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ICT in Business

Enterprise Architecture as an enabler for successful care-service delivery in a dynamic healthcare environment.

Name: Arno de Boer
Student-no: s1310488

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1st supervisor: Drs. Bas Kruiswijk
2nd supervisor: Dr. Hans Le Fever

MASTER'S THESIS

Leiden Institute of Advanced Computer Science (LIACS)
Leiden University
Niels Bohrweg 1
2333 CA Leiden
The Netherlands

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Preface

During my study at the university of Leiden I experienced 3 lucky changes in my life; the birth of my first daughter Milou, the birth of my second daughter Jessa and the birth of my first son Torean. These positive changes added a huge amount of extra challenges in completing my study.

I am proud that I have found the strength to complete the study in these very hectic times. A huge part of this strength was delivered by my loved ones especially my fiancée Nanda Felix who helped me carrying on even when doubt arose. A very special thank you to her for unburdening me.

Arno de Boer, 2016

Abstract

Problem

As a result of the major transitions in the Dutch healthcare market care service providers face a major challenge. They need to maintain the current quality level of its care services whilst being confronted with increased complexity in accountability demands and decreased funding.

Research and research questions

In this light we investigate how enterprise architecture may help a care service provider in meeting this challenge. More specifically our research is about:

- 1- finding the core elements (business services and processes) that build the care service delivery architecture and
- 2- their guiding principles to enable a care service provider to successfully respond to the changes in the healthcare market and with that realize a care service reference architecture.

This brings us to the following main research question:

- What care service enterprise reference architecture (CASERA) enables care service providers to successfully respond to the changes in the healthcare market?

The answer to this question is built on the following support sub-questions:

- What is (the current state of) enterprise architecture?
- What is the architecture of the care service delivery process?
- What changes occur in the healthcare market?
- How do these changes impact the care service delivery architecture?
- What guiding principles can be extracted to build the care service enterprise reference architecture?

Approach

To find the answers to these questions we needed to gain insights in the care service delivery process, the changes in the healthcare market and how it impacts this process. These insight were gained by conducting interviews with care experts (people with specific knowledge regarding care service delivery) and with care attendants (people that deliver care services on a day to day basis). The answers to these interviews were analysed, enriched with information from documents of regulatory and legislative institutions. These were transformed into 'architectural requirements' on which we based the development of the care service architecture. To build this 'architecture' we needed to know what architecture is and conducted an intensive literature study on enterprise architecture. The outcome of this study was a framework with viewpoints to model the requirements. By using a design science approach in modelling we build the reference architecture on a 'build'- 'evaluate' cycle.

Results

In this thesis we have modelled a care service delivery architecture and its transition as a result of the recent changes in the healthcare market. Based on these models we have extracted guidelines and main elements to enable a care service provider to successfully respond to the changes in the healthcare market. These guidelines and main elements ultimately form de Care Service Reference Architecture.

PART I: Research start-up and design

1 Problem definition & context

1.1 Problem definition

Organizations that provide care services to people with psychiatric, mental, intellectual and / or social disabilities face major changes. These changes can be characterized by three major movements (Van Rijn, 2014)

- There are changes in the way health care is financed which results in major cuts in funding which forces these organizations to make its operations more efficient.
- An increase in complexity and dynamics regarding accountability requirements
- There is a focus shift in the way politics, science and society looks at these care services. From a focus on 'nurturing a disabled person' to a focus on 'supporting a civilian in 'increasing the level of self-reliance'.

Organizations are looking for ways to respond to these changes without discontinuing the quality of care-services they currently deliver.

Effective and coherent digitalization to increase the effectiveness and flexibility of its business processes may be crucial in meeting these and future challenges. Therefore in this thesis we investigate how Enterprise Architectures can enable care-organizations to transform their processes and (digital) structure in a coherent, controlled yet responsive manner so they can meet the challenges and demands they face. A research that is executed with Promens Care as a reference case.

1.2 Context: the 'changing' care service delivery environment

The context of this thesis is formed by 'the 'care service delivery process' which is the core activity of care-organizations. This context is depicted in figure 1. The figure and the description below is based on the modelling activity that is described in Part III of this thesis. The aforementioned changes in the healthcare market have the biggest impact on this context. *In the figure this is marked with a green color.*

This context is centred around the client, a person in need of guidance and support. This client consumes care services from the care service provider. The care service provider has professional care attendants who actually deliver these care-services to the client.

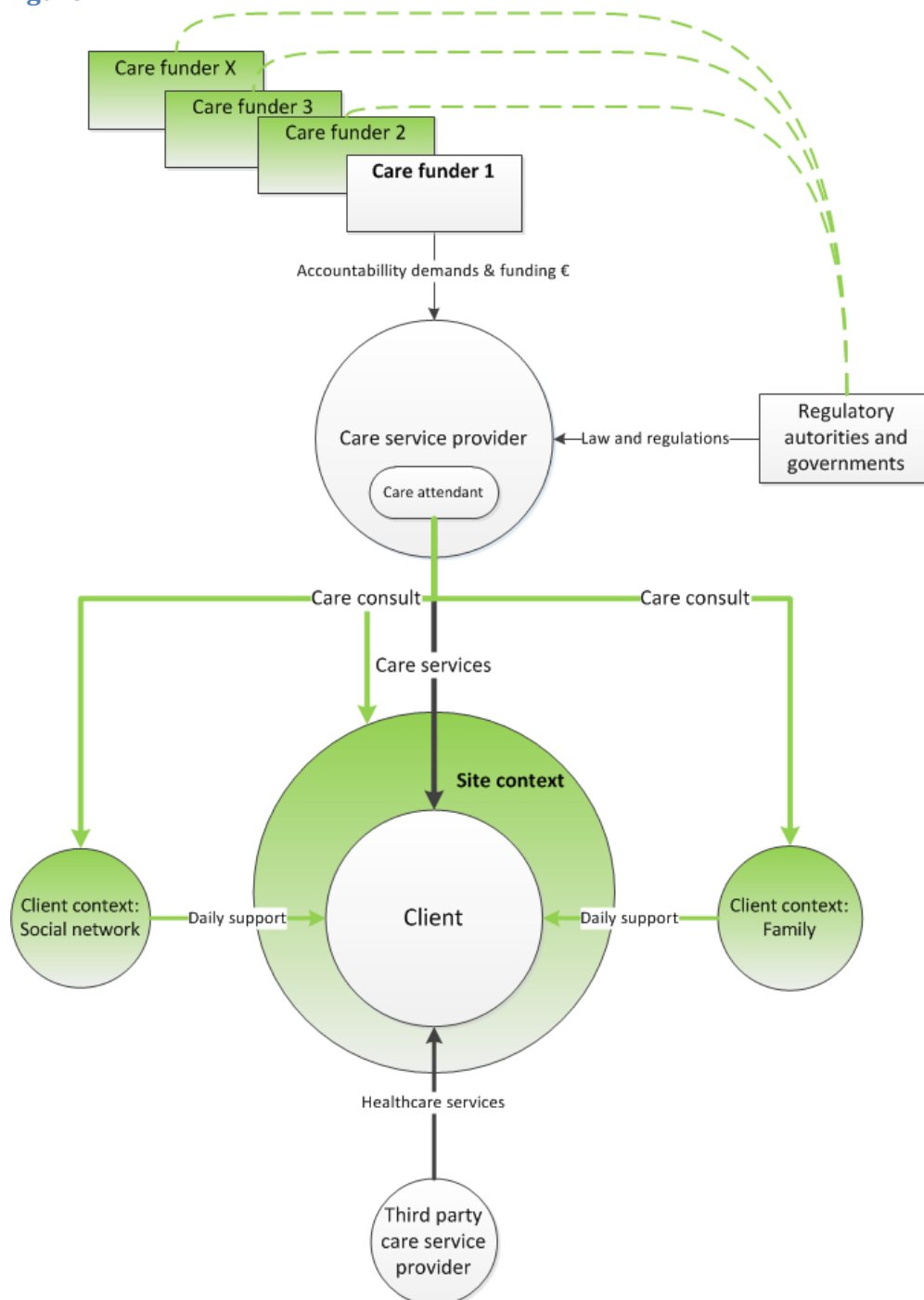
The care service provider receives funding from the funder, an organization that pays for this care service delivery. The care service provider needs to comply with accountability demands from its funder and law and regulative demands from regulatory institutions and governments. The figure shows that care service providers are confronted with increased complexity where more funders have more accountability demands. The green dotted arrow in the figure means that (local) 'governments' also have become funders

On a global level the model shows a focus split from the care attendant as a result of the changes; besides delivering care services to the client he now also delivers what we could call 'care consult' to:

- 1- enable the client context (the family and/or social network of the client) to deliver informal care to the client. The increasing activity of informal care is a direct consequence of a reduction of funding and the focus on self-reliance; to increase the level of self-reliance the idea is to enable the clients social network (family, friends and neighbours) to support the client.
- 2- Deliver consult to the site context (people with a potential care need that live near the physical location where the care service provider is active and may need support).

This context will be the main focus-area of this research.

1.2.1 Figure1



2 Theoretical frame: Enterprise Architecture

As a result of changes in the way healthcare is financed and organized, a care service provider is forced to change its primary processes. Enabling change in a coherent way is the main focus of Enterprise Architecture. Within this thesis we are searching for the aspects and elements of enterprise architecture that may help guide the transition of the key process of a care service provider.

As we will see further down this document the service concept plays a central role in Enterprise Architecture. The service concept is a unit of functionality that some entity (process, system or department) makes available to its environment and has value for certain entities in the environment. In Enterprise Architecture the service is one of the two enablers that can guide the agile enterprise. As a language for modelling enterprise architecture, ArchiMate has embraced the service concept as a key in creating a common language that helps bridge communication gaps between stakeholder that are central in a business process.

Throughout this document the service concept is central in determining the conditions in which Enterprise Architecture enable and guide change in the care service delivery process. We use ArchiMate to model this and the enterprise architecture concepts and activities to visualize and communicate this. Enterprise Architecture is elaborated in detail in Appendix V where we build a framework (the CASERA-framework) that is used in this thesis to model the care service delivery process and to extract guiding principles to form a reference architecture.

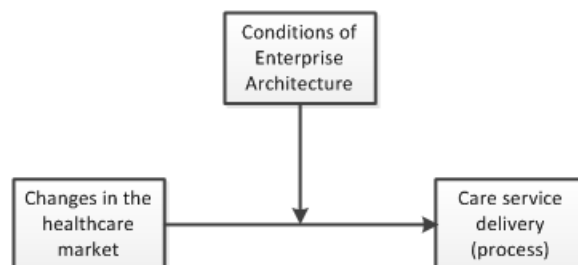
2.1 Conceptual model

This research is based on three concepts:

- 1- Conditions of Enterprise Architecture
- 2- Changes (the healthcare market)
- 3- The Care service delivery process

Figure II is the conceptual model of this thesis. It shows that changes (independent variable) may impact the care service delivery process (dependent variable) and that enterprise architecture may (positively) influence the way the changes in the healthcare market effect the care service delivery process and help this process coping with these changes.

2.1.1 Figure II



In this thesis we are searching for the way Enterprise Architecture can positively influence the impact changes have on the care service delivery process. This leads us to the following objectives and research questions.

3 Objective and research questions

3.1 Title/theme:

Enterprise Architecture as an enabler for successful care service delivery in a dynamic healthcare environment.

3.2 Primary objective

In this thesis, we conduct a research on how an enterprise architecture can enable a care-service provider to successfully respond to the developments and the demands from the healthcare environment. More specifically the objective here is to find out what core elements exists and/or should be realized within a care service provider and the conditions (guidelines, requirements) they must meet to enable the needed changes within a care service provider.

These elements and its conditions build the reference architecture for care service providers.

3.3 Main Research Question:

What care service enterprise reference architecture (CASERA) enables care service providers to successfully respond to the changes in the healthcare market?

From the main research question and the main objective the following supporting sub questions can be extracted:

3.4 Sub questions:

3.4.1 What is the current state of enterprise architecture?

In the first part of this thesis we are searching for what Enterprise Architecture is. Based on relevant literature, we will explore, examine and analyse enterprise architecture and search for the key characteristics that make up the enterprise architecture processes and its elements.

As we will see in analysing enterprise architecture its characteristics may have changed over the years. Within answering this question we will also make a contribution to further shape the enterprise architecture definition. The ultimate result of this sub question is a framework to model the care service delivery process. We call this framework the CASERA –framework (see Appendix V).

3.4.2 What is the architecture of the care-service delivery process?

Based on key findings that are extracted from interviews and care-process document study we found out the core processes, services and activities that make up the care service delivery process and modelled them. Through modelling them, using the viewpoints of the CASERA-framework (chapter 12) we found out how the architecture of the process should be constructed in its entirety. This resulted in a refinement the key process findings and a set of architectural requirements.

In Appendix II the final version of these findings are listed. In Appendix IV the Architectural Requirements are listed.

3.4.3 What changes occur in the healthcare market that impact this process?

Through conducting interviews and studying internal Promens Care documents and documents from external regulatory and funding organizations the concrete changes and its impact on the care

service delivery process are identified. The outcome of this inventory is recorded in the key changes (Appendix III).

3.4.4 How do these changes impact the care service delivery architecture?

Through modelling these changes in the architecture of the care service delivery process we extracted how the identified core services and processes need to change. These needed 'architectural changes' refined the Architectural Requirements and are recorded as such in Appendix IV.

3.4.5 What guidelines can be extracted to build the care service enterprise reference architecture?

Based on the composition of the care service delivery process and its changes we can extract guidelines that could be applied in general to build and change a care service architecture and its delivery process. Combined with the requirement's and models the CASERA- framework is then transitioned into CASERA (CAre, SService,Reference Architecture.)

3.5 Scientific relevance

- The outcome of this thesis will be a reference architecture that could help care organization to better meet the changing demands in the care-market. This kind of model does not exist in this form for these kind of organizations.
- The model will be built on the information that will be given to us by care-professionals (experts and attendants). Most reference models are based solely on managerial information i.e. information that is provided by functions and roles that have a certain distance to the care service delivery process.
- Most reference models deal with the funding side of a care service provider.
- ArchiMate has not been used to model changes in a care-service environment and the effect this has on the care-service delivery process within a care-organization.
- Through conducting the literature study and actualising its definition we contribute to the existing body of knowledge surrounding enterprise architecture.

4 Delimitation

In order to formulate solid answers to the research questions we need to address the borders of this research. Below we have summed up the limitations and scope of the research.

4.1 Care service delivery process and its relations

Part III of this thesis makes clear that a care service provider has three main processes, two of which can be identified as primary processes. This thesis has its main focus on one of them 'the care service delivery process. Details of the other processes will not be included in this thesis. However its relations to the other two processes will be included.

4.2 Detail level

This exploration is focussed on how EA can help guide a care service provider through the current changes. The level of detail that is used is determined by the extent to which it contributes to the objective of this research. When necessary details will be added, when unnecessary details will be left out.

4.3 TOGAF and ArchiMate form the core of the CASERA-framework.

Not all aspects and theory of enterprise architecture will be used and discussed during this thesis. Although other literature will be referenced, at its core the CASERA –framework will be built upon ArchiMate and TOGAF related literature.

4.4 Business layer and upper part of the application layer

Enterprise Architecture consists of several layers, some literature define 3 other define 4 layers. With ArchiMate and TOGAF being central we define the following three layers:

- Business
- Application
- Infrastructure

Our main focus is building the business layer, its relation to its environment and the functional part of the application layer. Regarding the application layer our focus lies on finding the services that should exist to directly support business processes and how to support them. How they are realized will not be part of this research.

4.5 Technical architecture is out of scope

The logical consequence of the delimitation mentioned in 4.4 is that the technical architecture does not fit within the boundaries of this research.

4.6 Situation in 2014: funding by the care-agency

This 'care service delivery process' description is based on the general process that was applicable until the end of 2014. This process, which was generating for 95% of the income of Promens Care, is directly funded by the care- agency.

4.7 Focus area of change in 2015

The change part of CASERA is focussed on the following three major changes that were a result of the major 'reorganization of the act for exceptional healthcare costs (AWBZ). The AWBZ is a collective insurance that covers long term need for healthcare that is not covered by regular healthcare insurance and cannot be insured individually.

The following changes fall within the scope of this research:

- The changes that were a result of the transition from AWBZ (act for exceptional healthcare costs) to the 'juvenile law' (Jeugdwet)
- The changes that were a result of the transition from AWBZ to the 'social support act' (Wet Maatschappelijke Ondersteuning)
- The changes that were a result of the transition from AWBZ to the act for enduring and intensive care (Wet Langdurige Zorg)

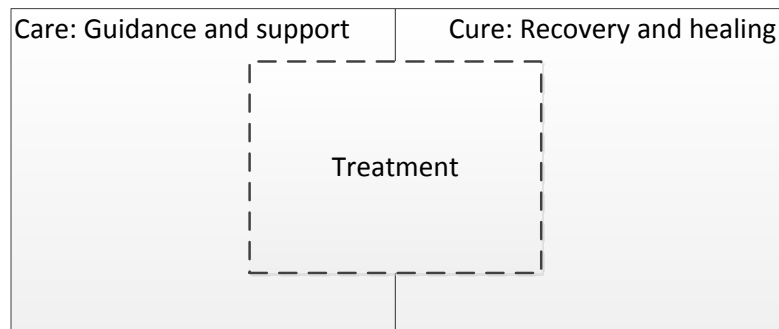
Other changes are less applicable to the care service delivery process and are therefore out of this scope.

4.8 Treatment is excluded

Dutch healthcare is organized with a distinction between 'cure' and 'care'.

- Care-services are focused on delivering guidance, counselling and / or support to a person that has a disability with a more chronic character.
- Cure- services are focused on recovery, healing and rehabilitation of a person with a temporary disability

Treatment resides on the boundary of care and cure. See the figure below:



There are 2 main reasons to exclude treatment from this study:

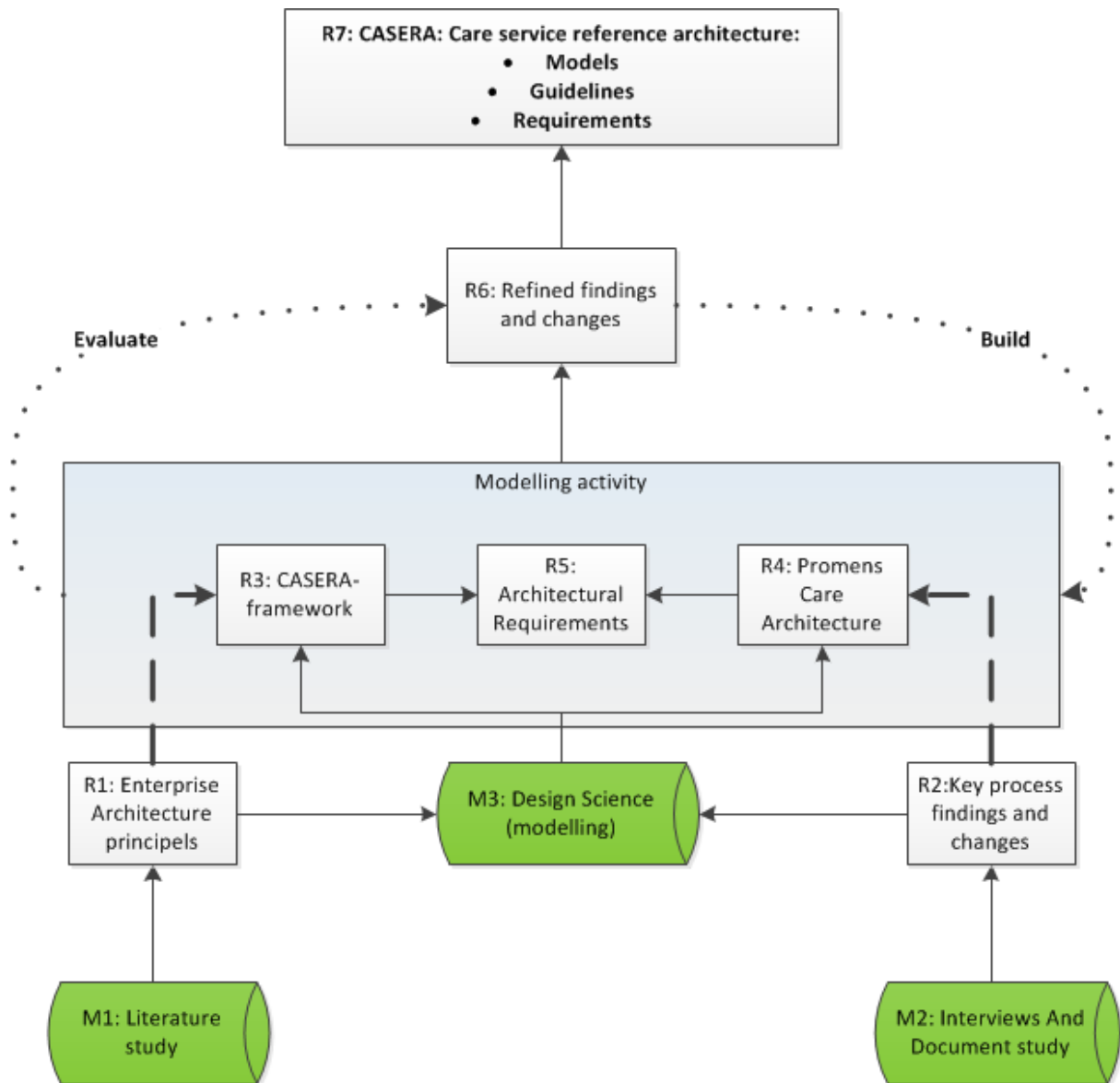
- 1- Its specific nature that deviates this from 'care guidance'
- 2- None of the changes mentioned in 4.7 have a relevant impact or an effect on this kind of healthcare services

5 Research design & methodology

Critical in performing solid scientific research is that the researcher needs to clarify in an unambiguous manner how the results and findings have come about. This will be detailed in this chapter

5.1 Research design

Below we have depicted the main road of this thesis. The green parts refer to the methodologies that are used while the white parts refer to the main results of this thesis.



The figure is to be read from bottom to top as follows:

Through conducting literature study (M1) we will search for the main enterprise architectural principles(R1). By modelling these architectural principles (M3) the CASERA- framework (R3) is developed. The main input for developing this framework are the key enterprise architectural principles (R1). This is depicted through a 'dotted line' and is solely a result of the literature study.

A set of key process findings and its changes (R2) surrounding the 'care service delivery process' are the result of conducting interviews and document study within daily care service delivery practises in our reference case Promens Care (M2).

With the objective and main research questions of this thesis in mind, this framework (R3) is then used to model (M3) the care service delivery architecture and its changes (R4). Based on a 'build' and 'evaluate' cycle the modelling activity brought us insights that resulted in architectural requirement's (R5) and refinement of the findings (R6). The key process findings and the architectural requirement's form the basis for developing the reference architecture by extracting the final architectural output (requirement's, models and guidelines, R6).

In 5.2. the different methodologies are described, in chapter 6 one model will be elaborated to clarify the analysis process.

5.2 Research methodology

5.2.1 M1: Literature study Enterprise Architecture

The research regarding existing theory is conducted through literature study that deal with the concepts of Enterprise Architecture and the architecture modelling tool ArchiMate. This activity has the aim of creating a theoretical framework that forms the basis for the development of the theory (in this case the care reference architecture)

5.2.2 M2: Interviews of professionals within the 'care service delivery process'

This main characteristic of this research is that it moves towards the development of a theory on the basis of daily practices, which forms the core of qualitative and explorative research. The result we aim to deliver is a model that visualizes and prescribes an architecture of a care-service process that is aligned with the demands of the changing healthcare-market. Because the search for answers is done in the workplace of the professional that delivers the guidance and support services or supports this, knowledge is obtained "through the eyes of the other" (Jonker en Pennink, 2004)

5.2.2.1 Interviews of professionals in healthcare

To develop the theory we need to know both the theory as described in 5.2.1 and the (practical) business problem (problem domain) that needs to be solved.

To create a deeper understanding of the business problem there are three underlying subjects that need to be analysed and considered, both of which are addressed by having face to face interviews with professionals that perform activities within Promens Care, our reference case.

The underlying concepts that need to be considered are:

- 1: Insights in (the day to day practice of) the care-service delivery process
- 2: Insights in the changing demands that originate from the changing healthcare market
- 3: Insight in how these changes affect the care-service delivery process

To gain these insights we have interviewed care-professionals that are part of Promens Care, a representative organization that delivers care-services as mentioned in the context. The interviewees are selected based on their function:

- they need to be care-attendant or a care-expert (someone who has expertise in a specific area within a care service organization).
- they need to deal with subjects that are a result of the changes as mentioned in the context.

There are two types of interviews, one type with the care attendant, the person that delivers actual care services on a day to day basis and the care expert, the person that supports this delivery and is relevantly involved in the changes.

All the interviews and its elaborations will be realized in the following manner:

- **1: Interviewing the care-professionals**
- **2: Making a report of the interview**
- **3: Verifying the report with the interviewees**

The following paragraphs describe how we have come from answers to interview questions to key findings and key changes.

5.2.2.2 The accumulation of the output of the interviews

After the verification by the interviewees the answers of the interviews are accumulated in the following order:

- ➔ For each question the answers are put under another.
- ➔ For each question the answers are undoubled
- ➔ For each question the answers are compiled substantively and translated into 'aggregated answers' by:
 - Merging the answers without changing the content
 - When necessary logically reformulating the answers without changing its content
 - Putting (parts of) the contents of various answers under the right question. *During the interviews several answers were made that belong under other questions than the one the care professional was answering.*
 - For each question, these 'aggregated answers' were compared with the original answers to verify that all information was still intact.

5.2.2.3 Formulating 'key findings'

Analysis of these statements form the basis for conducting some additional document and care related literature study from the following main sources:

- the information in formal documents that reside within Promens Care's quality manual
- external care-related formal documents.
- external care related subject specific websites.

This activity made it possible to solidly extract 'key findings' which made a direct link with the modelling activities (chapter 6) possible. The 'key process findings' and 'key changes' are described in appendix II and appendix III respectively and lie at the core of all models and conclusions within this thesis. To clarify this analysis one model will be elaborated in chapter 6 which will include the elaboration of a key finding.

5.2.3 M3: Design science

The primary aim of this study is developing a reference enterprise architecture for care- service providers. Enterprise Architectures deal with the concepts that exists within and 'on the boundaries of ' information systems and business processes. As such it resides within the field of information system research which addresses the interplay among business and information technology.

When working towards the development of a theory within the field of information system research it can be argued that the best route to come to a model in this way is the design science method (Hevner et al, 2004):

- The design science method builds artefacts that meet business needs; at this point in time there is no model or set of artefacts that enables a care-organization to better meet the changing demands in of the healthcare environment.
- The design science method seeks to create models or products that form the basis for effectively developing information systems and/or redesigning processes. Because enterprise-architectures describes both business as well as information system requirements and aspects it can be used to develop, purchase or adjust information systems.
- In the design science method knowledge and understanding of a problem (business) domain and its solution are achieved with the development and use of a model or artefact. This artefact can then be used as a solution to a business problem, in this case 'the problem of having a care-service delivery that cannot meet the changing demands of a healthcare environment effectively'.

A key aspect of design sciences is that the design is both a process and a product (of course the same can and will be said of enterprise architecture in part II) and as such research conducted needs to address both the design as well as the evaluation of the artefact. So the visualizations are built on an 'build-evaluate' cycle. During this build and evaluation cycles insights have risen (Key modelling findings, Appendix IV). Together with the key process findings these insights form the basis for the modelling results and guideline extraction on which we will build the reference architecture.

6 Elaboration of the analysis process

Understanding the analysis process is crucial in solid scientific research, therefore in this section we will elaborate one model based on the accompanying key process findings and (derived) architectural requirements. This is done in two parts:

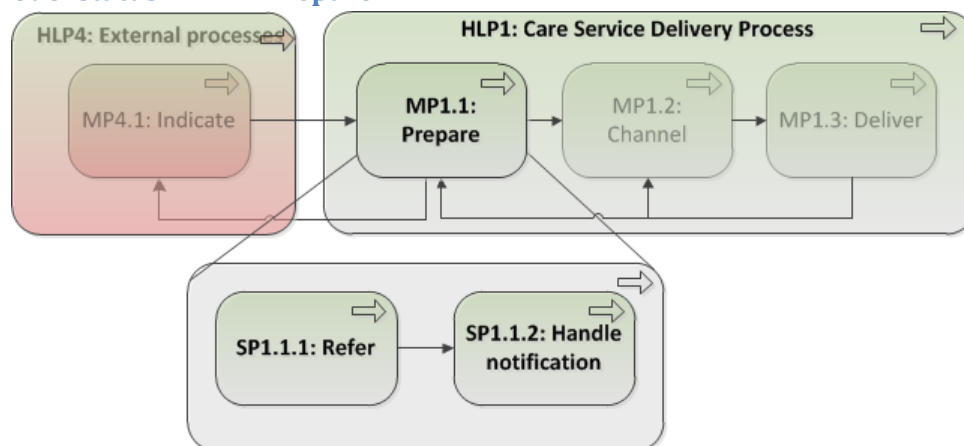
- 1: Model decomposition: Showing on what key process findings and (derived) architectural requirements the model is constructed.
- 2: Accounting a key finding that was used to construct the model : Showing from what interview statements the process finding has come about.

6.1 Model decomposition

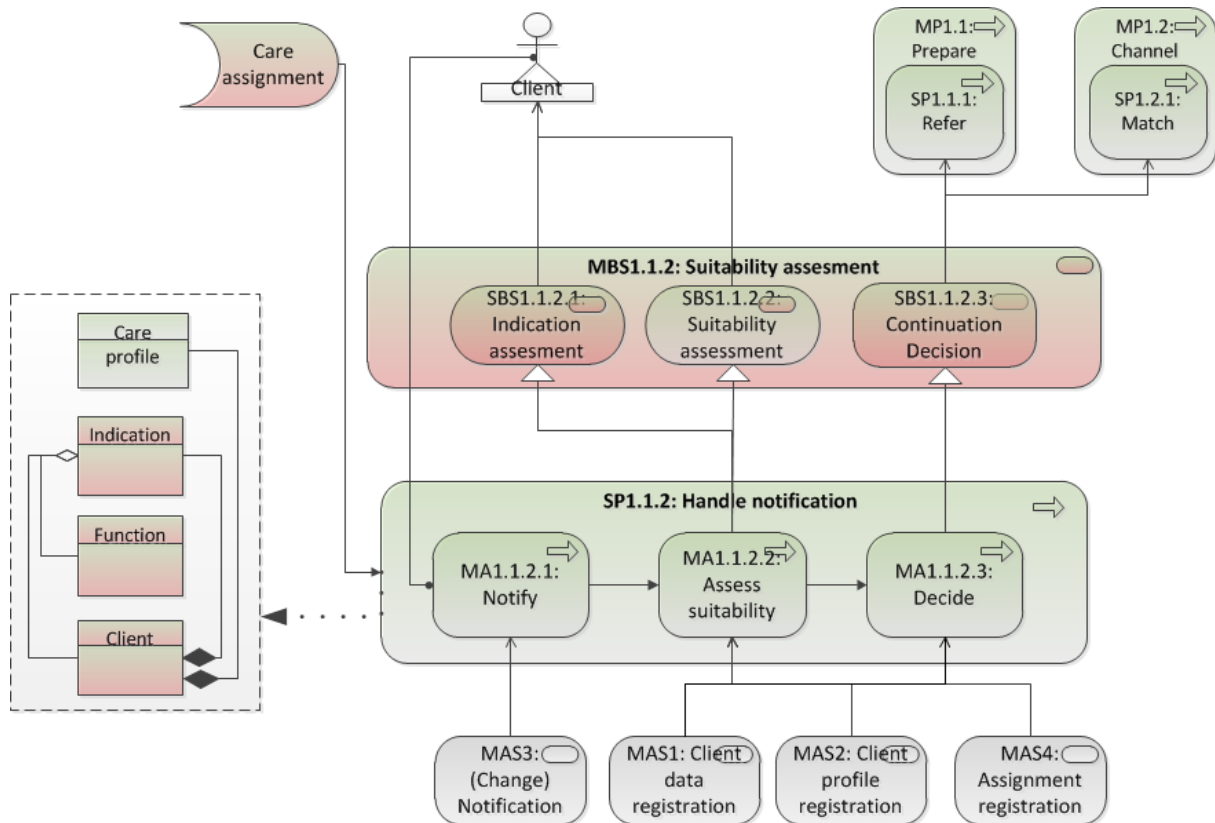
The model we have chosen to elaborate is based on the process to application viewpoint (see 12.4) that shows the sub process 'SP1.1.2: Notification Handling'. This sub process is part of the main process 'MP1.1 Prepare'.

Below we visualised where this step is located within the overall process followed by the model itself:

6.1.1 Model status MP1.2: Prepare



6.1.2 Model SP1.1.2: Handle notification



To justify the creation (and the position) of the model and to understand the analysis process the following subjects within the model need clarification:

- The 'Prepare' main process as the first phase in the care service delivery process.
- The 'Handle notification' sub process as the second step in the main process 'Prepare'
- The 'Handle notification' sub process's main activities, business services and their relations through business objects and services

6.1.3 The 'Prepare' main process as the first phase in care service delivery.

From the perspective of the care service provider the prepare main process 'prepares' the possible delivery of care both inside and outside the care provider. This conclusion is based on the key process finding KF6 and its sub findings that state:

- **KF6: The prepare main process shows how the client contacts the care service provider and how he may or may not fit within the 'offerings' of the care service provider.**
 - **KF6.A:** During the preparation, the client may come in contact with a care service provider
 - **KF6.B:** During the preparation main process the provider may refer the client to its following steps in finding proper care.
 - **KF6.C:** To continue the preparation the care service provider needs to receive an initial request for placement (notification) by a client (or someone who act on his behalf)
 - **KF6.D:** During the preparation background information of the client is retrieved to determine the clients' fitness for the provider and the status of its indication
 - **KF6.E:** Determination of fitness either leads to rejection (and referring to other providers), continuation or indication adjustment (referring to indication)

Modelling the main process MP1.1: Prepare and its sub processes 'SP1.1.1: Refer and SP1.1.2: Notify brought us insights that were translated in the following architectural requirement :

KMF9: Acting as a gateway the CSDA needs a main process (MP1.1: Prepare) that realizes the following main business services:

- **MBS1.1.1: Referring:** services that enable referring the potential client to the appropriate follow-up actions in order to be eligible for receiving needed care services. These referring services are used for obtaining or changing an indication, for guiding to notification and for referring to other providers
- **MBS1.1.2: Suitability Assessment services:** that allow a client to apply for care (SP1.1.2: Notification handling) and, based on this notification, enable assessment of the (potential) client for suitability of receiving care services within the provider including a continuation decision.

6.1.4 'Handle notification' as the second step in the main process 'Prepare'

The 'prepare' main process consists of two sub processes 'Refer' and 'Handle notification', the distinction and sequence of these two sub processes came about in the following matter:

6.1.4.1 'Refer' as the first step:

The choice for the refer-step as the first sub process is based on the fact that the 'Refer' step can be seen as a 'gate' for the potential client in being referred to the appropriate follow-up actions in order to be eligible for receiving needed care services. It also determines the next step outside the provider in case there is a need to refer the client to external organizations or providers as an outcome of the 'Notification Handling' (6.1.2) step. This choice is based on the following findings:

- **KF6.A: During the preparation, the client may come in contact with a care service provider**
- **KF6.B: During the preparation main process the provider may refer the client to its following steps in finding proper care.**
- **KF6.E: Determination of fitness either leads to rejection (and referring to other providers), continuation or indication adjustment (referring to indication)**

6.1.4.2 "Handle notification' as the second step:

In case the client gets referred (or is advised) to do an initial serious request for placement (notification) the second step is started. In this step this notification is being handled and assessments are made whether or not the clients' situation and indication status is suitable for receiving care services from the care service provider. The choice to position the 'Handle Notification' step as the second step is driven by the following key process findings:

- **KF6.C: To continue the preparation the care service provider needs to receive an initial request for placement (notification) by a client (or someone who act on his behalf)**
- **KF6.D: During the preparation background information of the client is retrieved to determine the clients' fitness for the provider and the status of its indication**
- **KF6.E: Determination of fitness either leads to rejection (and referring to other providers), continuation or indication adjustment (referring to indication)**

6.1.5 The 'Handle Notification' s main activities, relations and business services

6.1.5.1 *Notify:*

When the provider 'refers' the client to fill in a notification request the 'Notify' activity is executed that is done by the client (or someone who act on his behalf). This is shown in the model by the 'assignment' relation between 'client' and 'the Notify' activity and based on the following key finding.

- **KF6.C: To continue the preparation the care service provider needs to receive an initial request for placement (notification) by a client (or someone who act on his behalf)**

Thinking about how a client (or someone who act on his behalf) could fill in a notification and how the care provider could process this request we found out a digital registration service is needed. Combined with other insights in other main processes this lead us to formulate the following requirement:

- **KMF10: The CSDA needs an application service (MAS3) to enable 'notification' of the clients (changed) care service delivery needs and (changed) client information that can be used by the process and various stakeholders**

6.1.5.2 *Assess Suitability, Decide*

The second and third main activity (Assess Suitability, Decide) determine the actual fitness of the client in receiving care services from the provider, the status of the indication and the follow-up (decision) . These choices are based on the following key process finding:

- **KF6.D: During the preparation background information of the client is retrieved to determine the clients' fitness for the provider and the status of its indication**

To determine its fitness and its indication status digital access and recording of the following information (business objects) is needed:

- 'client data' (like name, gender etc): Client- business object
- the care related 'background' of the client: Client profile business object
- The indication and assignment information: Indication business object.

Based on these insights and modelling this process (and other main processes) we found the following requirements and derived application services

- **KMF11: The CSDA needs a client data registration application service (MAS1) to record and access client information (client object)**
- **KMF12: The CSDA needs an client profile registration application service (MAS2) to record information of the clients care needs (care profile object)**
- **KMF13: The CSDA needs an assignment registration application service (MAS4) to access indication, assignment and function information**

By judging the suitability (by accessing indication and client information) the modelled assessment services are realized. Finally a judgement leads to a continuation decision (decide):

- its service is used by the 'Refer' step in case the client needs (additional) indication or the client is not suitable for the care provider.

- Its services is used by the 'Match' sub process as a next step in case the client is suitable and has (a chance of getting) an indication.

The 'judgement' modelling choices are based on the following key process finding

- **KF6.D: During the preparation background information of the client is retrieved to determine the clients' fitness for the provider and the status of its indication**
- **KF6.E: Determination of fitness either leads to rejection (and referring to other providers), continuation or indication adjustment (referring to indication)**

6.2 Accounting the key process finding

Key findings have come about through analysing the statements from interviewees that were directly compiled from the original interview question. By combining these statements with other key findings new key findings were extracted. In this way a solid foundation was formed for modelling the processes and coming to understand its core processes, services and how they interrelate.

To complete the elaboration of the analysis process below one key finding is shown and what statements were used to compose it:

- **KF6.C: To continue the preparation the care service provider needs to receive an initial request for placement (notification) by a client (or someone who act on his behalf)**
 - o ZUU9: Na het 1e contact met Promens Care volgt de aanmelding en indicatiestelling; volgorde kan variëren, meestal is er al een indicatie. Een aanmelding is altijd nodig.
 - o ZUU11: Nadat de cliënt of de verwijzer zich heeft aangemeld wordt de aanvraag/aanmelding in behandeling genomen. Hierbij wordt informatie opgevraagd en verzameld naast het aanmeldformulier.

7 PART II: Care Service Delivery Architecture-Framework

For care-organizations to survive in the near future they need the ability to continuously change its services and with that its core business processes. Enabling change through an integrated approach is the core-focus of enterprise architectures (Lankhorst et al, 2005, TOGAF)

Throughout the progress of this thesis we developed a framework of an Enterprise Architecture containing descriptive, visualizing and prescriptive components that can help care-organisations to meet the changing demands of its external environment. An extensive elaboration of the framework is described in Appendix V. Although different literature is used in developing the framework, the core of this framework is based on ArchiMate and TOGAF literature

This care-service framework (to be called hereinafter the 'CASERA' –framework') will be used as a base in the proceeding chapters to visualize and describe the changes that occur within the 'care service delivery architecture'. Changes that are a direct consequence of the major transitions within the healthcare market .With that we will develop the essentials for a Care Service Reference Architecture (Casera)

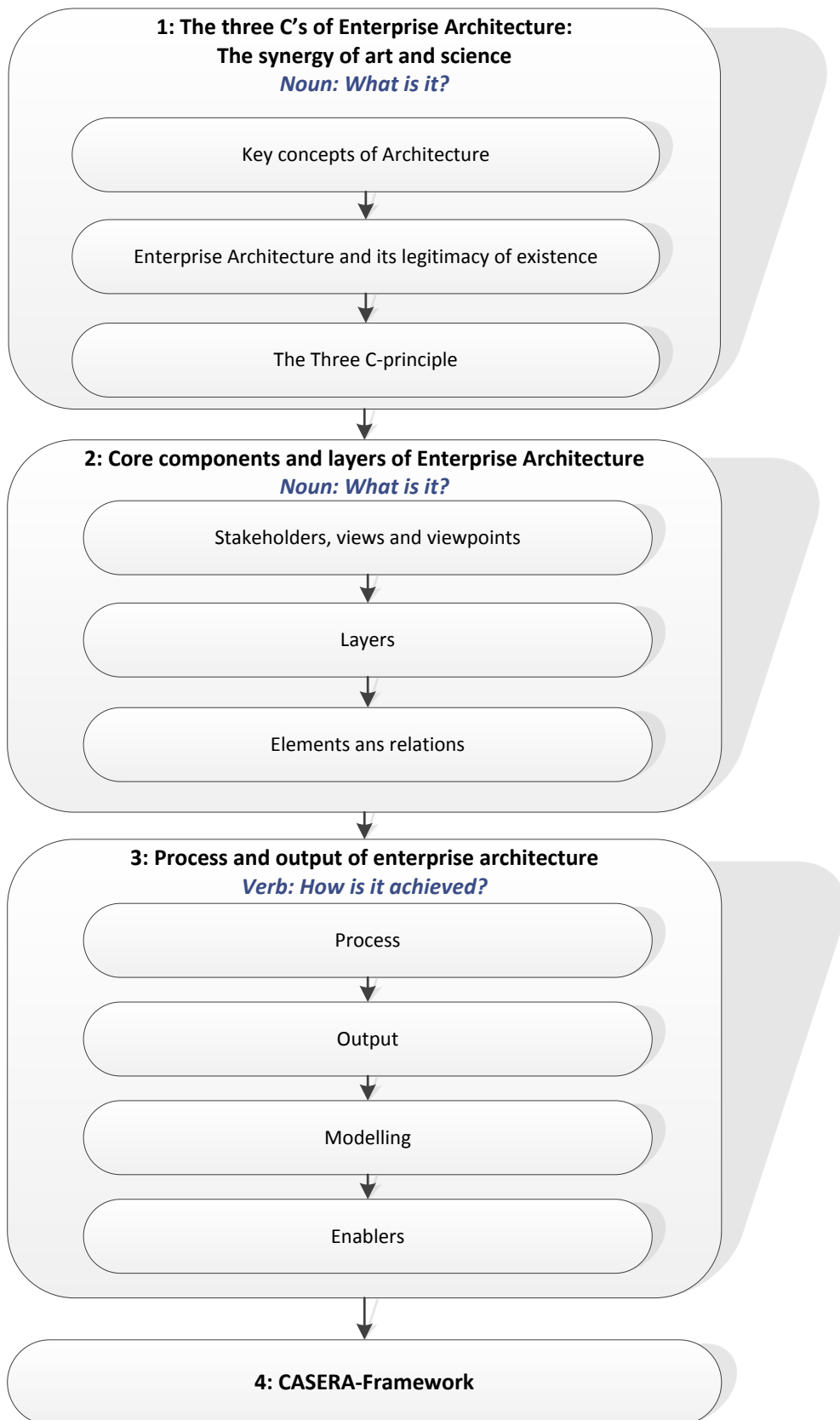
To achieve the CASERA- framework literature surrounding enterprise architecture is explored to find out the 'nouns' (subjects, what is it?) and the 'verbs' (activities, processes, how is it achieved?) (Lapkin et al, 2008) that make up the Enterprise Architecture.

With that the development of the CASERA-framework comprises the following building blocks:

- 1- Definition: Generalised concepts of Enterprise Architecture
- 2- Core components and layers of Enterprise Architecture
- 3- The architectural process and output

Based on Appendix V this chapter summarizes these building blocks and combines the outcomes of these three explorations into the CASERA- framework . In figure 1 the structure of this literature exploration is visualized:

7.1 Figure 1



8 Enterprise Architecture: the synergy of art and science

8.1 Introducing the 'three C principle' of Enterprise Architectures

In the first part of the literature study (Appendix V) we have extracted a total of eleven concepts that define the enterprise architectural activities (verbs) and (on an abstract level) the architectural components (its system) and artefacts (representations). In combining these concepts into a clear and catchy definition we introduced "the three c principle' of Enterprise Architecture:

Enterprise Architecture is (random order):

- **Creat(ivat)ion** and design of artefacts (models and guidelines) that represent a unified whole of related business, information and technology elements of the desired and responsive enterprise that fits its organizational context (vision, strategy and environment)
- **Communication** of these artefacts in a unified language that fits the perception (viewpoints and views) of the 'audience'
- **Control** the evolution and effective change of the enterprise towards reaching its desired state and fitness in its organizational context.

9 Core components and layers of Enterprise Architecture

In second part of our exploration of enterprise architecture we distinguished two manifestations of enterprise architecture:

- The real world entities consisting of the layers and its elements
- The architectural output, consisting of guidelines and the models that represent this

How these manifestations are perceived is dependent on the eye of the beholder. Crucial in enterprise architectural activities is gaining support and commitment for that what is intended to be the desired situation. This desired situation can be different depended on 'the eye of the beholder'; the stakeholder.

9.1.1 Stakeholder

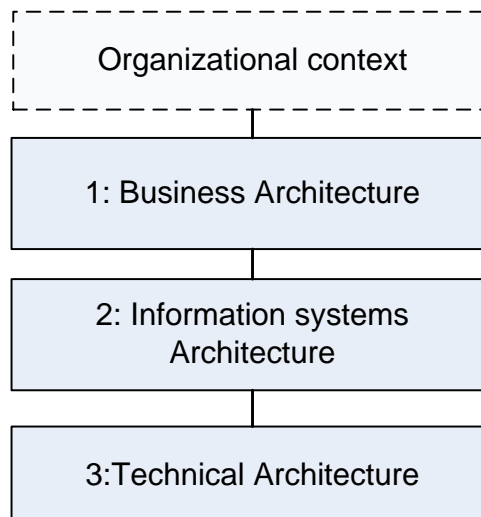
Every group of viewers looks and experiences the enterprise in a different way because their interests and concerns may differ from other groups. As Lankhorst et al (2005) outs it: "Different viewers have different conceptions of the universe they perceive ." This viewer in enterprise architecture is called the stakeholder.

9.1.2 Views and Viewpoints in Enterprise Architecture

The interests and concerns of stakeholders can be addressed by creating 'views' of the enterprise that focus on their concerns and leave out unnecessary information. (Lankhorst et al, 2005). These views are based on viewpoints. Viewpoints define the 'elements and relations' of the enterprise that are represented in the view. Simply put: a viewpoint is a format or template for creating views.

9.1.3 Layers and element of Enterprise Architecture

Within our literature exploration we ultimately concluded that enterprise architecture had an extended three layer- form, based on the three layer variant (business, application, infrastructure) with an added layer that represents the surrounding of the 'enterprise'. Below these layers are visualized and described:



1.1.1.1. Organizational Context

The best way to describe what happens and exist in the 'organizational context layer is 'the reason for a business to deliver services and products to its environment'. Elements that reside in this layer are 'stakeholder', 'requirement'.

1.1.1.2. Business

The aim of the business layer is to provide the actual products and services to its environment. The products and services are realized by executing processes in delivering business products that fulfils a need for the customer.

1.1.1.3. Information systems/Application

As we have seen in the description of the domains and layers the third layer is the information systems layer. This layer is intended to deliver automated services to the business layer to perform its processes and may consist of application services, application components and application functions.

1.1.1.4. Technical infrastructure

The technical architecture focuses on the physical aspects of the hardware, the network and the physical locations where systems are operated.

The elements and relations will be further elaborated in detail in 10.3 and 10.4.

10 Process and output of enterprise architecture

As stated in the previous chapter, enterprise architecture has two manifestations, one of them is the output of architectural activity that is used to realize the real world enterprise (consisting of its layers and elements) . And when there is output there is a process, in this section we will summarize the exploration regarding the process and output of enterprise architecture.

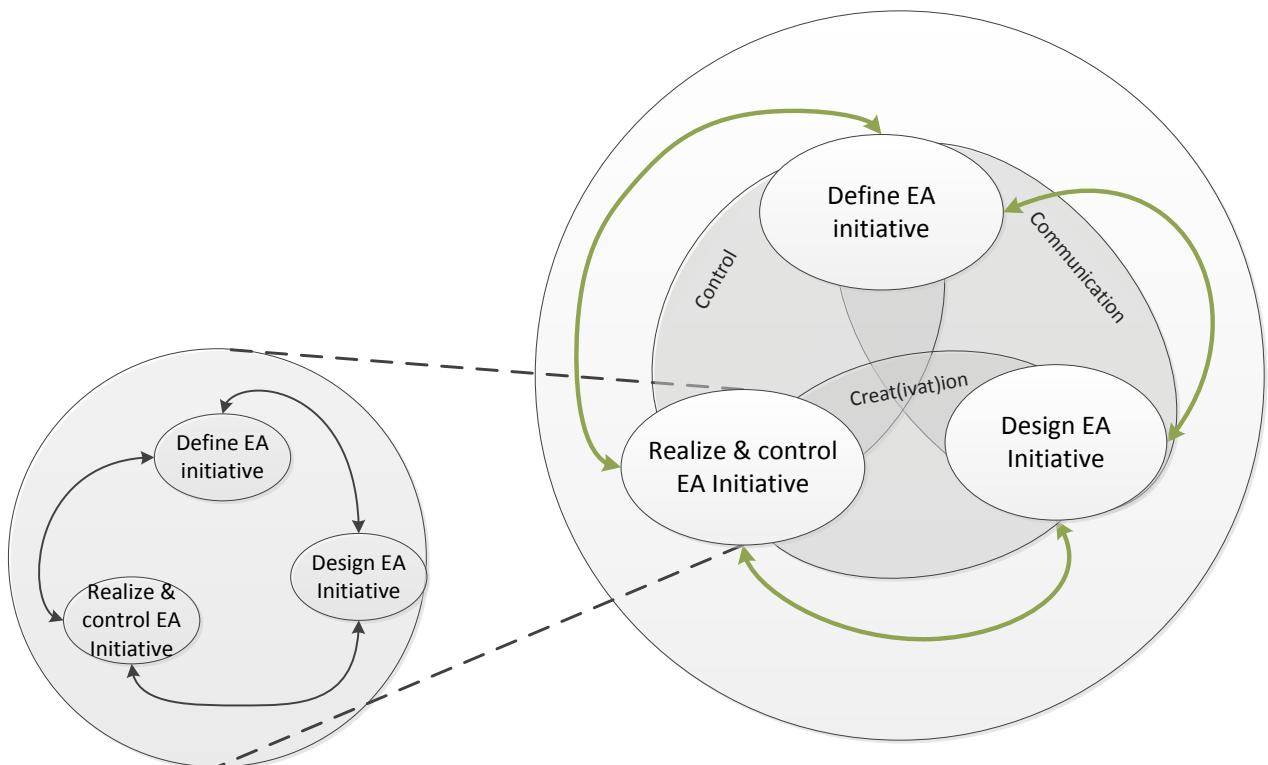
10.1 The Architecture Process

Throughout the literature study (Appendix V) we found three major activities that guide the creation, communication and control of enterprise architecture:

- **1: Define the EA Initiative:** Defining the scope of the architecture initiative.
 - Define the business goals and business and environmental drivers that fuels the initiative. (Lapkin et al, 2008)
 - Identify and record the key stakeholders and their concerns
 - Identify and record the key principles, guidelines and requirements.
 - Design a viewpoint
 - Obtain approval
- **2: Design the EA Initiative:** View realization and verification
 - Creating the current, transitional and/or desired view of the (part of the) enterprise.
 - Present the current, transitional and/or desired view of the (part of the) enterprise.
 - Verify the current, transitional and/or desired view of the (part of the) enterprise.
 - Refine the current, transitional and/or desired view of the (part of the) enterprise.
- **3: Realize & control EA Initiative:** Facilitate the control and the realization of the desired situation (based on the view) in the 'real world' enterprise
 - Plan the realization and evolution of the desired view.
 - Execute the plan
 - Refine the plan
 - Justify the realization
 - Evaluate the realization
 - Manage, monitor & control (changes to) the 'realized' initiative¹

These activities may be executed on different abstraction levels. This is visualised below:

1.1.1.5.CASERA- Process

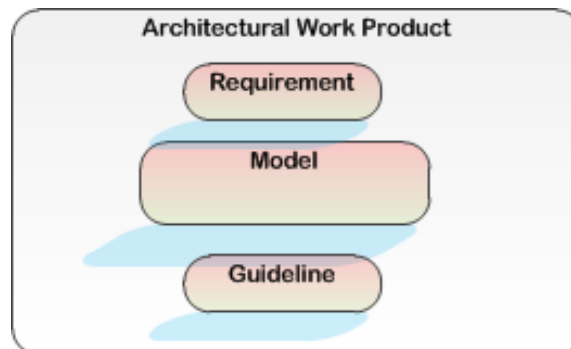


10.2 The architectural output

In general there are three forms of output that are produced during architectural activity (more on this in Appendix V)

- Model; the artefact that visualizes architecture; the model and its visualization are the most prominent artefacts that are used within enterprise architecture.
- Guideline: Architecture guidelines guide the creation of the architecture and its output.
- Requirement: A statement of need that must be met by a particular architecture or work package.

These forms of output will be used to develop CASERA:



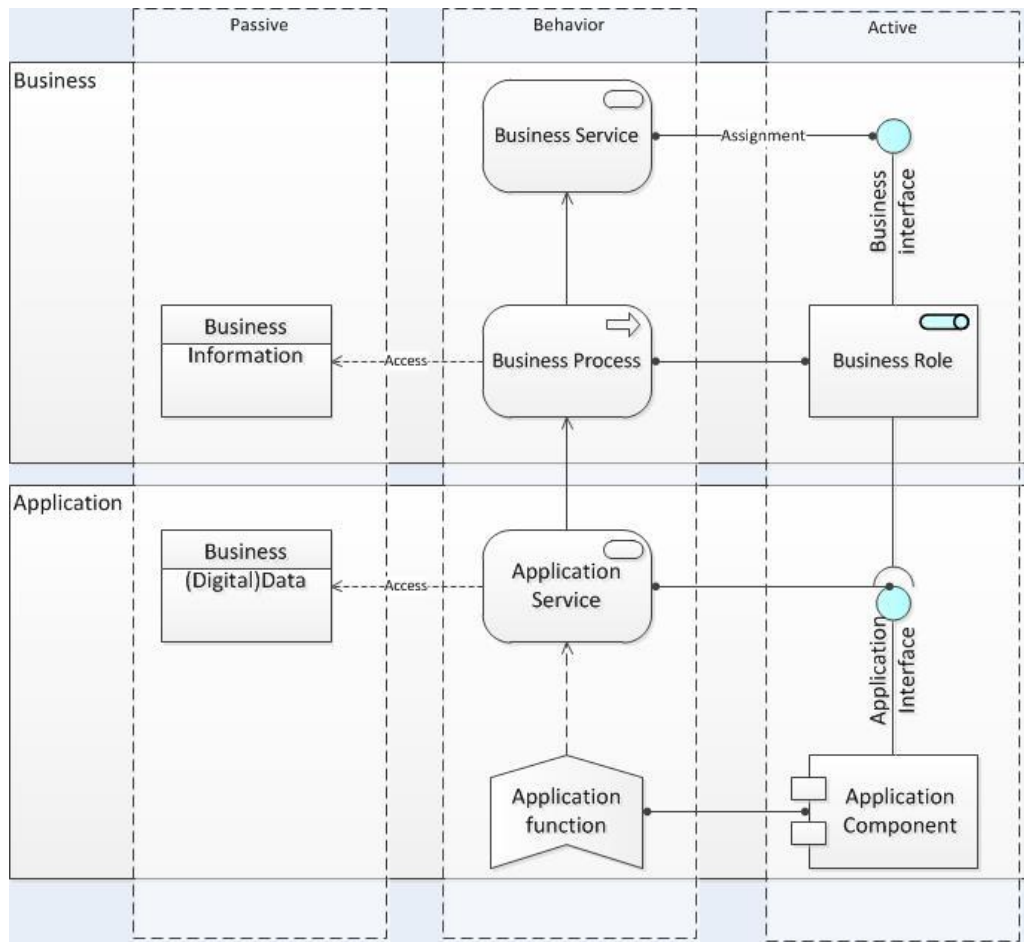
10.3 The model: the structure that builds the architecture

The elements and relation that are visualized in views and viewpoints within this thesis will be based on the ArchiMate language

10.4 ArchiMate: Modelling the Enterprise Architecture

A model allows an architect to communicate with stakeholders in an unambiguous way. In this paragraph we will summarize the ArchiMate language for modelling the enterprise architecture.

When studying ArchiMate the following can be extracted regarding how the most basic elements within the ArchiMate framework work together. Below a visualisation which will be described:

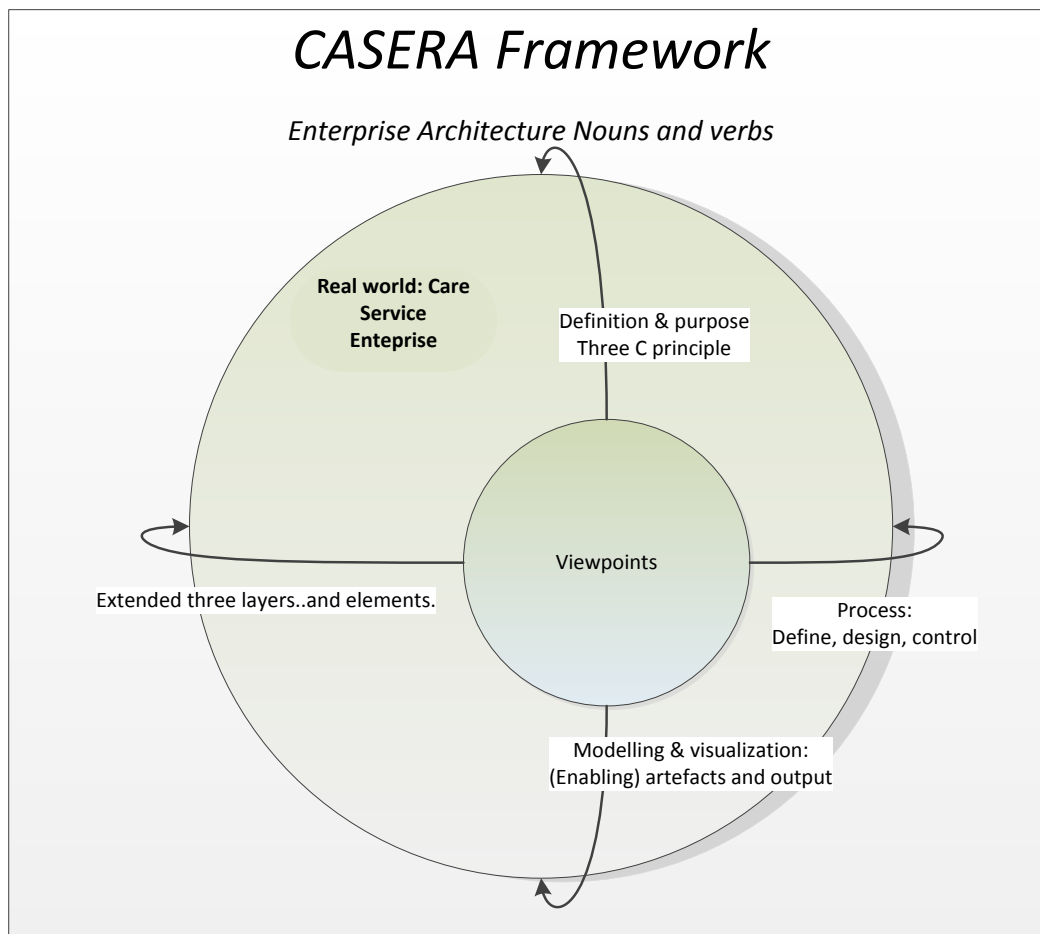


- ArchiMate recognises 3 layers within the Enterprise:
 - o The business layer
 - o The application (or information systems) layer
 - o The technology (or infrastructure) layer
- Within all of these layers three different kinds of elements can be identified:
 - o The active structure is the 'the subject', 'thing' or 'person' that can do something.
 - o The behaviour is the actual doing or the 'verb'
 - o The passive structure is the 'object' The passive structure is the object on which the 'doing' applies
- Business Layer: The active structure (**business role**) can be assigned to perform behavior (a **business process**) on an object (**business information**) and with that realize a **business service** or product. These business services can be provided to other business processes or directly to a customer. The business service is accessed by a (**provided**) **business interface**.
- Application Layer: The active structure (**application component**) can be assigned to perform behavior (an **application function**) on an application object (**business data**) and with that realize an **application service**. The application component can be used via the **application interface**
- Internal services are provided to other elements in the same layer
- External services are provided to other elements in the overlying layer.
- Relation between business and application

- (A part of) the **business process** can be executed by using an **application service**. This application service is realized by an application function that is performed by an **application component**
- A business role can perform an activity (business process) by using an application service and accessing it via an application interface. The application service is realized by an application function that is performed by an application component.

11 The CASERA- framework

In appendix V we have worked our way through finding the core of architectural activities and components or as Gartner calls them the ‘nouns’ and ‘verbs’ of enterprise architecture. Below we have visualized the outcome of our literature exploration:



11.1 Use of the CASERA-framework

The framework shows 4 aspects surrounding enterprise architecture. The most important aspect of enterprise architecture, modelling and visualization, will be used extensively in the following part of this thesis. The outcome of this modelling activity will be used to develop guidelines for the reference architecture including guidelines for the other three aspects of enterprise architecture. To start modelling we will first need to select the proper viewpoints.

12 Viewpoint selection regarding the 'care service delivery-architecture'

What we have seen throughout the literature explorations (Appendix V) is that viewpoints form a representation of the enterprise architecture that fits some stakeholders perception. As stated we cannot create an 'enterprise architecture'-description with a single model. So in designing the framework, we are actually designing viewpoints that fit some stakeholders perception of a 'care service delivery organization'. Defining a viewpoint means executing the following activities (Lankhorst et al, 2005):

- 1: Identifying stakeholders and their concerns (12.1)
- 2: select the proper elements for modelling (from in this case ArchiMate) → Viewpoints (12.2,12.3, 12.4)
- 3: select the non-modelling artefacts to use → See 10.2

12.1 Identifying key stakeholders/concerns within the care service enterprise

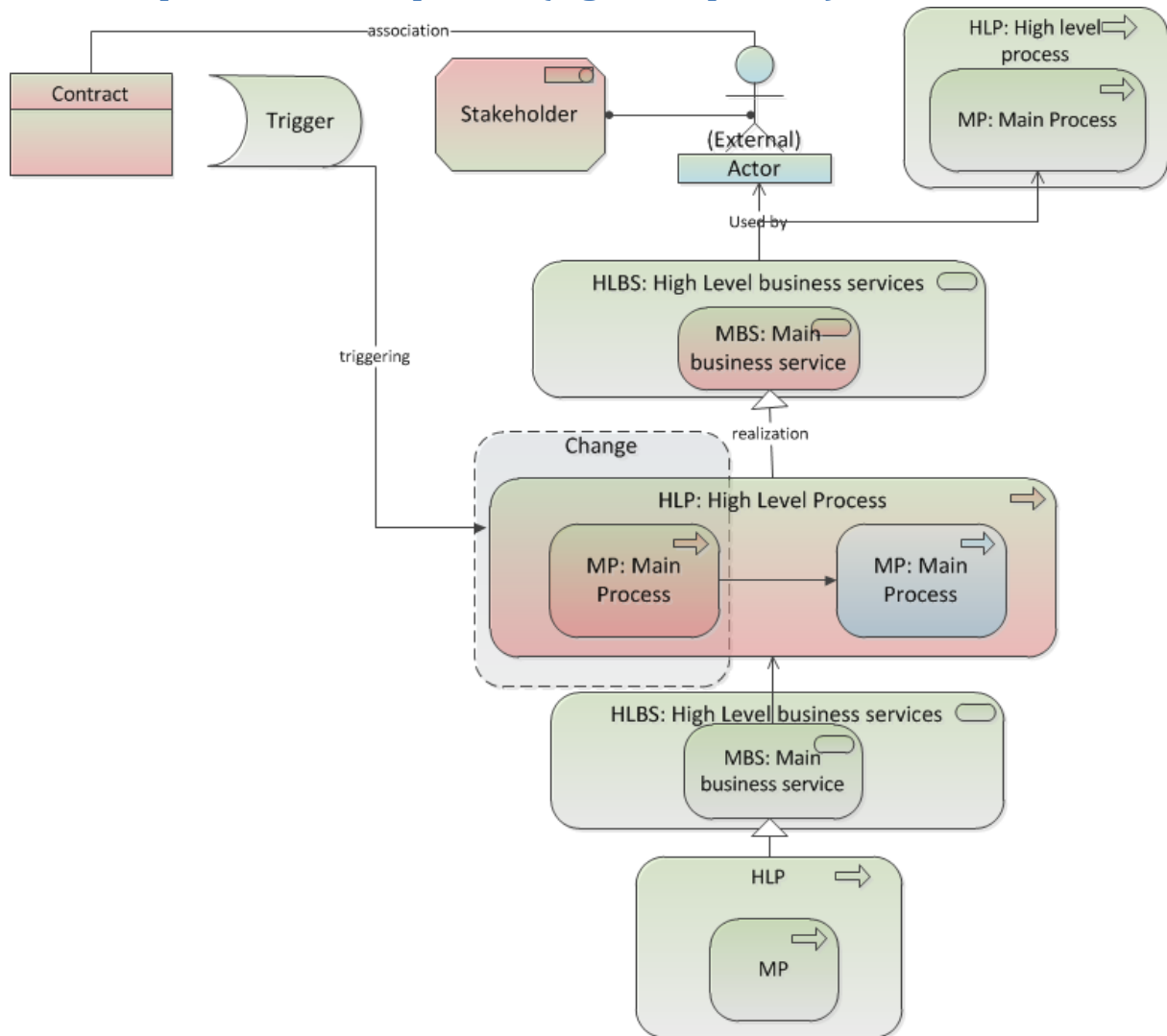
Within the care service delivery enterprise we distinguish the following stakeholders:

- Care executive officer which has concerns that reach beyond the care service delivery process.
- Care delivery manager which has concerns regarding the efficiency, the quality and the cost effectiveness of the care service delivered.
- Care process manager has concerns regarding process optimizations and digitalisations to support the efficiency, the quality and the cost effectiveness of the care service delivered.

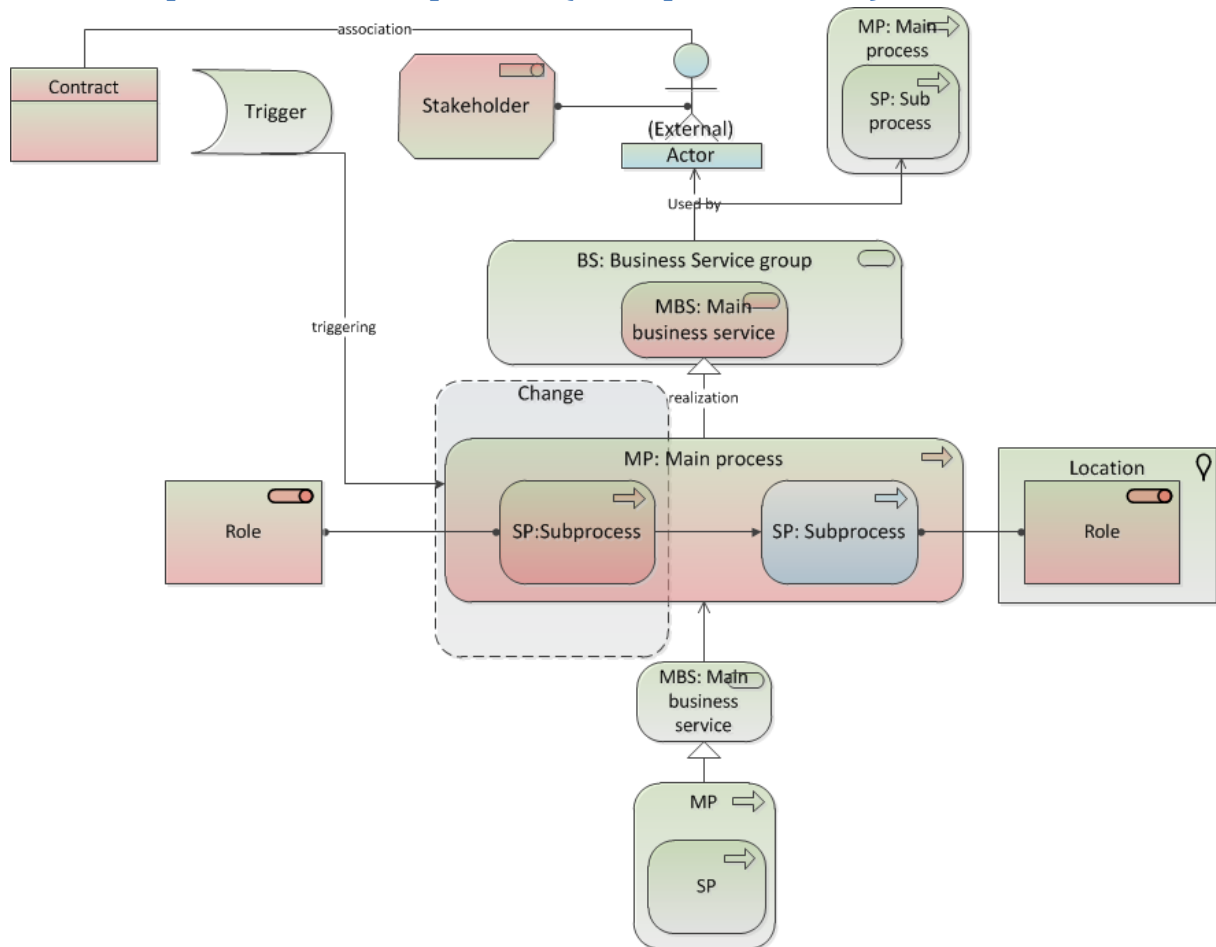
With these stakeholders in mind we created three viewpoints:

- 1- High level process to process viewpoint (12.2) shows the high level processes, its main processes and main business services, with the goal of modelling the surroundings of the 'care service delivery process'. Through the main processes and main business services it becomes clear how the care service delivery process relates to other (internal and external) high level processes. This view addresses the "Care executive officer" concerns.
- 2- Main level process to process viewpoint (12.3) shows the main level processes, the main business services and its sub processes, with the goal of modelling the details of a main level process and how it relates to other (from the perspective of the current main level process) internal and external main level processes. This view addresses the "Care delivery manager" concerns.
- 3- Sub level process to application viewpoint (12.4): This viewpoint shows on a subproces level how subservices are realized and what application services are needed to realize the business (sub)services. This viewpoint has the aim of finding 'process optimizations'

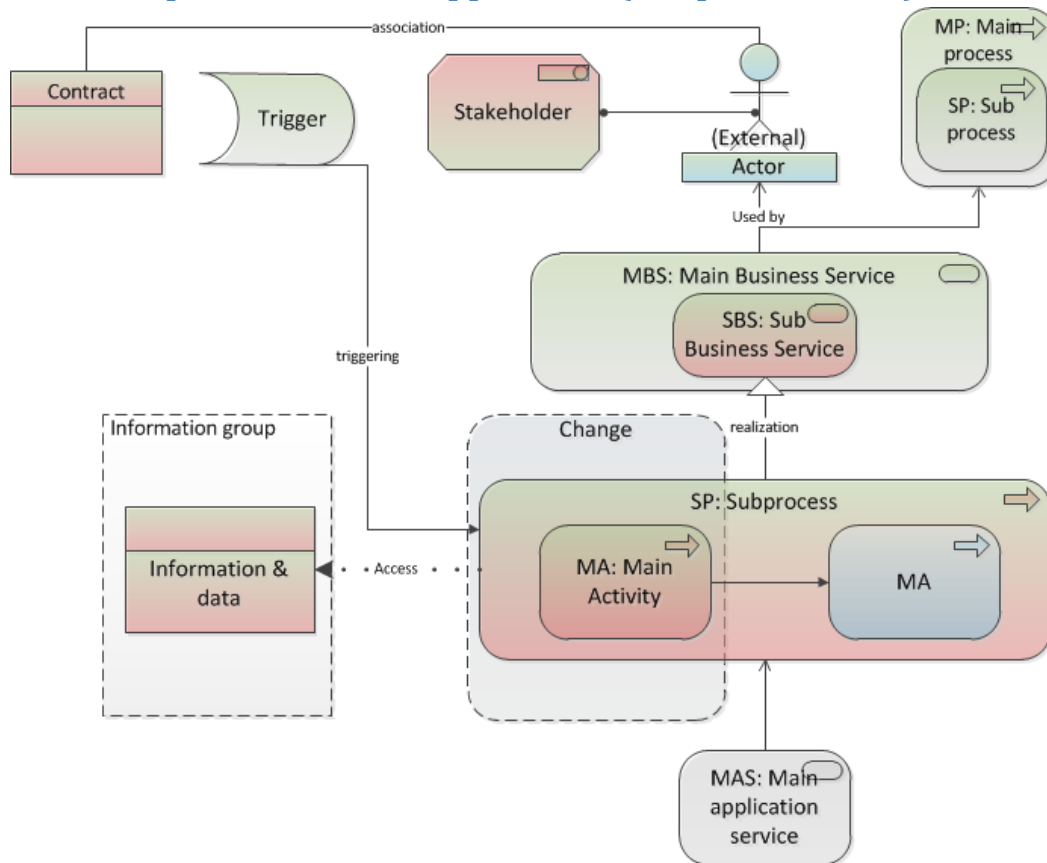
12.2 Viewpoint Process to process (high level process)



12.3 Viewpoint Process to process (main process level)



12.4 Viewpoint Process to application (sub process level)



PART III: the changing care service delivery process

The objective of this part of the thesis is to find and visualize the care service delivery architecture and how it is impacted by the changes in the healthcare market. This is done by modelling the situation that was operational in 2014 (current state) and the transition state of the care service architecture that is the situation in 2015. This transition state visualizes the changes that are a result of the major transitions in the health care market. During this visualization we model its core business processes and activities and its relations to the functional layer (application services) of the information systems architecture. The visualizations are based on:

- The viewpoints as described in 12.2, 12.3, 12.4
- the key process findings (Appendix II)
- the (derived) requirements and guidelines (Appendix IV)

How the models came about is elaborated extensively in chapter 6. Promens Care is the reference provider where we base the modelling on.

We will reference to these process findings, guidelines and requirements and the beginning of each paragraph.

Three phases of developing the (reference) architecture

The guidelines and requirements that were derived from modelling and the key process findings form the basis for translating the CASERA-framework into a reference architecture. These guidelines and requirements are listed in appendix IV. The ‘transformation’ of the CASERA-framework is done in three phases:

- The Current State: The ‘pre-change’ phase of the care-service delivery process (CH13, Part III)
- The Transition State: The ‘change’ phase of the care-service delivery process (CH14, Part III)
- CASERA: The ‘enabling’ phase of the care service delivery process; CASERA (CH 15, Part IV)

13 The ‘pre-change’ phase of the care service delivery process

13.1 The care service enterprise and its two primary process

Relevant process finding, guidelines and requirements: KF1, KF2, KF4, KF8, KMF1 to KMF8, (Appendix II and IV)

Analysing the outcomes of the interviews, documents and the process descriptions of Promens Care show that at its core organizations that provide care- services to people with mental, physical and/or social limitations have two primary processes (2014).

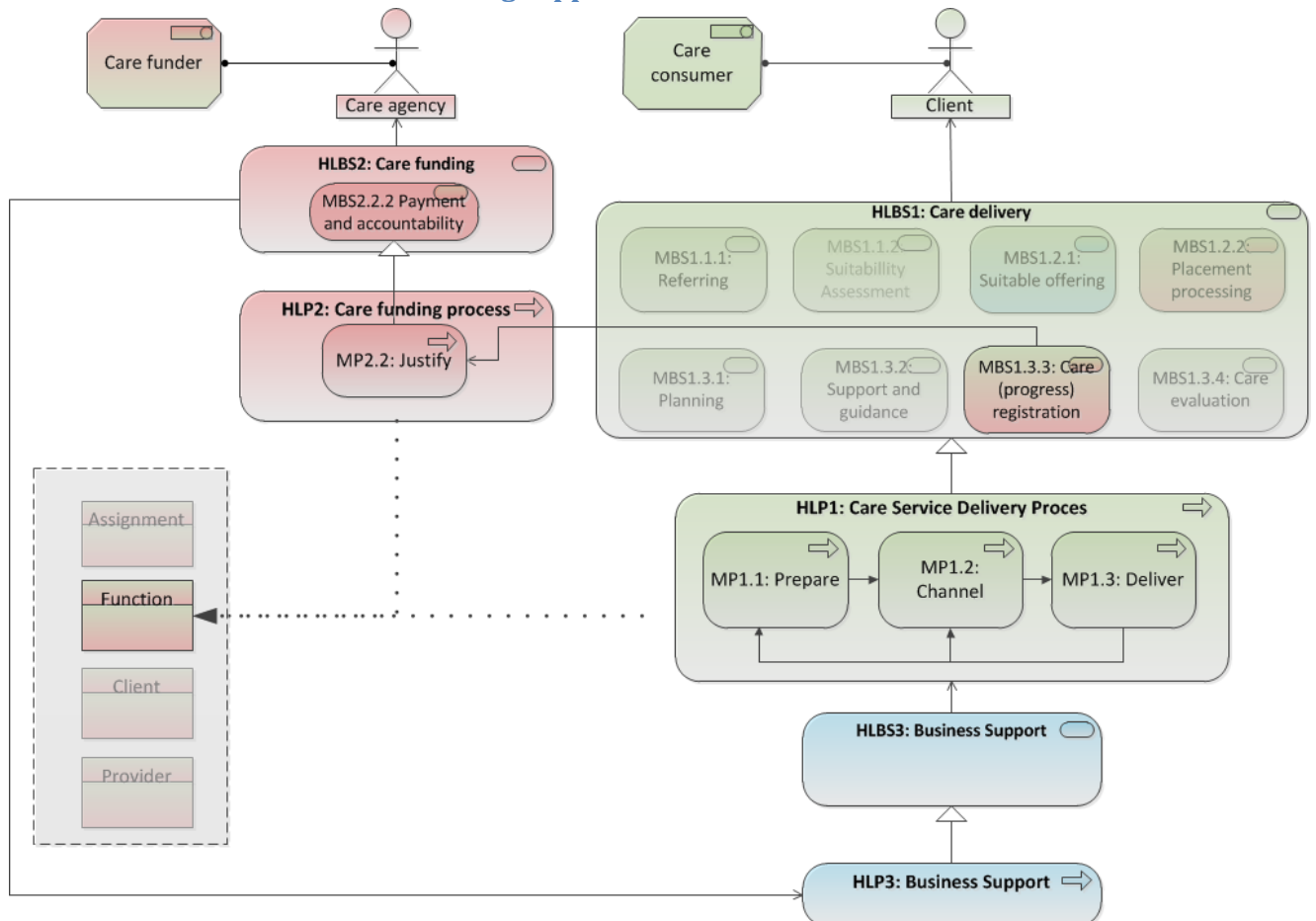
Within the ‘care-service enterprise’ the actor that consumes the ‘care-services’ is different from the actor that pays for them. The actor that pays for the care service delivery is called ‘the funder’. The actor that consumes the care is called ‘the client’. A comment made by an interviewee expressed this from the perspective of the ‘care service enterprise’ perfectly: “there is money needed to provide care and care is needed to generate money”.

Adding ‘business support’ that uses the funding for organizing people, resources and facilities this comment can be translated to the different perspectives of these two primary processes:

- HLP1: the care service delivery process → uses the funding (via HLP3: business support processes) for organizing and delivering the actual care services.
- HLP2: the care funding process → uses the care service delivery process for generating income

Model HLP1 shows these processes, its main services and its actors. The colors represent the different processes (red for funding, green for care delivery and blue for business support).

13.1.1 Model HLP1: Overview funding support



It shows that the two primary processes both use the 'function' business object. The function is a standardized business object for determining the price of the care, the amount of care delivered and a global substantive direction. In the care service delivery process 'the function' is used for registering the amount of 'functions' that are delivered per client. In the model this is depicted by the care registration service. This service is used by the care funding process to realize 'payment and accountability' services that are used by the 'care funder' to determine the amount of money that is made available to the provider.

The 'business support' process uses the 'money' (through the care funding service) to provide business support services to facilitate the care delivery process with resources and people to actually deliver the care.

13.2 Overview of the care service delivery process

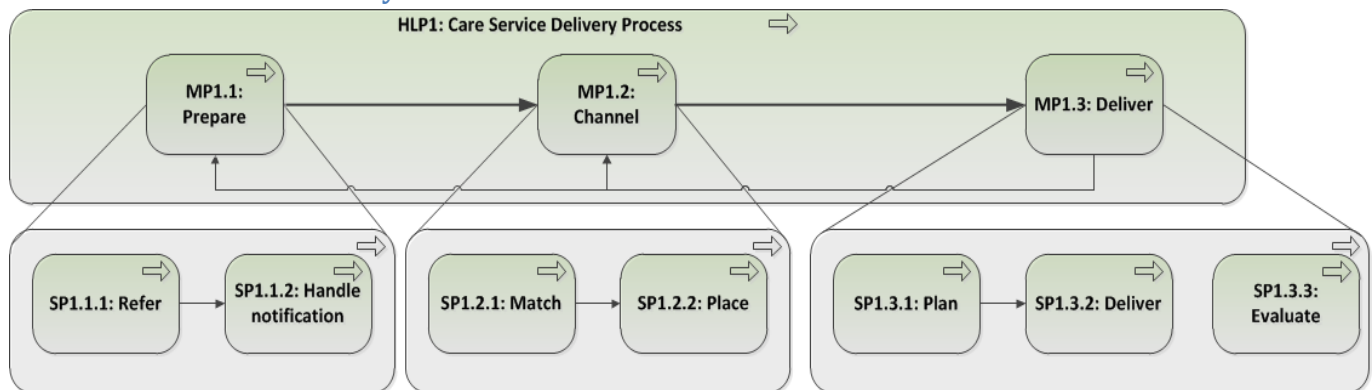
Relevant process finding, guidelines and requirements: KF3, KF6, KF7, KF8, KMF1 to KMF8, (Appendix II and IV)

The care service delivery process consists of three main processes (Prepare, Channel and Deliver) that have a strongly relation to the (external) 'Assign' main process. As we will see further down this chapter the existence of this process, which is executed outside the care service provider, is a crucial condition for the execution of the care service delivery process. However the 'Assign' main process is not a part of the care service delivery process nor is it part of any other internal process within the care service provider.

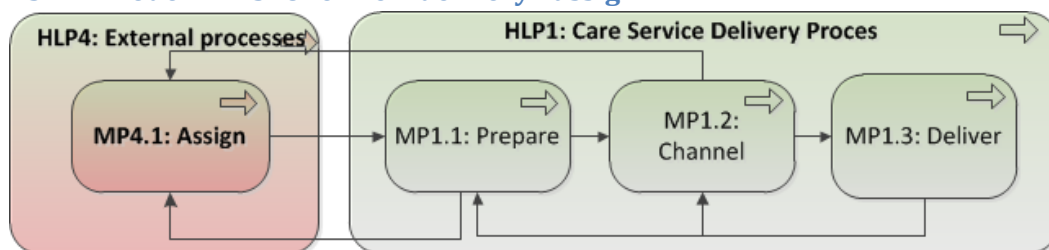
Model HLP 2: a linear version of the care service delivery process shows a first insight in the main processes that make up the care service delivery process; model HLP3 shows the care service delivery process and its relation to the 'Assign' external process. It shows the 'Assign' process tight relationship; it may trigger the Care service delivery process and be triggered by the Care service delivery process (Channel and Prepare main processes).

Elaboration of these models will follow in the next sections.

13.2.1 Model HLP2: Delivery basic overview



13.2.2 Model HLP3: Overview delivery - assign



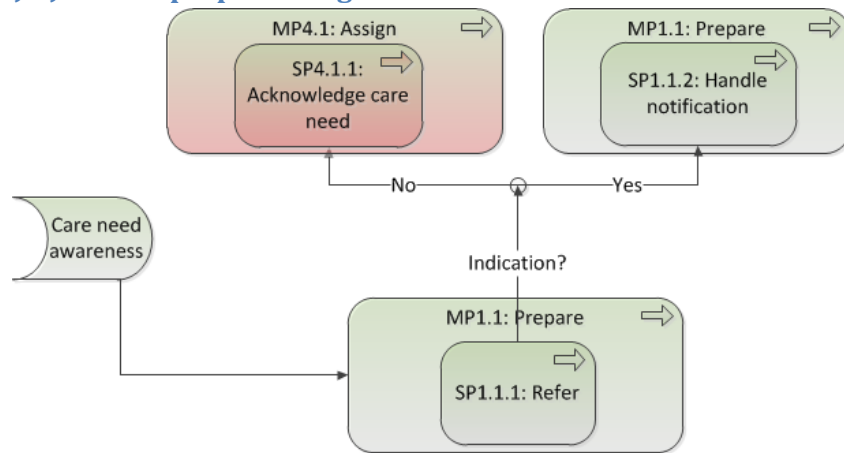
13.3 Launching the quest for care; the care service delivery process

Relevant process finding, guidelines and requirements: KF5, KMF8, KMF10, (Appendix II and IV)

From the perspective of the care service provider the quest of a person in seeking care services starts with the 'SP1.1.1: Refer' sub process. This is shown in model J.1. where from the care service provider perspective the process starts with the 'refer' step, in this step the care service provider finds out the basic needs of the client and if needed sends a person on his way to 'get an indication' and with that triggering the care indication process. On the other hand when an indication already is available the 'SP1.1.1: Refer sub process' will trigger the 'SP1.1.2: Handle Notification' sub process

An indication acknowledges a person's legal right of consuming care services that matches his/her needs.

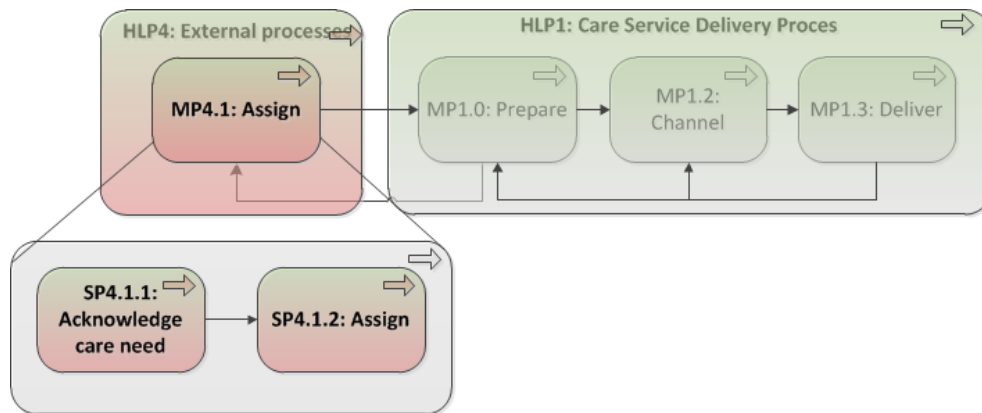
13.3.1 Model J1:Junction prepare assign



13.4 The Assign main process

Relevant process findings and modelling findings: KF2,KF5, KF8, KMF8 to KMF10, (Appendix II and IV)

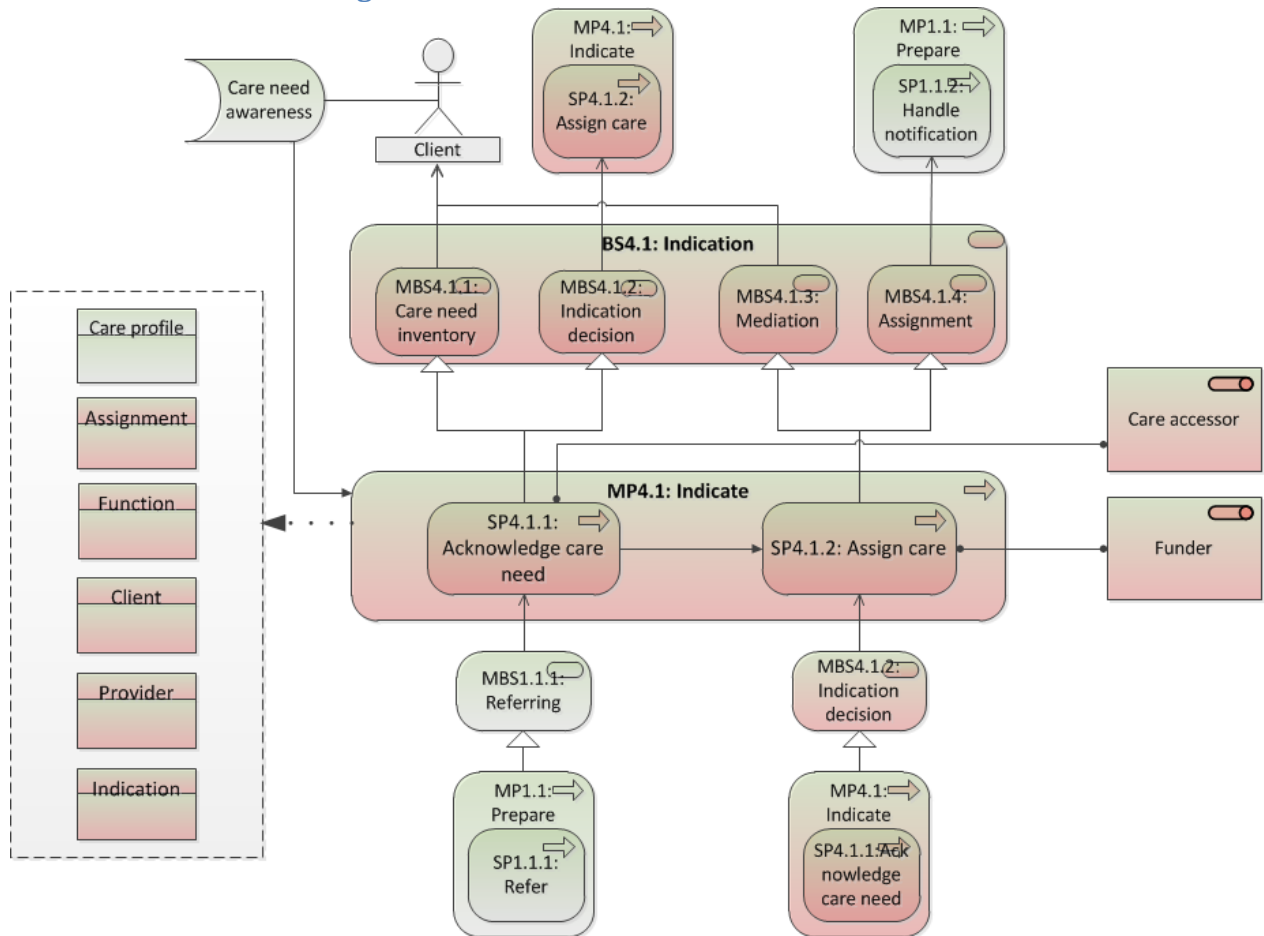
There are two major ways of starting the quest for care (1) from the care provider perspective as described in 13.3 and (2) from the external perspective. In this section the step 'outside the care service provider' will be described: the assign main process. Below we can see how the 'assign' process is situated relative to the care service delivery process:



The 'MP4.1: Assign' main process has two sub processes:

- To acknowledge the care needs of a person
- To assign acknowledged care to a provider.

13.4.1 Model MP4.1: Assign



13.4.2 SP4.1.1: Acknowledge care need

In the model the care need acknowledgement- step is assigned to the care assessment centre. In this step a care assessment centre assesses the care needs of a person (care need inventory service, and profile object) and, when appropriate this is recorded in an indication. This indication acknowledges a person's legal right of consuming care services that matches his/her needs. In the model this person is called the client. Within the care service indication these care needs are divided in one or more standardized 'care functions'.

After the indication is recorded the care agency automatically receives a so called ‘indication decision message’ from the care assessment centre. This message contains a confirmation of the type and the amount of care-services the client is entitled to. The care agency (the main funder) now knows where the client is entitled to, based on the act of exceptional healthcare costs (AWBZ).

13.4.3 SP4.1.2: Assign

Immediately after obtaining the 'care indication' an activity within the care agency is started; the 'assign' step. In this step the care agency is formally responsible for the assignment of care-functions to one or more care service providers.

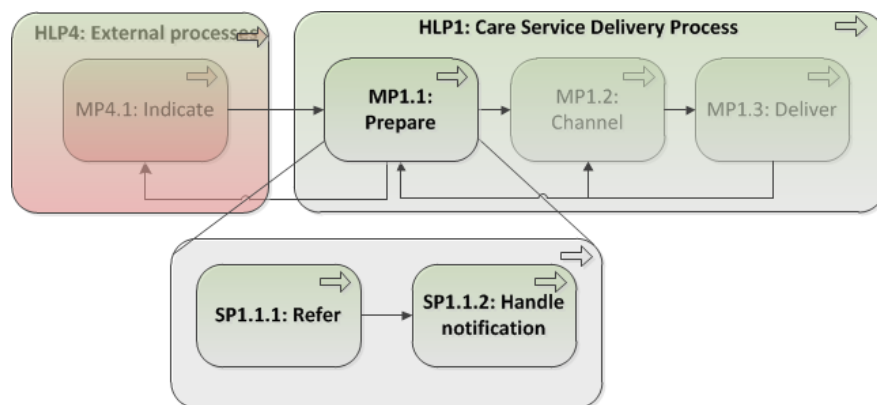
Before assignment takes place, the care agency looks at the indication decision message and finds out if the client has indicated a preferred provider. Within an indication a person can suggest his or her preferred care-service provider. When a client does not have a preferred 'care-provider' the care funder (or the care agency) will mediate in finding a suitable provider (mediation service).

When the suitable provider is selected, the care agency sends a care assignment message to the preferred care service provider. The care service provider is then responsible for contacting the client and starting the 'MP1.1:Prepare' main process.

13.5 The prepare main process

Relevant process findings and modelling findings: KF6, KMF9 to KMF11, KMF15 to KMF26, (Appendix II and IV)

The second option for a person to start his quest in finding care services is by contacting a care service provider directly and with that triggering the 'prepare' main process as the first step of the care service delivery process. Below it is visualized where the 'prepare' main process is situated within the care service delivery process:

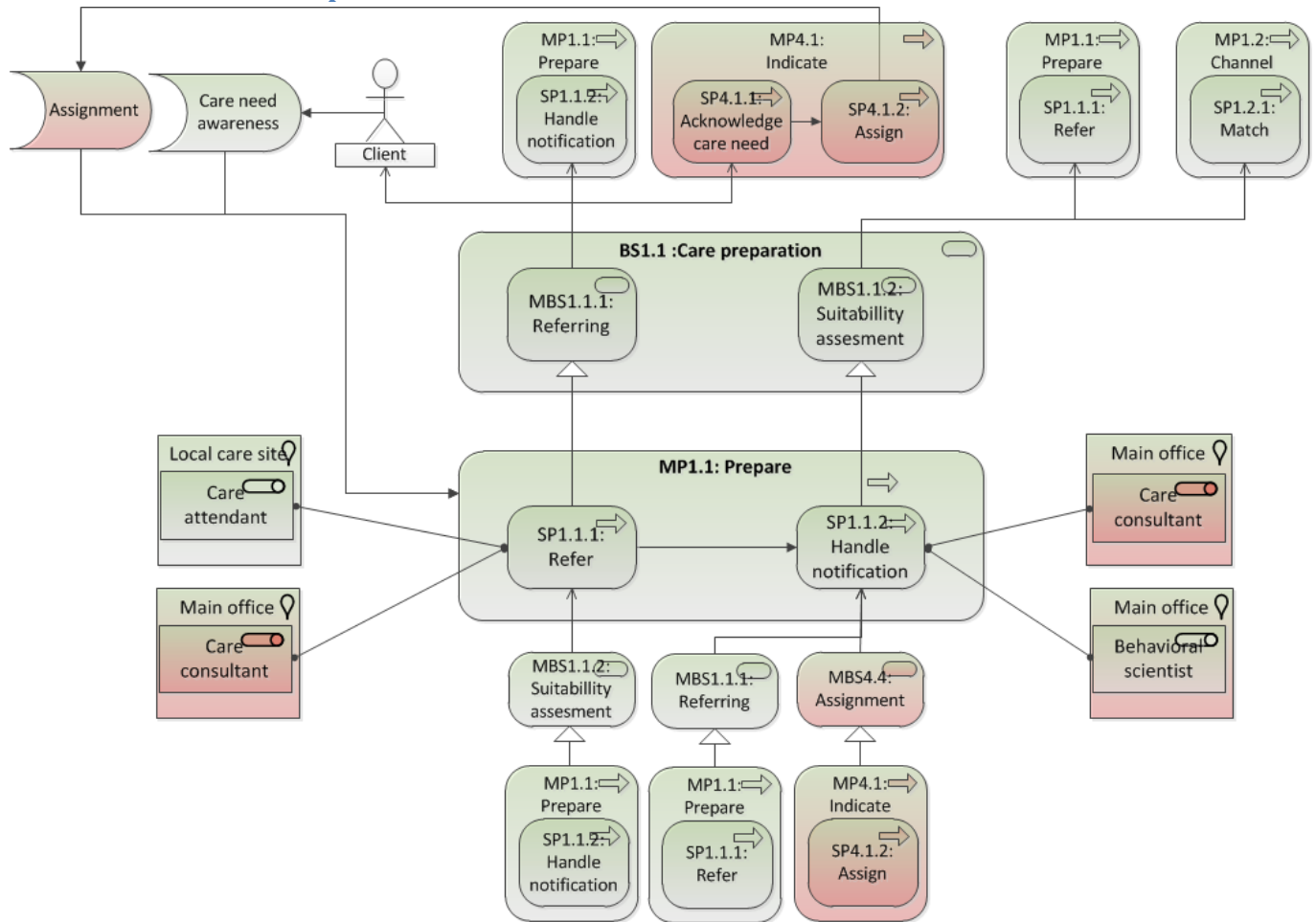


Main goal of this main process is to guide and refer a potential client to suitable care services both inside as well as outside the provider. Two sub processes (refer and handle notification) are executed:

- Based on his care needs (client profile object) the 'refer' activity helps the client in his next steps in seeking care services,
- the notification handling step determines suitability and decides whether or not an client is suitable for its internal care service offerings.

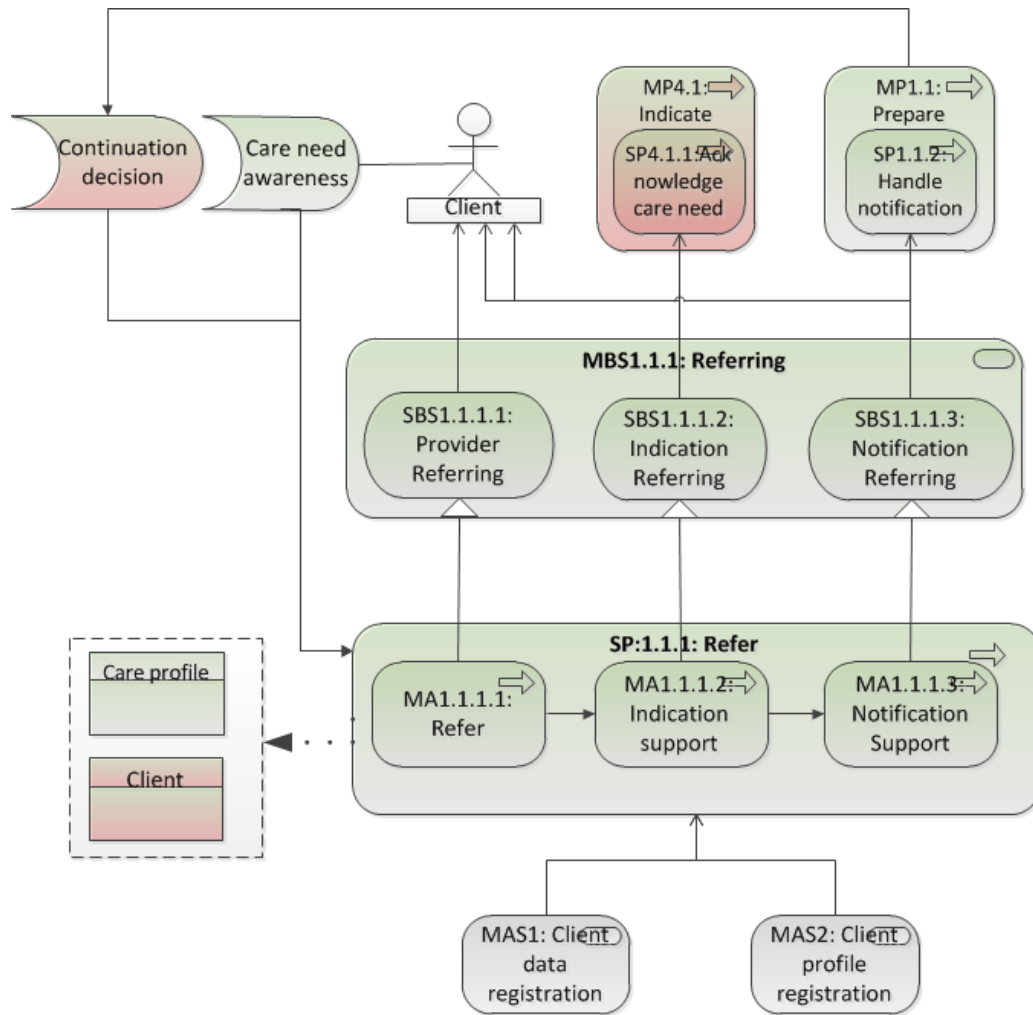
Below the process and its relations with other main processes is modelled. These two sub processes are described and modelled in detail in the following paragraphs.

13.5.1 Model MP1.1: Prepare



13.5.2 Model SP1.1.1: Refer

Below the refer step is shown in more detail:



The initial trigger of the refer step is the awareness by a person or his social network that (a change in) professional guidance and support is necessary (care need awareness trigger). As seen in previous sections this 'awareness' may triggers referring activities (refer, indication support, notification support). To perform these activities application registration services are needed to register and access client and client-profile data (client data registration, care profile registration). Based on his care needs (care profile object) the refer sub process helps a client on his way in:

- **Indication referring service:** Obtaining a (change in the) care indication. In this case the care service provider acts as a referrer for the client in gaining legitimacy for (additional) care services. In the model the client and the indication sub process are then utilizing the indication referring service. The continuation decision may trigger this refer step (indication support) when the indication is insufficient.
- **Notification referring service:** applying for care services (notification). In this case the step is followed by the notification handling step. In the model the client and the notification handling step are utilizing the notification referring service.

- **Provider referring services:** Finding a suitable provider in case the continuation decision has a negative outcome and the client does not fit in within the care service provider.

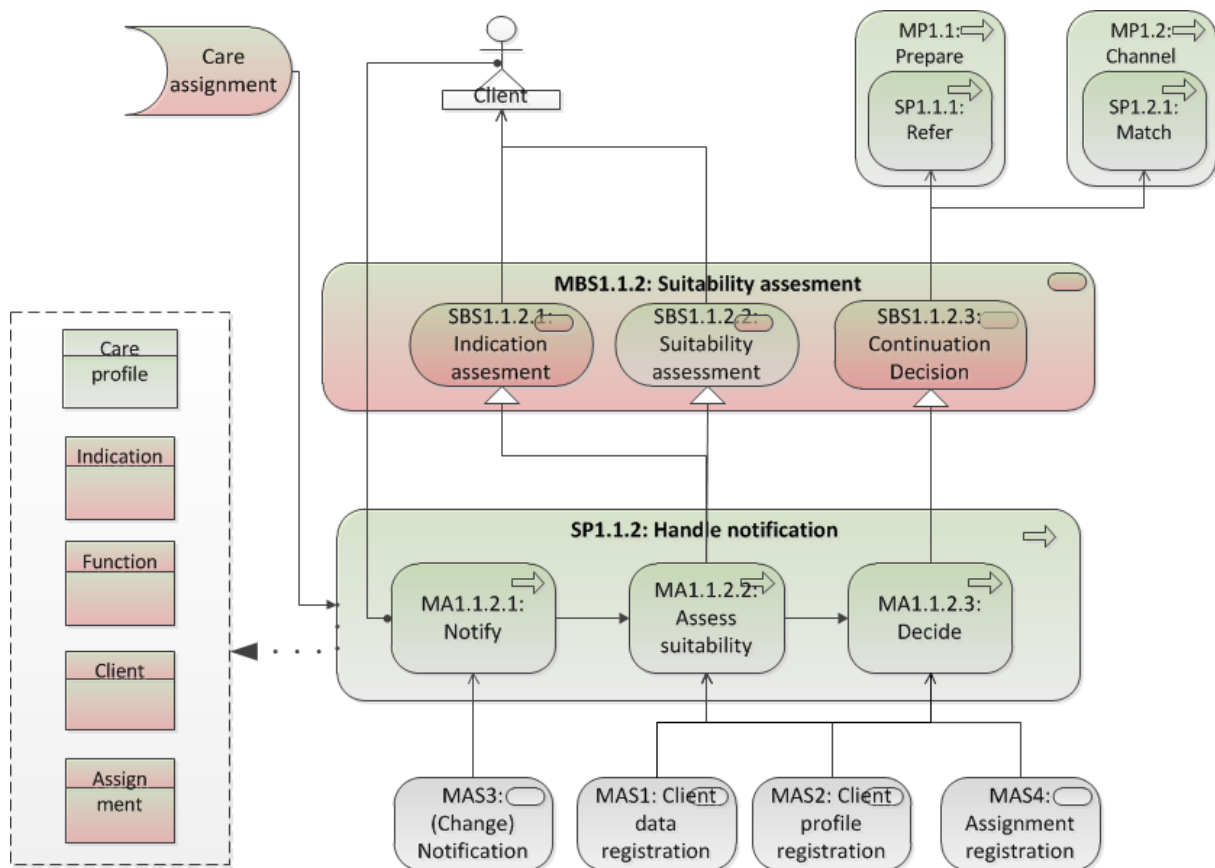
The referring step may be executed from different locations by different roles :

- Whenever a client visits a site of a care service provider directly. Employees from the care site will then act as a referrer → Care attendant on local care site
- When a client contacts or visits a the main office of the care service provider. Employees from the main office will then act as a referrer → Care consultant on main office.

These referring sub process is followed by the notification handling step which is modelled in Model SP1.1.2: Handle Notification

13.5.3 Model SP1.1.2: Handle Notification

The main goal of the notification handling step is to determine the fitness of the client for receiving care services from the care service provider. Below this is visualised and described:



13.5.3.1 MA1.1.2.1: Notify

The 'notification handling step can start as a logical sequel to the refer activity or when it is triggered by an automated care assignment (assignment registration).

In both cases the client (or his referrer) needs to notify the provider by filling out a notification form (application service); in this notification form the substantive background and/or history of the client

is described (care profile registration). After receiving the notification form the care consultant will take this form into consideration .

13.5.3.2 MA1.1.2.2: Assess suitability/MA1.1.2.3: Determine continuation

In case the care assignment is the trigger, the care consultant will then act as referrer delivering 'notification referring service' (notification support, 13.5.2). After this form is received the next steps will be started.

The '**assess suitability**' logically precedes the '**determine continuation**' and are therefore described in one section. Within these two steps the following checks/assessments are executed on which a continuation decision is based:

- Indication Assessment service: A check needs to be done on the indication of the potential client to determine if an indication is available and whether the height of the indication or 'care assignment' is sufficient and fits the client's needs. If the care assignment (or indication) is not available or sufficient the care-consultant looks at the chances of realizing (or changing) a 'care service indication' successfully and judges whether or not the client is getting assistance in retrieving one. If assistance will be provided, the 'care consultant' will then act as the referrer and realises the indication referring service 13.5.2
- Suitability Assessment service Regarding the suitability the following is checked where the consultant can rely on a behavioural scientist for expertise.
 - Check if the client's needs and diagnoses fit the type of care that the care service provider is allowed to deliver to ultimately reach a correct judgment
 - Check if the care service provider has the proper facilities and knowledge to fulfil the client's needs that are a result of his disabilities. This check is done through the organizations' policy on admission.
 - Does the combination of the amount and type of care fit into the contract conditions that exist between the care agency and the care service provider?

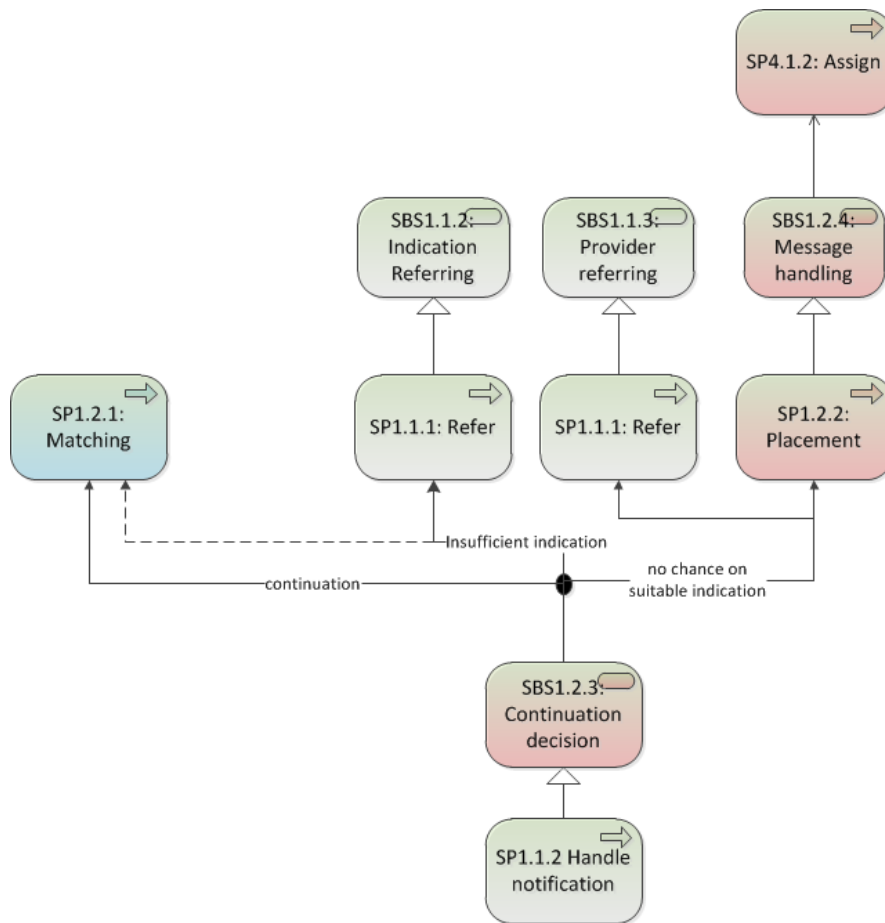
This can result in either a rejection of the potential client (or a referral to another provider/ 'provider referring service' 13.5.2) or continuation of the process (care channelling 13.6)

13.5.4 Model J2: Junction prepare channel

An important outcome of the care preparation sub process is the decision whether or not a client fits the care service offerings of the provider. The continuation decision service is used by the refer activity and by the channel main process. In this part of the model it is not shown what outcome triggers what step. This is described in this section. The continuation decision has three possible outcomes:

- 1- The indication is insufficient: this triggers the 'indication support' activity in the 'refer' step, but the client also may proceed to the next step.
- 2- The client is not suitable (or has no chance for a suitable indication) for the care service providers offerings: this triggers two activities:
 - a. the refer step where the client will be guided to a different provider.
 - b. The placement step that realizes the message handling service. This service is used by the (external) care assignment step to receive the status of the decision
- 3- The client continues in the process and starts the matching step.

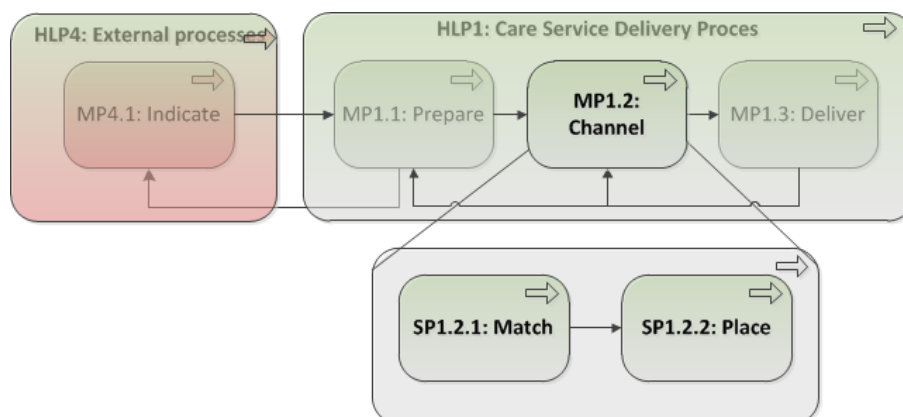
The model below visualizes this:



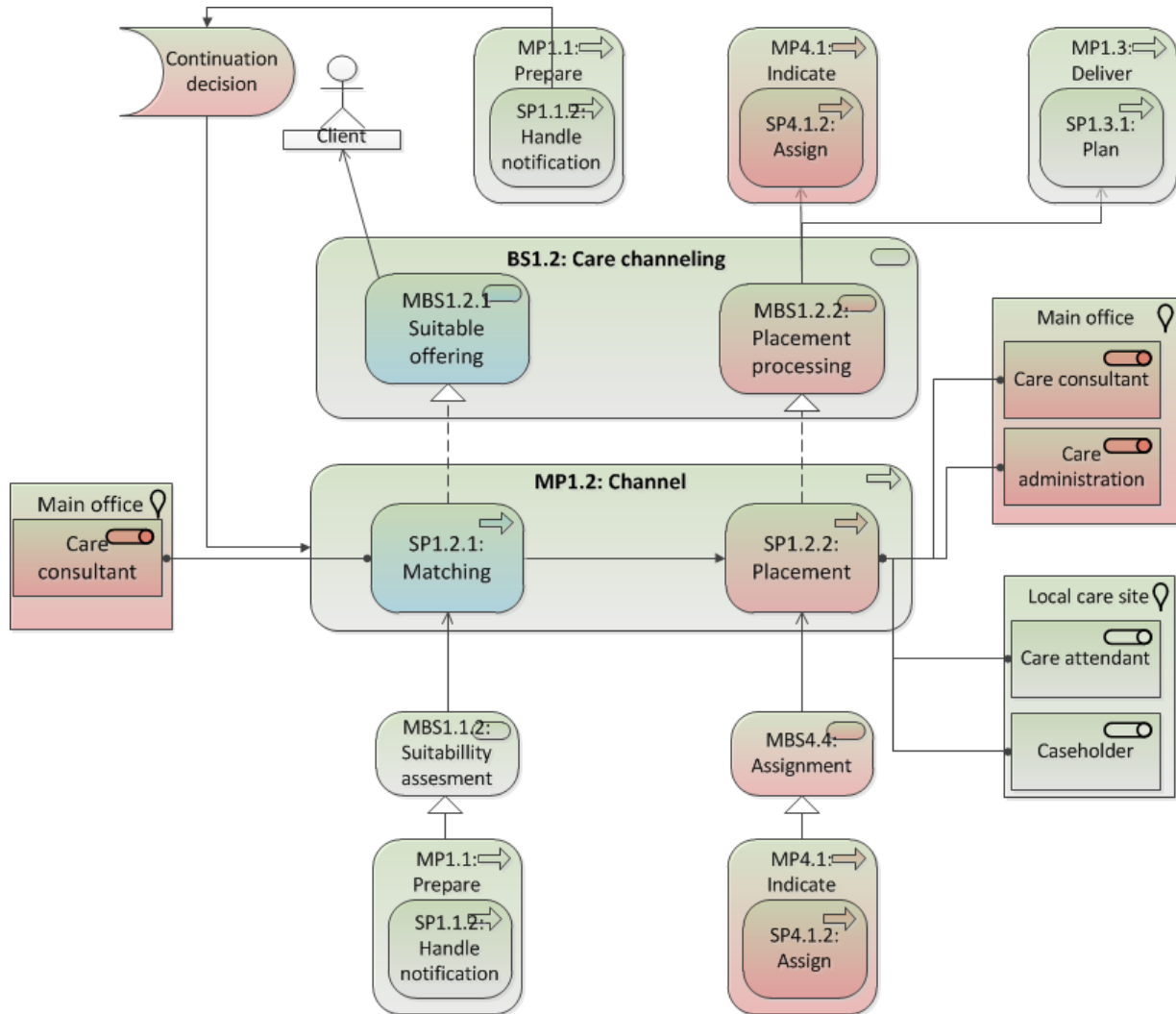
13.6 The channel main process

Relevant process findings and modelling findings: KF7, KMF11 to KMF14, KMF15 to KMF26, (Appendix II and IV)

Immediately after deciding whether or not to continue (continuation decision) the channel process is started. Main goal of this main process is to guide the client to receive a care service offering that matches its needs, its indication, its wishes and inabilities ultimately placing a client on a suitable site. The channel process is also responsible for handling status messages to the care agency. Below it is visualized where the 'channel' main process is situated within the care service delivery process followed by the model of the main process itself (13.6.1):

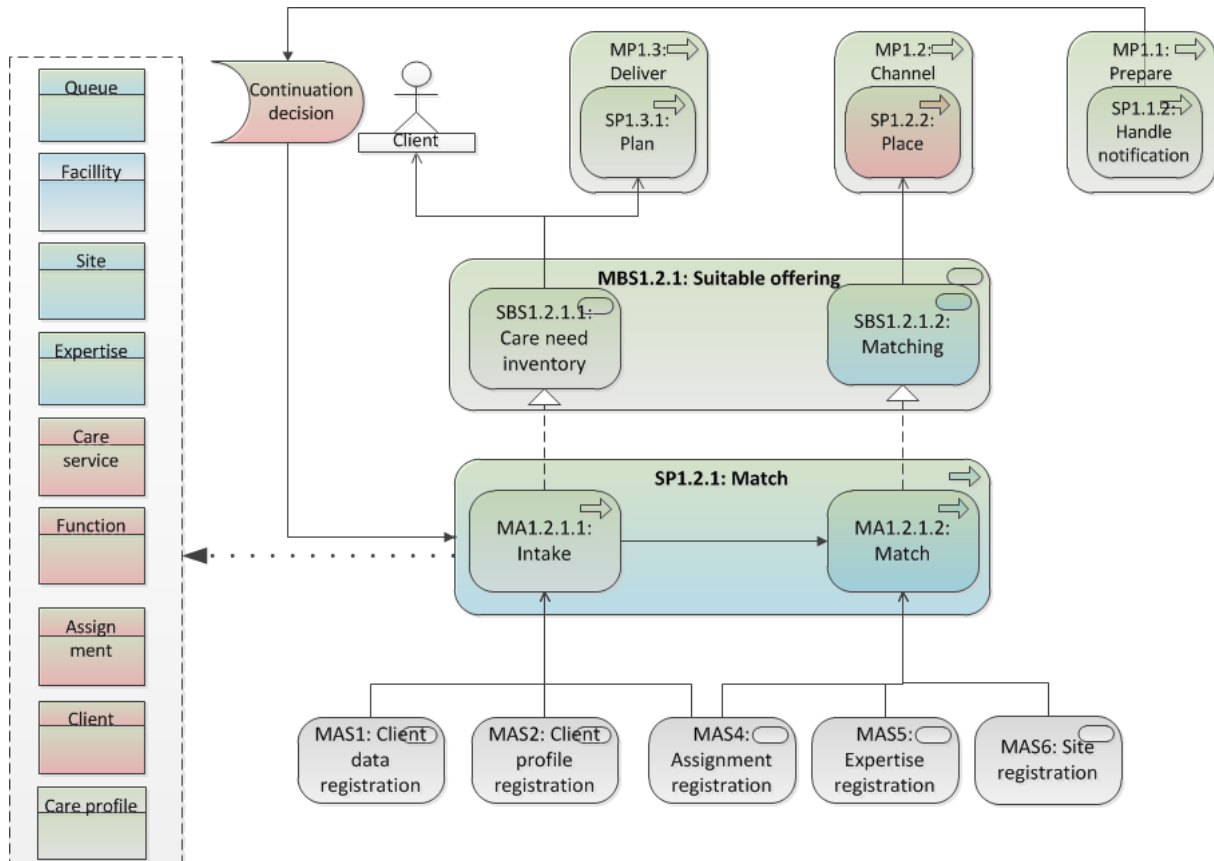


13.6.1 Model MP1.2: Channel



Depending on the outcome of the continuation decision (13.5.4) either the matching (positive outcome) or the placement step (negative outcome) will be executed.

13.6.2 Model SP1.2.1: Match



The positive continuation decision triggers ‘the match sub process’. The aim of the match sub process is to match the clients’ needs (care profile) and the content of the indication to the Promens Care ‘care service’ offerings.

13.6.2.1 MA1.2.1.1 Intake

The match sub process within the channel main process will start with the intake step. The intake step will take place directly after determining the continuation and the (requested) level of the indication.(13.5.3). The outcomes and information from the ‘prepare main process’ form the basis for the intake interview.

During this intake, the clients background, the clients wishes and demands, its diagnoses, his current situation and care needs on diverse areas of life will be clarified. For this the client data, the care profile and the assignment registration services are used to access and record information

13.6.2.2 MA1.2.1.2: Match

During the ‘match’ step the care-consultant matches the needs of the client to the care service offerings that Promens Care delivers which are based on accessing the following business objects:

- Care service
- Client profile; including the nature of a person’s ‘inability’ (psychiatric, mental or social), urgency
- Assignment (and indication)
- Expertise (and/or guidance style)
- Site characteristics (facilities and geographical location)

- Client data

During the 'match step' a client may indicate (a) preferred site(s). The outcome may be one or more suitable 'care service sites' with the appropriate guidance and support style, facilities and geographical location. The matching and intake step may result in a (list of) suitable and/or preferred location(s).

13.6.2.3 Care service catalogue

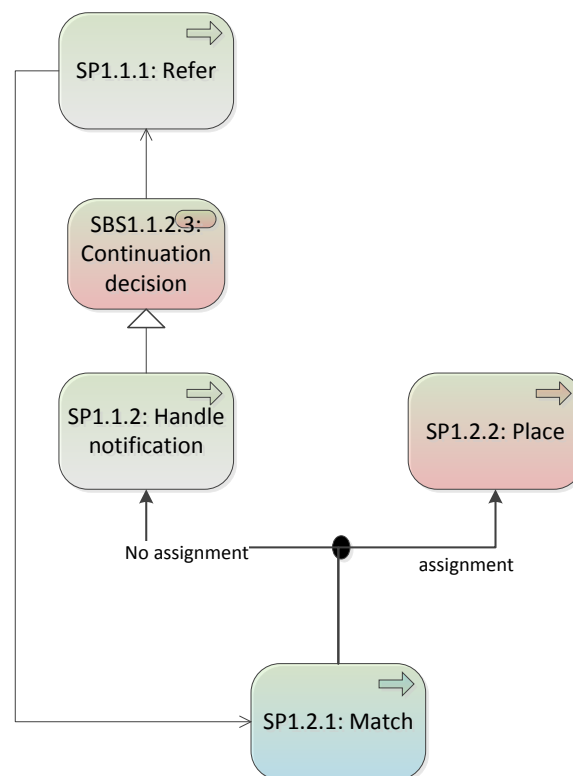
The care service offerings that Promens Care delivers are based on the following care service categories:

- 24/7 residential care services where the clients home resides within a 'site'
- Home support residential care services where the clients home resides outside the care provider and the site is more a site-office.
- Daytime Activity services; this kind of services helps the client in having a meaningful occupation.

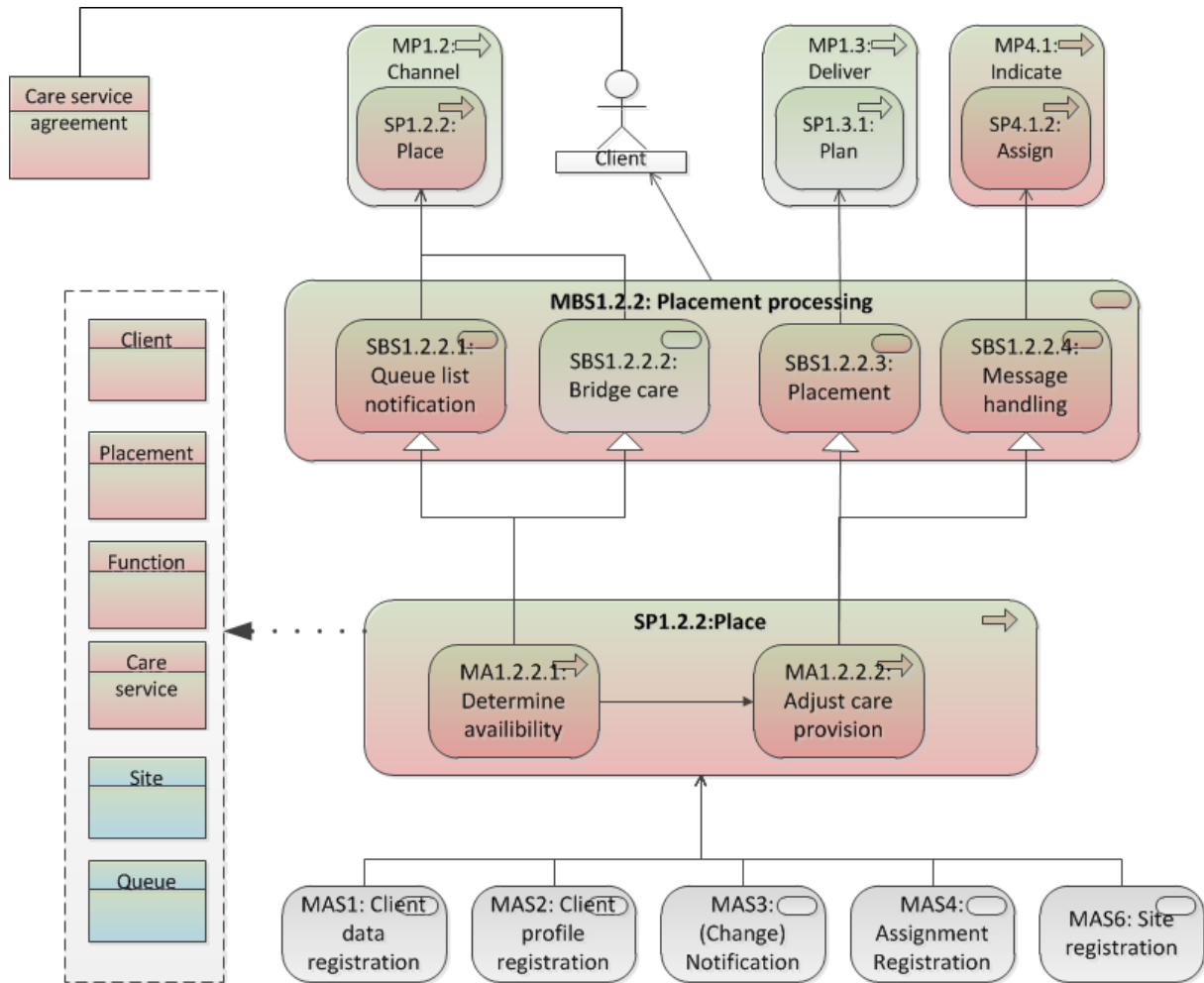
With 'daytime activity services' and '24/7 residential services' the services are delivered to the client on the site. The matching step is executed on all functions that are listed in the indication, as a result a client is often matched with multiple sites.

13.6.2.4 Model J3 Junction assignment

Before the placement-activity can begin, the client needs to have an assignment to all functions in the indication for which the matching has occurred. In the vast majority of the clients, this is the case. However in case the assignment is not yet in place for one or all functions in de assignment the 'continuation decision' - service is used. Below this is visualized:



13.6.3 Model SP1.2.2: Place



The placement-activity has two main steps:

13.6.3.1 MA1.2.2.1: Determine Availability

The first step determines which option(s) is/are best for placement based on the clients preferences and the availability of the site. When there is availability on the primary preferred site the status is recorded in the queue-list (queue list notification) and the 'adjust care provision' step will be started immediately. In case there is no 'short term' availability on the preferred site, which particularly applies to 24/7 residential care services, the client has the option to be placed on the queue list (object) or the option for placement on an alternative location (without queue-list placement) which then will be sequenced by the 'adjust care provision' step. When placed on the queue list; the client will wait until availability arises. During this 'waiting' there are some options for the client to 'bridge' the gap between 'placement on the queue-list' and 'placement on the preferred location', which are:

- go to an alternative location with queue-list placement on the preferred site.
- receive 'bridging care' within the current residential setting. When receiving 'bridging care' (the bridge care –service) the client stays on his current residential setting with additional (temporary) care services to fulfil its needs.

The site registration service is used to record (queue-list) the choice of the client. This status-information (queue-list notification service, bridge care services) is used in the launch care step to determine which messages need to be sent to the care agency. Both options will trigger the launch care step.

Queue-list check

The 'determine availability' step continuously checks availability for clients that are placed on a queue-list. When availability arises the 'adjust care provision' step will be executed for the vacant spot on the site a client is waiting for.

In general, the priority or handling the queue list is based on the date the person is placed on the queue list. This is called the 'queue list placement date', the person that has the 'oldest date' receives precedence when availability arises. There are however two exceptions:

- when there is urgency involved the client's placement may receive precedence.
- Temporary withdrawal, but with the 'queue list placement date' unchanged, from the 'queue list'. This happens when during the time spent waiting the financial and/or substantive conditions of the client have changed. This could include:
 - o The client doubts about placement
 - o The site (and its services) isn't available yet.
 - o The client has temporary physical problems which prevent the client from being placed.

13.6.3.2 MA1.2.2.2: Adjust care provision

The 'Adjust care provision' step utilizes the 'queueing list notification' service to determine the status of a client. Based on the status of the queueing list (by utilizing the queueing list service), the Adjust care provision step provides the administrative processing of new and changed (initiated by MP1.3: Deliver) client placements and the final steps in starting the actual care service delivery.

When the client has selected an appropriate site or is agreed with receiving bridging care on a site the client is introduced by a care consultant to a caseholder which mediates the client into placement on the site (placement service). This caseholder introduces the client to the site where the client gets to team up with his care attendant. The care attendant gets acquainted with the client and then 'notifies' (notification form service) the 'care administration' on what date the care services are started, this notification is accompanied by a 'care service agreement'. An agreement between the client and the care provider. The care administration will process the notification and update the status of the client (status messaging) to the care agency that executes the care assignment sub process within the care indication process (10.4).

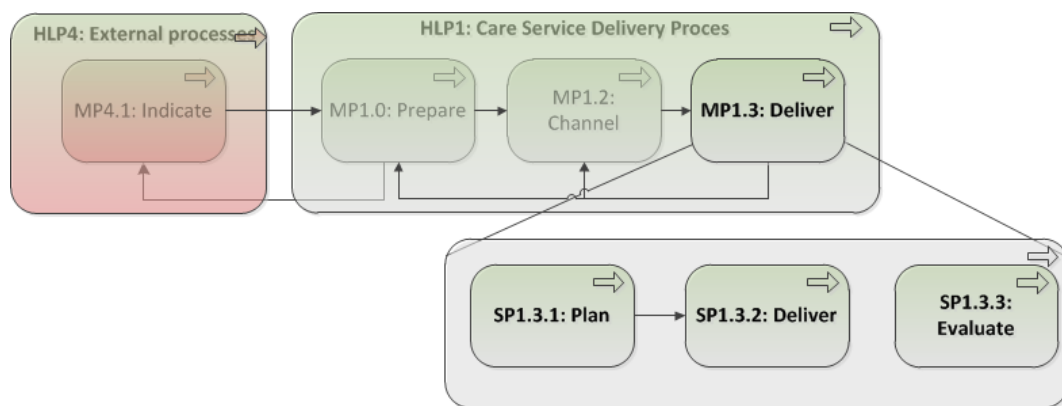
13.7 Deliver: Daily care guidance and support

Relevant process findings and modelling findings: KF8, KMF15 to KMF26, KMF27 to KMF33, (Appendix II and IV)

The Deliver main process forms the core business of a care service provider. It is the main process:

- that actual delivers the care guidance and support services to clients,
- records the progress of delivered care services,
- registers accountability demands,
- that executes and records possible security measures and restraints.
- registers delivery and client-changes

Below it is visualized where the 'deliver' main process is situated within the care service delivery process:

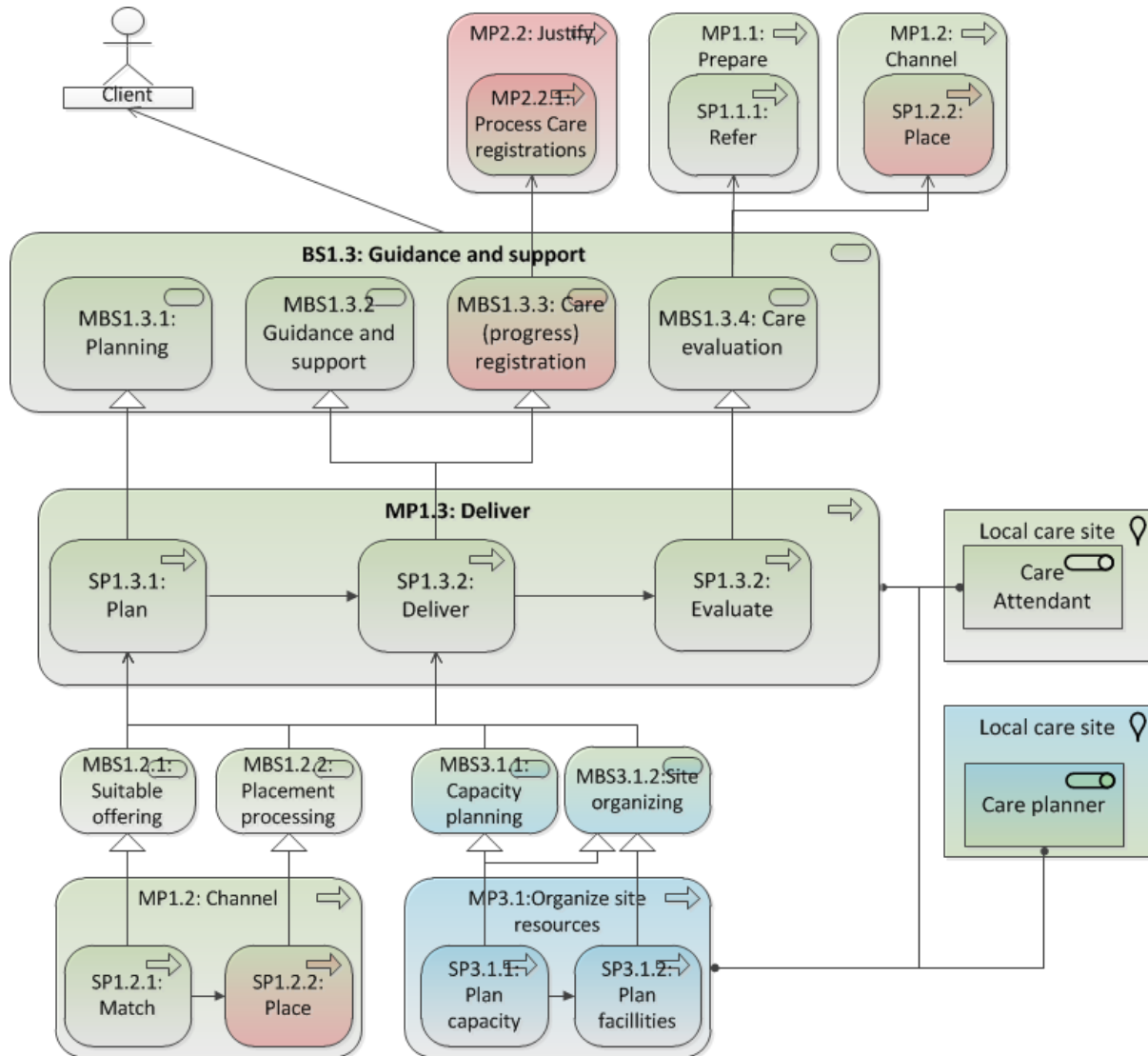


To model the 'Deliver' main process in the process to process viewpoint we needed two views:

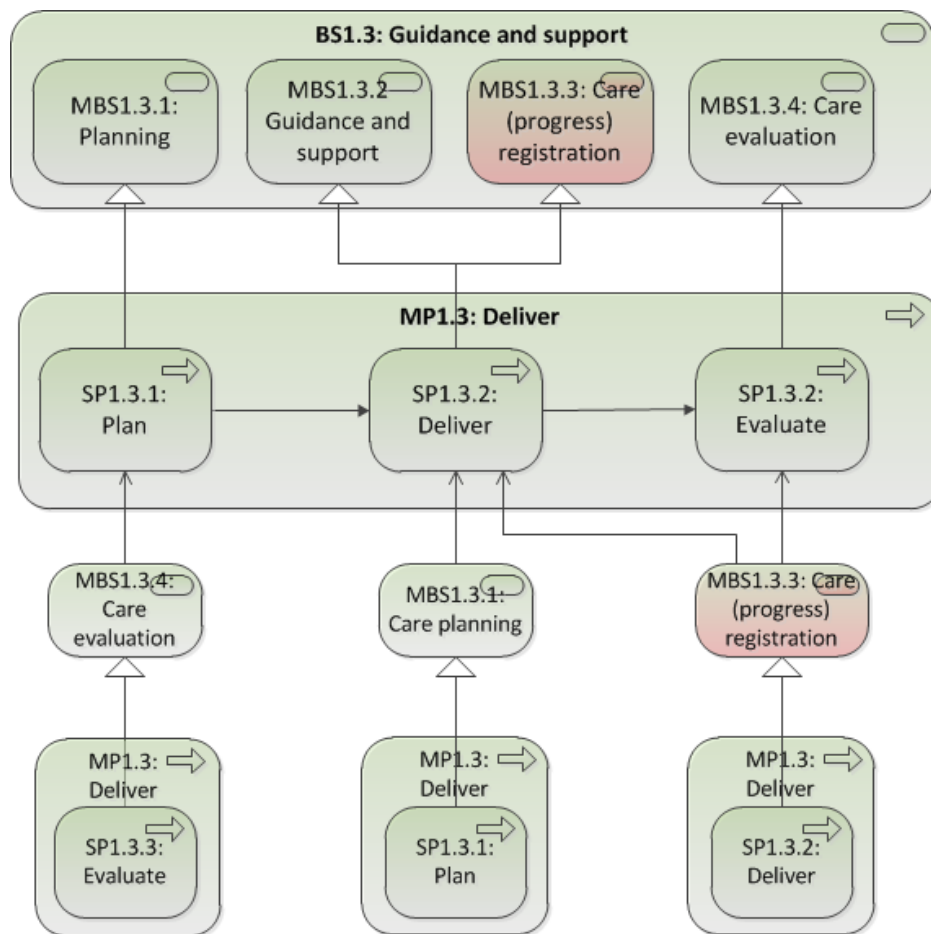
- One that shows relations with the other internal and external main processes
- One that shows its internal 'composition'

These models are shown in 13.7.1. and 13.7.2.

13.7.1 Model MP1.3: Deliver external



13.7.2 Model MP1.3: Deliver internal



The 'deliver- main process has 3 sub processes:

- **1: Plan:** The planning of care delivery to the individual client (care support plan)
- **2: Deliver:** The delivery of the services to both individual clients and client groups and its needed (substantive and accountability) registrations. This includes transfer of information to various stakeholders, recording the progress of delivered care services, register accountability demands and register changes in delivery and client data.
- **3: Evaluate:** The evaluation, adjustment and/or termination of the delivery of individual clients which includes triggering step in the other sub processes (preparation, channelling)

The 'Deliver' main process realizes 3 services that are used by stakeholders and other processes:

- (Care) planning services
- guidance and support services
- care (progress) registration services
- Care evaluation services

The sub processes within the Deliver process are assigned to the care attendants that execute these activities on a site. A site is a physical location (from) where a client may receive its services.

Accountability information that is provided through the 'care progress registrations' service are

processed within the care funding process. The 'Deliver' process is related to the two other high level processes:

13.7.2.1 The care support process:

Site organizing services: Services that are realized by activities that include planning, executing and registering events and tasks at site level. Tasks that exceed the individual client level which are non-care-related and are aimed at running the site properly. These activities are assigned to 'care planners', a role that may be performed by the same person that is the care attendant.

Capacity planning services: Based on the total amount of 'care services' that need to be delivered on a site; the employees ('care attendants') and their appropriate knowledge and skills are organized in shifts.

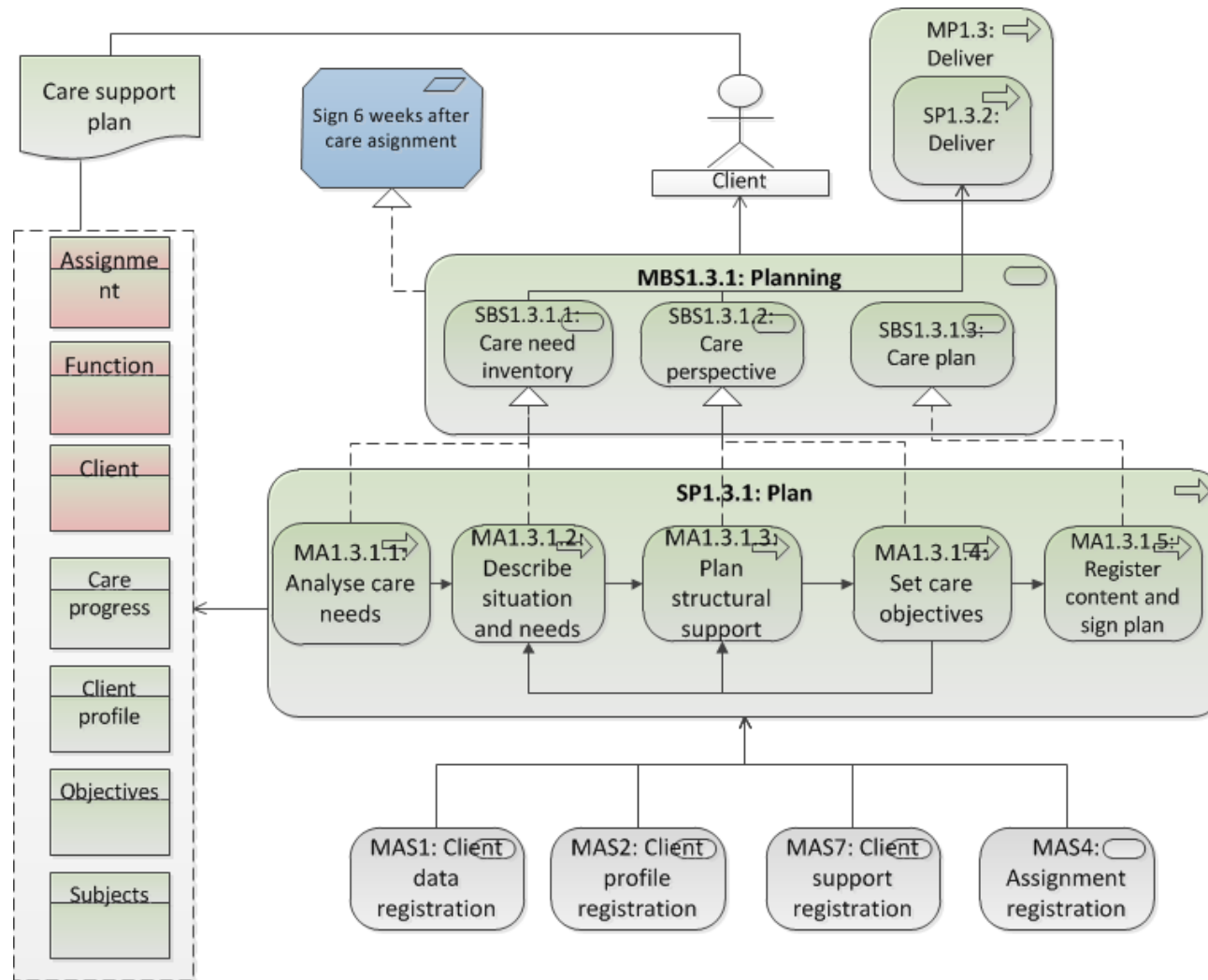
13.7.2.2 The care funding process:

The care funding process is related to the 'Deliver' process in the following matter:

The 'Deliver' process realizes a service that allow care providers to account for their delivered services and receive funding in return. This service is called the care (progress) registration service realized by the delivery activity (more on this in 10.7.3). All registrations are verified and processed in the care funding process to realize the payment and accountability service.

13.7.3 SP1.3.1: Plan

Below the 'planning' activity is visualized and described:



After or during placement on a site; the 'care attendant' is teamed up with the client and has an introductory interview to get a first insight in the clients background and inabilities. Often this is combined with realizing the care service agreement as described in the 'launch care' activity within the placement step (10.6.3.2) . The base for this introductory interview is formed by the 'intake report'.

After this introductory interview the 'care attendant' prepares a so called 'care support plan' by identifying the needs of the client in different social areas or domains of human life based on the interview and the indication. This care support plan is a detailed substantive elaboration on (and in this order):

- The clients wishes and inabilities (Analyse background and inabilities)
- The clients profile/current situation and risks (describe the situation and needs)
- The clients perspective; (plan structural support and set care objectives) the day to day scheme for delivering care services consisting of:
 - o Goals
 - o Structural support (recurring appointments and tasks)
 - o If necessary freedom restraints

There are two types of 'care support plans':

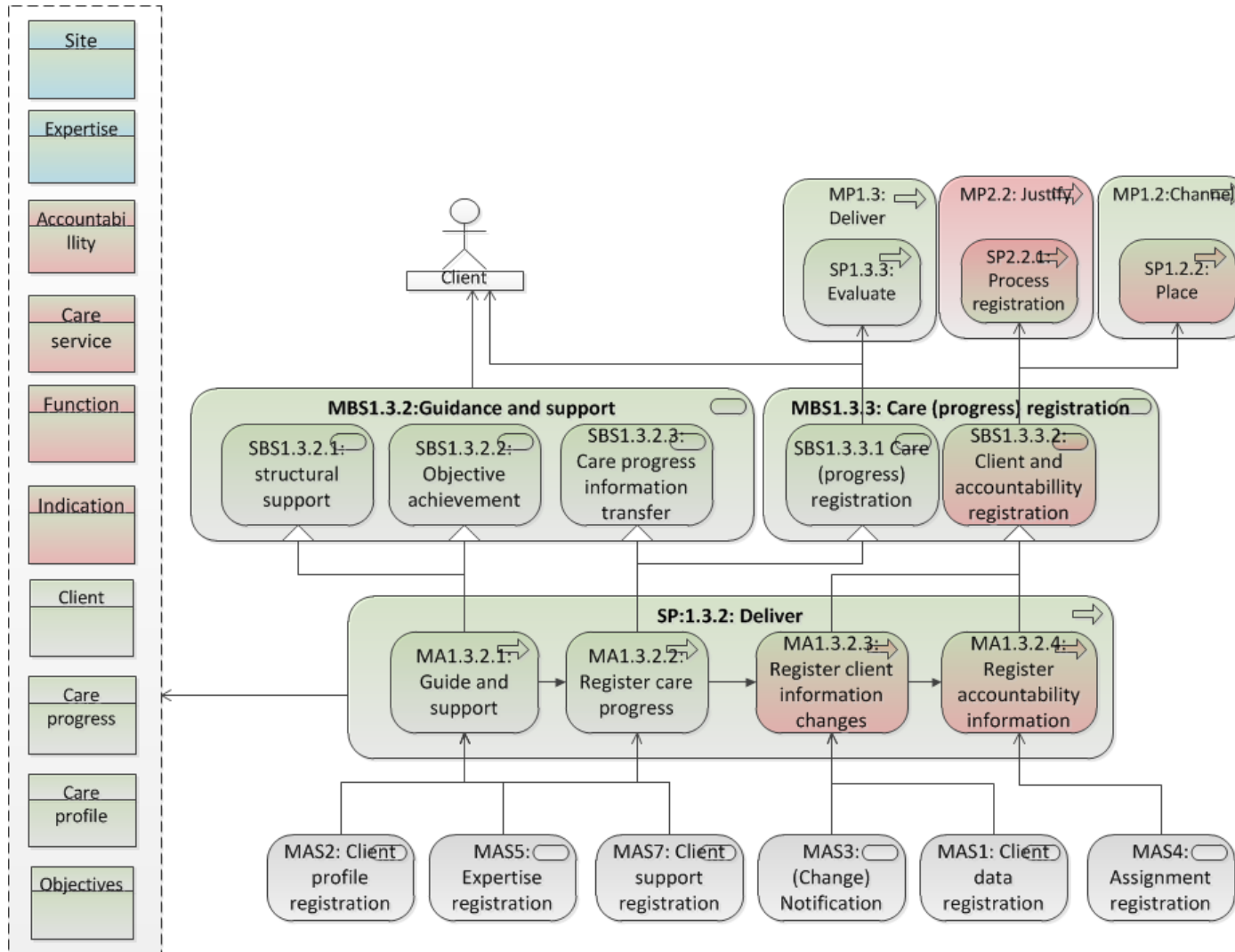
- 1- The 'signed care support plan' which makes the plan a juridical contract to actually execute the plan
- 2- The 'dynamic care support plan' which has the same type of content but this content can change based on the progress of 'care service delivery'

The 'care support plan' must be signed 6 weeks after the 'care assignment process'(requirement).

The 'care service planning' activity can start after (or during the last steps of) the care service placement (10.6.3) but also after the care service evaluation and adjustment step. (see 10.7.4)

13.7.4 SP1.3.2: Deliver

Below the 'delivery' activity is visualized and described:



These activities form the day to day activities of a care service provider. It consists of:

- **The execution of structural support** (which consist of recurring tasks and appointments)
 - Having face to face contact moments with the client and/or his family to discuss the progress and current situation; which could lead to 'evaluation and adjustment' of the plan.
 - Execute both recurring and 'ad hoc' tasks that are needed to help the client in his day to day life. These are tasks that the client itself is not capable of.
- **Support clients in achieving their objectives** as recorded in the care support plan
- **Care progress registrations** consisting of:
 - Registering care progress (care objectives).
 - Registering and sharing (information transfer service) abnormal situations and events in the clients behaviour
 - Registering and sharing (information transfer service) abnormal situations and events within groups of clients.
- **Administrative and accounting registration** consisting of:
 - Time and accountability registration
 - Notifying administrative departments when changes in the client's registration is needed
- **Processing administrative and accounting information**; an activity performed by administrative support

The first four activities are executed by and assigned to the care attendant. The last one is performed by administrative support.

The delivery process realizes three services:

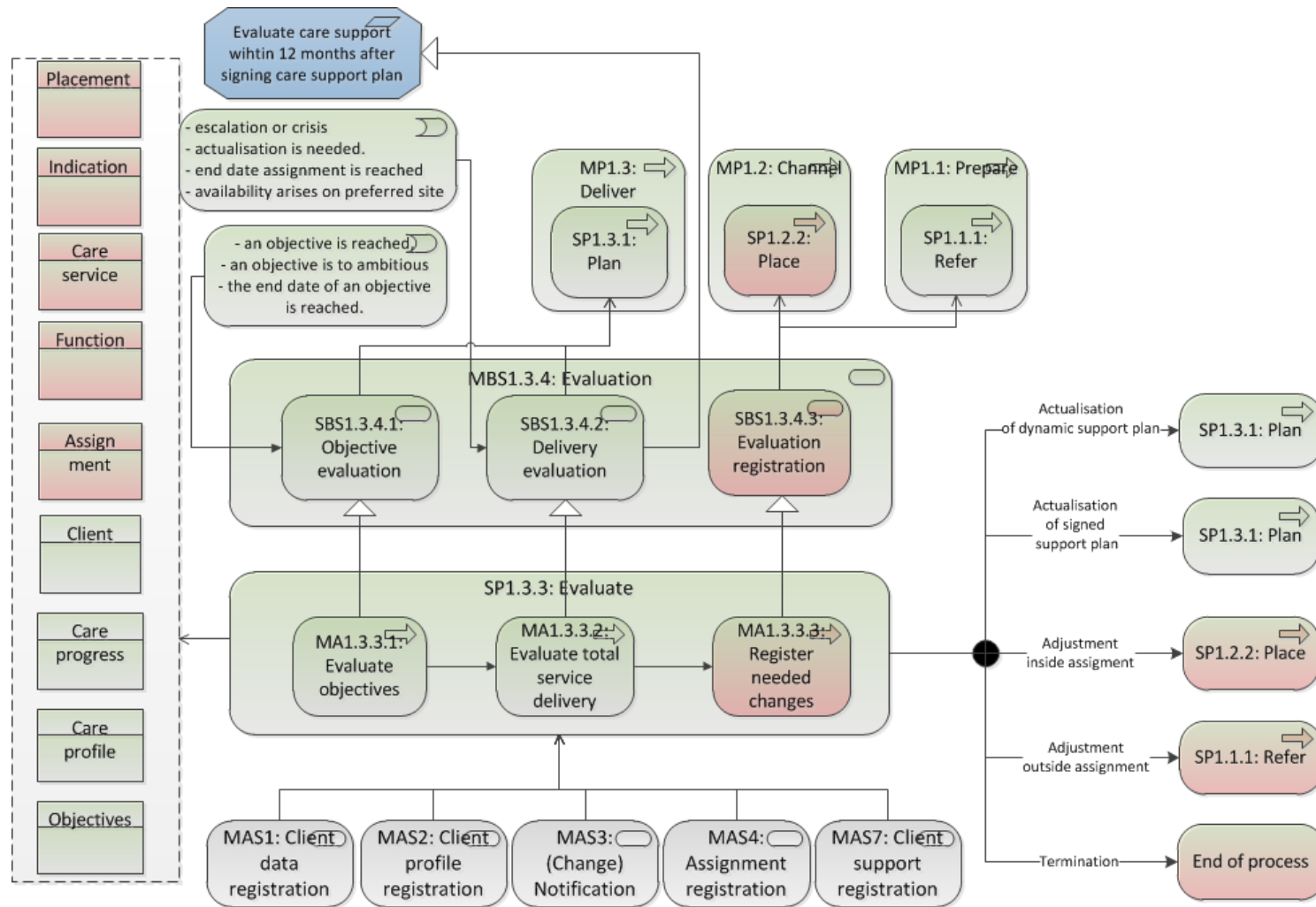
- 1- Care guidance and support services; the actual care delivered to the client
- 2- Care progress and information transfer services that are used by colleagues of the care attendant, the client, the clients social network and other people and/or organisations that are involved with the structural support or with the care objectives. The information that is transferred, recorded and produced form the recorded 'results' of the activities.
- 3- Care registration services as a result of the administrative and accountability registering activities.

These activities are executed parallel to one another. That's why no flow relation exists between them.

Non- care related site activities which are also executed by care attendants are not part of the delivery, but are part of the business support process and therefore the 'site activity service is modelled as used by the care delivery step.

13.7.5 SP1.3.3: Evaluate

The ultimate step in the care service delivery process is the 'evaluation' visualized and described in this section:



Activities that are executed during the care service delivery need to be evaluated. This evaluation has two aggregation levels:

The evaluation of individual objectives: This is done when an objective is reached, is too ambitious or when the end –date of an objective is reached. This leads to a change in the dynamic care support plan; this change does not need to be ‘signed’ by the customer.

The evaluation of the total care –service delivery which is done through the evaluation of the ‘care support plan’; this evaluation needs to be done:

- when the end date of an indication and/or assignment is reached
- as a result of an escalation or crisis
- when actualisation is needed
- when availability arises on the preferred site.
- termination of the care service is needed (10.7.5)

A total ‘care support plan’ evaluation can have 4 possible outcomes:

13.7.5.1 The actualisation of a support plan (signed or dynamic)

If this is the case the ‘planning’ step is started. It then is a routine step in plan-evaluate cycle (12 months). There are two possible options:

- An evaluation of the total plan; if this is the case adjustment of the total care support plan is needed and the client needs to sign this
- An evaluation of a specific objective; if this is the case specific objectives may be adjusted or renewed. Here signing is not needed.

13.7.5.2 Adjustment of the amount of care services delivered that fits within the current indication.

If this is the case the launch care step is executed (placement) resulting in a adjusted care service agreement or termination.

13.7.5.3 Adjustment of the amount of care services delivered which requires a higher indication.

If this is the case the care attendant or care consultant will then act as a referrer (indication referring service). In case of a changed indication the steps that follow have an adjustment character where information is checked and actualised.

13.7.5.4 End of process

The process ends with that the care service delivery is ended.

14 The ‘change’ phase of the care-service delivery process

In the previous chapter we have explored in relevant details how the ‘care service delivery’ process was organized before the ‘major transitions’. In this second chapter we will look at the changes a care service provider is confronted with as a direct consequence of these transitions.

The base for modelling the impact of these changes is formed by an inventory. This inventory is realized by analysing the interviews that were conducted with care- attendants and care –experts combined with the study of documents from external governments and institutions. The results of this inventory are presented in Appendix III. Per area the changes and its impact on the care service delivery process will be described in 14.2. The impact is then modelled in 14.3. Insights may occur in modelling these changes these are part of the Key modelling findings in Appendix IV. We start this elaboration by describing the major transitions (14.1).

14.1 The major transitions in the AWBZ

In 2015 the way the ‘care’- segment of healthcare was organized is changed. Healthcare that was delivered based on the act of exceptional healthcare costs (AWBZ) got incorporated into 3 other laws. In this description the transitions from the AWBZ to these 3 acts will be described. The reference case Promens Care delivers care services that are part of the descriptions below:

14.1.1 The act for enduring and intensive care: ‘WLZ’ (Wet Langdurige Zorg)

This act is meant for adults and/or children with severe intellectual disabilities that need (day) care services 24 hours a day with continuous supervision of a care attendant. Within this act a person may reside within a the care service provider or may choose to reside in its own home but with services delivered at his or her home 24 hours a day. At its core this act is a continuation of the AWBZ-act for the care-functions that stay in this act.

14.1.2 The social support act: ‘WMO’ (Wet Maatschappelijke Ondersteuning):

This act makes local authorities responsible for the financing, regulation and organization of care – functions from the AWBZ that deal with:

- ambulant assistance and day care-services for people with social and participation challenges. These challenges may be a result of physical, mental and/or intellectual disabilities.
- sheltered housing for people with severe mental disabilities.
- care support or relief support for informal care givers.

14.1.3 The juvenile law: ‘Jeugdwet’

This act makes local authorities responsible for the financing, regulation and organization of care – functions from the AWBZ that deal with:

- specialized care for young people or children with mental, physical, somatic and / or psychiatric disabilities.
- Ambulatory youth assistance for helping families with children who have problems . The assistance is provided at home. These are children and adolescents up to 18 years
- Residential youth care were children or young people (temporarily) reside within a home of the care service provider. This is done in case of behavioral problems, mental health problems or intellectual disabilities.

14.2 The process transition inventory

In 9.1 we described roughly the major changes in the healthcare market that were applicable to the reference case Promens Care. In this section we will concretize these changes by-describing the impact these transitions have on the care service provider and the care service delivery process.

At its core the effects of these changes can be divided into 4 areas:

- Changes in accountability demands and registrations
- Changes in the care funding with a significant budget rebate.
- Changes in the way in which the care service delivery process is executed
- Changes in the dynamics (opportunities, threats) of the external environment of care providers

Per category of changes we provide a table in which is shown what the change is and the impact it has on the care service delivery process. The impact is seen as a requirement. The changes have a key number that refers to Appendix III. In 14.3 these changes will be modelled

14.2.1 Changes in accountability demands and registrations

The first category of changes are a result of the fact that financing, organization and execution of healthcare in a region is now realized from a highly diverse group of 'funders and regulatory institutions'. These new funders want to have control over this and will come with diverse demands regarding information that needs to be generated and registered during 'care service delivery': The following concrete changes occur within this area of focus:

Key	Change	Impact (Architectural Impact AIM)
KFC1.A	Beside the care agencies new funders (local authorities) will be responsible for the purchase of care services from care providers.	<ul style="list-style-type: none">• AIM1: Registrations are needed that enable an active role of the care service provider in local care developments and help in realizing and/or expanding contracts with the new funders.• AIM2: In order to achieve the appropriate services for each funder a care provider will need different and flexible care (progress) registration activities• AIM3: Care (progress) registration activities need to be highly automated and highly accessible (for non-employees)
KFC1.B	There will be a relevant variety of non-standardized financial accountability demands from the new funders	
KFC1.C	There will be a decline in standardization and automation in the exchange of information between funder and provider	
KFC1.D	There will be a growing variety of 'care progress' accountability demands from the new funders. Funders want to know what the results are of the care delivery process.	
KFC1.E	There will be an increase in administrative burden and a decrease in capacity	
KFC1.F	New funders may also (partly) become regulatory institutions	

14.2.2 Changes in the funding in care-service with a significant budget rebate

The major transition also come with a significant budget rebate. Combined with the need for different registrations, which leads to 'higher' overhead within care service providers, a huge challenge lies ahead for care providers. This challenge may best be described by the impact these changes have on a 'care service provider' and can be summarized by the following 3 major challenges:

- Do it with the same results as you did before!
- Do it with a substantial budget rebate!
- Do it with a substantial increase in complexity!

Below these challenges are summed up:

Key	Change	Impact (Architectural Impact AIM)
KFC2.A	A substantial budget reduction will be applied to care services delivered. The 'funding' for each care service may decrease drastically.	<ul style="list-style-type: none"> • AIM3: Care (progress) registration activities need to be highly automated and highly accessible • AIM4: Care (progress) registration activities need to deliver real time information regarding quality, costs and (expected) revenue
KFC2.B	The uncertainty about 'care assignments' increases; there may be a decrease in duration of 'care assignments'	
KFC2.C	Reduction of advanced funding which may lead to problems regarding liquidity	
KFC2.D	Care services need to be delivered on the same quality level but with reduced capacity for deliverance	<ul style="list-style-type: none"> • AIM5: Capacity planning needs to be an integral part of the care service delivery process in order to deliver the services with 'just in time' appropriate qualitative and quantitative capacity

14.2.3 Changes in the way in which the care service delivery process is executed

The care service delivery process was a chronological as well as a stable linear process. With the transition comes the need for a flexible process that may be executed at any step, at any location and both inside as outside the provider with a variety of roles . Below these changes are summed-up and translated into impact on the process:

Key	Change	Impact (Architectural Impact AIM)
KFC3.A	The way 'assignment and matching' activities will be executed may vary per funder.	<ul style="list-style-type: none"> • AIM6: The way 'assignment and matching' activities will be executed may vary per funder.
KFC3.B	There will be more focus on delivering (digital) care services to (and enabling) the social context in which a client resides (family, friends, volunteers, third party care providers).	<ul style="list-style-type: none"> • AIM2: In order to achieve the appropriate services for each funder a care provider will need different and flexible care (progress) registration activities • AIM3: Care (progress) registration activities need to be highly automated and highly accessible (for non-employees) • AIM7: Care (progress) registration activities need to enable 'safe' knowledge and information sharing to the clients' social context
KFC3.C	There will be an increased emphasis on social teams that identify care needs in a neighborhood or district. Care service providers participate in these social teams.	
KFC3.D	There will be an increased emphasis on the degree of self-reliance of the client which determines the rights of a client in receiving professional guidance and support	
KFC3.E	The flexibility of the scheduling of personnel should be increased.	<ul style="list-style-type: none"> • AIM8: Capacity planning needs to be an integral part of the care service delivery process in order to deliver the services with 'just in time' appropriate qualitative and quantitative capacity

14.2.4 Changes in the dynamics (opportunities, threats) of the external environment of care providers

The final category of changes deal with strategic issues that a care provider is confronted with. Although different choices can be made, it is still possible to determine the impact on the care service delivery architecture. Below these strategic issues are summed up:

Key	Change	Impact (Architectural Impact AIM)
KFC4.A	There will be a greater distance between care attendant and client that pressures the effectiveness of the care service delivery and may increase the demand for care.	<ul style="list-style-type: none"> • AIM5: Capacity planning needs to be an integral part of the care service delivery process in order to deliver the services with 'just in time' appropriate qualitative and quantitative capacity
KFC4.B	There is a greater likelihood that clients get too little care assigned and get it (too) late	
KFC4.C	There will be opportunities to create different kinds of (digital) care services, residence- and care consultancy services;	<ul style="list-style-type: none"> • AIM8: There will be different types of consumers that reside within the context of a site that consume different forms of services. • AIM7: Care (progress) registration activities need to enable 'safe' knowledge and information sharing to the clients' social context
KFC4.D	Cooperation will lie at the center of the new care service delivery, knowledge and expertise sharing will be the key drivers for enabling this	
KFC4.E	Processes need to be prepared for changes	<ul style="list-style-type: none"> • AIM2: In order to achieve the appropriate services for each funder a care provider will need different and flexible care (progress) registration activities • AIM3: Care (progress) registration activities need to be highly automated and highly accessible (for non-employees)

14.3 Shaking the care service delivery process

Now we know the impact the changes have on the care service delivery architecture its now possible to visualize this impact on the process. In the table below it is shown in what kind of output covers the requirement and where we may find this:

Impact (Architectural Impact AIM)	Architectural output
AIM1: Registrations are needed that enable an active role of the care service provider in local care developments and help in realizing and/or expanding contracts with the new funders	<ul style="list-style-type: none"> - Model MC1 (14.3.1) - KMF27
AIM2: In order to achieve the appropriate services for each funder a care provider will need different and flexible care (progress) registration activities	<ul style="list-style-type: none"> - Model MC2 (14.3.2) - KMF1,KMF2,KMF3,KMF4, KMF27
AIM3: Care (progress) registration activities need to be highly automated and highly accessible (for non-employees)	<ul style="list-style-type: none"> - Principle (CH 15) - KMF23
AIM4: Care (progress) registration activities need to deliver real time information regarding quality, costs and (expected) revenue	<ul style="list-style-type: none"> - Principle (CH 15) - KMF27
AIM5: Capacity planning needs to be an integral part of the care service delivery process in order to deliver the services with 'just in time' appropriate qualitative and quantitative capacity	<ul style="list-style-type: none"> - Model MC3 (14.3.3) - KMF27
AIM6: The way 'assignment and matching' activities will be executed may vary per funder.	<ul style="list-style-type: none"> - Model MC4 (14.3.4) - KMF14
AIM7: Care (progress) registration activities need to enable 'safe' knowledge and information sharing to the clients' social context	<ul style="list-style-type: none"> - Model MC5 (14.3.1) - KMF27
AIM8: There will be different types of clients that reside within the context of the site that consume different forms of services.	<ul style="list-style-type: none"> - Model MC5 (14.3.1) - KMF31

14.3.1 Model MC1: The care monitoring service

AIM1: Registrations are needed that enable an active role of the care service provider in local care developments and help in realizing and/or expanding contracts with the new funders

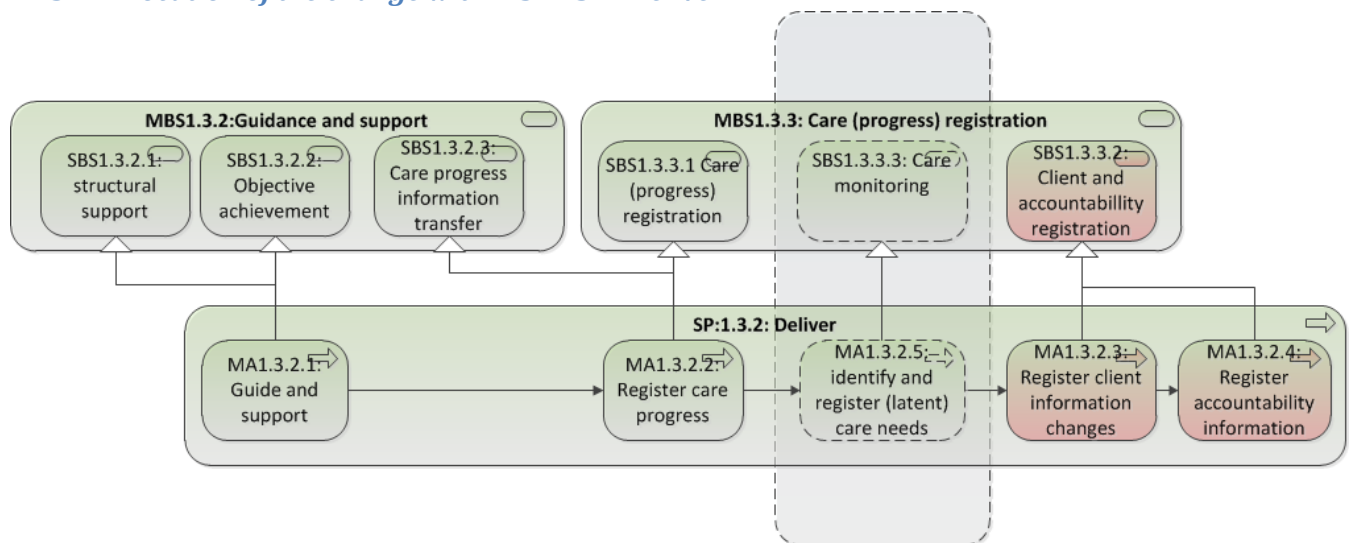
This active role can only be realized when a care service provider has appropriate information about how the local care needs are developing. This can be done by monitoring care progress of 'its own client' but It can also be done by registering care related findings and events that happen in the neighbourhood the care service provider is active.

The change here is that the delivery sub process needs to realize an extra service; what we call the 'care monitoring registration service' this registration service and its information can be used to influence local care developments and in acquiring new assignments and contracts.

This change affected the SP1.3.2: Deliver sub process (shown in 13.7.4). How this change affected is shown in two stages:

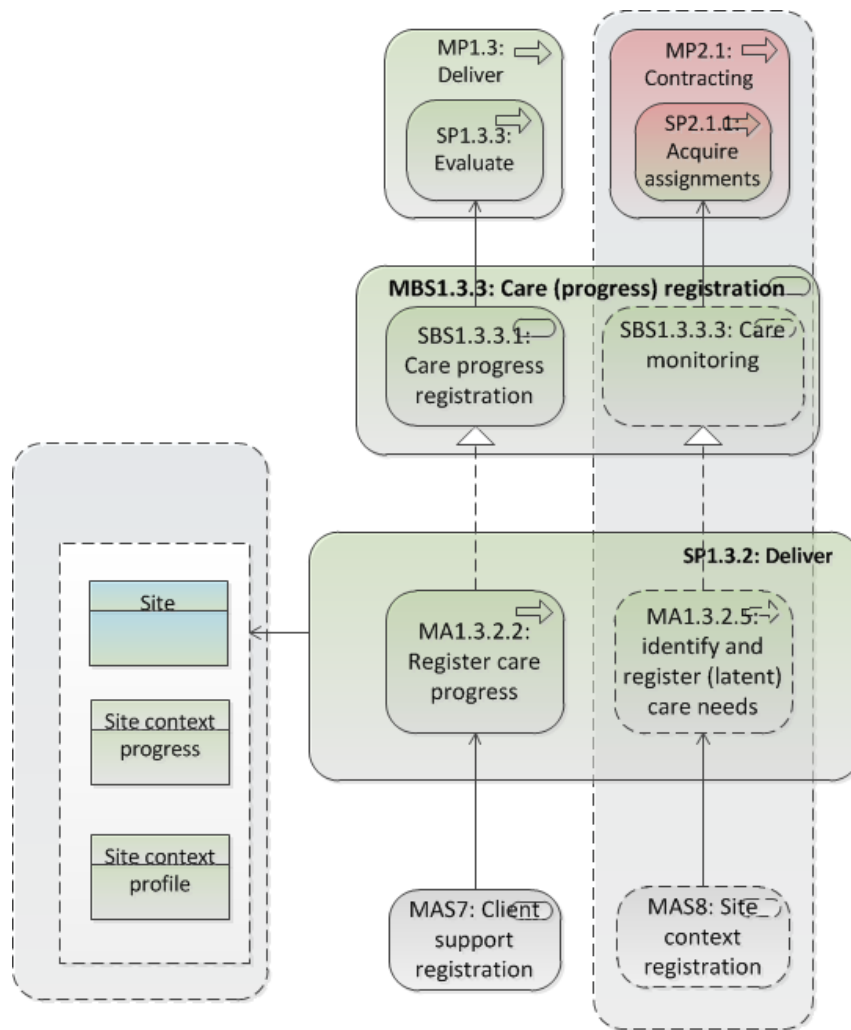
- 1- Showing where the change resides and the fact that it is expanding the Deliver sub process (there are no activities and/or services replaced or removed)
- 2- Showing the change in detail.

14.3.1.1 Location of the change within SP1.3.2: Deliver



14.3.1.2 The addition of the care service monitoring service

The extra service is realized by adding an extra main activity (identify and register latent care needs). We can see in the model that this main activity needs an application service to actual register this.



14.3.2 Model MC2: Funder, accountability and registration(service) expansion

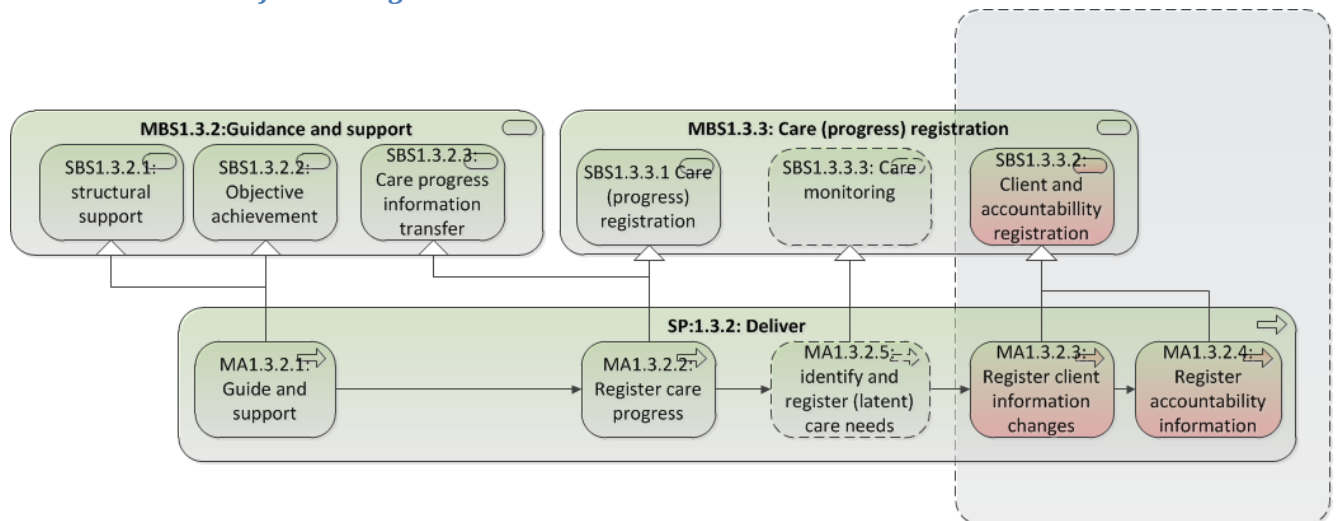
AIM2: In order to achieve the appropriate services for each funder a care provider will need different and flexible care (progress) registration activities

Although standards have been developed, the new funders (local authorities) have freedom to give substance to the implementation of care. This means that a care provider may be confronted with different demands resulting in different registration activities and services.

This change affected the SP1.3.2: Deliver sub process (shown in 13.7.4). How this change affected is shown in two stages:

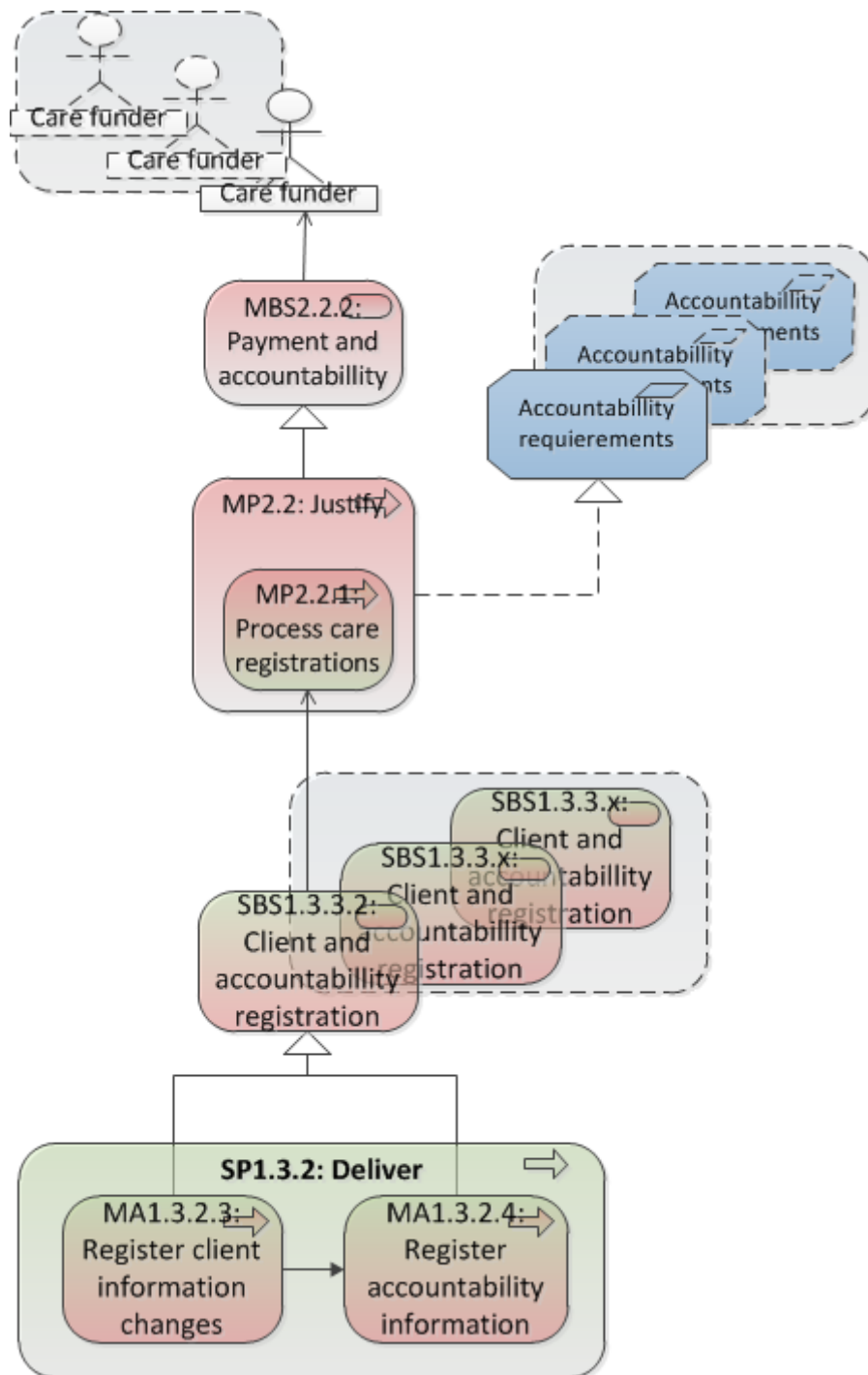
- 1- Showing where the change resides and the fact that it is expanding the Deliver sub process (there are no activities and/or services replaced or removed)
- 2- Showing the change in detail.

14.3.2.1 Location of the change within SP1.3.2: Deliver



14.3.2.2 The expansion of accountability demands.

Below it is show how the change may results in the need for more and different registration services with a variety of accountability requirements demanded by more funders.

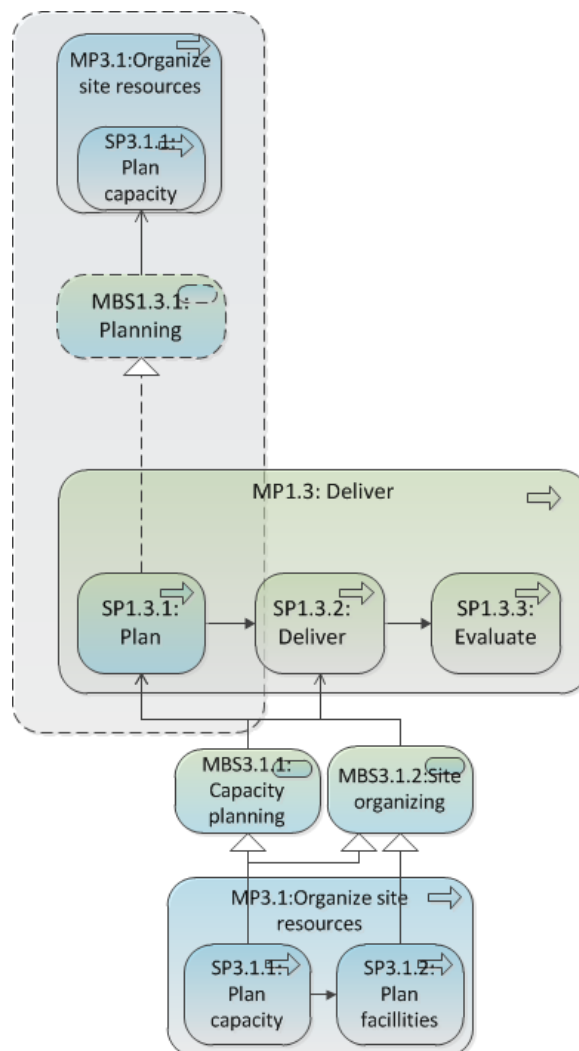


14.3.3 Model MC3: Capacity planning services

AIM3: Capacity planning needs to be an integral part of the care service delivery process in order to deliver the services with 'just in time' appropriate qualitative and quantitative capacity

Care providers cannot afford to be unproductive, but at the same time need to be prepared for 'ad hoc short term' surges in the request for care services. That's why the SP1.3.1: Plan sub process within the MP1.3: Deliver main process needs to enable the local care planner to realize just in time needed 'quantitative and qualitative capacity'. This change affected the MP1.3: Deliver main process (shown in 13.7.1). The thing that is changed here is that the sub process SP1.3.1: Plan and the service it realizes now have an added blue color. With the blue color we visualized this sub process in also having a business support character in the sense that the planning is not only care related but also serves as input for the care planner realize the just in time 'quantitative and qualitative capacity'

Below we visualized this:



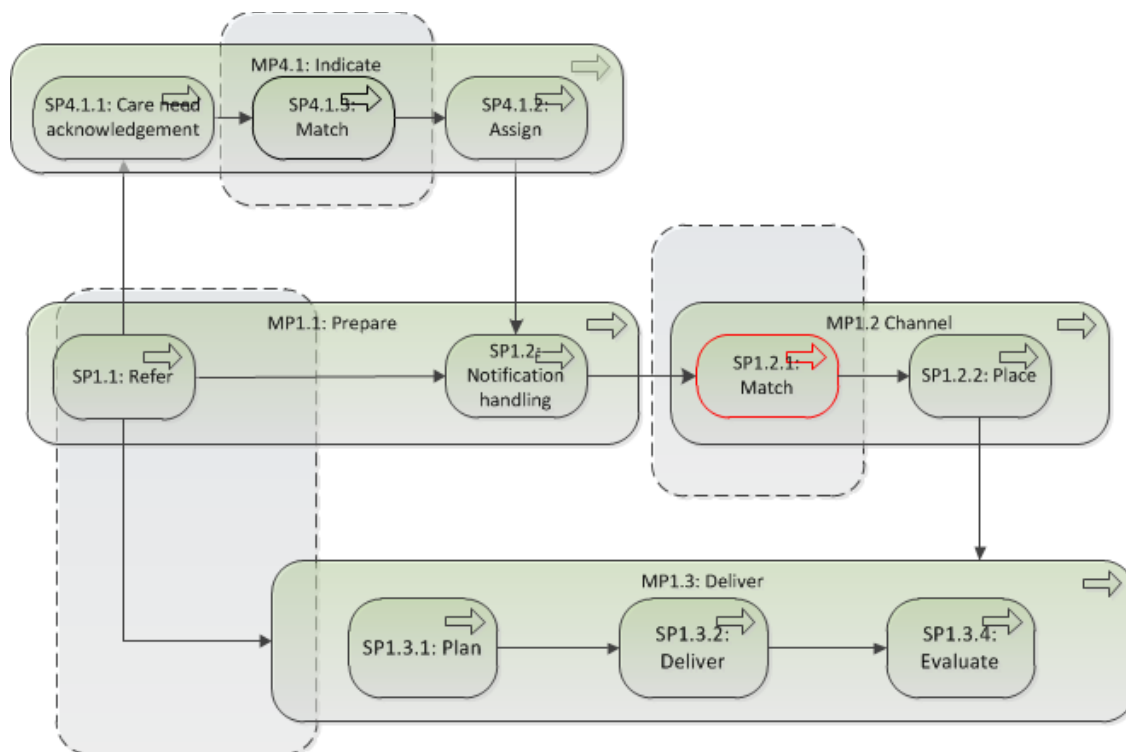
14.3.4 Model MC4: Variable assignment and matching sequence

AIM6: The way 'assignment and matching' activities will be executed may vary per funder.

In the pre-2015 era an assignment needed to be available before the launch care step could be executed. With the mentioned changes come different way of starting the delivery of care services. From the care provider perspective there will be two routes to start receiving care services.

- the route that existed in the pre-2015 era, which will continue within the WLZ- financed care services.
- the second route comes from the care that is financed through local authorities and applies to 'juvenile law and the social support act. In this we see three major changes:
 - o 1: The matching activity will become obsolete from the care provider perspective.
 - o 2: The matching activity will be executed during the indication main process
 - o 3: Care service may be started immediately (without 'assignment'), which will result in another 'status message' (for example: 'placed without assignment')

Below this is visualized:



14.3.5 Model MC5: Context facilitation

AIM7: Care (progress) registration activities need to enable 'safe' knowledge and information sharing to the clients' social context

AIM8: There will be different types of clients that reside within the context of the site that consume different forms of services.

The last and most impactful change is the fact that services will not only be delivered to clients but also to groups of individuals that reside within the context of the client (family, third party providers, social network) or the context of the site (in a geographical sense).

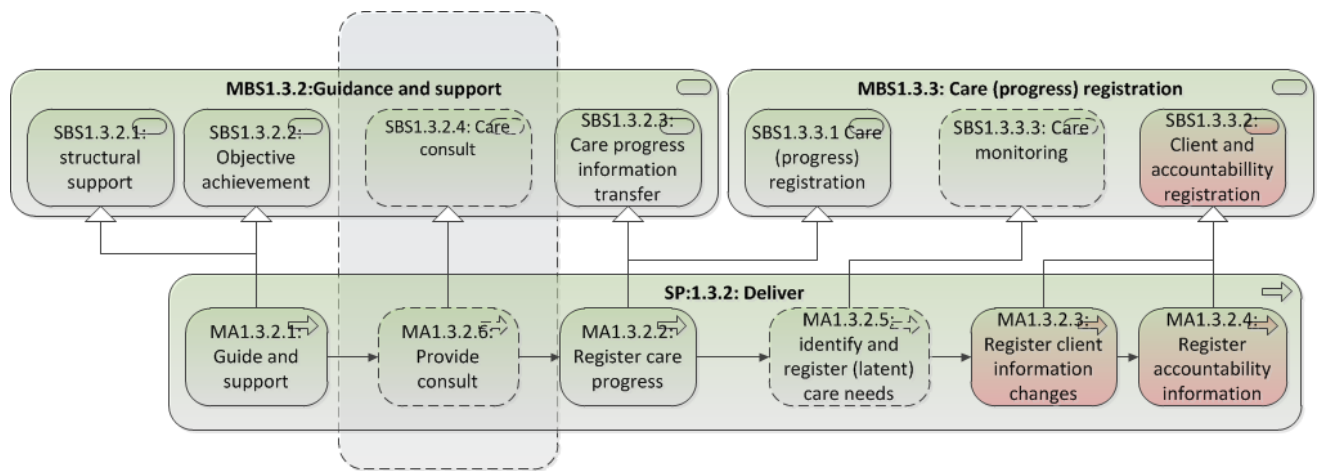
In this we distinguished two types of clients:

- Individuals that receive individual care services that are always aimed at an individual
- Individuals that receive consulting care services that are aimed at enabling the context of the client or a site.

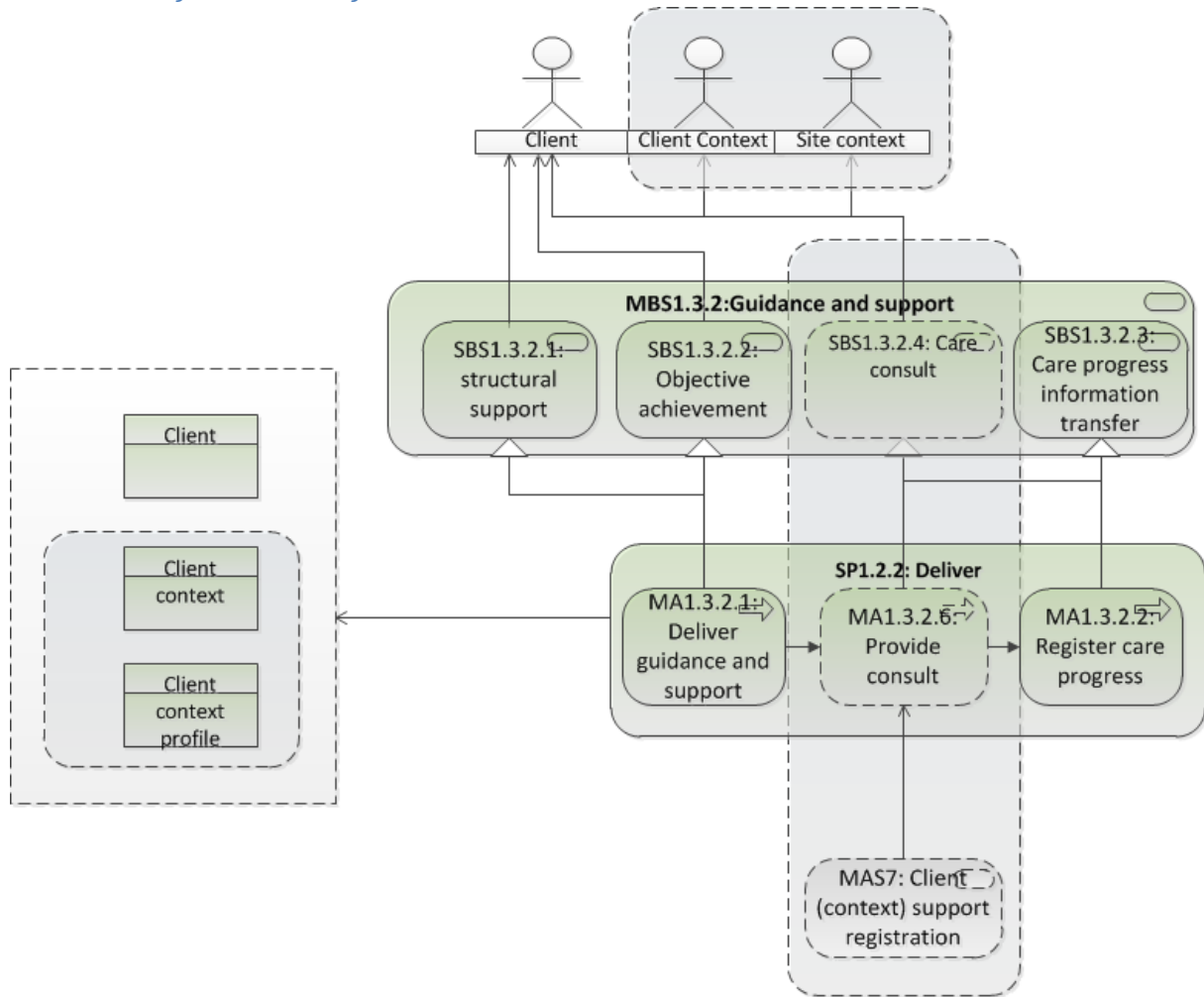
An important remark must be made here and that is that Individuals may be both; 'clients' as well as part of a context.

14.3.5.1 Location of the change within SP1.3.2: Deliver

Before we depict the facilitation of the context, we will first show that this change also affects the SB1.3.2 Deliver sub process that was shown in 13.7.4. Again only an activity and aa service is added: see below:

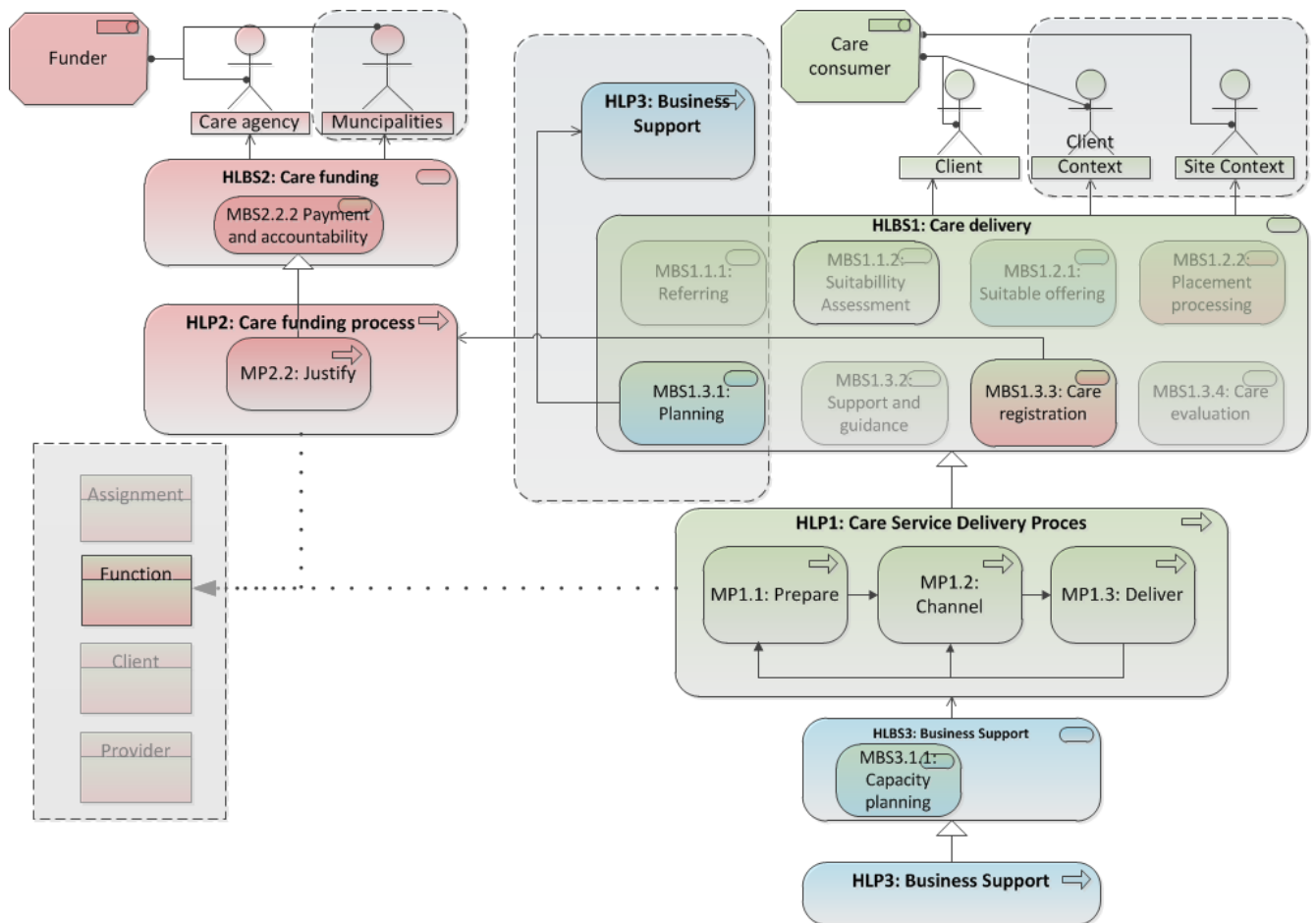


14.3.5.2 The facilitation of the client context and the site context



14.4 Change overview

In 13.1 we showed the care service delivery architecture of Promens Care on a high level viewpoint before the major transitions, we then concretised the changes in the surroundings of Promens Care and modelled them in this chapter based on the process to process main level viewpoint. Last step in completing our journey toward a change enabled care service architecture is to show the 'change enabled architecture, in a high level viewpoint that shows all the changes and shows all the main processes and service before the changes. Guidelines and conclusions will be drawn in the next chapter. Below the change enabled variant is shown:



Part IV Towards a change enabled care service architecture

15 Building the care service reference architecture CASERA

This thesis scientifically explores 'enterprise architecture' and the care service delivery process in its transformation. Primary objective is to build a reference architecture for this care service delivery process that may be used by care service providers that act in the same care market as Promens Care, our reference case. So far we have elaborated the following aspects:

- The theory surrounding 'enterprise architecture' resulting in a CASERA- framework to build the reference architecture on.
- The use of an enterprise architectural modelling tool ArchiMate to model the care service delivery process and its needed changes based on findings through conducting interviews and studying documents from regulatory institutions.

In the last part of the thesis we will combine the two aspects and transform them in a reference architecture. To do so this part is built on the following subjects:

- 1- Definition of reference architecture; to build a reference architecture we need to know when an 'architecture' may become a reference architecture. (15.1)
- 2- Building the reference architecture by translating the models results into guidelines and a structure for developing a care service delivery architecture. (Chapter 15.2)
- 3- Conclusion and discussion where we answer the main research questions and discuss possible follow up research and the possible 'blind spots' in this thesis. (Chapter 16)

15.1 Reference architecture definition

So in what circumstance may an architecture become a reference architecture? When searching for this answer we found one specific article (Greefhorst et al, 2009) that combined several definitions surrounding reference architecture with input from several architects during a workshop. This lead to the following definition:

"A reference architecture is a generic architecture for a class of systems based on 'best practices'"

They unravelled this definition into a list of characteristics that distinguish a reference architecture from a specific architecture:

- C1: A reference architecture is a generic architecture in a sense that it is an abstraction or blue print of a concrete architecture. Components within this generic architecture need concrete interpretation and implementation
- C2: A reference architecture is an architecture and therefore it describes both structure as well as guidelines and/or principles with:
 - o the structure being a logical structure that needs further concretization
 - o the guidelines and principles describing how to concretize the logical structure
- C3: A reference architecture describes a class of systems; a structure that resides within a collection of systems with systems being both organizational as well as software systems.
- C4: Principles and guidelines regarding reference architecture need to be based on well known and accepted 'best practises'. In our case TOGAF and ArchiMate

- C5: Reference architectures need to be specified by the abstraction level, the extent to which it is applicable to all organizations or a specific group of organizations, and the main subject or goal

15.2 Guiding principles in developing a care service delivery architecture:

With the characteristics of a reference architecture in mind we will now start building CASERA, the care service reference architecture. The reference architecture is based on the insights of the modelling activity that were recorded as guidelines and requirements. These are listed in detail in Appendix IV. In this paragraph we will select the most crucial guidelines and requirements and put them under the relevant aspects of the CASERA-framework which are:

- The Three C-Principle
- Extended Three Layer Architecture
- Architectural output
- Architecture process

Based on these guidelines we will answer the research questions and complete this thesis with concluding remarks and a discussion. This will be done in chapter 16

15.2.1 Guidelines regarding the 'three C-principle'

The Three C principle: The creativation of artefacts that represent the enterprise as a coherent whole of related primary elements, the communication of these artefacts and using these artefacts in controlling the evolution and change of the enterprise in reaching its desired state.

- G1: Use the models, descriptions, guidelines, requirements, viewpoints and views as a baseline and guiding reference to model a specific care service delivery architecture; within the modelling activity we proposed ('creativated') a set of primary building blocks in our visualizations, to establish 'a coherent whole' of the care service delivery architecture (CSDA).
- G2: Visualize and communicate the CSDA in different manners and on different abstraction levels, depended on the 'eye of the beholder'. Create three viewpoints that form the base for realization of the CSDA ; (1) one high level viewpoint for determining CSDA in its environment, (2) second a main process level for determining the main process structure and its relations to other main processes and the main business services it should realize (3) showing per main process how the process is composed and what application services are needed to execute the process

15.2.2 Guidelines regarding the structure

Extended 3- layer architecture: The enterprise consisting of different stacked layers where the upper layer is supported by the layer below

- G2: *this guideline also deals with the structure.*

15.2.3 Guidelines regarding architectural output and models

Architectural (enabling) output: The output of architectural activity where we have outlined the model as the most important artefact as a product of architectural activity. The guidelines regarding the architectural output are derived directly from our modelling activity. The translation of our modelling activity into guidelines are described in Appendix IV in detail. In this paragraph we will select and refine the most crucial ones. We will use the most relevant models to categorize the guidelines.

15.2.4 HLP1: Overview Change/HLP1 Overview indication

- G3: Base the development of the architecture on the fact that there are two primary processes (care funding and care delivery) that are completely dependent on each other that need to realize two high level business services for 'external' use: (1) care funding services and (2) care delivery services
- G4: Establish a connection between the funding and delivery by realizing a care (progress) registration (MBS1.3.3) service that enables the registration of the quantitative (per function) and qualitative (per client, client context or site context) outcome of the delivery.
- G5: Acknowledge the function as central business object or concept that is part of an assignment of a care consumer that binds the funding process to the delivery process in the following matter:
 - o (1) The function is the object that identifies the type of care that may be delivered (to a client, client context and site context) and against what price
 - o (2) The amount of care functions that are (planned to be) delivered determine the amount of money that is made available to the care provider by the funder
- G6: Acknowledge the 'assignment' business object or concept (in all 'forms') as the financial coverage of the functions to be delivered
- G7: Have 'business support processes' that realize services that enable the primary processes to be executed by means of people, resources and facilities
- G8: Position the 'care consumer' (the actor that consumes the care services) and 'care funder' (the actor that pays for delivered care services) stakeholders central in the care service delivery architecture
- G9: Have the 'indication' business object central in identifying the (formally and financially) acknowledged care needs of a client
- G10: Determine the extent to which assignment (in all forms) of all functions is needed to place a client on a site or to start the care delivery

15.2.5 MP1.1: Prepare

- G11: Acting as a gateway the CSDA needs a main process (MP1.1: Prepare) that realizes the following main business services:
 - o MBS1.1.1: Referring: services that enable referring the potential client to the appropriate follow-up actions in order to be eligible for receiving needed care services. These referring services are used for obtaining or changing an indication, for guiding to notification and for referring to other providers
 - o MBS1.1.2: Suitability assessment: services that allow a client to apply for care (SP1.1.2: Notification handling) and, based on this notification, enable assessment of the (potential) client for suitability of receiving care services within the provider.
- G12: Address the care service delivery architecture's relation with the assign (MP4.1: Assign) external process from the perspective of the provider on referring the client to get an indication (SP1.1.1: Refer) and using the external assignment service (SP1.1.2: Handle notification)

15.2.6 MP1.2: Channel

- G13: Acting as a channel the CSDA needs a main process (MP1.2: Channel) that realizes the following main business services:
 - o MBS1.2.1: Suitable offering: services that enable creating a care service offering that matches the needs, assignment (functions), wishes and inabilities of a care consumer

- MBS1.2.2: Placement processing: services that enable:
 - Realizing a placement for the client to receive the best available care service offering.
 - Realizing (automated) 'queue list' status messages to the care agency by using the external 'Assignment' service
 - Processing and recording of adjusted care service offerings that are (going to be) consumed by a care consumer
- G14: Make the subprocesses SP1.2.1: Match within MP1.2 Channel optional and determine the conditions when they are.

15.2.7 MP1.3: Deliver

- G15: The process (MP1.3: Deliver) should be put central in the CSDA. It's the process the realizes the following strategic business services:
 - MBS1.3.1: Care planning: services that enable planning the required care functions by translating these functions into daily guidance and support activities (care support plan) and assessing the needed capacity to execute these activities.
 - MBS1.3.2: Guidance and support; services that enable the actual delivery of guidance and support to a care consumer and enable information sharing about this delivery
 - MBS1.3.3: Care (progress) registrations: services that enable
 - recording the progress of delivered care services,
 - the registration of quantitative (per function) and qualitative (per client or context) outcome of the delivery to meet (changing) accountability requirements
 - the registration of client-changes.
 - the identification and registration of latent care needs within the context of a site.
 - MBS1.3.4: Care evaluation: services that enable evaluating the care delivery in different levels (care objective evaluation, total care evaluation) triggered by different events and that enable the appropriate follow-up (SP1.1.1: Refer, SP1.2.2: Adjust care provision, SP1.3.1: Plan)
- G16: Ensure a clear distinction between guidance and support (MA1.3.2.1) to an individual and consult (MA1.3.2.6) to a group (site context, client context)
- G17: Base the (organization of the) SP1.3.1: Plan sub process on the notion that there are two types of 'care support plans' which have the same format:
 - 1- The 'signed care support plan' which allows a care service provider juridical to actually execute the plan
 - 2- The 'dynamic care support plan' which has the same type of content but this content can change based on the progress of 'care service delivery'

15.2.8 Application services and information objects:

- G18: Realize (application) services that enable efficient and effective registration and information sharing during daily care service delivery;
- G19: Base the application services (development) on the main business objects that are accessed, recorded and manipulated during the different processes. Below we visualized this in a matrix by binding the Main Business Services to the Main Application Services via the business objects that are accessed:

Main Application Services	Main Processes		
	MP1: Prepare	MP2: Channel	MP3: Deliver
MAS1: Client data registration	Client	Client	Client
MAS2: client profile registration	Client profile	Client profile	Client profile
MAS3: (Change) notification	Client	Client	Client
	Client profile	Client profile	Client profile
	Assignment	Assignment	Assignment
	Indication	Placement	Placement
	Indication	Indication	Indication
MAS4: Assignment registration	Assignment	Assignment	
	Indication	Indication	
	Function	Function	
		Care service	
		Placement	Placement
			Accountability
MAS5: Expertise registration		Expertise	Expertise
MA6: Site registration		Queue	
		Facility	
		Site	Site
		Expertise	Expertise
			Site context
			Care progress
MAS7: Client (context) support) registration			Objectives
			Subjects
			Client context
MAS8: Site context support registration			Site progress
			Site context profile

- G20: Ensure high automation and high accessibility of these application services
- G21: Address within what processes the different information objects are accessed and relate the different objects to each other.

15.3 Guidelines regarding development and realization

Architectural process: The process consisting of defining, designing and controlling enterprise architecture activities on different abstraction level

Within CASERE we distinguished three phases of architecture:

- 1- Define
- 2- Design
- 3- Realize and control

Obviously we've been modelling in a define and design stage. However we do see that some of the guidelines mentioned in 15.2 kind of prioritize the way realization in the 'real world' could happen:

The guidelines G4,G5,G6 and G7 show the basic fundament of the care service delivery architecture that are most crucial in being 'change enabled'.

16 Conclusions & discussion

In the previous chapters we have focused on the search for the guidelines to realize the architecture and what core elements build it. In this chapter we return to the question why would a care service provider use these guidelines and models and with that coming to answering the main question:

What care service enterprise reference architecture (CASERA) enables care service providers to successfully respond to the changes in the healthcare market?

Before we do that we will start with answering the sub questions of this thesis:

16.1 Answering research questions

16.1.1 What is the current state of enterprise architecture?

- **The Three C principle:** The creativation of artefacts that represent the enterprise as a coherent whole of related primary elements, the communication of these artefacts and using these artefacts in controlling the evolution and change of the enterprise in reaching its desired state.
- **Extended 3- layer architecture:** The enterprise consisting of different stacked layers where the upper layer is supported by the layer below comprising of:
 - An organisational context layer which is the layer that extends....
 - A business layer
 - An application or information systems layer
 - An infrastructure layer.
- **Architectural (enabling) output:** The output of architectural activity where we have outlined the model as the most important artefact as a product of architectural activity and within that model the 'service' as enabling component as:
 - A basis for aligning the deployment of IT with the core purpose and objectives of the organisations
 - A basis for realizing business and process optimizations.
- **Architectural process:** The process consisting of defining, designing and controlling enterprise architecture activities on different abstraction level

16.1.2 What is the architecture of the care-service delivery process?

The care service delivery process is built upon three main processes that realize main business services and are supported by main application services. The process is executed by care attendants and care consultants. In the environment of the process; the care funding process uses the care (progress) registration service, the client uses the guidance and support main business services and the assign external business process uses the placement processing service.

The care service delivery architecture is described extensively in chapter 13 and shows the basic elements that are needed to provide care –services.

16.1.3 What changes occur in the healthcare market that impact this process?

- KFC1: Significant changes in accountability demands from funders and (local) regulators
- KFC2: Changes in the funding in care-service with a significant budget rebate
- KFC3: Changes in the nature of the care service delivery process

- KFC4: Changes in the dynamics (opportunities, threats) of the external environment of care providers

16.1.4 How do these changes impact the care service delivery architecture?

These changes require the following from the care service delivery architecture:

- AIM1: Registrations are needed that enable an active role of the care service provider in local care developments and help in realizing and/or expanding contracts with the new funders
- AIM2: In order to achieve the appropriate services for each funder a care provider will need different and flexible care (progress) registration activities
- AIM3: Care (progress) registration activities need to be highly automated and highly accessible (for non-employees)
- AIM4: Care (progress) registration activities need to deliver real time information regarding quality, costs and (expected) revenue
- AIM5: Capacity planning needs to be an integral part of the care service delivery process in order to deliver the services with 'just in time' appropriate qualitative and quantitative capacity
- AIM6: The way 'assignment and matching' activities will be executed may vary per funder.
- AIM7: Care (progress) registration activities need to enable 'safe' knowledge and information sharing to the clients' social context
- AIM8: There will be different types of clients that reside within the context of the site that consume different forms of services.

These changes are modelled extensively in chapter 14 and form the backbone of expanding the architecture into a change enabled one. In appendix IV we bound this impact to the guidelines and requirements.

16.2 Conclusion

In chapter 15 we combined the modelling activity, the changes that occur in the healthcare market and the start-phase of the architecture and translated them into guidelines. Guidelines that could be applied to other care service providers in realizing a change enabled care service delivery process?

Of course that's the question. The guidelines we have derived from modelling were ultimately based around 8 core business services. To answer the 'big question' we need to go back to the core of 'why' these services are needed to 'successfully' respond to the changes.

Below we made a table that shows the main business services and how they add value to the care funder and care consumer:

Main business services	Added Value
MBS1.1.1: Referring	Referring the potential client to the appropriate follow-up actions in order to be eligible for receiving needed care services. These referring services are used for obtaining or changing an indication, for guiding to notification and for referring to other providers
MBS1.1.2: Suitability assessment	Determine suitability of a client within a care service provider
MBS1.2.1: Suitable offering	creating a care service offering that matches the needs, assignment (functions), wishes and inabilities of a care consumer
MBS1.2.2: Placement processing	Processing, changing and recording of adjusted and new care service offerings that are (going to be) consumed by a care consumer including status messaging to the care -funder
MBS1.3.1: Care planning	planning the required care functions by translating these functions into daily guidance and support activities (care support plan) and assessing the needed capacity to execute these activities.
MBS1.3.2: Guidance and support	enable the actual delivery of guidance and support to a care consumer and enable information sharing about this delivery
MBS1.3.3: Care (progress) registrations	Recording the progress of delivered care services, <ul style="list-style-type: none"> the registration of quantitative (per function) and qualitative (per client or context) outcome of the delivery to meet (changing) accountability requirements the registration of client-changes. the identification and registration of latent care needs within the context of a site.
MBS1.3.4: Care evaluation	Enable evaluating the care delivery in different levels (care objective evaluation, total care evaluation) triggered by different events and that enable the appropriate follow-up

The guidelines, models and requirements express a way of ultimately realizing these business services in a change enabled way.

So to answer the main question:

What care service enterprise reference architecture (CASERA) enables care service providers to successfully respond to the changes in the healthcare market?

A care service reference architecture that provides guidelines, based on models and requirements to realize the 8 mentioned business services as described in chapter 15.

16.3 Discussion

An important aspect of scientific research is that the researcher needs to reflect its analysis process in coming to its conclusion and based on this needs to suggest follow up research.

In this thesis we found three possible ‘blind spots’:

16.3.1 Missing outcome validation and verification

The outcomes of this thesis weren’t validated. We decided not to add an extra outcome verification by a selected group (2 a 3 persons) . The main argument for not doing this lies in the fact that an outcome verification wouldn’t be representative.

16.3.2 The 'knowledge' of the researcher

A lot of insights we gained through modelling are, we could say unconsciously steered by the knowledge of the researcher, because the researcher is working in a care service provider. This may have resulted in a blind spot.

16.3.3 The exclusion of the 'second' primary process

The boundaries of this research touched the 'care funding process' but left out details. Of course there could have been relevance in these details

16.3.4 Possible follow up research

Given the three blind spots we thought of two possible follow up research that could be executed:

- 1- To what extent is the CASERA- reference architecture applicable in the day to day business of a care service provider?
➔ This could make the blind spots of this research visible.
- 2- What care funding architecture (CASERA) enables care service providers to successfully respond to the changes in the healthcare market?
➔ By having an same kind of research into the funding process the possible missing relevant links could be exposed.

Appendix I: Literature

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Appendix II: Key process findings

Aggregated statement(s) care attendants (ZUU) & care experts (ZUE)		Supporting documents and/or other findings
KF1: care service organizations have two primary processes: the care funding process and the care service delivery process.		
KF1.A/KF2: The care funding process shows how the delivered care is being payed and accounted for		
KF1.B/KF3: The care service delivery process consists of the steps needed to deliver (and end) care -services to a 'client'.		
ZUU15: Cliënten die zorg afnemen bij Promens Care hebben de behoefte aan hulp/ondersteuning bij het omgaan met diverse 'stoornissen'	Key Findings: KF2 and KF3	
ZUU16: Cliënten die zorg afnemen bij Promens Care hebben de behoefte langdurig te leren omgaan met de situatie ten gevolge van de beperking		
ZUU17: Cliënten die zorg afnemen bij Promens Care hebben de behoefte aan hulp/ondersteuning bij sociale en maatschappelijke (ook verslaving) problematiek		
ZUE41: De zorg bij Promens Care wordt (2014) voor het overgrote deel betaald door het zorgkantoor/zorgkantoren vanuit de AWBZ (95%).		
ZUE49: Deze kaders brengen wel een onnatuurlijke scheiding aan tussen de financier en de afnemer van de zorg, waardoor feitelijk bij AWBZ-zorgaanbieders 2 primaire processen ontstaan.		
KF2: The care funding process shows how the delivered care is being payed and accounted for		
K2.A: The 'function' concept is used for determining the price of the care, the amount of care delivered and a global substantive direction		
K2.B: The 'function' binds the 'care funding process' to the 'care service delivery process'		
ZUE18: De zorgdiensten die Promens Care kan leveren worden bepaald door de functies waarvoor Promens Care een toelating heeft. De toelating is op basis van de wet WTZI. Deze toelating geeft weer voor welke doelgroepen Promens Care welke typen zorg kan leveren.	KF5	
ZUU18: De begeleider registreert en meldt (niet geautomatiseerd) aan de centrale administratie de contactmomenten en aanwezigheid van cliënten (productie) teneinde de zorglevering binnen de financiële (indicatie) kaders te houden	[Vektis AW319] Declaratie en registratie gaat per functie en zorgwaarte pakket	
ZUE22: Wat Promens Care kan leveren wordt naast de toelating ook bepaald door de hoeveelheid geleverde zorg die uiteindelijk betaald wordt. Hiertoe maakt ze contractafspraken met de financier (meestal zorgkantoor) waarbij de tarieven per functie vaak onderhandelbaar zijn.		
ZUE44: Geleverde productie wordt middels geautomatiseerd berichtenverkeer maandelijks gedeclareerd en verantwoord bij de uitvoerder van de AWBZ (zorgkantoor) De huidige AWBZ kent zeer gestandaardiseerde formats	[Vektis AW319] Het AW319 specificatie toont de standaarden per functie van de AWBZ	
ZUE42: Aan het eind van het jaar vind de eindafrekening plaats. Hierbij wordt ook de verbinding gelegd tussen 'de liquide stroom' en de opbrengstvaststelling.		
ZUE45: Betaling vindt plaats aan Promens Care door middel van periodieke bevoorschotting.		
KF3: The care service delivery process consists of the steps needed to deliver (and end) care -services to a 'client'.		
KF3.A: The phases (or main processes) of the care delivery process are 'prepare' 'channel' and 'deliver'		
KF3.B: The client (or the person recieving or waiting for care) is central in the care service delivery process		
KF3.C: The care service delivery process must comply with legislative, regulatory, and (financial) accountability demands.		
ZUE48: De zorg binnen Promens Care moet voldoen aan alle wet en regelgeving die ze in het kader van haar toelating heeft en aan haar interne kaders	KF1, KF6 t/m KF8	
KF4: 'The care support process' supports the care funding process and the care service delivery process		

<p>ZUU6: Op locatie vinden ondersteunende en organiserende werkzaamheden plaats bestaande uit:</p> <ul style="list-style-type: none"> - Onderhouden van contacten in en rond de locatie - Kennismaken met en rondleiden van nieuwe en potentiële cliënten - Het rooster wordt opgemaakt en vastgesteld. - Algemeen werkoverleg 	<p>[Kwaliteitshandboek Promens Care]: Er zijn diverse processen beschreven die de zorglevering en financiering ondersteunen door de inkoop, werving en inzet van mensen en middelen.</p>
<p>KF5: The assign main process formally and financially acknowledges the type and ammount of care a person is entitled to.</p>	
<p>KF5.A: The Assign main process may be triggered by the care service preparation sub process</p>	
<p>KF5.B: The Assign main process may trigger the care service preparation sub process</p>	
<p>KF5.C: A care assesment centre may formally, legally and financially acknowledge needed care functions as part of an indication.</p>	
<p>K5.D: The care agency finds (mediation) or contacts (a) suitable care service provider(s) to assign the care.</p>	
<p>K5.C: An indication consist of different functions</p>	
<p>K5.E: Assignemt (and/or reassignment) of care is handled per function</p>	
<p>ZUU16: De begeleider registreert en meldt (niet geautomatiseerd) aan de centrale administratie de contactmomenten en aanwezigheid van cliënten (productie) teneinde de zorglevering binnen de financiële (indicatie) kaders te houden</p>	<p>[Handboek AZR]:Bij het proces indiceren zijn twee partijen betrokken: het CIZ dat de indicatie stelt en het zorgkantoor dat de indicatie ontvangt. Het CIZ bepaalt per functie op welke en op hoeveel zorg de klant recht heeft (indicatiebesluit). Dit besluit wordt verstuurd naar zorgkantoor. Het zorgkantoor is vervolgens verantwoordelijk voor de toewijzing van de zorg aan één of meer zorgaanbieders, die de zorg moeten gaan leveren.</p>
<p>ZUE4: Alvorens Promens Care zorg kan leveren heeft de cliënt een indicatie nodig, deze wordt verkregen bij een onafhankelijke partij die recht op toegang tot de zorg bepaald. Deze onafhankelijke partij is het indicatieorgaan CIZ.</p>	
<p>ZUU9: Na het 1e contact met Promens Care volgt de aanmelding en indicatiestelling; volgorde kan variëren, meestal is er al een indicatie. Een aanmelding is altijd nodig.</p>	
<p>ZUE5: Het CIZ bepaald het recht op zorg in een indicatie op basis van de behoefte van de cliënt. Hij kan hierbij een voorkeursaanbieder aangeven Heeft de cliënt geen voorkeursaanbieder dan gaat zorgkantoor zelf op zoek. Dan is het op grond van hun kennis van hun zorgaanbieders.</p>	
<p>ZUE6: Op basis van dit 'toegangsk kaartje ' (indicatie) geeft het zorgkantoor Promens Care opdracht om de zorg te leveren (toewijzing) en heeft ze het recht en de plicht om zorg aan de cliënt te leveren.</p>	
<p>ZUE7: Verwijzende instanties en/of Promens Care kunnen de cliënt helpen een indicatie te verkrijgen.</p>	
<p>ZUE8: Toewijzing/indicatie moet passen bij de toelating die PC heeft.</p>	
<p>ZUE43: op basis van de zorgtoewijzing wordt de levering van zorg (conform productdefinities en eenheden vastgelegd in de beleidskaders van de Nza) gepland en in het primaire proces geregistreerd en bevestigd.</p>	<p>Key findings: KF2, KF7</p>
<p>KF6: The prepare main process shows how the client contacts the care service provider and how he may or may not fit within the 'offerings' of the care service provider.</p>	
<p>KF6.A: During the preparation, the client may come in contact with a care service provider</p>	
<p>KF6.B: During the preparation main process the provider may refer the client to its following steps in finding proper care.</p>	
<p>KF6.C: To continue the preparation the care service provider needs to receive an initial request for placement (notification) by a client (or someone who act on his behalf)</p>	
<p>KF6.D: During the preparation background information of the client is retrieved to determine the clients' fitness for the provider and the status of its indication</p>	

KF6.E: Determination of fitness either leads to rejection (and referring to other providers), continuation or indication adjustment (referring to indication)	
ZUU7/ZUE1: Promens Care is bekend bij een potentiële cliënt doordat ze in zijn/haar omgeving actief is. o Het hebben van een goed imago (goed doen wat je doet) o (Naamsbekendheid bij) verwijzende partijen o Profileren via netwerken (Brancheorganisaties, RIBW Allianties, Gemeente, Voogdij organisaties) o Er zijn potentiële nieuwe cliënten in de omgeving van de huidige cliënt o Via het netwerk van de (potentiële) cliënt o Direct contact met of rondleiding op locatie en het voeren van een kennismakingsgesprek	[Kwaliteitshandboek Promens Care]: Promens Care kent een 'oriëntatieregistratie waar (potentiële) cliënten worden geregistreerd die zich oriënteren op zorg
ZUU9: Na het 1e contact met Promens Care volgt de aanmelding en indicatiestelling; volgorde kan variëren, meestal is er al een indicatie. Een aanmelding is altijd nodig.	[Kwaliteitshandboek Promens Care]: Wanneer de aanmelding in behandeling wordt genomen wordt aan de hand van beoordelingscriteria bepaald of de client in aanmerking komt voor zorg bij Promens Care. Dit is de geschiktheidstoets. Bij afwijzing, verwijst Promens Care client naar andere of algemene instanties.
ZUE7: Verwijzers, verwijzende instanties en/of Promens Care kunnen de cliënt helpen een indicatie te verkrijgen.	
ZUU10: Promens Care ondersteund in het verkrijgen (en/of aanpassen) van deze indicatie. Een cliënt heeft voor het verkrijgen van zorg een passende indicatie nodig.	
ZUE8: Toewijzing/indicatie moet passen bij de toelating die PC heeft.	
ZUU11: Nadat de cliënt of de verwijzer zich heeft aangemeld wordt de aanvraag/aanmelding in behandeling genomen. Hierbij wordt informatie opgevraagd en verzameld naast het aanmeldformulier.	
ZUE9: Zorg moet vallen binnen productie/contractruimte, bij intramuraal heet dit capaciteit;	
ZUU12: Op basis van de aanmelding wordt bepaald of client geschikt is	
KF7: The channel main process shows how the clients needs and its indication are aligned with the 'offerings' of a care service provider	
KF7.A: The clients' needs for care are further elaborated (intake) and matched with the care- service offerings (care-sites and care-services) of the care provider.	
KF7.B: The care service offering is a combination of site(s) with its characteristics (location, facilities etc) and its care- services (and functions in AZR terminology)	
KF7.C: If there is availability the client will be placed on the site, if not the client may receive bridging care	
KF7.D: The care channeling process realizes (queue-list) status messaging to the care- agency	
ZUE11: De vraag wordt vervolgens na intake gematched met het aanbod (locaties en diensten) en het moment van plaatsing	[Kwaliteitshandboek Promens Care]: Indien op de voorkeurslocatie geen plaatsingsmogelijkheden zijn, heeft de cliënt de volgende keuze mogelijkheden; • wachtlijstplaatsing • zich oriënteren op alternatieve plekken • overbruggingszorg (AWB) in de huidige verblijfssituatie
ZUU13: Als de cliënt is aangemeld volgt de intake en matchingsfase; hierbij wordt de zorgvraag verduidelijkt op basis van opgevraagde en aangereikte informatie teneinde een passende locatie en diensten aan te kunnen bieden. o de vraag van de cliënt wordt verduidelijkt, deze informatie is de basis voor het begeleidingsplan o de client wordt gematched met de juiste locatie/type begeleider/ de juiste groep/dagbestedingsplek en bespreekt dit met de locatie om te kijken of er ruimte/mogelijkheden zijn.	
o De intake vormt vervolgens de basis voor de eerste ‘verheldering’ van de zorgvraag en voor de match tussen zorgvraag en locatie (en de expertise op deze locatie). Eventueel wordt de GW’ er ingezet.	
ZUE24: Promens Care biedt in een combinatie van zorg en huisvesting (en vaak ook dagbesteding en behandeling), waarbij (het functioneren van) de cliënt 24/7 wordt gemonitord en hij/zij terug kan vallen op begeleiding.	
ZUE25: Thuisondersteuning is in de kern hetzelfde gedaan als bij de 24uurszorg, alleen gebeurt dit nu niet 24/7, maar op afspraak	

ZUE26: De cliënt wordt zowel bij de thuisondersteuning als bij het 'wonen' ondersteund bij het realiseren van structuur (weekprogramma) en krijgt praktische en emotionele ondersteuning.	
ZUE27: Dagbesteding is een vorm van ondersteuning met in de kern als doel hebben van een zinvol dagprogramma (werk). De invulling is toegespitst op de mogelijkheden en wensen van de client.	
<p>ZUU14: De cliënt wordt gematched en aangeboden aan de juiste locatie en wordt afhankelijk van beschikbaarheid op de wachtlijst geplaatst.</p> <ul style="list-style-type: none"> - Eventueel plaatsing op wachtlijst (indien geen 'open' plek)/ Na deze match wordt gekeken of er plek is op deze locatie, is deze er niet dan wordt client op wachtlijst geplaatst. <ul style="list-style-type: none"> - Als er plek is, wordt (door CBA) contact gezocht met client of hij/zij nog interesse heeft - Wanneer er plek is of vrijkomt wordt de cliënt geplaatst bestaande uit de volgende stappen <ul style="list-style-type: none"> o Na toewijzing volgt kennismakingsbezoek waarin: <ul style="list-style-type: none"> § Aanvraag nieuwe client/ start zorg melding wordt ingevuld § OZD/PGB contract wordt ondertekend, contract wordt opgemaakt ...Op basis hiervan volgt de Overeenkomst Zorg en Dienstverlening en/of PGB-offerte welke wordt ondertekend door cliënt. In de overeenkomst zorg en dienstverlening wordt een vertaalslag gemaakt van de indicatie naar de te leveren zorg. § Contract wordt z.s.m. opgemaakt. Waar mogelijk bij de 1e keer, anders bij de 2e. § Aantal uren inzet per week wordt besproken (op basis indicatie, eventueel volgt herindicatie, waarbij Promens Care kan ondersteunen § Bij dagbesteding wordt alle relevante informatie naar de begeleiding van de desbetreffende groep gemaild zodat ze zich vast kunnen inlezen. Mochten hier vragen uit naar voren komen, dan zal ik deze beantwoorden en zo nodig uitzoeken 	
ZUE12: In geval dat de gevraagde dienstverdeling (op basis van de match) nog niet te realiseren is, wordt de cliënt geplaatst op wachtlijst.	
ZUE13: Na plaatsing op wachtlijst wordt er in overleg tussen een cliëntconsulent en een locatie onderzocht, of er een vorm van overbruggingszorg kan worden geboden als tijdelijke tussenoplossing	
ZUE15: De cliënt wordt toegeleid naar locatie waarbij locatiehoofd en/of coördinator de persoonlijk begeleider toewijst welke een start zorg melding doet.	
<p>ZUE30: Promens Care zorgt voor een passende dienstverlening door goed vast te stellen wat de ondersteuningsvraag en de behoefte is en binnen de grenzen van de zorgtoewijzing /indicatie te bepalen welke soort begeleiding (vaardigheden en competenties), welke locatie en/of welke behandeling nodig is.</p> <p>ZUE32: Wanneer een indicatie niet toereikend is voor het 'financieren' van een passende dienstverlening wordt de cliënt geholpen met het verkrijgen van een 'ruimere' indicatie</p> <p>ZUE10: Promens care verheldert de vraag van de cliënt en vind een passend aanbod door in een intakegesprek de ondersteuningsvraag vast te stellen en te vertalen naar zorg en dienstverlening.</p>	
KF8: The 'deliver' main process is the final step in the care -service delivery process which includes the actual delivery of the care services to the client and the registration	
KF8.A: The deliver main process is made up by the planning of care services, the delivery of care services and its (progress) registration and the evaluation (and ending) of delivery	
KF8.B: The deliver main process produces a care support plan, financial (amount of function delivered) and substantive registrations	

[Handboek AZR]: De zorgaanbieder is verantwoordelijk voor het onderhoud van de cliëntgegevens en moet alle gegevens onderhouden met betrekking tot de aanvang van zorg, wijzigingen in de zorglevering en het einde van de zorg. De kwaliteit moet blijken uit het melding aanvangzorgbericht en het mutatie-/eindezorgbericht.

KF8.C: The deliver main process uses capacity-planning and site organizing services	
K8.D: The deliver main process may trigger the prepare main process for indication purposes	
K8.D: The deliver main process may trigger the channel main process for placement purposes	
KF8.E: The evaluation step may lead to adjusting or 'ending' the delivery of care services.	
<p>ZUU2: De zorgverlening start met het maken van een ondersteuningsplan</p> <ul style="list-style-type: none"> - De begeleider start de zorgverlening door op basis van de intake, de indicatie en de overeenkomst zorg en dienstverlening en samen met de cliënt (en of zijn familie) te starten met het opstellen van een ondersteuningsplan bestaande uit <ul style="list-style-type: none"> o Het vaststellen van de huidige situatie: <ul style="list-style-type: none"> § Het beschrijft wie de cliënt is, wat de cliënt kan en niet kan en de wensen en behoeftes van de cliënt. o Het vertalen van deze huidige situatie naar <ul style="list-style-type: none"> § concrete invulling in doelen § (Terugkerende) afspraken en handelingen waarbij ondersteuning wordt geboden bij de zaken die echt niet zelf gedaan kunnen worden. <ul style="list-style-type: none"> § Risico's en VBM o In het plan staat de inhoudelijke invulling (hulpvraag) van het 'contract' beschreven. o De zorgverlening wordt uiteindelijk (na een periode van 'leren kennen van de cliënt') vastgesteld en plan wordt ondertekend door cliënt <ul style="list-style-type: none"> o Voorlopig plan moet er zijn binnen 6 weken (dit is te kort om écht een passend plan te hebben) 	
<p>ZUU3: De begeleider voert de zorgverlening uit door (meestal op vooraf geplande data) bij de cliënt thuis te komen. Tijdens een afspraak wordt ondersteuning geboden bij:</p> <ul style="list-style-type: none"> o Praktische zaken à Huishouden/ Post/ Administratie/ Persoonlijke verzorging o Constateren, observeren, signaleren en beschrijven van opvallende zaken en acties uitzetten daar waar nodig. o Bepalen/beoordelen van de thuissituatie van de cliënt/Signaleringsfunctie o Helpen/ondersteunen bij het ordenen en structureren van gedachten; bij ADL <ul style="list-style-type: none"> o Contact met familie en netwerk o Hulp bieden bij het omgaan met een psychische beperking o Samenwerken met andere instanties o Gesprek voeren over de voortgang 	
ZUE16: Vanaf het moment dat de zorg is toegewezen en/of gestart wordt de informatie mbt de zorglevering geregistreerd in de daarvoor bestemde systemen.	
ZUE31: Promens Care zorgt voor een passende dienstverlening door middel van de Dagelijkse zorg en/of het zorgplan de behoefte verder te concretiseren naar concrete invulling (terugkerende afspraken, taken en doelen)	
ZUE47: voor verantwoording blijft het zorgplan (hoe wordt planmatig gewerkt aan doelen en hoe zijn deze in overleg met de cliënt geëvalueerd) van belang. Daarnaast zijn ook registraties nodig t.a.v. veilig en verantwoord werken (denk aan vrijheidsbeperkingen, medicatiebeleid , behandelplan)	
ZUE43: op basis van de zorgtoewijzing wordt de levering van zorg (conform productdefinities en eenheden vastgelegd in de beleidskaders van de Nza) gepland en in het primaire proces geregistreerd en bevestigd.	

<p>ZUU3: De begeleider voert de zorgverlening uit door (meestal op vooraf geplande data) bij de cliënt thuis te komen. Tijdens een afspraak wordt ondersteuning geboden bij:</p> <ul style="list-style-type: none"> o Praktische zaken à Huishouden/ Post/ Administratie/ Persoonlijke verzorging o Constateren, observeren, signaleren en beschrijven van opvallende zaken en acties uitzetten daar waar nodig. o Bepalen/beoordelen van de thuissituatie van de cliënt/Signaleringsfunctie o Helpen/ondersteunen bij het ordenen en structureren van gedachten; bij ADL <ul style="list-style-type: none"> o Contact met familie en netwerk o Hulp bieden bij het omgaan met een psychische beperking o Samenwerken met andere instanties o Gesprek voeren over de voortgang 	
ZUU4: De zorgverlening wordt geleverd aan de individuele cliënt vooral op basis van planning	
<p>ZUU5: De begeleider registreert, monitort en evalueert de voortgang van de zorgverlening</p> <ul style="list-style-type: none"> - De begeleider registreert en monitort de voortgang door: <ul style="list-style-type: none"> o Het bespreken van voortgang van doelen. Een doel geeft duidelijkheid over wat een cliënt uiteindelijk wil, het geeft richting aan zijn of haar leven. o Registreren en rapportage van de voortgang op doelen o op basis van verbetering of verslechtering de zorglevering (doelen en afspraken) bijstellen en na een bepaalde periode evalueren. Soms volgt tijdelijke terugval naar een 'GGZ-instelling' o Evalueren en bijstellen plan en doelen 	

Appendix III: Key changes

Aggregated statement(s) care attendants (ZUU) & care experts (ZUE)	Supporting documents and/or other findings	Impact
KFC1: Significant changes in accountability demands from funders and (local) regulators		AIM 1, AIM2, AIM 3
KFC1.A: Beside the care agencies new funders will be responsible for the purchase of care services from care providers.		
KFC1.B: There will be a relevant variety of non-standardized financial accountability demands from the new funders		
KFC1.C: There will be a decline in standardization and automation in the exchange of information between funder and provider		
KFC1.D: There will be a growing variety of 'care progress' accountability demands from the new funders. Funders want to know what the results are of the care delivery process.		
KFC1.E: There will be an increase in administrative burden and a decrease in capacity		
KFC1.F: New funders may also (partly) become regulatory institutions		
ZUU37: De begeleider moet meer en gevarieerder registreren ten behoeve van verantwoording	[Factsheet WMO][Transitieplan WMO] [Factsheet Jeugdwet] [Transitieplan Jeugdwet] - Per 2015 wordt de jeugdzorg,	
ZUU39: Toename van verantwoording op bereikte inhoudelijke resultaten		

ZUE58: Er ontstaan meer opdrachtgevers en financiers; van 2 naar +/- 40	<p>extramurale begeleiding, dagbesteding, kortdurend verblijf en persoonlijke verzorging, beschermd wonen en de inloooovoorziening uitgevoerd en georganiseerd door gemeenten (WMO, Jeugdwet) [Transitieplan WLZ] De overige zwaardere zorg blijft verankerd in de wet langdurige zorg. De Wlz biedt in dat stelsel een vangnet voor wie - ook met steun van de sociale omgeving, de gemeenten en/of de zorgverzekeraars - niet (meer) zelfredzaam kan zijn. - Het is van belang dat gemeenten worden ondersteund bij het ontwikkelen van kwaliteitsbeleid, waaronder het formuleren van lokaal kwaliteitsbeleid, het doorvertalen daarvan naar aanbesteding/contractering en naar handhaving en toezicht.</p> <p>[www.istandaarden.nl] Gedurende de transitieperiode vult het ministerie van VWS de randvoorwaarden voor het iWmo-berichtenverkeer in. VWS regelt bijvoorbeeld de financiering van het beheer van de informatie-uitwisseling, en bewaakt het bestuurlijk draagvlak om ervoor te zorgen dat gebruik van de iWmo wordt gestimuleerd. - Gemeenten krijgen een grote mate van beleidsvrijheid om op lokaal niveau het beleid en de uitvoering hiervan vorm te geven.</p>		
ZUE59: Er ontstaan minder eenduidige kaders en/ of verschillende kaders per opdrachtgever			
ZUE64: Er ontstaan vele vormen van registratie, (meer inhoudelijke) verantwoording en declaratie in de zorg			
ZUU54: Structureer registraties meer ‘voor’ waardoor administratieve last en bureaucratie wordt gereduceerd.			
ZUE75: In de basisregistraties moet ruimte gecreëerd worden voor de vastlegging van “niet-vooraf-te-definiëren-diensten en moeten voorbereid zijn op complexe situatie dor het moeten verantwoorden op meer vormen			
ZUE79: Alles moet gericht zijn op ‘het goed kunnen vaststellen op welke manier je invulling geeft aan een opdracht, met welke middelen en hoe je er op stuurt’ o Kennis nemen van de gestelde en afgesproken voorwaarden voor levering o Inrichten van nieuwe eisen aan administratieve organisatie, inhoudelijke zorglevering en financiële verantwoording en de koppeling hiertusse			
KFC2: Changes in the funding in care-service with a significant budget rebate			AIM3, AIM4, AIM5
KFC2.A: A substantial budget reduction will be applied to care services delivered. The 'funding' for each care service may decrease drastically.			
KFC2.B: The uncertainty about ‘care assignments’ increases; there may be a decrease in duration of ‘ care asignments’			
KFC2.C: Reduction of advanced funding which may lead to problems regarding liquidity			
KFC2.D: Care services need to be delivered on the same quality level but with reduced capacity for deliverance			

ZUE57: Er wordt/is minder geld beschikbaar gesteld voor de zorg	[Factsheet WMO][Transitieplan WMO] [Factsheet Jeugdwet] [Transitieplan Jeugdwet] : Deze veranderingen gaan gepaard met forse budgetkorting - Eerder de juiste hulp op maat te bieden, om het beroep op dure gespecialiseerde hulp te verminderen;	AIM2,AIM3,AIM6,AIM7,AIM8
ZUU52: Promens Care moet zorgen voor ‘financiële’ bewustwording bij haar medewerkers.		
ZUE73: Er ontstaan voor Promens Care concretere en kortstondiger opdrachten		
ZUE81: een risico van de veranderingen is potentiële krimp		
ZUE82: Liquiditeitsproblemen en budgettaire onzekerheid neemt toe (geen garantie dat je betrokken blijft)		
KFC3: Changes in the nature of the care service delivery process		
KFC3.A: The way 'assignment and matching' activities will be executed may vary per funder.		
KFC3.B: The flexibility of the scheduling of personnel should be increased.		
KFC3.C: There will be more focus on delivering (digital) care services to (and enabling) the social context in which a client resides (family, friends, volunteers, third party care providers).		
KFC3.E: There will be an increased emphasis on social teams that identify care needs in a neighborhood or district. Care service providers participate in these social teams.		
KFC3.F: There will be an increased emphasis on the degree of self-reliance of the client which determines the rights of a client in receiving professional guidance and support		
ZUU44: De intake stap binnen het gemeentelijk domein ‘verdwijnt’; na aanmelding en ‘start zorg’ melding start ‘het dagelijkse werk’	[Factsheet WMO][Transitieplan WMO] [Factsheet Jeugdwet] [Transitieplan Jeugdwet]: Preventie en uitgaan van de eigen verantwoordelijkheid en eigen mogelijkheden (eigen kracht) van de burger, van jeugdigen (en hun ouders) komen meer centraal te staan. Dit maakt meer integrale hulp in geval van meervoudige problematiek beter mogelijk: één gezin-één plan- één regisseur. Sociale wijkteams bieden maatwerk, door in gesprek met de burger en zijn netwerk, ondersteuning te organiseren die nodig is. De rol van de informele ondersteuning en zorg zal verder moeten worden versterkt. Bevorderen van innovatie en het verspreiden van goede voorbeelden zal	
ZUU46: De flexibiliteit van de inzet van het personeel moet worden vergroot		
ZUE63: Voor het deel dat wordt overgeheveld naar het gemeentelijk domein (WMO, Jeugdwet & participatiewet) ontstaat een totaal andere benadering en houding. Hierbij wordt uitgegaan van het volgende: o In principe ben je zelfredzaam als burger o Bij verminderde zelfredzaamheid ga je via een aantal stappen naar professionele zorg; Verkrijgen van recht op betaalde zorg komt alleen in het uiterste geval.		
ZUE60: Er ontstaat een grotere variatie in toewijzing (Gemeente, Jeugdzorg, Huisarts, CIZ)		
ZUE66: Er ontstaan onduidelijkheden in de overgang ten gevolge van de transities. Bij een toewijzing in het gemeentelijk domein vanaf begin 2015 is de werkwijze en taakverdeling nog in ontwikkeling.		
ZUE67: De regie van de toeleiding ligt voor de WMO bij de gemeente en niet bij Promens Care		

<p>ZUE68: Focus van de begeleiding moet meer komen te liggen op het faciliteren/ondersteunen van zorghandelingen door het netwerk van de cliënt en het vergroten en/of instant houden van het netwerk van de cliënt. wordt minder uitvoeren en meer regisserend van aard</p> <p>ZUE78: Met contractpartners/opdrachtgevers in kader van innovatie basisafspraken maken (ruimte voor nieuwe beleidsontwikkeling creëren) met nadruk op innovatie en alternatieve vormen van (meer effectieve) ondersteuning:</p> <ul style="list-style-type: none">§ Niet altijd dure hulpverleners§ Zorg op afstand§ Digitalisering <p>ZUE70: De veranderingen vragen een andere benadering van de zorg; aanpassen van het denken en gedrag van begeleiders;</p> <ul style="list-style-type: none">o De uitdaging voor begeleiders is om cliënten onderdeel te laten worden van het ‘zorgen voor elkaar’, ‘wederkerigheid’, ‘maatschappelijke betrokkenheid’, ‘minder overheid’, ‘meer sociaal netwerk rond burgers’.o Een andere houding naar de cliënt, alleen ‘hulp’ bieden als het echt moet.o Veel meer de omgeving van de client ondersteunen	<p>daarin worden meegenomen. Meer ruimte voor professionals om de juiste hulp te bieden en vermindering van administratieve lasten; betrokken professionals die sociale netwerken in de omgeving van het gezin, het kind en de burger weten in te schakelen.</p>
<p>KFC4: Changes in the dynamics (opportunities, threats) of the external environment of care providers</p>	
<p>KFC4.A: There will be a greater distance between care attendant and client that pressures the effectiveness of the care service delivery and may increase the demand for care.</p>	
<p>KFC4.B: There is a greater likelihood that clients get too little care assigned and get it (too) late</p>	
<p>KFC4.C: There will be opportunities to create different kinds of (digital) care services, residence- and care consultancy services;</p>	
<p>KFC4.D: Coörporation will lie at the center of the new care service delivery, knowledge and expertise sharing will be the key drivers for enabling this</p>	
<p>KFC4.E: Processes need to be prepared for changes</p>	
<p>ZUE83: De andere ‘houding’ (zoals eerder genoemd) werkt in de praktijk niet</p> <p>ZUU42: De veranderingen leiden tot extra risico’s en/of problemen in de zorg:</p> <ul style="list-style-type: none">o Risico op slechte naam Promens Care door onzorgvuldige inzet door het netwerk.o Risico op een toename (i.p.v. afname) van hulpvragen;o Toename van indicatieloze en onzichtbare cliënten met meer overlast tot gevolgo Grote problemen bij clienten op de grens WLZ-WMO <p>ZUE62: Scheidslijn ambulant en 24-uurzorg vervaagt</p>	<p>[Factsheet WMO][Transitieplan WMO] [Factsheet Jeugdwet] [Transitieplan Jeugdwet] - Gemeenten zullen samen met het veld (aanbieders, professionals en cliëntorganisaties) landelijke kwaliteitsstandaarden ontwikkelen voor maatschappelijke ondersteuning waar partijen dat samen nodig achten.- het opvoedkundig klimaat te versterken in gezinnen, wijken, scholen en voorzieningen</p>
<p>ZUU47/ZUU48: Promens Care moet zich meer profileren en meer netwerken en meer invloed moeten uitoefenen op lokale, regionale en landelijke bewegingen door krachten te bundelen met collega aanbieders en meer samen te werken met ketenpartijen.</p>	

<p>ZUU51: Promens Care moet bij haar corebusiness (en zichzelf) blijven:</p> <ul style="list-style-type: none"> o Gericht op kwalitatief goede zorg o Het voorkomen van 'klasse justitie'; zit je in WMO krijg je bijna niks, zit je in WLZ krijg je alles o Terugval (voor cliënten) organiseren binnen Promens Care tussen WLZ en WMO locaties 	als kinderopvang en peuterspeelzalen - De mate waarin gemeenten en zorgaanbieders erin slagen om op het niveau van de jeugdige en zijn omgeving de jeugdhulp te transformeren bepaalt het succes van de stelselwijziging.[transitieplan wlz] een volledig pakket thuis of een modulair pakket thuis - Daarnaast stelt het CIZ vast in welk inhoudelijk zorgprofiel de cliënt het beste past.	
ZUE69/ZUE77: Er ontstaan mogelijkheden tot een ander contact met financier en opdrachtgever (meer accountmanagement, samenwerken, actief mede ontwikkelaar van transformatie). Invloed uitoefenen op de totstandkoming van de contracten (de hoeveelheid zorg die je mag leveren van de opdrachtgever)		
ZUE71: Voor de cliënten van Promens Care betekent dit minder passende zorg en langer wachten op zorg.		
ZUE72: Er ontstaan meer mogelijkheden om de expertise en kennis van Promens Care in te zetten. Er ontstaan meer mogelijkheden tot specialisatie		
ZUE74: Promens Care moet een meer flexibel ingerichte en procesgestuurde organisatie zijn met flexibel ingerichte bedrijfsvoering processen (personeel, vastgoed, dienstenaanbod en informatievoorziening) die continue voorbereid is op verandering.		
ZUE76: Promens Care moet Informatie-uitwisseling dusdanig faciliteren, dat kan worden geborgd, dat alle betrokkenen steeds op maat de actuele informatie kunnen delen en uitwisselen.		
ZUE80: Promens Care wordt veel meer een netwerkorganisatie die zorgt voor flexibele afstemming en samenwerking om maatwerk voor cliënten te optimaliseren.		
ZUE84: afbreuk kwaliteit personeel door ontbreken juiste kennis en kunde om conform benodigde aanpassingen te werken en decentrale contacten goed/warm te houden		
ZUE86: Kwaliteitsverlies. Deels doordat toeleiding bij gemeente komt te liggen en vooronderzoek minder zorgvuldig gedaan wordt. Risico bestaat dat men gaat 'doen' en niet eerst een plan opstelt. Dit geldt vooral voor de complexere situaties.		

Appendix IV: Key modelling findings (requirements and guidelines)

Appendix IV- Modelling findings: Requirements and guidelines			
Nr	Modelling findings	CASERA Aspect	References
HLP1: Overview_funding_support			
KMF1	Base the development of the architecture on the fact that there are two primary processes (care funding and care delivery) that are completely dependent on each other that need to realize two high level business services for	Three C	KF1

	'external' use: (1) care funding services and (2) care delivery services		
KMF2	Establish a connection between the funding and delivery by realizing a care (progress) registration (MBS1.3.3) service that enables the registration of the quantitative (per function) and qualitative (per client or context) outcome of the delivery.	Three C	KF8
KMF3	Acknowledge the function as central business object that is part of an assignment of a care consumer that binds the funding process to the delivery process in the following matter: (1) The function is the object that identifies the type of care that may be delivered (to a client, client context and site context) and against what price (2) The amount of care functions that are (planned to be) delivered determine the amount of money that is made available to the care provider by the funder	Three C	KF2
KMF4	Acknowledge the 'assignment' business object (in all 'forms') as the financial coverage of the functions to be delivered		
KMF5	Have 'business support processes' that realize business support services that enable the primary processes to be executed by means of people, resources and facilities	Three C	KF4, KF8
KMF6	Position the 'care consumer' (the actor that consumes the care services) and 'care funder' (the actor that pays for delivered care services) stakeholders central in the care service delivery architecture	Three C	KF1
KMF7	Have the 'indication' business object central in identifying the (formally and financially) acknowledged care needs of a client	Three C	KF5
MP4.1: Assign			
KMF8	Determine the extent to which assignment (in all forms) of all functions is needed to place a client on a site or to start the care delivery	Three C	KF5
MP1.1: Prepare (SP1.1.1: Refer, SP1.1.2: Handle Notification)			
KMF9	Acting as a gateway the CSDA needs a main process (MP1.1: Prepare) that realizes the following main business services: o MBS1.1.1: Referring: services that enable referring the potential client to the appropriate follow-up actions in order to be eligible for receiving needed care services. These referring services are used for obtaining or changing an indication, for guiding to notification and for referring to other providers o MBS1.1.2: Suitability Assessment services: that allow a client to apply for care (SP1.1.2: Handle Notification) and, based on this notification, enable assessment of the (potential) client for suitability of receiving care services within the provider including a continuation decision.	Process and output	KF6
KMF10	Address how the 'SP1.1.1: Refer' sub process may trigger the 'MP4.1: Assign process' by referring the client to get an indication or how the 'SP1.1.1: Refer' sub process may trigger the next step within the care service provider.	Three C	KF5
J2: Junction prepare channel			
KMF11	Address the conditions (J2: Junction prepare channel) needed to start matching the (potential) care consumers needs	Three C	KF5

	to the care service offerings		
MP1.2:Channel (SP1.2.1: Match, SP1.2.2: Place)			
KMF12	<p>Acting as a channel the CSDA needs a main process (MP1.2: Channel) that realizes the following main business services:</p> <ul style="list-style-type: none"> o MBS1.2.1: Suitable offering: services that enable creating a care service offering that matches the needs, assignment (functions), wishes and inabilities of a care consumer o MBS1.2.2: Placement processing: services that enable: <ul style="list-style-type: none"> § Realizing a placement for the client to receive the best available care service offering. § Realizing (automated) 'queue list' status messages to the care agency by using the external 'Assignment' service § Processing and recording of adjusted care service offerings that are (going to be) consumed by a care consumer 	Process and output	KF7
KMF13	The CSDA needs a process step and services (SP1.2.2: Place) that continuously checks availability for clients that are placed on a queue-list and realizes 'queue list' status messages to the care agency	Process and output	KF7
KMF14	Make the subprocesses SP1.2.1: Match within MP1.2 Channel optional and determine the conditions when they are.	Process and output	KF7
Application services and corresponding information objects.			
KMF15	The CSDA needs an application service (MAS3) to enable 'notification' of the clients (changed) care service delivery needs and (changed) client information that can be used by the different processes and various stakeholders	Process and output	KF5 to KF8
KMF16	The CSDA needs a client data registration application service (MAS1) to record and access client information (client object) including its relations with other information objects	Process and output	KF5 to KF8
KMF17	The CSDA needs a client profile registration application service (MAS2) to record and access information of the clients care needs (care profile object) including its relations with other information objects	Process and output	KF5 to KF8
KMF18	The CSDA needs an assignment registration application service (MAS4) to record and access indication, assignment and function information including its relations with other information objects	Process and output	KF5 to KF8
KMF19	The CSDA needs an expertise registration application service (MAS6) to record and access expertise and guiding style including its relations with other information objects	Process and output	KF5 to KF8
KMF20	The CSDA needs a site registration application service (MAS6) to record and access facility, site location, site expertise and site queue list information including its relations with other information objects	Process and output	KF5 to KF8
KMF21	The CSDA needs a client support registration application service (MAS7) to record and access client support information, care planning information consisting of client profile, client objectives, client subjects, client safety measures and care progress	Process and output	KF5 to KF8
KMF22	The CSDA needs a site context support registration application service (MAS8) to record and access site support information	Process and output	KF5 to KF8
KMF23	Ensure high automation and high accessibility of these application services	Process and output	KF5 to KF8
KMF24	Base the application service on the main business objects that are accessed, recorded and manipulated.	Structure	KF5 to KF8

KMF25	Realize (application) services that enable efficient and effective registration and information sharing during daily care service delivery;	Process and output	KF5 to KF8
KMF26	Address within what processes the different information objects are accessed and relate the different objects to each other.	Structure	KF5 to KF8
MP1.3:Deliver (SP1.3.1: Plan, SP1.3.2: Deliver, SP1.3.3: Evaluate)			
KMF27	<p>The process (MP1.3: Deliver) should be put central in the CSDA. It's the process the realizes the following strategic business services:</p> <ul style="list-style-type: none"> o MBS1.3.1: Care planning: services that enable planning the required care functions by translating these functions into daily guidance and support activities (care support plan) and assessing the needed capacity to execute these activities. o MBS1.3.2: Guidance and support; services that enable the actual delivery of guidance and support to a care consumer and enable information sharing about this delivery o MBS1.3.3: Care (progress) registrations: services that enable <ul style="list-style-type: none"> § recording the progress of delivered care services, § the registration of quantitative (per function) and qualitative (per client or context) outcome of the delivery to meet (changing) accountability requirements § the registration of client-changes. § the identification and registration of latent care needs within the context of a site. o MBS1.3.4: Care evaluation: services that enable evaluating the care delivery in different levels (care objective evaluation, total care evaluation) triggered by different events and that enable the appropriate follow-up (SP1.1.1: Refer, SP1.2.2: Adjust care provision, SP1.3.1: Plan) 	Process and output	KF8
KMF28	The actual delivery of care services needs to be supported by site organizing and capacity planning services	Process and output	KF8
KMF29	The CSDA needs a process step (SP1.3.1: Plan) and services that inventories information regarding the client profile, client objectives, client subjects and client safety measures that is recorded and 'signed' by the client within the statutory period	Process and output	KF8
KMF30	<p>Base the (organization of the) care plan sup process on the notion that There are two types of 'care support plans' which have the same format:</p> <ul style="list-style-type: none"> 1- The 'signed care support plan' which allows Promens Care juridical to actually execute the plan 2- The 'dynamic care support plan' which has the same type of content but this content can change based on the progress of 'care service delivery' 	Process and output	KF8
KMF31	Ensure a clear distinction between guidance and support (MA1.3.2.1) to an individual and consult (MA1.3.2.6) to a group (site context, client context)	Process and output	KF8
KMF32	The CSDA needs a process step and services (SP1.3.2: Deliver) that delivers and records care consult tot the clients context and the site context	Process and output	KF8
KMF33	Determine the events that may trigger evaluation	Process and	KF8

		output	
General Guidelines			
	Create three viewpoints that form the base for realization of the CSDA ; (1) one high level viewpoint for determining CSDA in its environment, (2) second a main process level for determining the main process structure and its relations to other main processes and the main business services it should realize (3) showing per main process how the process is composed and what application services are needed to execute the process	Process and output	KF1 to KF8
	Use the models, descriptions, guidelines, requirements, viewpoints and views as a baseline and guiding reference to model a specific care service delivery architecture	Process and output	KF1 to KF8
Changes			
AIM1	Registrations are needed that enable an active role of the care service provider in local care developments and help in realizing and/or expanding contracts with the new funders	KMF27	
AIM2	In order to achieve the appropriate accountability services for each funder a care provider will need different and flexible care (progress) registrations that are build around the function	KMF1,KMF2,KMF3,KMF4, KMF27	
AIM3	Care (progress) registration activities need to be highly automated and highly accessible (for employees and non-employees)	KMF23	
AIM4	Care (progress) registration activities need to deliver real time information regarding quality, costs and (expected) revenue	KMF27	
AIM5	Capacity planning needs to be an integral part of the care service delivery process in order to deliver the services with 'just in time' appropriate qualitative and quantitative capacity	KMF27	
AIM6	AR6: The way 'assignment and matching' activities will be executed may vary per funder.	KMF14	
AIM7	Care (progress) registration activities need to enable 'safe' knowledge and information sharing to the clients' social context	KMF27	
AIM8	There will be different types of clients that reside within the context of the site that consume different forms of services.	KMF31	

Appendix V: The Care service delivery architecture framework

an enterprise architecture literature exploration

For care-organizations to survive in the near future they need the ability to continuously change its services and with that its core business processes. Enabling change through an integrated approach is the core-focus of enterprise architectures (Lankhorst et al, 2005, TOGAF)

Therefore the objective of this chapter is to develop a framework of an Enterprise Architecture containing descriptive, visualizing and prescriptive components that can help care-organisations to meet the changing demands of its external environment. Although different literature will be discussed, the core of this framework will be based on ArchiMate and TOGAF literature

This care-service framework (to be called hereinafter the 'CASERA' –framework') can be used to visualize and describe the changes that occur within the 'care service delivery architecture' as a direct consequence of the major transitions within the healthcare market .

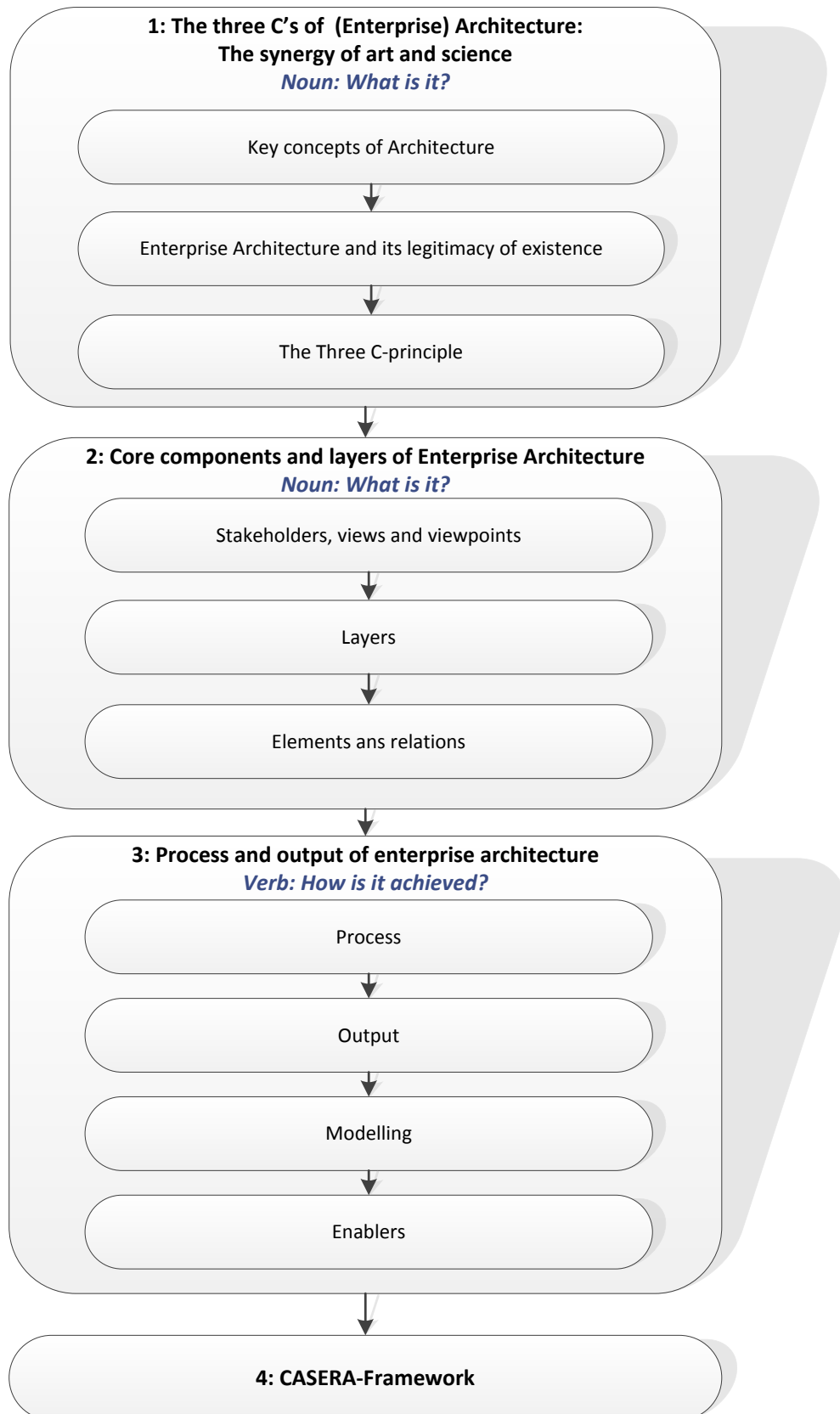
To achieve the CASERA- framework literature surrounding enterprise architecture will be explored to find out the 'nouns' (subjects, what is it?) and the 'verbs' (activities, processes, how is it achieved?) (Gartner, 2008) that make up the Enterprise Architecture.

With that this section of the thesis comprises the following chapters:

- 4- Definition: Generalised concepts of Enterprise Architecture
- 5- Core components and layers of Enterprise Architecture
- 6- The architectural process and output

In the fourth chapter we ultimately combine the outcomes of these three explorations into the CASERA- framework that can help shape the realization of a 'change enabled care-service delivery architecture'. In figure 1 the structure of this literature exploration is visualized:

Figure 1



(Enterprise) Architecture; the synergy of art and science

As we all know 'architecture' and 'architectural activities' have been of relevance to society throughout all eras of history. In defining 'enterprise architecture' we need to understand what it is an architect does, whether it is in constructing a building, constructing a pyramid, constructing a city or constructing an enterprise.

To obtain understanding of the core of 'architectural' activities and subjects one needs to confront themselves with the confusing tangle of definitions and literature surrounding enterprise architecture. In this thesis we will do this by extracting the main concepts out of these definitions and literature. We do this by:

- 1.1 Seeking and exploring the concepts of 'architecture' in general
- 1.3, 1.4, 1.5 Seeking and exploring the concepts of the enterprise and the added value of 'enterprise architecture'
- 1.6 Combining these explorations into the CASERA- definition of Enterprise Architecture

Concepts within architecture

The best way in understanding architecture in general is by using a common example from the physical world of 'architecture' and by linking it to relevant literature. In the example we use the design and construction of a **multifunctional building** that fits the atmosphere of a city:

***Example:** An architect that is concerned with the design and construction of a multifunctional building will first have to identify with different stakeholders how the building should look like, for what purposes it is to be used and how to make it future proof. Furthermore he needs to make sure the building fits 'the atmosphere of the city'. This architect will translate all these aspects into a prototype of the building which includes details that addresses the most crucial functions and details that address the way it fits the 'atmosphere of the city'.*

He will make these prototype into a form that is understandable for all stakeholders involved and addresses the specific needs of these different stakeholders which conceive the world around them differently.

Concept 1: Designing and creating artefacts that address wicked problems surrounding the 'desired' situation of a system embodied in its components.

The architect needs to create and design this prototype (an artefact about the 'fundamental organization') (IEEE1474) in a circumstance where he needs to deal with 'indeterminate' desires and restrictions that are in an idea-forming phase. Problems that are 'indeterminate' are so called wicked problems. Wicked problems are contexts (not categories) of thinking where 'a problem' that is poorly defined is to be translated into an 'artefact', before the final result is known. Wicked problems are central in the 'design' activity and need creativity to solve them. (Buchanan, 1992). The design activity is an activity where the architect must discover or invent a particular subject out of the problems and issues of specific circumstances. (Buchanan, 1992).

Concept 2: Balancing between ‘structure’ and ‘form’ to fit the desires of different stakeholders

As part of the wickedness, the architect determines and models the key functionalities and makes a design in a form that is understandable and fits the desired perceptions of the different stakeholders. This makes the architect balance between structure (usability, durability) and form (‘look and feel’, experience) (Rijsenbrij, 2005. Buchanan, 1992) and makes architecture a fit between ‘form’ (an understandable format for everyone involved) and ‘function’ (the ‘facts’).

Example: *This prototype needs to describe the building (enterprise) as a part of the city (environment) in a coherent way to ensure that all the key elements, key needs of different stakeholders and how they link to each other are exposed. In this way it can help in reaching a common understanding with different stakeholders (e.g. client, mayor, user, subcontractors etc) about how the building should look like, for what purposes it is to be used and how to make it future proof.*

Concept 3: A coherent whole of related primary elements that fits the environment

The prototype needs to show “the fundamental organization of the building embodied in its components, their relationships to each other, and how it fits the atmosphere of the city”

Concept 4: Create a common frame of reference to ensure effective communication

These stakeholders need to share a common frame of reference (in the case of a building everyone can recognise ‘the door’ within an architectural visualisation). Creating modelled and designed artefacts by using a common frame of reference helps bridge the ‘communication-gap’ between stakeholders and architects and help reach a common understanding of the end result. In this way the prototype acts as a medium for communication (Lanhkorst, 2005 et al)

Example: *This prototype can then be used by the architect for a ‘product-breakdown’ for defining, prescribing, guiding and designing detailed views and descriptions that are used to realize parts or segments of the building. There is a detailed plan (or detail prototype) for every discipline that always supports the overall architecture, with the architect acting as a contractor for the subcontractors and overseeing and controlling the total design.*

Concept 5: Control complexity and guide the realization of functionality

By using the ‘overall’ prototype with different stakeholders to define detailed plans the architectural activity helps structure and control complexity and desired functionality (Lankhorst et al, 2005) It shows how the different parts are linked with each other and guides its evolution over time to its end result (Kruiswijk, Poel, 2011; Gartner , 2008)

Summarizing 'architecture'

Within the example and the accompanying lines one can see that the architect balances between art (perception, wicked problems) and science (structure, complexity) where functionality binds them together. This is reflected in the defining architectural activities and concept:

- Designing and creating artefacts that address wicked problems
- Balancing between 'structure' and 'form' to fit the desires of different stakeholders
- Communicate a coherent whole of related elements that fits the environment
- Create a common frame of reference to ensure effective communication
- Control complexity and guide the realization of functionality

Enterprise Architecture and its legitimacy of existence

The 'architectural' concepts that were extracted in the previous section are based on an example of the physical world. And we can say 'architecture' in the physical world has proved its use for man. In finding out the core reasons, purposes and added value behind 'doing' and 'having' enterprise architecture these 'architectural concepts' will be extended in order to fit the context of the enterprise.

Before starting this, it is necessary to change our focus from 'the building' to the 'enterprise'. In this section the 'architectural activity' needs to be focused on the enterprise embodied in its components. In 1.4 the enterprise is defined and in 1.5 the purpose and added value are extracted by exploring literature.

Enterprise definition

Exploring different literature regarding enterprise architecture resulted in the following definitions of the term enterprise:

"An organization (or cross-organizational entity) supporting a defined business scope and mission. An enterprise includes interdependent resources (people, organizations, and technology) who must coordinate their functions and share information in support of a common mission (or set of related missions). (Thomas et al, 2010)"

or as Lankhorst et al (2005) put it:

"any collection of organizations that has a common set of goals encompassing all of its information and technology services, processes, and infrastructure."

and maybe the most effective definition:

"the entire organization as a system that creates and/or delivers something of value to a market, and in order to achieve this it needs an internal system of processes and resources to make good on its promises." (Rummler, Ramias, 2008)

Summarized we can state that **the enterprise has an objective of achieving goals in delivering something of value to a market and needs business processes, information, technology services, and infrastructure to do this.**

Purpose and added value of Enterprise Architecture

Below the purpose and added value of enterprise architecture is depicted:

Concept 6: Responsiveness to change

Probably the most common theme when studying literature is the contribution enterprise architecture delivers to the organizations' ability to timely change its services, processes and IT-systems to be more competitive and aligned with the demands of the environment. Also a key issues within the 'care service delivery- environment.

Supporting information systems and infrastructure used to have a delaying effect on needed changes in the business (Kruiswijk, Poels, 2010). Enterprise Architecture facilitates the use of specific elements that form the essence of the enterprise (Lankhorst et al, 2005). These elements remain stable while the possible combinations of these elements support a large number of different compositions (in the form of processes or functionalities). In this way it act as an organic system that can adapt to a changing environment (Rijsenbrij, 2005) and in doing so enabling and accommodating change.

Concept 7: Maximum support of the organizational context (vision, strategy, environment)

Although enterprise architecture originates from the IT- and information disciplines (Rummler, Ramias, 2008), it supports the business with the design and modelling of the required processes, application- functions and technologies in coherence including its relation to the businesses goals and needed changes. (Lankhorst et al, 2005) With this facts, insights can be captured more easily which results in:

- better (impact) analyses, planning and decision making including a consideration of costs and risks (Thomas et al, 2010, Kruiswijk, Poels, 2010)
- optimized operations that are more aligned with the organizations goals. (Lankhorst et al, 2005)
- being more compliant with laws and regulatory pressure (Lankhorst et al, 2005, Thomas et al 2010, Kruiswijk, Poels, 2010)
- strategic use of emerging technologies (Thomas et al 2010)

Concept 8: Providing insight into the coherence of the enterprise and its domains

The core competence and power of enterprise architecture is that it gives insight in the relationship between different domains (business goals, processes, products, information systems and infrastructure) of the organization and possible effects or impact of (desired) changes. In this way it supports the two aforementioned reasons for doing architecture and helps evolving the business (and all its components).

With this insight optimization, integration, consistency and standardization within and across these domains is supported whilst remaining agile. (TOGAF, 2010, Kruiswijk, poels, 2010).

Through creating these insights architecture can help reduce complexity by reducing 'details' and remaining focused on the 'holistic' total. This simplifies decision making (Rijsenbrij, 2005, Kruiswijk, poels, 2010)

Concept 9: Balancing between stability and flexibility

Stable yet flexible (Rijssenbrij, 2005), these seemingly contradicting concepts mutually reinforce each other with enterprise architecture. Artefacts (whether they are principles, requirements, models and/or guidelines) can enable reaching a successful enterprise architecture that has its base on controllable flexibility while ensuring integration and synergy across the enterprise. (Truijens, 2005, Lankhorst et al, 2005)

Concept 10: A cross-domain common frame of reference'

One could call enterprise architecture the Columbus 'egg in realizing an agile and flexible organization, and of course it isn't but it surely can make a significant contribution in realizing it.

But the extent to which it does depends on the way the architect uses 'the cross domain common frame of reference'. Creating modelled and designed artefacts by using a common frame of reference (Lankhorst, 2005) helps bridge the 'communication-gap' between stakeholders and architects. The success of enterprise architecture depends on the ability of the architect to address the concerns of key-roles or stakeholders that can identify needed changes.

To address these concerns a standardized vocabulary is needed that exceeds the level of the single domain but at the same time is recognizable for all of those that have concerns. (Lankhorst et al, 2005, Thomas et al 2010). Several frameworks and modelling tools have since been created to improve communication where of ArchiMate is the most commonly used.

Bottom line is that within realizing an enterprise architecture a common frame of reference or general language is needed to help all stakeholders establishing a mental 'idea' of the enterprise that matches their perception and conception (Lankhorst et al, 2005).

Concept 11: Enabling effective enterprise change towards reaching its 'desired' state

Enterprise Architecture and its artefacts can model and describe the enterprises future state and its difference with the current state and help shape a roadmap to reach its desired state (evolution).

Especially Gartner (2008) is keen on this process expressing that a core aspect of enterprise architecture is "translating business vision and strategy into effective enterprise change by enabling its evolution"

Introducing the ‘three C principle’ of Enterprise Architectures

In the previous sections we have extracted a total of eleven concepts that define the enterprise architectural activities (verbs) and (on an abstract level) the architectural components (its system) and artefacts (representations). In combining these concepts into a clear and catchy definition we introduce “the three c principle’ of Enterprise Architecture:

Enterprise Architecture is (random order):

- **Creat(ivat)ion** and design of artefacts (requirements, principles, models, guidelines) that represent a unified whole of related business, information and technology elements of the desired and responsive enterprise that fits its organizational context (vision, strategy and environment)
- **Communication** of these artefacts in a unified language that fits the perception (viewpoints and views) of the ‘audience’
- **Control** the evolution and effective change of the enterprise towards reaching its desired state and fitness in its organizational context.

In the matrix below we have translated out the extracted concepts of architecture, enterprise and the different purposes to the s ‘Three C principle’

Mapping the concept to the Three C-principle			
Concept	Creativation	Communication	Control
Concept 1: Designing and creating artefacts that address wicked problems surrounding the ‘desired’ situation of a system embodied in its components.	x	x	
Concept 2: Balancing between ‘structure’ and ‘form’ to fit the desires of different stakeholders		x	
Concept 3: A coherent whole of related primary elements that fits the environment	x		x
Concept 4: Create a common frame of reference to ensure effective communication		x	
Concept 5: Control complexity and guide the realization of functionality			x
Concept 6: Responsiveness to change	x	x	x
Concept 7: Maximum support of the organizational context (vision, strategy, environment)	x	x	x
Concept 8: Providing insight into the coherence of the enterprise and its domains	x		x
Concept 9: Balancing between stability and flexibility			x
Concept 10: A cross-domain common frame of reference		x	
Concept 11: Enabling effective enterprise change towards reaching its ‘desired’ state			x

Considerations regarding the 'Three C-principle'

Creativation:

Designing and creating artefacts is the central activity of the architect. An artefact describes or models (some aspects) of the enterprise architecture (Sessions, 2007). One important aspect is the way architects need to deal with so called wicked problems, these problems are central in the design activity (Buchanan, 1992). The enterprise architect needs to 'create something out of that what does not yet exist' (Buchanan, 1992) and has to balance between structure and form (Rijsenbrij, 2008). He needs to create the desired (part of) the enterprise and needs to do this when there are different stakeholders who perceive and conceive this 'desired enterprise' differently. Wicked problems are solved by using creativity. This is the main reason for introducing the term "Creativation".

This emphasizes the role of creativity in designing, modelling and creating artefacts that describe and visualize architecture. 'Creativation' merges 'creativity' with 'creation'.

'Enterprise' changes : a product guided by architectural activity?

There are different notions in literature on whether or not the (realization of the) real life (part of the) 'enterprise' itself should be part of the architectural activity. Zachman (1993) states that 'the physical state of the enterprise itself is not (part of the) 'architecture' because it is not a representation. More recently however one can find several statements that the realized –end product itself could be part of the output of the architectural activity:

- "guiding its design, evolution and development over time" (Kruiswijk, Poels, 2008, IEEE1471)
- "that are used in the design and realization of an enterprise" (Lankhorst et al, 2005)
- "translating business vision and strategy into effective enterprise change by enabling its evolution" (Gartner, 2008)

Key question here; What good are representations of desired situations if you cannot realize them? For example: if an artefact is 'a plan for realizing a specific part of functionality' and the output of that plan is 'the realized part of functionality', then the output is the end-product of the architectural activity which is the real life change within the enterprise.

The best definition in supporting this plea is the most commonly used one: "architecture **'is'** the system embodied in its components"

That is why in the 'Casera' - framework, Enterprise Architecture **is** the actual system of an enterprise embodied in its components....and is realized by executing 'architectural activity'

Core components and layers of enterprise architecture

Enterprise Architecture as seen in the 'three C principle' is the creat(ivat)ion and communication of (and around) artefacts that represent and control (the change of) related primary elements that are part of the enterprise. In this we distinct two manifestations of components that comprise the enterprise architecture:

- 1: The layers, elements and relations: these are the actual 'real world' entities that can be 'represented' which will be discussed in this section.
- 2: Artefacts, these are the entities that represent them and their required change. These form the output of architectural activity which will be discussed in 9.0

In this chapter the layers, elements and relations that form the real life enterprise will be described. How these layers, elements and relations are experienced is dependent on the person perceiving this (the eye of the beholder)

The eye of the beholder: Stakeholders, viewpoints and views

Crucial in enterprise architectural activities is gaining support and commitment for that what is intended to be the desired situation. This desired situation can be different depended on 'the eye of the beholder'. Here the enterprise architect is confronted with 'the wicked problem' where he needs to form an image (not a fact) of how the beholder perceives the enterprise to enable effective communication. So a representation (an artefact) of (a part of) the enterprise needs to appeal to the inner experience of the beholder (Rijsenbrij, 2005) .

Addressing different stakeholders means that there is not just one representation that can cover all and with that there is no single 'reality'Within Enterprise Architecture this is solved by using the concepts of stakeholder, viewpoints and views.

Stakeholder

Every group of viewers looks and experiences the enterprise in a different way because their interests and concerns may differ from other groups. As Lankhorst et al (2005) outs it: "Different viewers have different conceptions of the universe they perceive ." This viewer in enterprise architecture is called the stakeholder. The stakeholder has concerns and interests relative to the outcome of the architectural activity (Lankhorst et al, 2005, TOGAF,2010, ArchiMate). Concerns may pertain to any aspect of the system's (or architectures) functioning, development or operation. (TOGAF).

Designed artefact's that address a stakeholders interests needs to be depicted in a form that is relevant, understandable and recognizable to the stakeholder (Zachman, 2003).

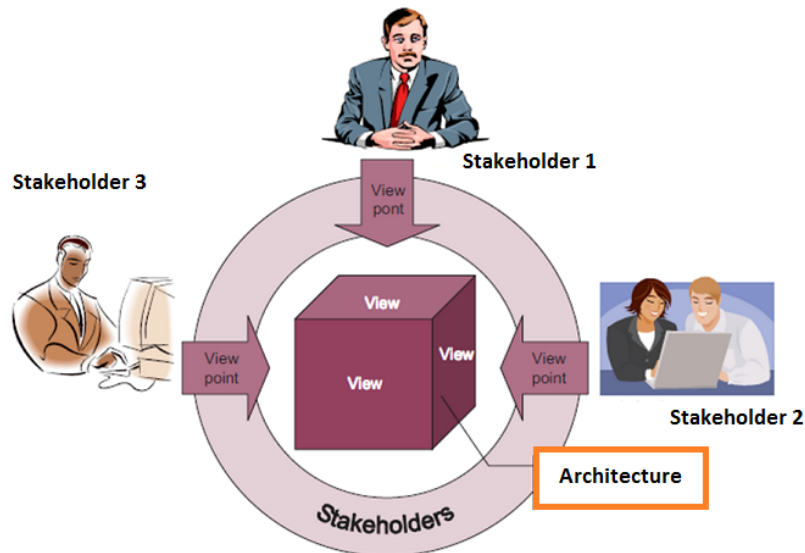
Identifying the key stakeholders and their concerns is crucial in creating and above all communicating architecture. (Rijsenbrij, 2005)

Views and Viewpoints in Enterprise Architecture

The interests and concerns of stakeholders can be addressed by creating 'views' of the enterprise that focus on their concerns and leave out unnecessary information. (Lankhorst et al, 2005). These views are based on viewpoints. Viewpoints define the 'elements and relations' of the enterprise that are represented in the view.

One important remark that must be made here is that a view does not have to be visual or graphical in nature (TOGAF), so this means a view can be both a model as well as a textual description (Lankhorst et al, 2005). Yet models and visualisation techniques seem the best way to create a 'view'

Besides using viewpoints for addressing the stakeholders perspective, viewpoints can also be made for specific purposes (Rijssenbrij, 2005). Simply put: a viewpoint is a format or template for creating views. Below view, viewpoint, stakeholders are visualized (Kruiswijk, Poels, 2010)



Layers and structure of enterprise architecture

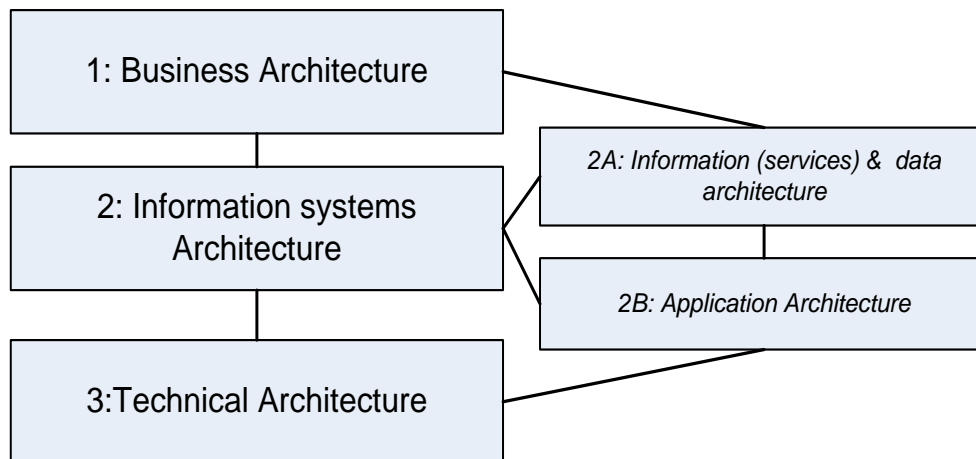
As we have seen in the previous section is that there are many perspectives (stakeholder, viewpoints, views) to look at (parts) of the Enterprise. Next question is, what is it the stakeholder looks at?

As we have mentioned in the beginning of this chapter, the enterprise is composed out of elements, relations and layers.

The layers of enterprise architecture

When looking at the different frameworks and supporting literature, we see two 'viewpoints' of decomposing the layered structure of enterprise architecture; the 4 layered (Kruiswijk, Poels, 2010, Rijssenbrij, 2002, Mac Leod, 2002,) and the 3-layered versions (Lankhorst et al, 2005, TOGAF)

The 4 layered versions describe the business-layer, the information or data- layer, the application-layer and the infrastructure layer. The three layered versions describe the business-layer, the application (or information system)-layer and the infrastructure-layer. In the visualisation below the different layers are mapped to each other:

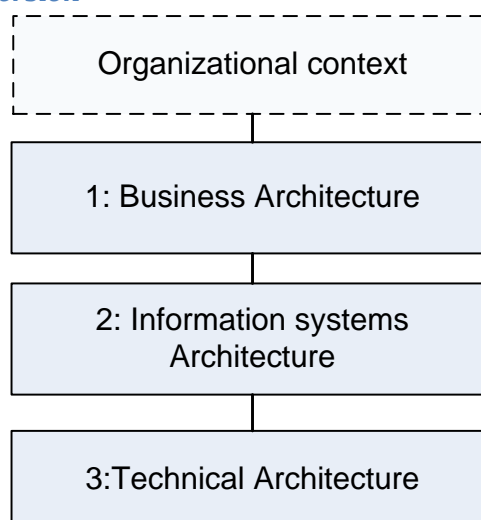


As we can see here the middle layer of the three layered architecture can be divided into an information side and an application side within the four layered model. Within the three layered forms the information resides mostly in the ‘business architecture’ and the applications services, the data and components reside in the ‘information systems architecture’. (Lankhorst et al, 2005). Even though Rijsenbrij has accommodated an information-layer, he still agrees that this is closely intertwined with the business layer independent of the degree of automation.

As we have stated in the beginning of this part of the thesis is that we will use the way ArchiMate has formed the layered structure and this is in a three- layered manner.

However due to the notion that ‘care service organizations’ are very much influenced by the changing market we feel an extra layer is necessary to depict the elements and relations that form ‘the organizational context’. To model this the ‘organizational context’ is depicted in the figure. The dotted line helps reminding us that is a customized layer compared to the ArchiMate model. In the rest of this thesis we will referring to this as the ‘extended three layer variant’. Below the ‘extended three layer version’ is depicted:

The Extended three layer version



The structure that builds the 'extended three layer architecture'

The elements will be based on the ArchiMate language, source of these descriptions come from Lankhorst et al (2005). These elements can be part of a component (e.g. a model, or textual description) that forms the output of architectural activity (2.2.3).

Organizational Context

The best way to describe what happens and exist in the 'organizational context layer is 'the reason for a business to deliver services and products to its environment'. Within ArchiMate these can be modelled through the business motivation extension.

Business Motivation- elements are used to model the motivations, reasons or drivers that underlie the design or change of enterprise architecture.

Business

The aim of the business layer is to provide the actual products and services to its environment. The products and services are realized by executing processes in delivering business products that fulfils a need for the customer.

Information systems/Application

As we have seen in the description of the domains and layers the third layer is the information systems layer. This layer is intended to deliver automated services to the business layer to perform its processes.

Technical infrastructure

The technical architecture focuses on the physical aspects of the hardware, the network and the physical locations where systems are operated.

Process and output of enterprise architecture

In the previous chapter we have focused ourselves on the 'real life elements that exists within enterprises. Through complex forms of collaboration these elements support the delivery of services and products to a market. To remain competitive enterprises nowadays need to continuously change and update these services and products and with that the elements (whether they be business processes, people or applications) that support them.

To guide and realize change within enterprises, artefacts are used to represent these elements and their (cross layered) relations (Sessions, 2007). These artefacts form the output of the architectural process.

In this chapter we will discuss these two subjects of enterprise architecture 'output' and 'process', where extra attention is paid on the most prominent type of artefact, the model and the enabling aspects within it. With this we come to the following chapter division

- Architectural output
- Modelling
- Enablers of enterprise architecture
- The architectural process.

Output of enterprise architecture

With the 'the extended three layer model' (2.2) we have discussed the basic elements that are part of the different layers of the enterprise architecture. These element can be modelled, prescribed, described and designed depending on the stage of the development of the architecture.

Architectural output are the components that guide the control, the evolution and the realization of the 'desired' architecture (Kruiswijk, Poels, 2010).

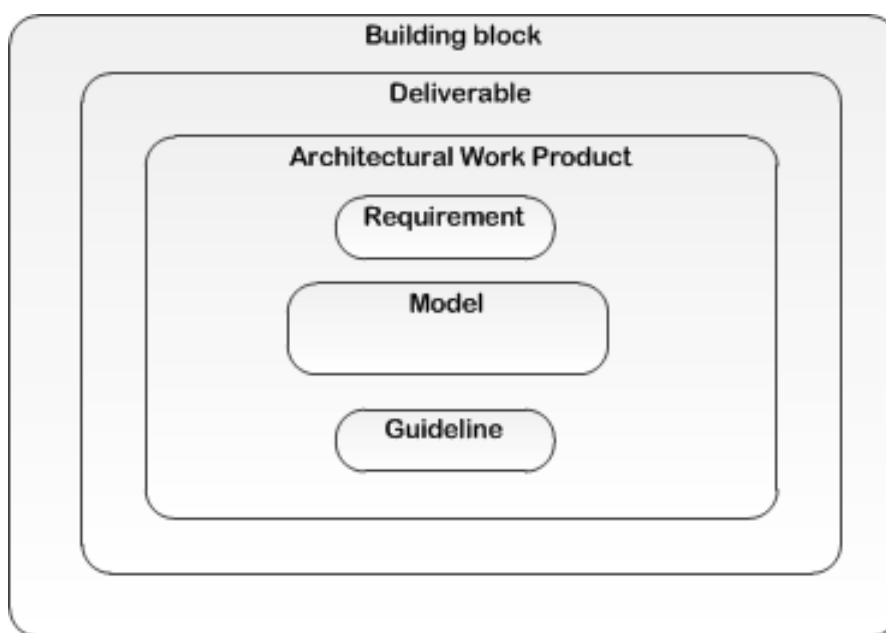
Below we have reasoned the structure of enterprise architecture components based on the TOGAF framework (opengroup)

- The Enterprise Architecture consists of several layers and is described, modelled, realized and changed by using 'architectural output'
- This output is part of the 'architecture' process; the subject, the form and the content may differ depending on the phase in which the architectural output is produced. These outputs can take different visual and textual forms and are called artefacts (Sessions, 2007; Lankhorst et al, 2005)
 - o Model
 - o Principle & Guideline: Architecture guidelines guide the creation of the architecture and its output.
 - o Requirement: A statement of need that must be met by a particular architecture or work package.
- Different (forms and content of) output are likely to address the same subject. All this output together will then be combined to form an 'architectural description'(Sessions, 2007) or 'deliverable' (TOGAF). which also could take different forms). The deliverable needs to be approved by the stakeholder. It is possible to have solely one outcome that is part of the deliverable.
- The content of architectural output always describes or models elements and relations that are part of one or more layer. The chosen viewpoint will prescribe which layers, elements and relations need to be described or modelled.

- A building block of an Architecture is formed by one or more deliverables.
- The Enterprise Architecture representation is formed by one or more building blocks and is one model that can be presented in different formats (Lankhorst et al, 2005)

What we described here is the output of architectural activity, which are representations of 'the real world' enterprise. Of course these representation-forms do not guide the level of abstraction of these representations. In other words, the enterprise in a holistic view can be represented through one artefact that forms the total architecture description which in turn is part of one deliverable which is part of one building block.

In the figure below a visualisation of the different representations:



ArchiMate: Modelling the Enterprise Architecture

The model and its visualization are the most prominent artefacts that are used within enterprise architecture. A model allows an architect to communicate with stakeholders in an unambiguous way. In this paragraph we will introduce the ArchiMate language for modelling the enterprise architecture.

Overview and background of ArchiMate

Until recently there were no languages that had succeeded in becoming the language that enables integrated modelling of architectural domains and layers (Jonkers et al, 2003; Lankhorst et al, 2005). Examples of domain dependent modelling are the business process modelling notation (BPMN) used for modelling the business architecture and the unified modelling language (UML) for modelling the application architecture.

An important risk of using different languages is the problem of the 'confusion of tongues' whereas reality is constructed from a single (layer) perspective without considering effects and/or opportunities from other layers. This leads to misunderstandings that hinder the collaboration and communication of architects and stakeholders (Lankhorst et al, 2005)

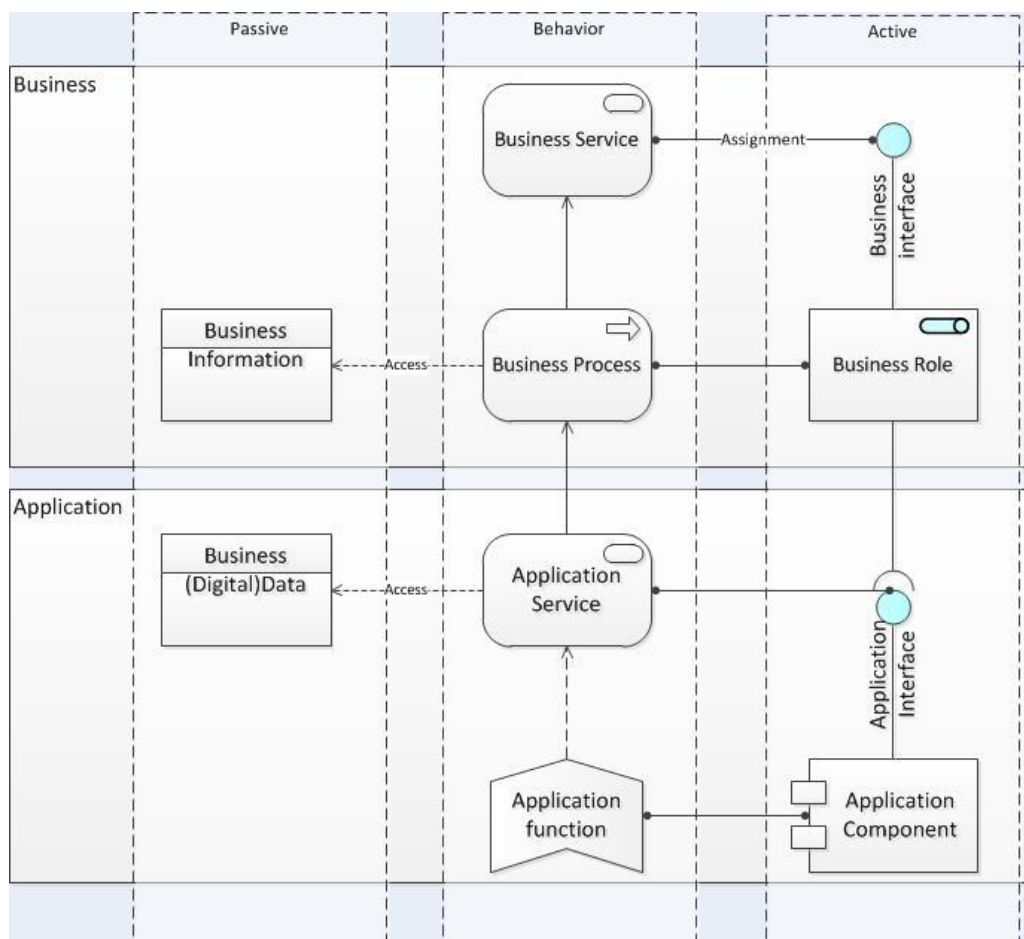
As one of the core purposes of enterprise architecture is to represent a unified whole of related business, information and technology elements and effectively communicate this, the need for a language that models a coherent architectural description, several architectural domains and layers as well as their relations was obvious.

This led to the development of the enterprise architecture modelling language: ArchiMate. ArchiMate is a modelling language that enables the architect to model a coherent description of enterprise architecture which can provide insights, enables communication among stakeholders and guides complicated change processes that expand the boundaries of a single layer (Lankhorst et al, 2005)

As the aforementioned 'confusion of tongues' is also a relevant risk within care service delivery organisation, we will use the ArchiMate language to model the care service delivery architecture description. As said earlier a model can be represented in different way.

Structure and elaboration within ArchiMate-models

When studying ArchiMate the following can be extracted regarding how the most basic elements within the ArchiMate framework work together. Below a visualisation which will be described:



- ArchiMate recognises 3 layers within the Enterprise:
 - o The business layer
 - o The application (or information systems) layer
 - o The technology (or infrastructure) layer

- Within all of these layers three different kinds of elements can be identified:
 - o The active structure is the 'the subject', 'thing' or 'person' that can do something.
 - o The behaviour is the actual doing or the 'verb'
 - o The passive structure is the 'object' The passive structure is the object on which the 'doing' applies
- Business Layer: The active structure (**business role**) can be assigned to perform behavior (a **business process**) on an object (**business information**) and with that realize a **business service** or product. These business services can be provided to other business processes or directly to a customer. The business service is accessed by a (**provided**) **business interface**.
- Application Layer: The active structure (**application component**) can be assigned to perform behavior (an **application function**) on an application object (**business data**) and with that realize an **application service**. The application component can be used via the **application interface**
- Internal services are provided to other elements in the same layer
- External services are provided to other elements in the overlying layer.
- Relation between business and application
 - o (A part of) the **business process** can be executed by using an **application service**. This application service is realized by an application function that is performed by an **application component**
 - o A business role can perform an activity (business process) by using an application service and accessing it via an application interface. The application service is realized by an application function that is performed by an application component.

An example is on its place here: the **business service** could be 'providing information regarding the delivery status' and is accessed by contacting **the business role** delivery support (**business interface**) The **business role** "delivery support" performs activities in the **business process** "deliver information", for example 'contacting the logistics department' to retrieve the information and then analyses this information and then providing (or sending) this information to another business process or to a customer and with doing that realizing the '**business service**'

Of course this is the none automated way, we could make the life of 'delivery support' a bit easier by using an application or information system to retrieve the information

The **business service** could be 'providing information regarding the delivery status' and is accessed by contacting **the business role** delivery support (**business interface**) The **business role** "delivery support" performs activities in the **business process** "deliver information". This is done by accessing **an application component** that retrieves **business data** via an **application interface** that realizes the application service that provides the information in an automated way. The business role then analyses this information and provides this this information to another business process or to a customer and with doing that realizing the '**business service**'

In this paragraph we presented the most basic elements of Enterprise Architecture according to ArchiMate and how they interoperate.

Guidelines for modelling

As a prominent contributor to the ArchiMate project, Lankhorst et al (2005) provides best practise guidelines to use ArchiMate effectively. Below we have highlighted the most prominent

recommendations in modelling. These modelling guidelines will also be chosen or ignored to fit in the CASERA-framework.

Model according to the needs and customs of the organization:

In line with the comments made by Sessions (2007), Lankhorst et al (2005) also advises to model (a part of) the architecture in such a way that it fits the organization. In this and other literature it is recommended to model conform the ArchiMate language, but at the same time provide a readable and understandable presentation or visualization form that highlights the core of the model.

Start from single element and work inwards, upwards, downwards, sideways

- Inwards: the internal composition of the element
- Upwards: towards the elements that are supported by it
- Downwards: towards its realisation by other elements
- Sideways: towards peer elements with which it cooperates

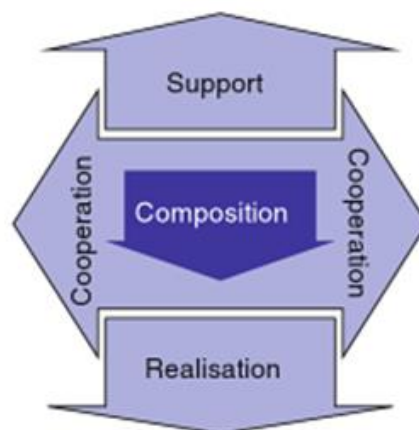


Fig. 6.2 Metaphorical directions for viewpoints

Maxim of quantity:

Make your model as informative as necessary and do not make your model more informative than necessary

Enabling aspects of Enterprise Architecture

What is it within Enterprise Architectures that enables the enterprise move like an organic creature (Rijsenbrij, 2005)? In what way can enterprise architecture help organizations to have a stable set of elements that represent the core of the enterprise whilst making it possible to have agility through the combinations of these elements (Lankhorst et al, 2005)? And above all realize a common understanding of these aspects through communication?

For our CASERA framework we need to find out which are the 'enablers' of Enterprise Architecture that can help care organization remain stable but at the same time be responsive in meeting the demands of the dynamic healthcare environment.

In this paragraph we will look at two major movements within both the business as well as the application architecture that are likely to help us find these enablers:

- Within the business architecture it is the current trend of 'continuous improvement of business processes' through achieving better 'performance', more 'customer' focus 'eliminating waste'.
- Within the application architecture of course it is the current trend of thinking in services instead of 'systems', services that have the same meaning for both IT-pro's as well as business folks.

Enterprise Architecture and business process improvement

Enterprise Architecture makes visible where potential (automated) optimizations are in business processes and the extent to which these processes add value to the core objectives of the organization. EA does this on different levels of abstraction, in diverse layers and from different perspectives (stakeholders), which ultimately leads to bigger optimizations.

Enterprise Architecture and Service Orientation

ArchiMate modeling is based on the principle of services and the concepts that realize these services; the enabler is the fact that you start with the "service" element since it is hereby possible to determine within the same language to imagine what the core functionality (or added value) is of a service and which activities are necessary in order to realize the service. With this insights unnecessary and / or "high-risk" activities can be isolated and if necessary be removed from the process.

In ArchiMate, the service concept plays a central role. The service concept is a unit of functionality that some entity (system or department) makes available to its environment and has value for certain entities in the environment. In Enterprise Architecture the service is one of the two enablers that can guide the agile enterprise.

Services are made available by the lower layer to the higher layer which leads to the layered view of the enterprise. Within a layer there can also be internal service, a service that is needed to realize a service that is used by the higher level layer.

- Services of a different nature and granularity exists
- Services lead to layered view of EA models

Enterprise Architecture process and activities

Wherever there is output there is a process! With the increased attention and understanding of the capabilities and added value of Enterprise Architecture comes the need for a uniform process framework that helps structure the architectural activity. At this point the most prominent framework for showing the process and the 'phases of the architecture development' is the TOGAF Architecture Development Method (ADM)(Kruiswijk, Poels ,2010). ADM provides a process for developing architectures. It provides different phases for 'delivering architectural output'.

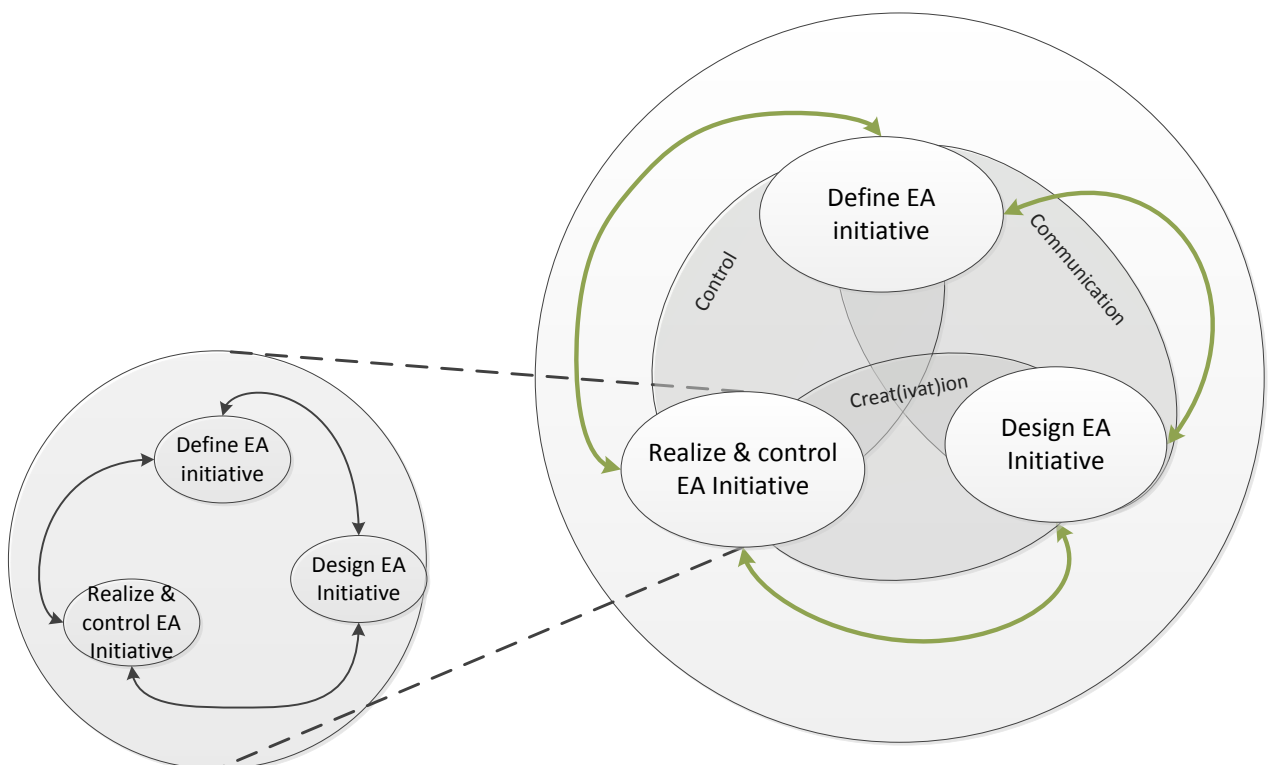
Analysing and abstracting these phases gives us a process that is applicable on different levels of abstraction depending on the state of the total enterprise architecture and its components. With every step in moving to a desired state enterprise we see 3 main activities; Define, Design and Realize (and control)

Below the main activities of the architectural process as we have extracted them from the ADM-model are mapped to these main activities.

TOGAF Phase	Define	Design	Realize and control
Preliminary	X		
Architecture Vision	X		
Business Architecture	X	X	X
Information Architecture	X	X	X
Technology Architecture	X	X	X
Opportunities & Solutions			X
Implementation Governance			X
Architecture Change Management			X
Requirements Management	X	X	

- **Define the EA Initiative:** Defining the scope of the architecture initiative.
 - Define the business goals and business and environmental drivers that fuels the initiative. (Gartner, 2008)
 - Identify and record the key stakeholders and their concerns
 - Identify and record the key principles, guidelines and requirements.
 - Design a viewpoint
 - Obtain approval
- **Design the EA Initiative:** View realization and verification
 - Creating the current, transitional and/or desired view of the (part of the) enterprise.
 - Present the current, transitional and/or desired view of the (part of the) enterprise.
 - Verify the current, transitional and/or desired view of the (part of the) enterprise.
 - Refine the current, transitional and/or desired view of the (part of the) enterprise.
- **Realize & control EA Initiative:** Facilitate the control and the realization of the desired situation (based on the view) in the 'real world' enterprise
 - Plan the realization and evolution of the desired view.
 - Execute the plan
 - Refine the plan
 - Justify the realization
 - Evaluate the realization
 - Manage, monitor & control (changes to) the 'realized' initiative²

CASERA- Process



When no EA-initiatives have been started, the enterprise could start with the mother of all initiatives, which would be the holistic view, during the realisation of this initiative other initiatives could be defined. So the realisation of an initiative could be the trigger to start a lower level initiative. However the characteristics of the activity remain the same, the 'subject' and the output is different.

A framework for care service delivery modelling

The last step in designing the CASERA-framework that could form as a basis for the CASERA-reference architecture is defining the viewpoints in such a way that the most important elements within the Care service delivery architecture are modelled. Based on this model different visualizations can be used to communicate this with the different stakeholders of the care-service delivery enterprise.

What we have seen throughout the literature explorations is that viewpoints form a representation of the enterprise architecture that fits some stakeholders perception. As stated we cannot create an 'enterprise architecture'-description with a single model. So in designing the framework, we are actually designing viewpoints that fit the key stakeholders of a 'care service delivery organization'.

In this chapter we summarize the different explorations and extent them with the aforementioned viewpoints to complete the framework. The framework will then be used to model the 'Care service delivery architecture' and its changes.

The CASERA- framework: overview and visualisation

So far we have worked our way through finding the core of architectural activities and components or as Gartner calls them the 'nouns' and 'verbs' of enterprise architecture. Consisting of:

1: The Three C principle: The creativation of artefacts that represent the enterprise as a coherent whole of related primary elements, the communication of these artefacts and using these artefacts in controlling the evolution and change of the enterprise in reaching its desired state.

2: Extended 3- layer architecture: The enterprise consisting of different stacked layers where the upper layer is supported by the layer below comprising of:

- An organisational context layer which is the layer that extends....
- A business layer
- An application or information systems layer
- An infrastructure layer.

3: Architectural (enabling) output: The output of architectural activity where we have outlined the model as the most important artefact as a product of architectural activity and within that model the 'service' as enabling component as:

- A basis for aligning the deployment of IT with the core purpose and objectives of the organisations
- A basis for realizing business and process optimizations.

4: Architectural process: The process consisting of defining, designing and controlling enterprise architecture activities on different abstraction levels.

Below we have visualized the outcome of our literature exploration:

CASERA Framework

Enterprise Architecture Nouns and verbs

