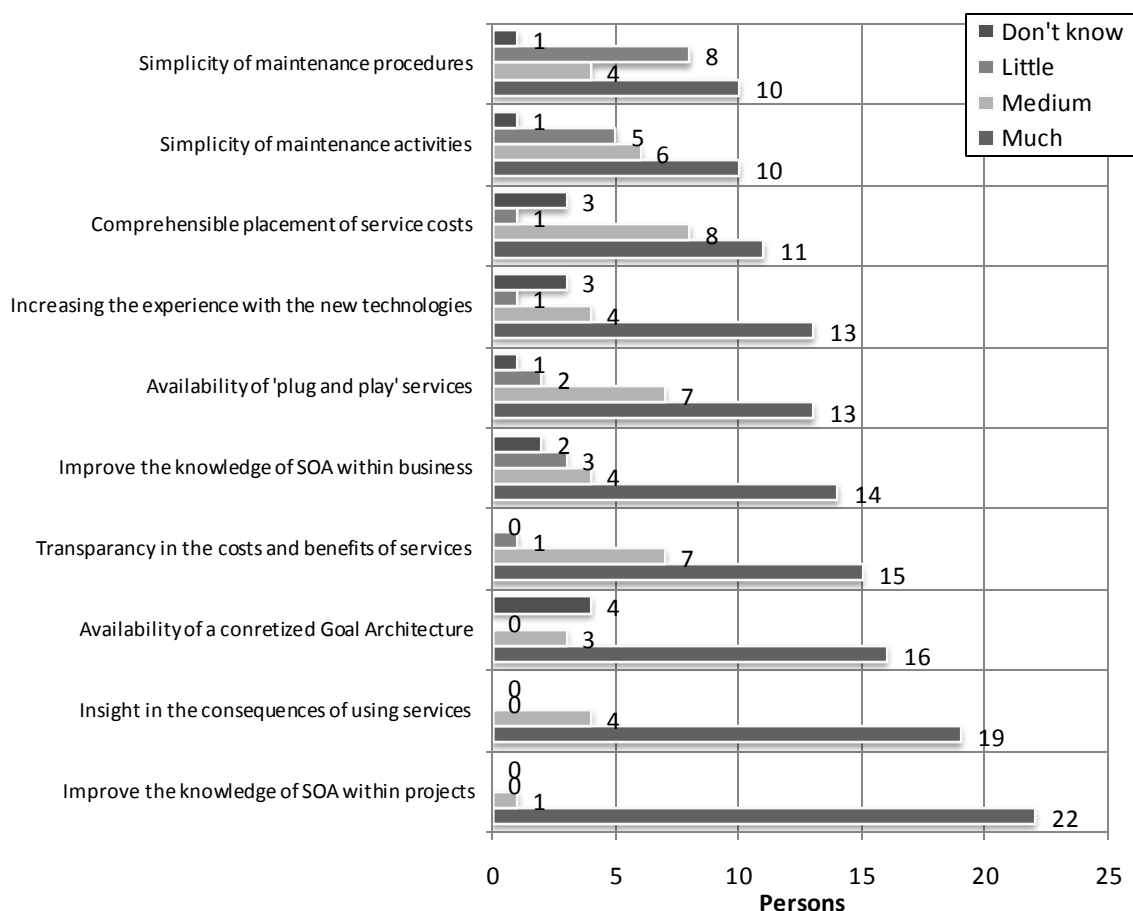
- How to deal with the introduction of SOA and consequences for suppliers with long-term contracts?

10. Can you indicate how much each the following factors could improve the introduction of SOA in Mail NL?

The results are shown in the following figure. The factors are ordered from (conceived) least influential to most influential. There were no apparent differences between the Marketing & Sales and Operations business units, or any of the clusters.

Additionally, the following factor was added to the list of factors:

- Insight in the added value of SOA for the business.



11. Do you think there should be a (concretized) Goal Architecture (to-be situation in 3-5 years) before the organization proceeds with the introduction of SOA?

No: 17 persons      Yes: 6 persons<sup>19</sup>

<sup>19</sup> There were no apparent differences between the two business units (Marketing & Sales and Operations) or any of the clusters.

12. *Do you think the introduction and application of SOA (and architecture in general) would be improved in case of the availability of a Goal Architecture?*

No: 2 persons      Yes: 21 persons<sup>19</sup>

*Currently, various governance questions are being treated as a part of the development of the architecture process of Mail NL. Examples of these questions are: “Where to place costs of architectural development and accompanying exploitation costs?” and “Who decides on new policies?”*

*One of the principles is that projects and programs incorporating process renewal are utilized for further policy development and architectural decision making, in accordance with existing policies and the overall strategic development direction.*

13. *Which additional governance questions in the context of projects and programs would you like to add?*

The respondents answered with the following questions:

- Are previously defined standards still opportunistic in a changing company like TNT Post?
- How can architecture help to determine what (and when) activities should be outsourced?
- What kind of differentiation (in terms of projects/applications) is made within the architecture?
- Who is responsible for and guards the dependencies between architecture elements?
- How to maintain the overall direction if policies are being developed within separate projects? Who will keep an overview of all these developments?
- How to check individual developments in the context of the strategy of TNT/TNT Post, for example with the help of a Design Authority?
- How to implement Project Portfolio Management in the current organization?
- What is the relation between Enterprise Architecture and Domain Architecture(s)?

Most of these questions were posed by the Marketing & Sales business unit.

One respondent added the following comment:

“In my opinion, the primary goal of projects and programs is the realization of a business need. It makes sense to do this by incorporating a broader framework the solution should fit in. However, the business will always remain responsible for the procedures and processes. The supporting system architectures should pose any restrictions on this development. Furthermore, I don’t think it would be wise to decide on program exceeding issues in the context of a project or program.

14. *Do you have any ideas or suggestions as to how governance (decision making, budgeting, etc.) should be implemented in the context of projects and programs?*

The respondents replied with the following ideas:

- Additional budget and financing should be made available outside of projects or programs, especially in the initiation phase. A client is not likely to finance development that does not lead to any benefits for his organization, even if it may be beneficial to TNT (Post) as a whole. A central budget could be used to subsidize projects that greatly help to realize the (Goal) Architecture.
- A ‘Fast Lane’ at T&I could lower the turnaround time of these projects, providing them with more time to further realize the (Goal) Architecture.
- The initial investments for the overall platform (the common infrastructure) will need to be widely supported, after which a business party will have to function as a sponsor.
- Business is always leading.
- Clear and comprehensible procedures should be used.

Centrally available funding was only (yet, multiple times) requested by the Marketing & Sales business unit.

## ARCHITECTURE & PROJECTS

*The following questions relate to the role of architecture in the context of projects and the application of the Project Architecture.*

15. *Is it clear what the goal of the Project Architecture is?*

No: 5 persons<sup>20</sup>      Yes: 18 persons

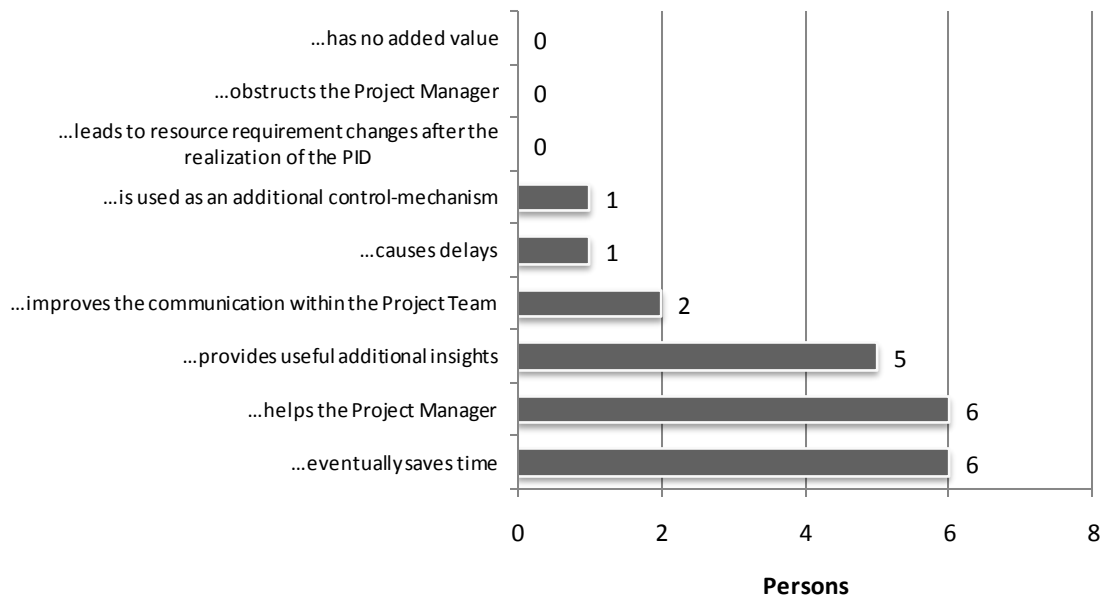
16. *Have you been involved in a project that incorporated a Project Architecture?*

No: 16 persons      Yes: 7 persons

There were no apparent differences between the two business units (Marketing & Sales and Operations) in terms of experiences with the Project Architecture (3 and 4 respectively).

17. *Which of the following statements describes your experience with the Project Architecture best?*

The results are shown in the figure below. The Project Architecture...



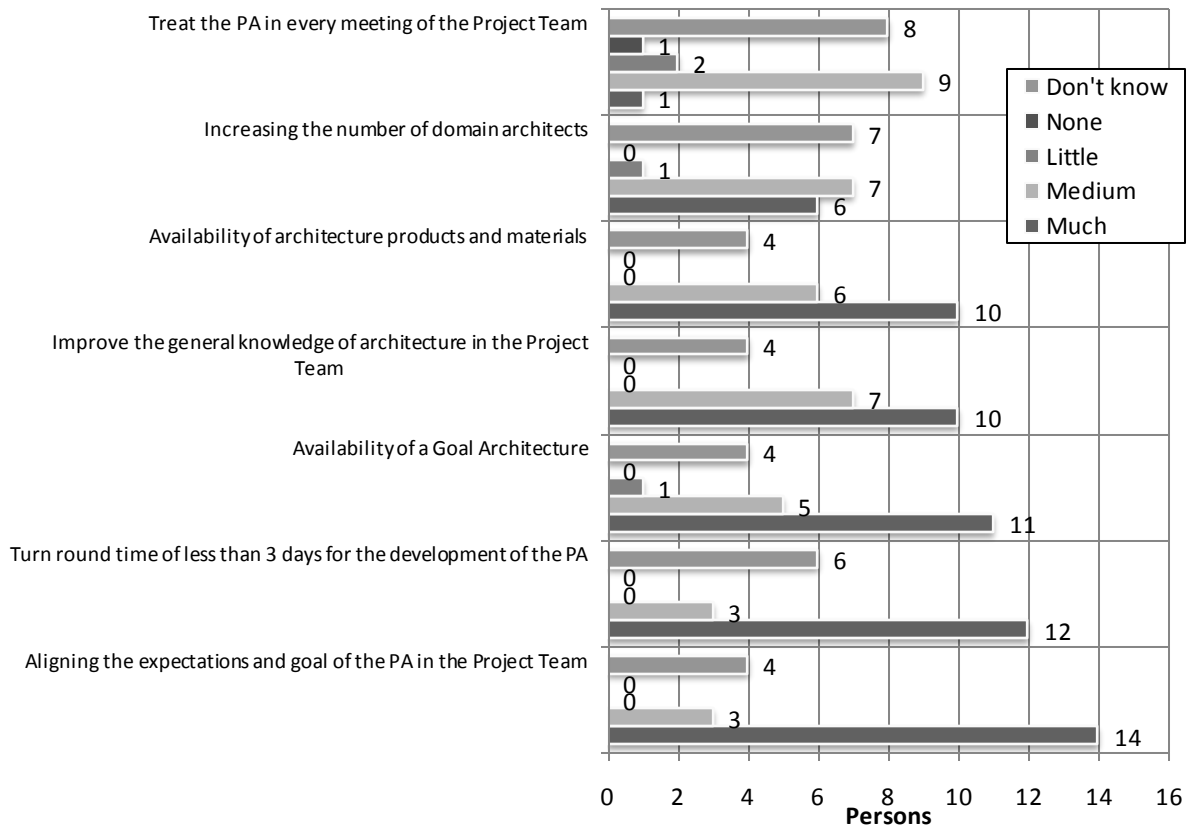
The following additional comments were added:

- The Project Architecture eventually leads to time savings for (business) critical projects and applications. The house is built 'under architecture', but the garden shed is not.
- During my project, the Project Architecture was no more than an empty shell, due to the fact that it was not sufficiently clear what the project goals were. On a side note, getting these project goals clear was considered to be part of the project's activities.

Again there was no difference between the two business units.

18. *Can you indicate how much each the following factors could improve the use of the Project Architecture?*

<sup>20</sup> Amongst the five persons who answered this question with "No" were two persons who did not attend any of the Information Management Architecture Sessions.



The following two factors were added:

1. Providing clear procedures that determine when the Project Architecture should be applied and when it should not be applied.
2. Availability of budget for the development of a Project Architecture in projects that do not have approved financing (yet).

Two persons did not provide an answer to this question and many respondents answered the question with “Don’t know”. As a result, it was not possible to identify differences between any of the business units or clusters. However, the following results were notable:

- The cluster Client Systems identified the factor ‘Turn round time of less than 3 days for the development of the Project Architecture’ as the most important factor, with all persons answering ‘Much’.
- Increasing the amount of domain architects is considered to be of much less importance by the ‘Client Systems’ cluster than all other clusters.

19. *What suggestions or ideas would you like to contribute to improve the architecture function of Mail NL in the context of projects and programs?*

The following suggestions were submitted:

- Reinforcing the architecture team with additional architects, in order to give the architecture team a more governing role within the clusters.
- Assigning a (domain) architect to every cluster. The architect will (In consultation with the cluster members) develop an initial architecture map and take on an active role in the cluster’s projects.
- Translating the (currently) abstract ideas and visions into more concretized and usable guidelines, criteria and instruments.
- Make the architecture function part of the procedures of T&I, most importantly, the Capex procedure.

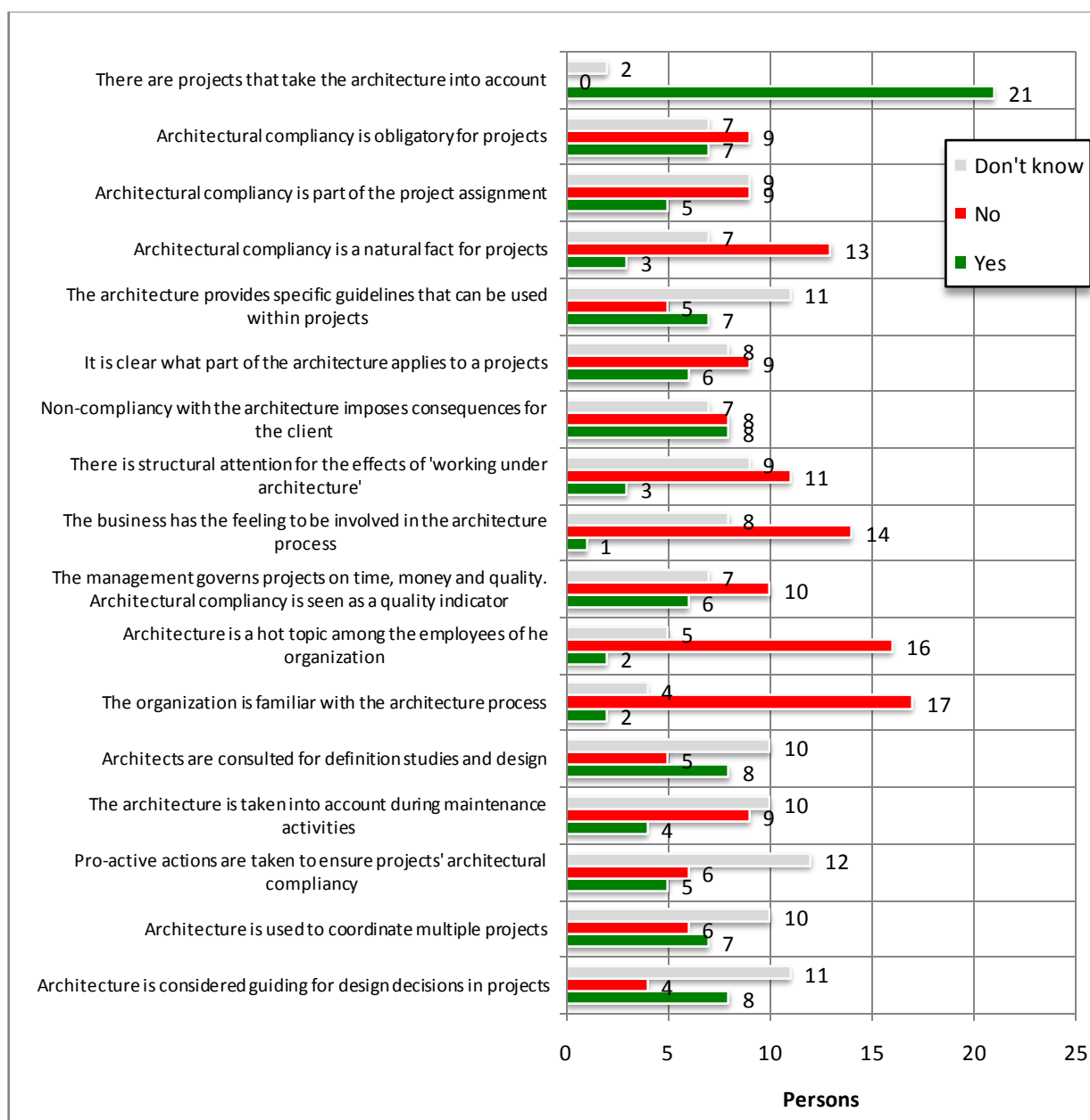
- Providing a general budget for the development of the Project Architecture within projects.
- Develop a practical and usable set of guidelines and/or rules to apply in projects
- Improving the communication with the business on architectural subjects and architecture in general. Being able to convince the business of the necessity of architecture is more important than the architecture methods itself. Currently, the focus lies too much on the IT domain.

Most input was delivered by the Marketing & Sales business unit.

## ARCHITECTURE MATURITY MAIL NL

*Below you will find a selection of a questionnaire to determine the maturity index of an organization's architecture function, as used within the DYA method by Sogeti. (Van Den Berg & Van Steenberghe, 2004)*

20. Can you specify for each of the statements below whether or not they apply to the organization of Mail NL.



Just as with question 18, it is hard to identify any differences between the two business units or any of the clusters, because the respondents often opted for the option “Don’t know”, with the first question being the only exception. This greatly corresponds to the much stated comment that TNT Post – Mail NL has only just started its architecture endeavors and the experiences with architecture and its processes are still fairly limited. This lack of experience naturally makes it difficult to make a valid assessment on the abovementioned aspects. However, the following results were notable:

- The Operations business unit opted more often for “Yes” on “Architectural compliancy is part of the project brief” than the Marketing & Sales business unit (4 versus 1, respectively).
- The cluster Client Systems seems to have more insight on the architectural scope of projects than all other clusters (3 out of 5 respondents of Client Systems opted for “Yes” on statement 6).
- All respondents of the Client Systems clusters opted for “Yes” for “Architecture is considered guiding for design decisions in projects”, whereas the respondents of other clusters mostly opted for “Don’t know” for this statement.
- Lastly, the answers on the statements differ greatly between all the respondents. Furthermore, the answer on the statement greatly depends on a persons’ interpretation of both the statements and the way of working within Mail NL. The fact that many persons have not yet been involved with a Project Architecture is an example of a source of this diversity.

21. *In case you have any additional comments on architecture in general as well as its application within Mail NL, you may provide these below.*

The following comments were added:

- Support for architecture could be increased by clear communication on the topic.
- It will take some time before architecture will become self-evident and will be accepted as a standard way of working without being seen as bureaucratic obstacle. Architecture requires little effort but leads to many benefits.
- We (Mail NL) just started with the application of architecture in our organization and it will take a lot of effort to ensure it will not end up in ‘hollow phrases’ and ‘empty promises’. Therefore, I specifically did not provide any favorable answers.
- In my opinion, TNT Post’s projects and programs are currently strongly governed on time and money, in lesser degree on quality and hardly on architectural compliancy. TNT Post’s architecture is still in its infancy and the current efforts to put the subject on the organization’s agenda should be encouraged. Eventually, this will lead to respondents opting for “Yes” more often.
- For me personally, the last statements in the previous questions were posed too early. So far, I have not had any experience with architecture and its incorporation in projects. It would be interesting to present this list of statements again in a year.
- The current movement with increased attention for architecture and the idea that projects should take architecture into account is very good.

## APPENDIX D – COMMUNICATION FRAMEWORK

Both Mail NL and ICT Mail have created their own architecture portals<sup>21</sup> to centrally disclose their own architecture documentation. As a result, the following three architecture portals are in use:

1. T&I ICT Guidelines
2. Architecture Mail NL
3. Architecture ICT Mail

Each architecture portal only stores documentation and information that is considered to be relevant for its own organization. Links are used to refer to documentation that is stored on other locations, to prevent abundant storage of architectural information.

The architecture portal of Mail NL contains all architecture products that are relevant within the organization of Mail NL. All architecture products are stored in their corresponding Domain Architecture, which might be the entire organization of Mail NL or a smaller domain such as a single department.

The Enterprise Architecture is mostly developed and maintained in the context of projects or programs. As soon as an architectural product is validated, it will be migrated into the Enterprise Architecture of Mail NL and maintained as such.

Figure 25 illustrates the collaboration and relations between the three architecture portals and individual projects.

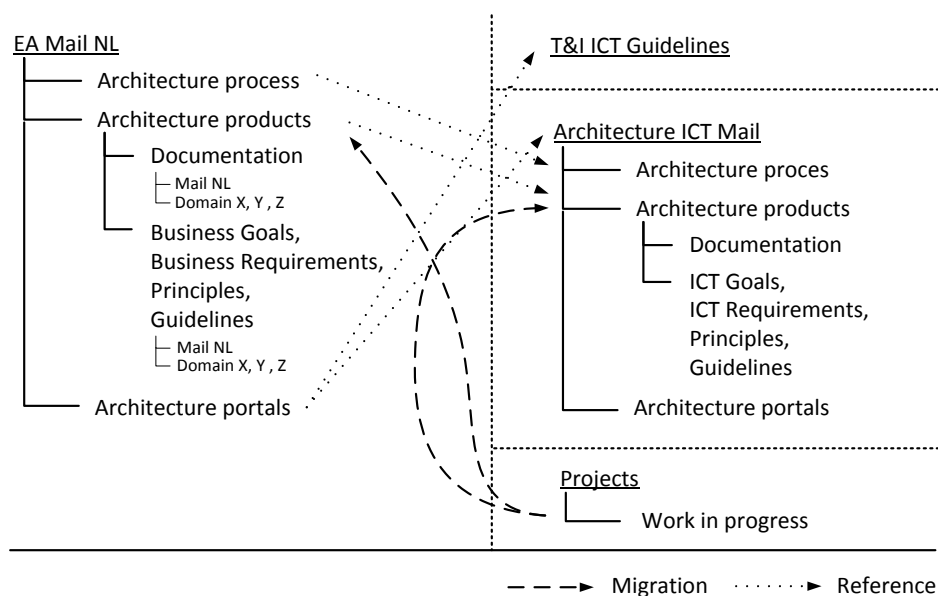


FIGURE 25 RELATIONS BETWEEN ARCHITECTURE PORTALS

The SharePoint website 'Architecture Mail NL' has the purpose of a central portal website, which implies the existence of links to documentation on other locations. In order to maintain these connections and the usability of the portal, involved documentation is subject to a number of conventions that should help ensure the maintainability of the portal and contained documentation.

<sup>21</sup> The architecture portals are created with Microsoft SharePoint, the main communication tool on TNT Post's intranet.



## DOCUMENTATION GUIDELINES

The following guidelines apply to all architectural documentation of Mail NL.

- Guideline 1. Filenames are static and only contain the document title; the version number and date are not part of the filename.
- Guideline 2. Concept versions are not made available on the architecture portal of Mail NL.
  - a. A document is no longer considered to be a concept as soon as its contents are being applied in practice. The designation 'concept version' is therefore not linked to the document's version number.
  - b. The filename of a concept version contains the prefix "\_concept\_".
- Guideline 3. The PDF format is used to publish documentation on the architecture portal of Mail NL.
  - a. Documentation that should be delivered on the architecture portal of Mail NL is delivered in the PDF file format by the document's owner.
  - b. The document's owner is responsible for the storage and availability of the original (editable) version of the document.
- Guideline 4. Only documentation that is maintained as a part of the Enterprise Architecture of Mail NL is stored on the architecture portal of Mail NL.
  - a. Documents that are not stored on the architecture portal of Mail NL but do need to be made available in the context of the Enterprise Architecture of Mail NL are stored on the SharePoint website of the respective owner and linked from the architecture portal of Mail NL.
- Guideline 5. Every published version of a document has a new version number.
- Guideline 6. The version number of a document as displayed on the architecture portal of Mail NL corresponds to the version number in the document.
- Guideline 7. Architecture documentation uses a standard layout (see below).
- Guideline 8. Universally valid entities (such as information, conventions and definitions) are presented and maintained in a single document (repository, location, etc.).
  - a. New universal entities should be added to the most appropriate documentation.
  - b. Information that does not belong in a document, or is maintained elsewhere should be incorporated by means of reference and not be copied.

## STANDARD LAY-OUT OF TEXT DOCUMENTS

All architecture documentation of Mail NL uses a standard lay-out, which is based on the standard TNT Post document template.

The content of the document is preceded by the following elements:

- I. Cover page
- II. Version and distribution history
- III. Table of Contents

The contents of the document start off with an introduction that describes the document's purpose and goal, the context and scope of its contents as well as the anticipated target audience. In case necessary, this section should also contain a reading guide.

The contents of the document are concluded with one last additional section:

- IV. References
  - a. Internal document sources that were used for the production of the document.
  - b. References to internal documentation.
  - c. Additional literature.

## APPENDIX E – ARCHITECTURE MATURITY SCANS

As of February 2009, two architecture maturity scans had been performed within the 'Generiek Spoor' committee of ICT Mail. This committee mostly consists of representatives of the ICT Mail department, with additional representatives of T&I, Information Management Mail NL and the Parcels business unit.

The DYA Architecture Maturity Model (Van Den Berg & Van Steenberghe, 2004) is used for the assessment of TNT Post's architecture function. The architecture maturity levels were determined by means of the consultation of experts and document research.

The first scan was done in October 2007 and showed a maturity scale of 0 or 1 for most areas of attention for the scope of TNT Post. These results were then used by the committee to determine the target maturity scale: the realization of maturity level 3 by July 2008. The second scan was performed in July 2008 and showed a significant increase in the maturity scale of most areas. The results of this scan are shown in Table 5.

<i>Maturity Scale</i>	0	1	2	3	4	5	6	7	8	9	10	11	12	13
<i>Area of Attention</i>														
Development of architecture		A			B			C						
Application of architecture			A			B				C				
Adjustment with business		A				B				C				
Adjustment with development process			A				B		C					
Adjustment with administration/maintenance					A			B			C			
Relation with existing situation					A				B					
Responsibilities and authorities				A		B					C			
Coordination and development							A			B				
Governance				A		B		C		D				
Quality management								A		B			C	
Management of architecture process							A		B		C			
Management of architecture products					A			B					C	
Commitment and motivation		A					B		C					
Architecture functions and -training				A		B			C			D		
Application level architecture method				A						B				C
Consultation			A		B				C					
Architecture tools							A				B			C
Budget and planning				A							B		C	

**Legend:**

A/B/C/D Maturity Levels



Realized maturity scale



Gradual development

TABLE 5 ARCHITECTURE MATURITY SCAN JULY 2008

## APPENDIX F – TEMPLATE PROJECT ARCHITECTURE DOCUMENT

Below, the structure of the Project Architecture document is presented, along with short explanations on the content of various sections. Existing models and new models should be included by means of references, to prevent redundant models and to ensure that these models are maintained and edited in the proper (single) modeling environment.

### 1. PROJECT

#### 1.1 Introduction

*A short description of the Project Architecture, this document, and their goals.*

#### 1.2 Goal

*A description of the project's goal in 5 lines of text with references to all relevant business goals.*

#### 1.3 Reason

*A summary of all the motives to start the project: the business drivers (including references to more detailed descriptions such as business plans) and/or technological drivers (including references to more detailed documentation such as annual plans of the ICT department).*

### 2. BUSINESS ARCHITECTURE

#### 2.1 Delimitation

*In this section, the project is projected on the existing Business Architecture models for processes, organization, products, services and information. In case of the absence of models, these models are created, based on the project's scope.*

##### 2.1.1 Organization

*Provide an overview of all external stakeholders for the project and their interests and which parts of the internal organization benefit from or have interests in the results of the project.*

##### 2.1.2 Products and Services

*Provide an overview of the products and services that are involved in the project, by making use of existing product models and portfolios, which may span both the as-is and to-be situation.*

##### 2.1.3 Processes

*Provide an overview of the processes (and directly related processes) that are involved in the project and which processes, by making use of existing process models, which may span both the as-is and to-be situation.*

##### 2.1.4 Information

*Provide an overview of the information involved in the project and which processes, by making use of existing information models, which may span both the as-is and to-be situation.*

#### 2.2 Project exceeding design decisions

*This section provides an overview of all design decisions with a scope that exceeds the project's scope and for which yet no existing architecture principles and guidelines are available. Every choice is documented in a separate paragraph, featuring the decision, the alternatives and the decision criteria.*

##### 2.2.1 Design Decision 1

##### 2.2.2 Design Decision n

#### 2.3 Architecture principles and guidelines

*This section presents all references to all the relevant architecture principles and guidelines. Principles and guidelines the project is absolutely sure to comply with can be discarded. Non-existing principles and guidelines are also described in this section. Each of the architecture aspects is treated in a separate paragraph.*

##### 2.3.1 Organization

##### 2.3.2 Products and services

##### 2.3.3 Processes

##### 2.3.4 Information

#### 2.4 Architecture deviations

*In case of decisions to deviate from the existing architecture, these deviations are documented in this section, including references to the involved principles and guidelines, the motive for the deviation and the measures to compensate for the deviation.*

### 3. APPLICATION ARCHITECTURE

#### 3.1 Delimitation

*In this section, the project is projected on the existing application landscape(s) and data models. In case of the absence of models, these models are created, based on the project's scope. The relevant models should be presented, along with an indication of the directly involved elements and the elements that are involved through direct interfaces and/or connections.*

3.1.1 Application Services

3.1.2 Data

3.1.3 Applications

3.2 Project exceeding design decisions

*See 2.2*

3.3 Architecture principles and guidelines

*See 2.3*

3.4 Architecture deviations

*See 2.4*

#### **4. TECHNICAL ARCHITECTURE**

4.1 Delimitation

*In this section, the project is projected on the existing infrastructure models. In case of the absence of models, these models are created, based on the project's scope. The relevant models should be presented, along with an indication of the directly involved elements and the elements that are involved through direct interfaces and/or connections.*

4.1.1 Platform

4.1.2 Middleware

4.1.3 Network

4.2 Project exceeding design decisions

*See 2.2*

4.3 Architecture principles and guidelines

*See 2.3*

4.4 Architecture deviations

*See 2.4*

#### **5. DECISIONS**

*It may be useful and preferred to document Project Architecture related issues and decisions in the Project Architecture document for future reference. As such, this section may be updated regularly throughout the project. By using an additional section for these 'dynamic' aspects, a separation is made between architectural aspects that were known from the start of the project and aspects that were introduced or treated during the project. At the end of the project, the issues in this section should be assessed from an architectural point of view, to determine the required follow-up actions.*

*Architectural decisions are documented individually and grouped by architecture layer (Business, Application, and Technical).*

5.1 Business Architecture

5.2 Application Architecture

5.3 Technical Architecture