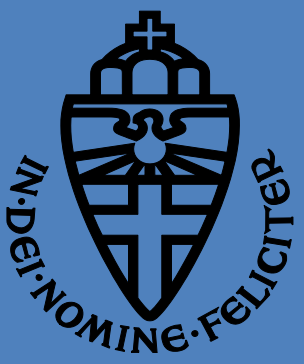

Digital Architecture in the context of outsourcing

University	Radboud University
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Study	Information Sciences
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Version	1.0
Status	Final
Date	5 Jul 2007
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Place, date:	Nijmegen, 5 Jul 2007	
Version, status:	1.0, Final	

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Preface

This thesis describes the results of my research on Digital Architecture in the context of outsourcing. The research, which I conducted as conclusion to my study of Information Sciences at the Radboud University in Nijmegen, was performed in close collaboration with the Dutch Outsourcing Platform.

During my research and the writing of this thesis I have spoken with a large number of experts on the subjects of Digital Architecture and/or outsourcing. I would like to thank the following persons for their time and the enthusiasm that they have shown during my research:

- *Gerrit van Asch*, HP
- *Willem van Asperen*, PA Consulting
- *Martin van den Berg*, Sogeti
- *Jacob de Boer*, UWV
- *Ruud Brink*, PA Consulting
- *Dhiraj Deschmukh*, Tata Consultancy Services
- *Guus Delen*, Verdonck, Klooster & Associates
- *Sjors Dignum*, Microsoft B.V.
- *Peter-Paul van Dijk*, AkzoNobel
- *André de Graaf*, Capgemini
- *Denis Hageman*, ABN AMRO
- *Cor Halling*, HP
- *Henrik Jacobsson*, Shell
- *Alfred de Jong*, Microsoft B.V.
- *Jeroen van der Meer*, IBM
- *Sietse Overbeek*, Radboud University
- *Jaap Schekkerman*, Verdonck, Klooster & Associates
- *Peter Verkoulen*, Atos Origin
- *Herbert van de Wetering*, ING
- *Frank Willems*, Twijnstra Gudde

In special I would like to thank my supervisor, Daan Rijsenbrij, for his guidance and support during the different phases of my research. His expertise on the subjects of Digital Architecture and outsourcing as well as the introduction that he provided to many, useful contacts proved to be indispensible for my research.

Furthermore I would like to thank my father, Ilse, Jan-Willem, Jelena, Jeroen and Josien for the many times that they reviewed my thesis and provided me with valuable remarks and advices. Finally I would like to thank the many people that are close to me: my parents, friends, housemates and fellow fraternity members. It was their support, trust and friendship which made my study time in Nijmegen such a fantastic experience.

Mark van Liefland
Nijmegen, June 2007

Contents

Management abstract

Now more and more organizations decide to outsource one or more of their services the question rises how the architecture function should be organized in order to optimally manage the provision of services during the different phases of the outsourcing process. This research, which is performed in close collaboration with the Dutch Outsourcing Platform, focuses on two important questions regarding the organization of the architecture function in the context of outsourcing: how is the architect population to be shaped if an organization decides to outsource one or more services, and about which subjects do these architects communicate with each other?

In order to provide an answer to these questions interviews have been conducted with eleven representatives of outsourcers, service providers and consultancy firms. All interviewed persons have supported one or more outsourcing deals and dispose of much knowledge and experience of the subjects of outsourcing as well as digital architecture. By means of the Sourcing Life Cycle, formulated by the taxonomy study group of the Dutch Outsourcing Platform, these persons gave their opinion about the positioning of the different architect types and the activities that they fulfill during the phases of the sourcing process, namely the decision-making, selection, transfer, transformation, provision of services and termination phase. During the research a distinction has been made between three types of outsourcing, namely an 'as is' transfer, the integration of the processes and tooling to the standards of the service provider and transformational outsourcing.

The results of this research are used to formulate a model which is validated by a second group of organizations, once again consisting of outsourcers, service providers and consultancy firms. The results show that the positioning of the different architect types is strongly dependent on the phases of the Sourcing Life Cycle and the type of the outsourcing deal. Furthermore this research provides an overview of the activities that the architects should fulfill during the different phases of the sourcing process.

The results show that architecture is an indispensable tool for the successful management of an outsourcing deal and the enforcement of the quality of the provision of services. In practice however architects cannot always dispose of a clear mandate and important decisions are sometimes made without the architects being consulted or even informed. Also, for a successful outsourcing the service provider(s) should be willing to embed the provision of services on a high level within their own organization. For this reason the use of a mature architecture and the focus on innovation should be rewarding for the outsourcer as well as the service provider(s).

The results that are described in this thesis are highly interesting because of the newsworthiness of the subjects of outsourcing and digital architecture, the representation of a large number of outsourcers, service providers as well as consultancy firms and the implementation of an external validation. Because of these aspects the results of this research are important for organizations that are currently in the process of a sourcing deal as well as organizations that are still situated in the decision-making phase of the sourcing process.

1. Introduction

1.1 Cause for my research

More and more organizations decide to outsource one or more of their services. Architecture is an indispensable tool for the successful management of an outsourcing deal and the enforcement of the quality of the provision of services. Daan Rijsenbrij and Guus Delen already described this in 2004 in their article: 'Enterprise architecture is a necessary condition for reliable outsourcing'. [RIJ04c] In order to maximize the direct and indirect advantages of an outsourcing deal both parties have to make optimal use of the advantages and possibilities that the service provider can provide. On the other hand the outsourcer shall often be afraid to lose too much control of the provision of services during an outsourcing deal. Architecture can provide the outsourcer as well as the service provider with an indispensible tool to manage these concerns, but in order to obtain successful results the positioning of the architects and the activities that they perform should be clearly described and agreed upon.

1.2 Definition of the problem

The main question of my research is:

- *How is the architect population to be shaped if an organization decides to outsource one or more services?*

In order to answer this question, another question is added:

- *About which subjects do these architects communicate with each other?*

In order to provide an answer on the main questions they have been subdivided into five sub questions:

Sub question 1
Which architect types exist and which activities do they perform?

Sub question 2
Where should the architect types be positioned during the different phases of an outsourcing deal?

Sub question 3
About which subjects do the architect types report during the different phases of an outsourcing deal?

Sub question 4
Is the positioning of the architect types and the subjects that they discuss during the different phases of an outsourcing deal dependent on the type of the outsourcing?

Sub question 5
Does the situation change if the outsourcer simultaneously uses the services of multiple service providers?

1.3 Research environment

The main part of my research has taken place at the Dutch Outsourcing Platform (Platform Outsourcing Nederland). The members of the PON[1] consist of outsourcers, service providers, consultancy firms, law firms and universities. The main target of the PON is the professionalization of outsourcing in the Netherlands. In order to elaborate this target the PON focuses on knowledge sharing, the transparency of the sourcing market and improvement of the collaboration between outsourcers and service providers. During my research I have spoken with several members of the PON in order to collect information and validate the results of my research. During my research I have held contact with a feedback group of the PON, consisting of André de Graaf and Guus Delen.

1.4 Method of research

1.4.1 Literature study

I have started my research with a literature study on digital architecture and outsourcing. I have read relevant books, publications and articles in order to gain a more in-depth knowledge of these subjects. The literature study provides the foundation for my research and is the basis for the introductory chapters and the interviews which took place later on during my research.

1.4.2 Interviews

Subsequently I have interviewed a relevant selection of outsourcers, service providers and consultancy firms in order to examine their opinion about the definition of the problem and the different sub questions of my research. I have used oral interviews with open questions because this method provides the opportunity to reach consensus with the interviewee about the terms used. Next to that open questions provide the interviewees with much space for their own explanation and clarification. After each interview I have sent a summary of the interview to the interviewee. This gave the interviewee the possibility to provide changes or comments on the summary.

I have used the results of the literature study, the interviews and my personal vision to formulate a model that provides an answer to the second, third and fourth sub question of my research.

1.4.3 Validation

The model is tested by validation interviews performed by two consultancy firms, two outsourcers and two service providers. The results of this validation are described in chapter 5.

1.5 Structure of the thesis

In chapter 1 the research is introduced and the main and sub questions of the research are presented.

The results of the literature study are presented in chapter 2 and 3 where the subjects of digital architecture and outsourcing are introduced and explained. These chapters formed the basis for the interviews that took place later on during my research.

[1] Dutch Outsourcing Platform (www.platformoutsourcing.nl). This organization is comparable to the NOA, the National Outsourcing Association, in the UK (www.noa.co.uk).

In chapter 4 I describe the model that is formulated according to the results of the literature study, the interviews and my personal vision. Subsequently I describe the role of consultancy firms during the phases of the sourcing process and the implications of deals with multiple service providers.

The results of the validation interviews are described in chapter 5. In chapter 6 a résumé of the answers on the research questions is given, along with general recommendations for the use of digital architecture during the sourcing process. The chapter is concluded with suggestions for further research.

In appendix A my personal reflection on the research process and the formulation of the thesis is given. In appendix B I describe the opinions of specialists in the subject of digital architecture about the different architect types. The summaries of the interviews conducted for my research are given in appendix C.

2. What is digital architecture?

2.1 Definition

When people hear the term architecture they often think about cities, buildings, landscapes and the interior. For the meaning of the term architecture it is necessary to go back to the origin of the term architect. The term architect is derived from the Greek word 'architekton', which consists of 'archi' (first, main) and 'tekton' (carpenter, craftsmen, shipwright, artist). The Greek 'architekton' originates from the Sanskrit and is made up out of a combination of 'arh' (dignified, meritorious) and 'takshati' (he who forms, constructs). The original meaning of Architect is therefore: he who forms with dignity.

Through the ages the meaning of the word architect is often directed at the field of study that received the most social interest. In an age that is described by many[2] as the digital age the need for digital architects should come as no surprise.

The definition of digital architecture which I will use throughout my research, originates from Rijsenbrij. He defines digital architecture as:

'a coherent, consistent collection of principles, particularized into rules, guidelines, and standards which describe how an enterprise, the information supply, the applications, and the infrastructure are shaped and behave in their usage.' [RIJ04a]

Rijsenbrij explains these principles as: principles are guiding statements for the purpose of essential decisions. They consist of a fundamental idea meant to fulfill a general requirement. Architecture principles find their origin in the mission statement, the vision and the chosen competition strategy of the organization as well as from the environment. Moreover they must fit the intended culture of the organization. Good principles are holistic of character and therefore noticeable in every part of the company. Principles need to be made concrete to things obligatory, rules and standards, and things that are sensible, guidelines, also called 'best practices'. Rules apply within the organization. Standards are necessary for the communication with the outside world and for the possible use of bought components. With respect to rules directives have more interpretation freedom. [RIJ04d]

2.2 Architecture worlds

Many architecture schools subdivide the field of digital architecture in several worlds.[3] Rijsenbrij divides this field in four different worlds. These worlds can be seen as four consecutive layers. As shown on the following figure the starting point of the architecture considerations lies in the business. The architecture considerations of the following layers are drawn up subsequently. The facilities of the underlying layers enable the functioning of the top layers. [RIJ04a]

[2] For example the Dutch Government and the United Nations.
[3] In the DYA model Sogeti describes the 'business architecture', the 'information architecture' and the 'technical architecture'.

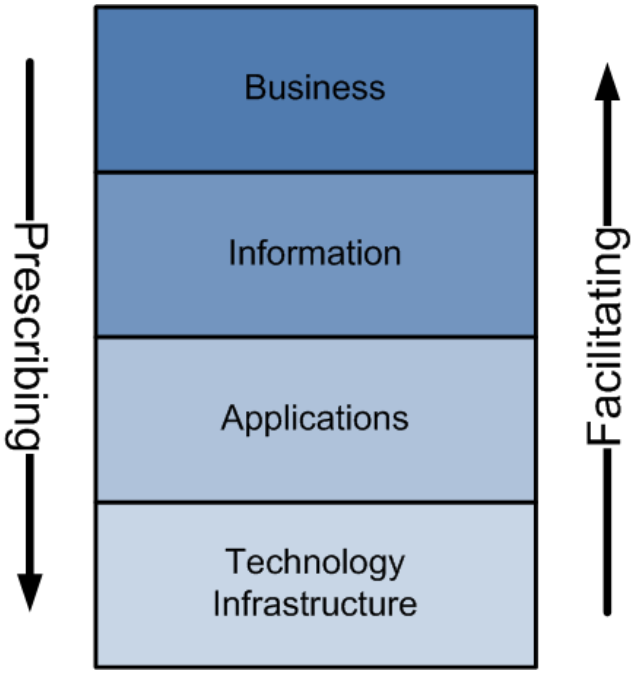


Figure 1: The four architecture worlds [RIJ04a]

Business (B-world)
This is the layer in which the 'real' world takes place: the world of doing business, regulating, etc. In this layer people speak about the products and services that the organization provides, the business processes that are necessary to create these products and services and the organization and the control of people and resources needed to facilitate these processes. The business is prescribing for the I, A and T-world.

Information (I-world)
This layer consists of the Information streams, the document streams, the information needs, the information sources and the information exchange with the outside world. The areas of knowledge management and content-management also belong to this architecture layer.

Applications (A-world)
In the layer of the applications the architect concentrates on the application portfolio, integration mechanisms and the characteristics of the application architecture. Computerized data collections also belong to this layer. This architecture layer provides the connection between the business and the technical infrastructure.

Technical Infrastructure (T-world)
The technical infrastructure forms the foundation on which the applications of the organization run. This foundation consists of networks, communication connections, hardware, system software and common software facilities such as packages for word processing and e-mail. The technical infrastructure is facilitating for the A, I and B world.

2.3 Governance and security

For a healthy organization all four of the above architecture worlds deserve the full attention. An important challenge of the architect is thus to ensure that the organization uses all of the

facilitating services of the underlying architecture worlds. In addition to this Rijsenbrij calls for two important extra views at the four architecture worlds, namely governance and security.

The security[4] architecture describes the methods used to design the security and considers the whole spectrum of security regulations: from user to service and vice versa. Every world has its own security principles. Principles of the security architecture can sometimes be conflicting with other principles of an architecture world. For example, sometimes a balance has to be found between the user-friendliness of an application and the security of this application. Also, the security principles of the different worlds need to be adjusted to each other in order to form a whole.

Governance defines the extensive organization that is necessary in order to manage and control the four worlds in accordance with each other.

2.4 Levels of view

There are different levels of view on which architecture can be applied. Recognizable levels of view of physical architecture are for example the city plan, the district plan, the building design and the interior design.

Figure 2: Four levels of view on physical architecture

According to Rijsenbrij this division is fully usable for describing the architecture of the digital world[5]. In order to reduce the complexity of the architecture, Rijsenbrij distinguishes four levels of view: the organization level, the domain level, the Information systems level and the level of the digital workspace. [RIJ04a]

The organization level

At the organization level a design of the whole organization is made at a high abstraction level. The goal of this design is to create the first division of the organization in different domains, consisting of business processes, applications and the underlying technical infrastructure. It is convenient to

[4] Privacy included

[5] Rijsenbrij does note a few remarks. Digital architecture is never completely finished. Furthermore a digital architecture should not be the ultimate goal of an organization. Instead it should be used as a strategic tool.

look at the organization as an internal ecosystem, in which the different domains deliver services and products to each other as well as to the (external) customers.

The domain level
At the domain level it should only take a single glance to see which principles apply, which business processes are running, how the business is developing, how the technology is integrated and how the customers are connected to the domain. A domain can be seen as the collection of services which the domain delivers to the environment.

The Information systems level
At this level the architecture of the individual Information systems is formulated. The architecture at this level contains all the principles, rules and guidelines that are needed to decide about the realization of those information systems.

The level of the digital workspace
The digital workspace can provide a user access to a very large mixture of different domains. Also, the workspace can be completely tailored to the role type of the user. This level can be compared to the 'interior design' of the physical world; the work of an interior architect. At the level of the digital workspace the right balance has to be found between the interest of the company and the individual interest of the users.

2.5 Architect types

Most of the architecture schools and organizations that use a digital architecture distinguish between different types of architects which carry out their tasks at different levels of the organization. At the moment however there is no generally acknowledged standard that describes the different types of architects. Wieringa states in his article that many of the discussions about architect types elapse with great difficulty and many emotions. There seems to be no party that is willing to adjust its convention. According to Wieringa this is mainly due to a commercial interest: the party that is able to promote his terminology to a standard has a commercial advantage compared to a party that has to adapt his terminology to the new founded standard. [WIE05]

A discussion that stands in close relation to the discussion mentioned above deals with the definitions of the term architect and the term engineer. In the literature and in employment advertisements the word architect is used to describe a very diverse variety of roles. Mentioned for example are security architects, firewall architects, network architects, Java architects and SQL architects. According to Rijsenbrij these roles do not describe architects but instead describe engineers. The main difference between architects and engineers is the approach that they take. Architects use a top-down approach while engineers use a bottom-up approach. In other words: engineers provide a partial solution for a bigger problem starting from their product or solution knowledge. Architects on the other hand rely on their insight and their view of the big picture. [RIJ04d]

This 'top down' approach is also expressed in the definition of an architect given by Wieringa: 'An information and communication architect analyses the needs of an organization and uses those needs to design fitting information and communication solutions.' [WIE05]

For my research I use a classification of architect types based on the thoughts and publications of three persons, namely Daan Rijsenbrij, Martin van den Berg and Roel Wieringa. A summary of their ideas about architect types is given in appendix B.

Like Rijsenbrij I make a distinction between four architect types which are classified into two groups: the scoping architects and the solution architects. Next to these architects I explicitly name the roles of the infrastructure engineer and the security engineer because their activities are of great importance for the continuity of an organization in an outsourcing context.

Scoping architects

- Enterprise architect
- Domain architect

Solution architects

- Application architect
- Workspace architect

Engineers

- Infrastructure engineer
- Security engineer

Enterprise architect
Conducted by the mission, vision and the strategy of the organization the enterprise architect focuses on the Information systems world (I-world). The goal of the enterprise architect is to organize the information streams in such a way that the organization can optimally function. For this purpose the enterprise architect maps the products, services and processes of the organization and investigates which information should be available when and where. Using architecture principles the enterprise architect ensures that the information streams of an organization run in an efficient and effective manner.

The enterprise architect deals with the organization in its whole, the relation of the organization and its environment and the division of the organization in different fairly autonomous domains. A domain can be considered as a collection of services that the domain provides to its environment. The enterprise architect maps and describes the interfaces between the different domains as clear as possible.

Domain architect
The domain architect formulates the architecture of a specific domain. The domain architect will focus primarily on the business world (B-world). The architect is able to (re)design the domain in order to transmute the domain to the architecture of the organization. It is of major importance that the domain architect understands the business of the domain and that the architect has a lot of experience and knowledge of the different products, services and processes that are important for the domain. Ideally a domain architect is a domain specialist with a talent for architecture.

Application architect
The application architect deals with the architecture of the applications of the organization (the A-

world). The architecture defines the architecture principles for the applications at the organization level, the domain level and the level of the individual applications. In the case of individual applications the architecture will consist of a subset of the principles of the scoping levels. Architecture principles of the scoping levels can be adjusted by new insights in the field of software engineering, new technological possibilities, changing user requirements and experiences of earlier projects.

Workspace architect
The workspace architect deals with the architecture of the digital workspace. In order to formulate this architecture the workspace architect has to pay attention to the perception and the experience of the users. He needs to find the right balance between the interest of the organization and the interests of the individual users.

Infrastructure engineer
The infrastructure engineer deals with the technical infrastructure of the organization (the T-world). Moreover the engineer pays attention to the technical relation of the organization with its environment (for instance interoperability) and the specific technical requirements of the different domains. The technical infrastructure has to comply with the architecture principles of the organization and the individual domains and has to facilitate their needs.

Security engineer
The security engineer deals with the security of the organization at the organization level, the domain level and the level of the individual applications. The architects of the organization should in my opinion be responsible for the formulation of the security principles. The engineer however is responsible for the implementation and safeguarding of these principles at the different levels of the organization. The security engineer should have thorough knowledge and experience of the field of security. Architects work together with the security engineers when they formulate or adjust security principles.

3. What is outsourcing?

3.1 Definition

Nowadays almost all magazines concerning information technology deal with the subject of outsourcing. In addition almost all IT-related companies and consultancy firms have a division that specifically focuses on the questions and deals concerning outsourcing.

Associations like the Dutch Outsourcing Platform (Platform Outsourcing Nederland) and the National Outsourcing Association in the United Kingdom aim themselves at the further professionalization of outsourcing. The main targets of the PON are to amass knowledge, to create a more transparent market and to strive for more collaboration between outsourcers and service providers.

The taxonomy study group of the Dutch Outsourcing Platform defines outsourcing as:

Outsourcing is the transfer of the provision of services, and if applicable, the accompanying employees and resources, to a specialized service provider followed by the reception of services during the length of the contract against an agreed quality level and financial compensation structure. [TAX06]

3.2 Sourcing domains

In 1937 Nobel prize winner Coase recognized the make-or-buy decision and mentioned it in his Transaction Cost Theory. The make-or-buy decision compares the costs of providing a service or manufacturing a product with the costs of buying the service or product from an external party. In 1989 the term IT-outsourcing arose as a result of the outsourcing of the IT-departments of Kodak to IBM and DEC. [DEL05] At this moment the outsourcing of information systems is often summarized as Information Technology Outsourcing. The outsourcing of other services is described as Facility Management Outsourcing or, if the services include a large administrative component, as Business Process Outsourcing.

Some examples of Facility Management services that are commonly outsourced are:

- *Cleaning*
- *Catering*
- *Security*

Some examples of Business Process services that are commonly outsourced are:

- *HRM Services*
- *Financial Administration*
- *Procurement*

The distinction between ITO and BPO is slowly fading. Delen and Rijsenbrij state that the IT-component becomes more and more important for successful BPO-deals, while the support of business processes becomes more and more important for successful ITO-deals. Delen illustrates this with an example of DHL and UPS, two large organizations that are specialized in logistic

services. While these organizations formerly only delivered packages for their clients, they now provide their clients with complete order processing systems.

In the following figure Rijsenbrij and Delen apply this increasingly fading difference to the four architecture worlds. The left figure shows the classic distinction between BPO- and ITO-deals. The right figure shows the increasing blending.

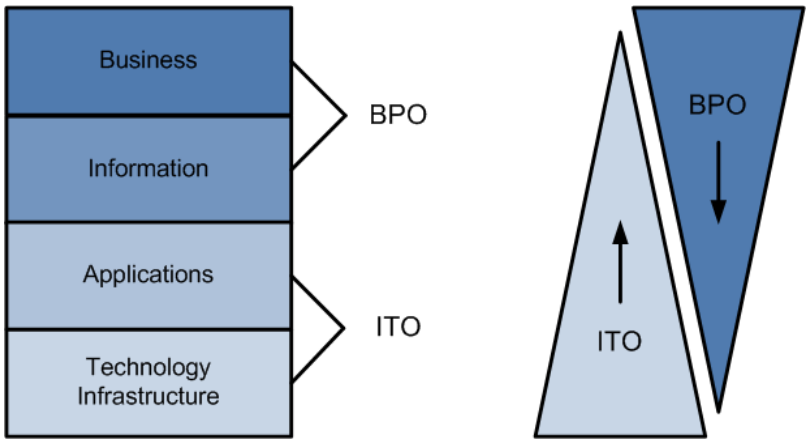


Figure 3: The blending of ITO and BPO [RIJ04c]

3.3 Phases of the sourcing process

Because the sourcing process encompasses many different activities and responsibilities it has to be planned with care. In order to make it more controllable the sourcing process is often divided in different phases. These phases can be planned to the level of a few weeks. The use of phases makes it possible to divide and describe the different roles and responsibilities that are important for a successful sourcing deal. Many consultancy firms and service providers use their own phasing model to describe the sourcing process. The taxonomy study Group of the PON has used these models to create an integrated model: the sourcing life cycle. [TAX06]

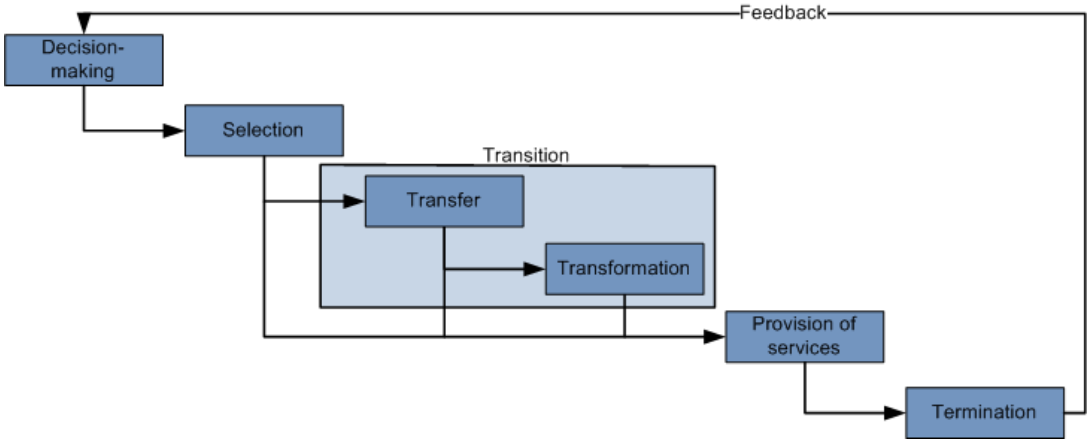


Figure 4: Sourcing Life Cycle, PON [TAX06]

Decision-making
Before an organization decides to outsource one or more services it has to formulate a sourcing strategy. By means of this strategy the organization should examine which services can be outsourced and consider the advantages and disadvantages of this decision. There are many different types of relationships between an outsourcer and one or more service providers. An organization can decide to outsource the entire IT-department (full outsourcing) or it can decide to outsource a selected subset of services that the IT-department provides (selective sourcing). An organization can outsource to a single service provider (single sourcing) or use more than one service provider (multiple sourcing). Furthermore an organization has to decide if the services will be provided by one or more service providers that are located in the same region as the outsourcer (nearshoring), a different region (offshoring) or even in multiple regions (global sourcing).

Selection
When an organization has formulated its sourcing strategy and decides that outsourcing is preferable it should select one or more service providers. The selection of service providers is often divided in three successive iterations; the Request for Information (RFI), the Request for Proposal (RFP) and the Request for a Best and Final Offer (BAFO). In the RFI phase the organization approaches potential service providers to inquire into their willingness, their ability and their proven experience to take on the service in question. By means of this information a first selection of potential suppliers is made. It is common to select up to five providers after the RFI phase. In the RFP phase these providers are asked to hand in a proposal and an offer for the provisioning of the services. After this phase it is common that the two best service providers are asked to make a definitive, final offer. This offer is used to make the final choice for a service provider. Before the contract is signed both parties will perform a Due Diligence examination. This examination is used by the service provider to verify the quality and the value of the portfolio of services, assets and employees of the outsourcer. The outsourcer uses the Due Diligence to verify the quality and durability of the service provider. Reference visits are often used by both parties during the Due Diligence.

Transition
During this phase the desired provision of services will be implemented. The transition phase starts with the signing of an agreement of intention, the precursor of the final contract. The transition phase is divided in two sub phases; the transfer phase and the transformation phase.

During the transfer phase the actual provision of services, including the accompanying employees and resources, is transferred to the service provider. During the transformation phase the provision of services is adjusted to the standards of the service provider in order to benefit from the specific knowledge and scale of the provider. The taxonomy workgroup of the PON distinguishes three types of transformation:

- *An 'as is' transition: The service provider continues the processes and tooling of the outsourcer: no transformation takes place.*
- *Integration of the processes and tooling to the standards of the service provider: transformation at the service provider's side.*

- *Transformational outsourcing: transformation of the processes and tooling in order to significantly improve the quality of the provision of services: transformation at both sides of the sourcing deal.*

Provision of services

The provision of services can continue for several years, depending on the contract. During this phase the service provider provides one or more services for the outsourcer. The outsourcer will regularly assess the provision of services in order to determine whether the quality of the services meets the agreements of the contract. This assessment is supported by the implementation of a consultation structure and regular reportages of the service provider. In some cases the contract can be altered during the provision of services. Matters that can lead to the altering of the contract are for example important technological changes or changes in the wishes and possibilities of the outsourcer or the service provider.

Termination

When the contract ends the outsourcing organization has to make an important choice. The outsourcer can decide to renew the contract with the current service provider (resourcing), to transfer the contract to a different service provider (follow-up sourcing) or to bring the provision of services back within the own organization (backsourcing). The outsourcer has to evaluate the past outsourcing period and the contract before making this decision. [TAX06] Follow-upsourcing as well as backsourcing requires a retransition.

4. Activities and positions of architects in an outsourcing context

4.1 Introduction

For the formulation of the model I have interviewed persons who fulfill an active role within their organization at the field of sourcing. In many cases these persons represent their organization in the Dutch Outsourcing Platform. All interviewed persons have a thorough knowledge of the topic of sourcing and were actively involved in one or multiple sourcing deals. Many of the interviewed persons also have substantial knowledge of the field of Digital Architecture.

For acquiring information I used oral interviews with open questions. After a short introduction in which the purpose of the interview was explained and the definitions of architects and engineers involved (see chapter two) were explained I have assessed the views and experiences of the interviewed persons by means of the Sourcing Life Cycle of the PON and the following figure:

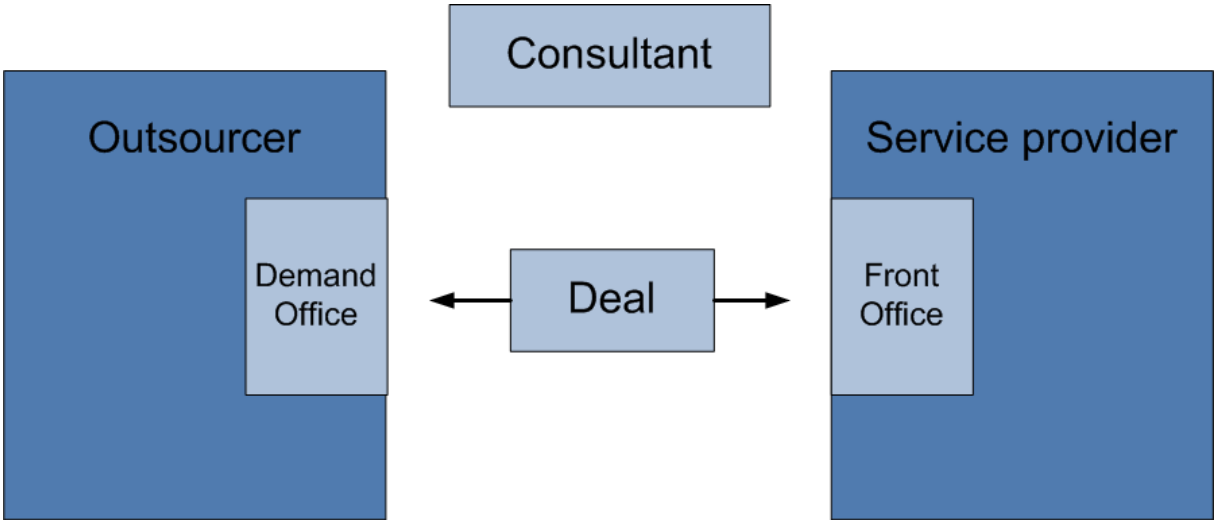


Figure 5: Sketch of the sourcing environment.

Outsourcer: An organization that outsources (a part of) her provision of services, and if applicable, the accompanying employees and resources, to a service provider.

Demand office: A department of the outsourcer that is responsible for the communication with the service provider and with the business units of the outsourcer. It acts so to say as the bridge between the external provider and the internal organization.

Service provider: An organization that delivers services to one or multiple outsourcers during the length of a contract against an agreed quality level and financial compensation structure.

Front office: A department of the service provider that is responsible for the communication with the outsourcer.

Deal: A partnership between an outsourcer and one or multiple service providers during the length of a contract against an agreed quality level and financial compensation structure.

Consultant: An external organization that is hired by the outsourcer or service provider that has knowledge and experience of the field of sourcing (hopefully also about digital architecture) and advises the outsourcer and the service provider during the phases of the Sourcing Life Cycle.

In total I have interviewed four consultancy firms, three outsourcers and four service providers.[6] The model is based on the results of these interviews as well as on my personal vision. Afterwards the model is tested by validation interviews performed at two consultancy firms, two outsourcers and two service providers. The results of this validation will be described in the next chapter.

The model is based on the phases of the Sourcing Life Cycle. The first three phases of the Sourcing Life Cycle are applicable to all three types of outsourcing: an 'as is' transition, integration of the processes and tooling to the standards of the service provider and transformational outsourcing. The utilization of the subsequent phases is dependent on the type of outsourcing. Conditional upon the type of outsourcing the following phases of the model will be utilized:

General phases
1. Decision-making (§ 4.3.1)
2. Selection (§ 4.3.2)
3. Transfer (§ 4.3.3)

Subsequent phases
As is transition
4. Not applicable in this situation
5. Provision of services (§ 4.3.6)

Integration
4. Transformation (§ 4.3.4)
5. Provision of services (§ 4.3.7)

Transformational outsourcing
4. Transformation (§ 4.3.5)
5. Provision of services (§ 4.3.8)

Termination
As is transition
6. Termination (§ 4.3.9)

Integration or transformational outsourcing
6. Termination (§ 4.3.10)

For every phase of the model I have listed the position of the different architect types and the activities that they perform. The contents of these activities is further described in § 4.2.

[6] In most sourcing deals there are also law firms involved. But their contribution has no impact on the question of the architects needed. Therefore they were out of the scope of this research.

- The model is based on the perspective of the outsourcer, and the position and the activities of the different architect types deal with his interests and concerns.
- If an architect type is placed at the outsourcer this does not mean that the same architect type is not also active at the service provider.
- Just like the outsourcer the service provider will use his architecture as an important tool during the phases of the Sourcing Life Cycle.

After the model I will describe the role of external consultants (§ 4.4). I will conclude this chapter by describing the implications of deals with multiple service providers (§ 4.5).

4.2 List of activities

A1: Evaluate architecture maturity of the outsourcer.
During the decision-making phase the architects of the outsourcer ensure that the architecture of the outsourcer is mature enough in order to deal with the consequences of the outsourcing.

A2: Define the scope of the outsourcing.
Architects of the outsourcer play an important advising role during the definition of the scope of the parcel that is considered for outsourcing. This parcel can be a domain or a fairly autonomous part of a domain.[7]

A3: Map the interfaces and services of the parcel.
A parcel provides one or more services to the rest of the organization. In order to provide these services the parcel can require services from other parts of the organization. The architects of the outsourcer map these services and the interfaces between the parcel and the rest of the organization.

A4: Give advice on the feasibility and the risks of the outsourcing.
Based on the architecture of the organization the architects of the outsourcer give advice on the feasibility and the risks of the outsourcing.

A5: Formulate requirements for the service providers.
During the selection of the service providers the architects of the outsourcer provide requirements based on the architecture principles, rules, guidelines and standards of the organization. These requirements are usually formulated in the RFI and the RFP.

A6: Formulate response on the requirements of the outsourcer.
The architects of the service provider formulate the response on the requirements of the outsourcer for which they use the architecture principles, rules, guidelines and standards of their own organization.

A7: Assess service providers by means of knock-out criteria.
The architects of the outsourcer assess the responses of the services providers by means of knock-out criteria and give advice in order to select the 'best' service provider.

A8: Evaluate architecture maturity of the service provider.
During the Due Diligence examination the architects of the outsourcer assess the maturity and architecture capabilities of the service provider.

A9: Formulate migration plan.
Based on their respective architecture principles the architects of the outsourcer formulate or check the migration plan. This plan describes how to transfer the services and processes of the parcel from the outsourcer to the service provider.

[7] In his Master thesis Erwin van der Graaf formulates and describes principles and criteria for the delineation of parcels. [GRA06]

A10: Facilitate the migration.
The architects of the outsourcer facilitate the migration of the services and processes of the parcel from the outsourcer to the service provider. They provide the service provider the relevant know-how in order to continue the provision of services in accordance with the architecture.

A11: Formulate transformation plan.
Based on their respective architecture principles the architects of the outsourcer and the service provider formulate the transformation plan. This plan describes how to transform the services and processes in order to improve the quality of the provision of services.

A12: Define and communicate/discuss changes of the architecture.
The architecture of an organization is never completely finished. During the provision of services the different architect types of the outsourcer and the service provider will define and communicate or discuss changes in the architecture.

A13: Perform regular inspections.
The architects of the outsourcer will perform regular inspections in order to ensure that the provision of services complies with the architecture of the organization.

A14: Focus on innovation.
Both the architects of the outsourcer and the service provider should continually focus on innovation in order to improve the provision of services and adapt to technological changes or changes in the environment.

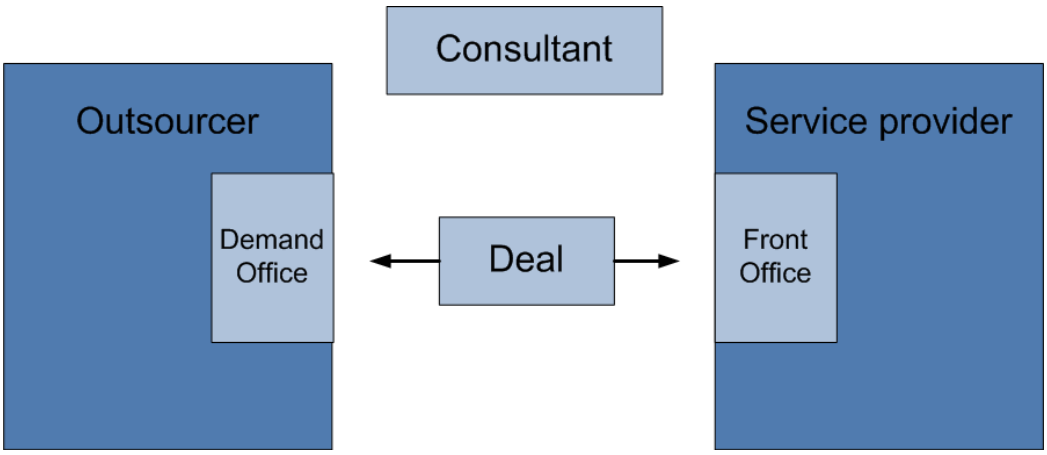
A15: Evaluate past outsourcing period.
During the termination phase the architects of the outsourcer will evaluate the past outsourcing period and the effects of the outsourcing on the architecture of the organization. Based on this evaluation the architects of the outsourcer will advise to renew the contract, transfer the contract to a different service provider or bring the provision of services back within the own organization.

A16: Perform final assessment of the architecture compliance.
Although regular inspections take place during the provision of services phase, a final inspection of compliance should take place during the termination phase. The architects of the outsourcer assess if the architecture of the parcel is still compliant with the architecture of the rest of the organization, and if they can dispose of all the relevant know-how and documentation needed to continue the provision of services. This should be guaranteed before resourcing, follow-up sourcing or backsourcing takes place.

A17: Support the final assessment of the architecture compliance.
Architects of the service provider that were involved during the past outsourcing period should support the architects of the outsourcer during their final assessment of the architecture compliance, even if the contract is not renewed.

4.3 Model

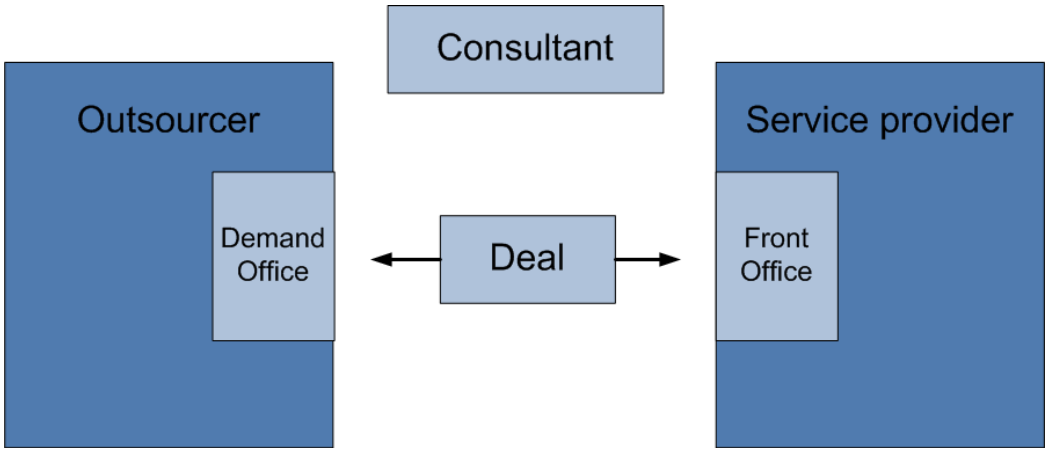
4.3.1 Phase: Decision-Making



Architect/engineer	Location	Activities
Enterprise architect	Outsourcer Consultant	A1: Evaluate architecture maturity of the outsourcer. (enterprise architecture level)
	Outsourcer	A2: Define the scope of the outsourcing. A3: Map the interfaces and services of the parcel. A4: Give advice on the feasibility and the risks of the outsourcing. (enterprise architecture level)
Domain architect	Outsourcer Consultant	A1: Evaluate architecture maturity of the outsourcer. (domain architecture level)
	Outsourcer	A2: Define the scope of the outsourcing. A3: Map the interfaces and services of the parcel. A4: Give advice on the feasibility and the risks of the outsourcing. (domain architecture level)

Application architect	Outsourcer Consultant	A1: Evaluate architecture maturity of the outsourcer. (application architecture level)
	Outsourcer	A4: Give advice on the feasibility and the risks of the outsourcing. (application architecture level)
Workspace architect	Outsourcer Consultant	A1: Evaluate architecture maturity of the outsourcer. (workspace architecture level)
	Outsourcer	A4: Give advice on the feasibility and the risks of the outsourcing. (workspace architecture level)
Infrastructure engineer	Outsourcer Consultant	A1: Evaluate architecture maturity of the outsourcer. (infrastructure level)
	Outsourcer	A4: Give advice on the feasibility and the risks of the outsourcing. (infrastructure level)
Security engineer	Outsourcer Consultant	A1: Evaluate architecture maturity of the outsourcer. (security level)
	Outsourcer	A4: Give advice on the feasibility and the risks of the outsourcing. (security level)

4.3.2 Phase: Selection



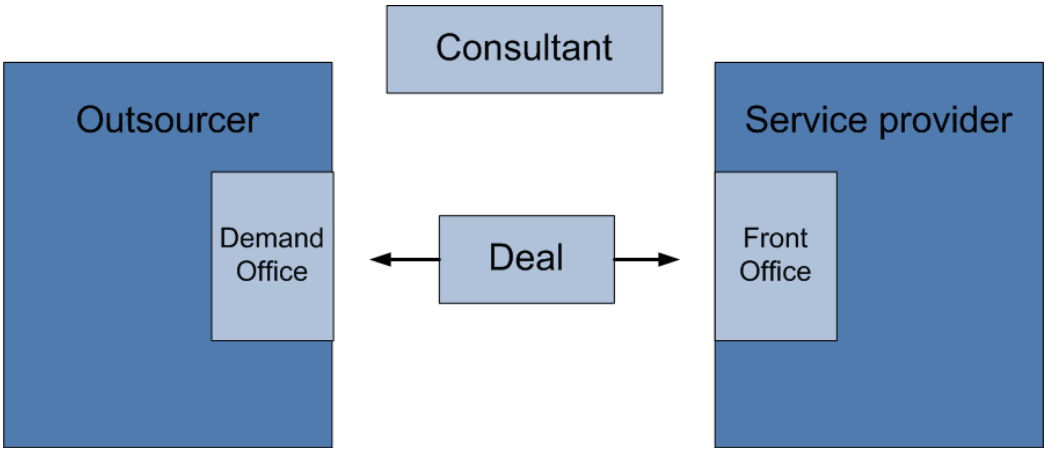
Architect/engineer	Location	Activities
Enterprise architect	Outsourcer	A5: Formulate requirements for the service providers. (enterprise architecture level)
	Service provider	A6: Formulate response on the requirements of the outsourcer. (enterprise architecture level)
	Outsourcer	A7: Assess service providers by means of knock-out criteria. (enterprise architecture level)
	Outsourcer Consultant	A8: Evaluate architecture maturity of the service provider. (enterprise architecture level)

Domain architect	Outsourcer	A5: Formulate requirements for the service providers. (domain architecture level)
	Service provider	A6: Formulate response on the requirements of the outsourcer. (domain architecture level)
	Outsourcer	A7: Assess service providers by means of knock-out criteria. (domain architecture level)
	Outsourcer Consultant	A8: Evaluate architecture maturity of the service provider. (domain architecture level)
Application architect	Outsourcer	A5: Formulate requirements for the service providers. (application architecture level)
	Service provider	A6: Formulate response on the requirements of the outsourcer. (application architecture level)
	Outsourcer	A7: Assess service providers by means of knock-out criteria. (application architecture level)
	Outsourcer Consultant	A8: Evaluate architecture maturity of the service provider. (application architecture level)

Workspace architect	Outsourcer	A5: Formulate requirements for the service providers. (workspace architecture level)
	Service provider	A6: Formulate response on the requirements of the outsourcer. (workspace architecture level)
	Outsourcer	A7: Assess service providers by means of knock-out criteria. (workspace architecture level)
	Outsourcer Consultant	A8: Evaluate architecture maturity of the service provider. (workspace architecture level)
Infrastructure engineer	Outsourcer	A5: Formulate requirements for the service providers. (infrastructure level)
	Service provider	A6: Formulate response on the requirements of the outsourcer. (infrastructure level)
	Outsourcer	A7: Assess service providers by means of knock-out criteria. (infrastructure level)
	Outsourcer Consultant	A8: Evaluate architecture maturity of the service provider. (infrastructure level)

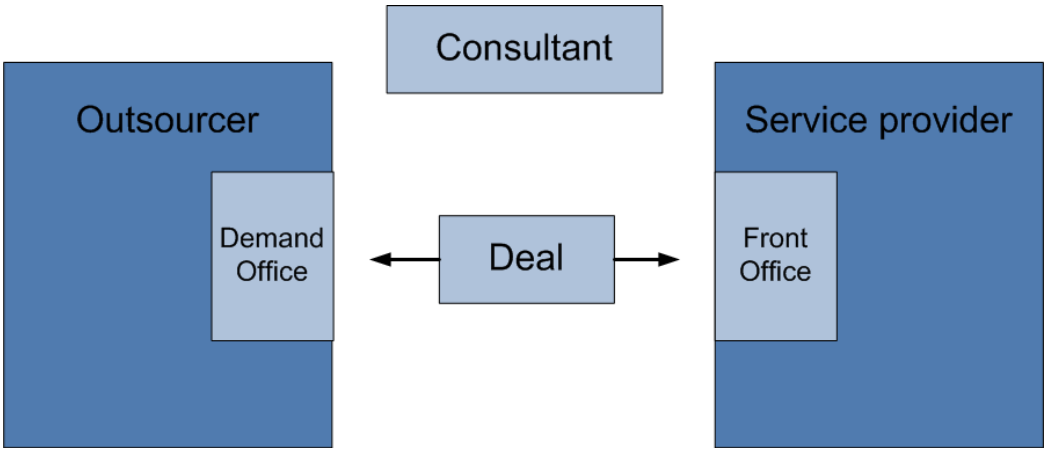
Security engineer	Outsourcer	A5: Formulate requirements for the service providers. (security level)
	Service provider	A6: Formulate response on the requirements of the outsourcer. (security level)
	Outsourcer	A7: Assess service providers by means of knock-out criteria. (security level)
	Outsourcer Consultant	A8: Evaluate architecture maturity of the service provider. (security level)

4.3.3 Phase: Transfer



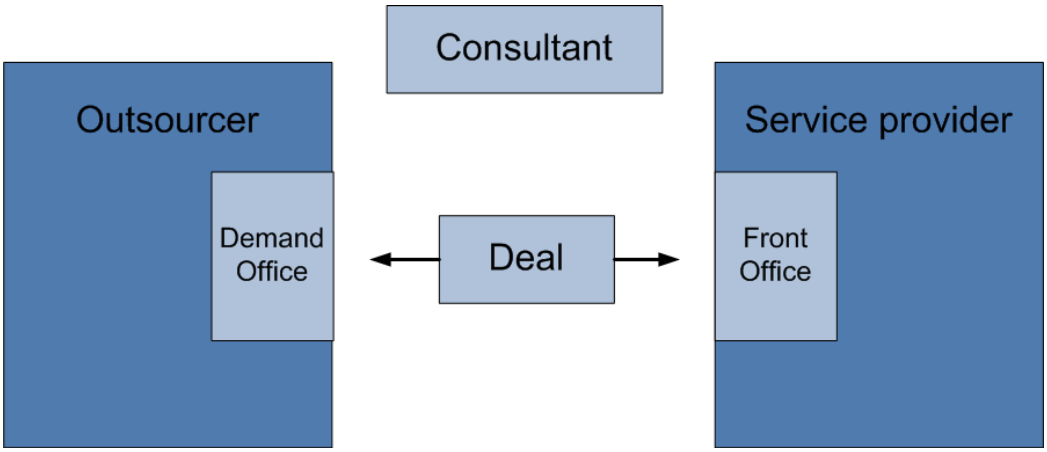
Architect/engineer	Location	Activities
Enterprise architect	Outsourcer	A9: Formulate migration plan. (enterprise architecture level) A10: Facilitate the migration.
Domain architect	Outsourcer	A9: Formulate migration plan. (domain architecture level) A10: Facilitate the migration.
Application architect	Outsourcer	A9: Formulate migration plan. (application architecture level) A10: Facilitate the migration.
Workspace architect	Outsourcer	A9: Formulate migration plan. (workspace architecture level) A10: Facilitate the migration.
Infrastructure engineer	Outsourcer	A9: Formulate migration plan. (infrastructure level) A10: Facilitate the migration.
Security engineer	Outsourcer	A9: Formulate migration plan. (security level) A10: Facilitate the migration.

4.3.4 Phase: Transformation (integration)



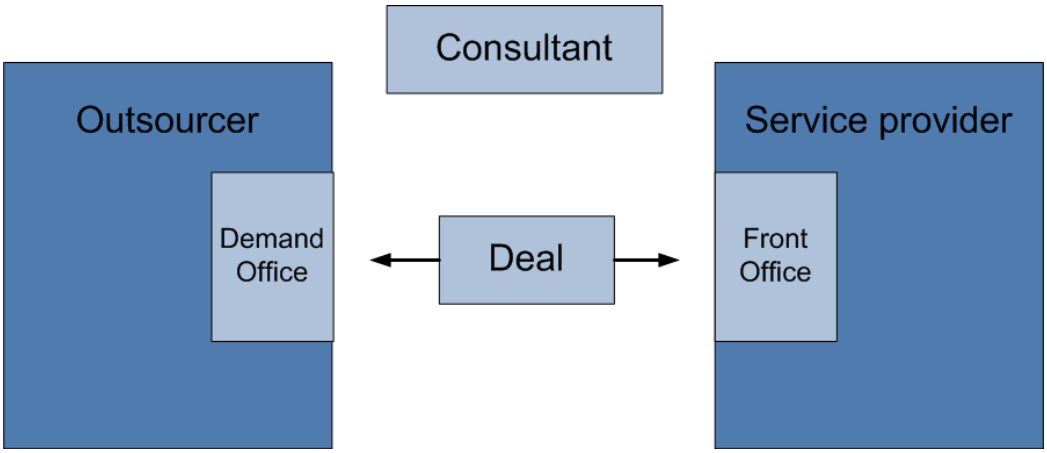
Architect/engineer	Location	Activities
Enterprise architect	Outsourcer	A10: Formulate transformation plan. (enterprise architecture level)
Domain architect	Outsourcer	A10: Formulate transformation plan. (domain architecture level)
Application architect	Service provider	A10: Formulate transformation plan. (application architecture level)
Workspace architect	Outsourcer	A10: Formulate transformation plan. (workspace architecture level)
Infrastructure engineer	Service provider	A10: Formulate transformation plan. (infrastructure level)
Security engineer	Outsourcer	A10: Formulate transformation plan (security level)

4.3.5 Phase: Transformation (transformational outsourcing)



Architect/engineer	Location	Activities
Enterprise architect	Outsourcer Service provider	A10: Formulate transformation plan. (enterprise architecture level)
Domain architect	Outsourcer Service provider	A10: Formulate transformation plan. (domain architecture level)
Application architect	Service provider	A10: Formulate transformation plan. (application architecture level)
Workspace architect	Outsourcer Service provider	A10: Formulate transformation plan. (workspace architecture level)
Infrastructure engineer	Service provider	A10: Formulate transformation plan. (infrastructure level)
Security engineer	Outsourcer	A10: Formulate transformation plan (security level)

4.3.6 Phase: Provision of Services (as is)

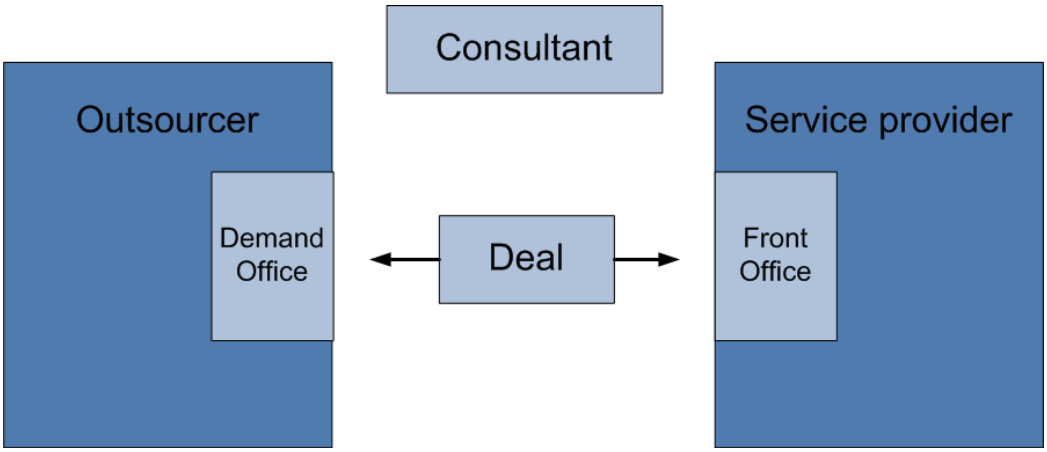


Architect/engineer	Location	Activities
Enterprise architect	Outsourcer	A12: Define and communicate changes of the architecture.[8] (enterprise architecture level) A13: Perform regular inspections.
	Outsourcer Consultant	A14: Focus on innovation.
Domain architect	Outsourcer	A12: Define and communicate changes of the architecture. (domain architecture level) A13: Perform regular inspections.
	Outsourcer Consultant	A14: Focus on innovation.
Application architect	Outsourcer	A12: Define and communicate changes of the architecture. (application architecture level) A13: Perform regular inspections.
	Outsourcer Consultant	A14: Focus on innovation.

[8] Although no active transformation of the provision of services will take place during an as is transition, the architecture of an organization can still change, for example due to changes in the environment or new technological developments.

Workspace architect	Outsourcer	A12: Define and communicate changes of the architecture. (workspace architecture level)
	Outsourcer Consultant	A14: Focus on innovation.
Infrastructure engineer	Outsourcer	A12: Define and communicate changes of the architecture. (infrastructure level) A13: Perform regular inspections.
	Outsourcer Consultant	A14: Focus on innovation.
Security engineer	Outsourcer	A12: Define and communicate changes of the architecture. (security level) A13: Perform regular inspections.

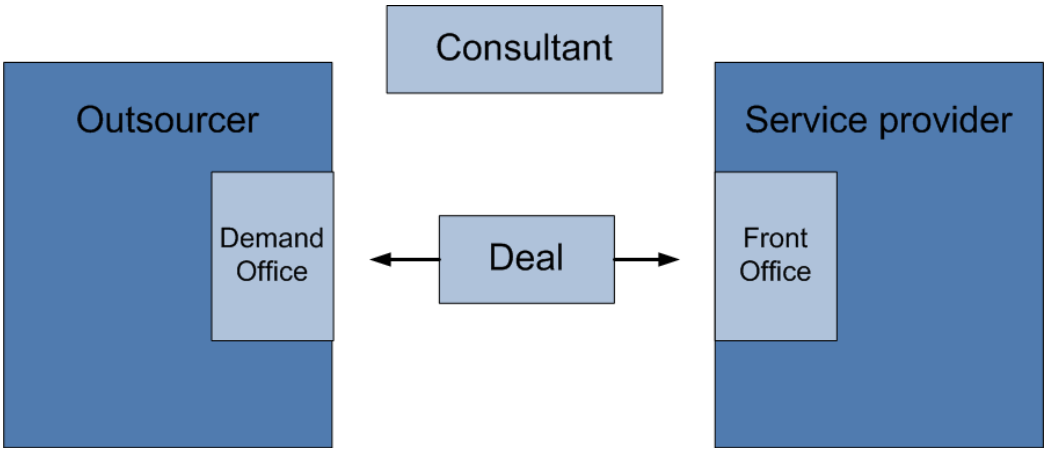
4.3.7 Phase: Provision of Services (integration)



Architect/engineer	Location	Activities
Enterprise architect	Outsourcer	A12: Define and communicate changes of the architecture. (enterprise architecture level) A13: Perform regular inspections.
	Outsourcer Consultant	A14: Focus on innovation.
Domain architect	Outsourcer	A12: Define and communicate changes of the architecture. (domain architecture level) A13: Perform regular inspections.
	Outsourcer Consultant	A14: Focus on innovation.
Application architect	Service provider	A12: Define and discuss changes of the architecture. (application architecture level)
	Service provider Consultant	A14: Focus on innovation.
Workspace architect	Outsourcer	A12: Define and communicate changes of the architecture. (workspace architecture level)
	Outsourcer Consultant	A14: Focus on innovation.

Infrastructure engineer	Service provider	A12: Define and discuss changes of the architecture. (infrastructure level)
	Service provider Consultant	A14: Focus on innovation.
Security engineer	Outsourcer	A12: Define and communicate changes of the architecture. (security level) A13: Perform regular inspections.

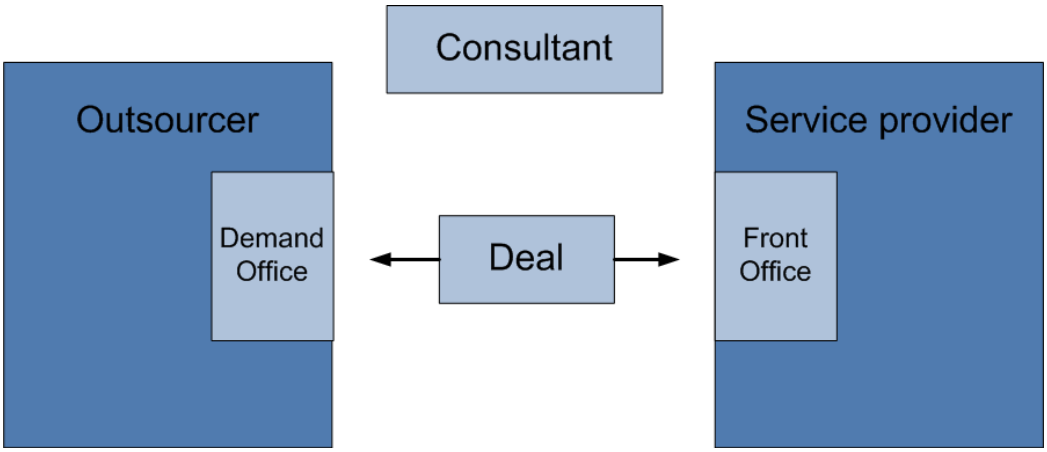
4.3.8 Phase: Provision of Services (transformational outsourcing)



Architect/engineer	Location	Activities
Enterprise architect	Outsourcer Service provider	A12: Define and discuss changes of the architecture. (enterprise architecture level) A13: Perform regular inspections.
	Outsourcer Service provider Consultant	A14: Focus on innovation.
Domain architect	Outsourcer Service provider	A12: Define and discuss changes of the architecture. A13: Perform regular inspections.
	Outsourcer Service provider Consultant	A14: Focus on innovation.
Application architect	Service provider	A12: Define and discuss changes of the architecture.
	Service provider Consultant	A14: Focus on innovation.

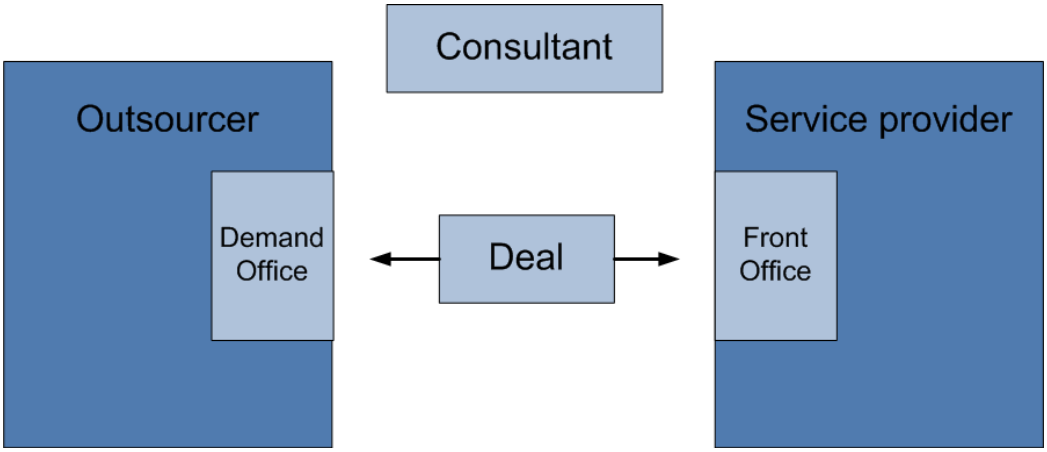
Workspace architect	Outsourcer Service provider	A12: Define and discuss changes of the architecture.
	Outsourcer Service provider Consultant	A14: Focus on innovation.
Infrastructure engineer	Service provider	A12: Define and discuss changes of the architecture.
	Service provider Consultant	A14: Focus on innovation.
Security engineer	Outsourcer	A12: Define and communicate changes of the architecture. A13: Perform regular inspections.

4.3.9 Phase: Termination (as is)



Architect/engineer	Location	Activities
Enterprise architect	Outsourcer	A15: Evaluate past outsourcing period. A16: Perform final assessment of the architecture compliance. (enterprise architecture level)
Domain architect	Outsourcer	A15: Evaluate past outsourcing period. A16: Perform final assessment of the architecture compliance. (domain architecture level)
Application architect	Outsourcer	A16: Perform final assessment of the architecture compliance. (application architecture level)
Workspace architect	Outsourcer	A16: Perform final assessment of the architecture compliance. (workspace architecture level)
Infrastructure engineer	Outsourcer	A16: Perform final assessment of the architecture compliance. (infrastructure level)
Security engineer	Outsourcer	A16: Perform final assessment of the architecture compliance. (security level)

4.3.10 Phase: Termination (integration and transformational outsourcing)



Architect/engineer	Location	Activities
Enterprise architect	Outsourcer	A15: Evaluate past outsourcing period. A16: Perform final assessment of the architecture compliance. (enterprise architecture level)
Domain architect	Outsourcer	A15: Evaluate past outsourcing period. A16: Perform final assessment of the architecture compliance. (domain architecture level)
Application architect	Service provider	A17: Support the final assessment of the architecture compliance. (application architecture level)
Workspace architect	Outsourcer	A16: Perform final assessment of the architecture compliance. (workspace architecture level)
Infrastructure engineer	Service provider	A17: Support the final assessment of the architecture compliance. (infrastructure level)
Security engineer	Outsourcer	A16: Perform final assessment of the architecture compliance. (security level)

4.4 Role of external consultants

Rijsenbrij and Delen state that Digital Architecture is a necessary condition for reliable outsourcing. [RIJ04c]. The architecture of an organization is never completely finished. Instead architecture should be based on the dynamics of the organization and her environment and is therefore always changing. Architects should be able to continually adapt the architecture to the changing situation of their organization. It is my opinion that the roles of the different architect types require knowledge and experience that can be supported, but not substituted by the activities of an external consultancy firm.

Consultancy firms have often supported many different outsourcers and service providers during a great number of outsourcing deals. Their practical knowledge and experience, combined with their external and independent status, gives consultants the possibility to provide valuable and objective answers and viewpoints to the different questions of the Sourcing Life Cycle. Because of this consultancy firms are often asked to provide assistance to both parties of the sourcing deal. The outsourcer or the service provider should however always be accountable for the decisions made.

4.5 Deals with multiple service providers

An outsourcer can decide to outsource his provisioning of services to multiple service providers (multiple sourcing). In this case an outsourcer can coordinate the service providers on a one to one basis or delegate the coordination and integration between the service providers to one of the service providers; the service integrator or prime contractor. [TAX06]
This is shown in the following two figures. The first figure shows the coordination of the service providers on a one to one basis. The second figure shows the use of a service integrator, in this case service provider B.

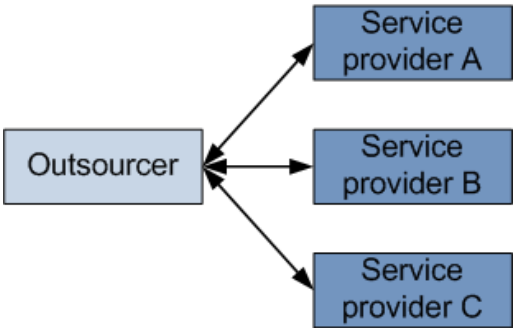


Figure 6: Coordination on a one to one basis.

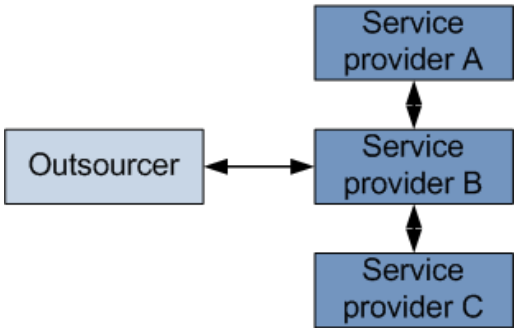


Figure 7: Use of a service integrator (Service provider B).

If the outsourcer coordinates the different service providers on a one to one basis the positions of architects will strongly depend on the activities and roles of the different service providers. The activities and results of one service provider will often influence the activities and results of the other service providers and thus the total quality of the provision of services. In order to successfully manage a sourcing deal of this type the outsourcer needs to make sure that the service providers are well acquainted with all changes in the architecture that influence their activities or the provision of services.

If the outsourcer uses a service integrator to coordinate the different service providers the architects of the outsourcer will communicate changes in the architecture with the architects of the service integrator. The architects of the service integrator are responsible for the communication of these changes with the architects of the other service providers. It is important that the architects of the service integrator help to streamline the total provision of services and focus on innovation. Because of this the reliability and maturity of the architects of the service integrator is of major importance for the success of the sourcing deal. As a matter of fact in this case there are also architects positioned in the deal.

5. Validation

In order to validate the model it has been presented to two outsourcers, two service providers and two consultancy firms. The persons that performed the validation were not involved in the first interview round and the validation was their first acquaintance with the results of my research. Because of this the interviewed persons were able to independently assess the results of my research and were not prejudiced by the conversations which took place before and during the formulation of the model.

The validation is conducted by means of face to face meetings in which I have guided the persons through the different phases of the model. This gave me the opportunity to exemplify the model if needed. After the entire model was discussed I asked the interviewees the following questions:

- Do you recognize the positions of the architects and the activities that are presented in the model?
- During which phases of the Sourcing Life Cycle do architects fulfill the most important role?

In this chapter the results of the validation are presented. First I describe the results of the individual validation interviews. At the end of this chapter I present the general conclusion of the validation.

5.1 Results of the individual interviews

5.1.1 Outsourcers

AkzoNobel

At AkzoNobel I have spoken with Peter-Paul van Dijk, Manager Global Architecture and Integration. He recognizes the positions of the architects and the activities presented in the model. According to Peter-Paul van Dijk architects fulfill the most important role during the following phases of the Sourcing Life Cycle:

1. Selection
2. Transformation
3. Termination

According to Peter-Paul van Dijk the importance of the different phases is strongly dependent on the scope and the contents of the outsourcing. In general architects fulfill the most important role during phases in which the organization of the provision of services significantly changes.

Shell

I have spoken with Henrik Jacobsson, Manager IT Architecture at Shell Exploration & Production. Henrik Jacobsson did recognize the positions of the architects and the activities in the model but made it clear that the model describes a desired situation. In practice some activities do not get the desired attention of the architects because of time constraints or financial aspects. It is Henrik Jacobsson's opinion that architects fulfill the most important role during the following phases of the Sourcing Life Cycle:

1. Transfer

2. Provision of services

3. Termination

During these phases it is the responsibility of the architects of the outsourcer to provide the architects of the service provider with the relevant know-how needed to successfully fulfill their function. The architects of the outsourcer also fulfill an inspecting role during these phases, because they need to make sure that the service provider adheres to the agreements made.

5.1.2 Service Providers

Capgemini

At Capgemini I have spoken with André de Graaf, Vice President and Account Executive Education. André de Graaf recognizes the positions of the architects and the activities mentioned in the model. According to him, the phases in which architects fulfill the most important role are:

1. Decision-making

2. Selection

During the decision-making phase the most important activities that the architects fulfill are A1: 'Evaluate architecture maturity of the outsourcer' and A2: 'Define the scope of the outsourcing'. During the selection phase the most important activity that the architects fulfill is A7: 'Evaluate architecture maturity of the service provider'.

Tata Consultancy Services

I have spoken with Dhiraj Deschmukh, member of the Architecture Group of Tata Consultancy Services and currently working at ABN AMRO on behalf of TCS. Dhiraj Deschmukh recognizes the positions of the architects and the activities mentioned in the model. According to him architects fulfill the most important role during the following phases:

1. Decision-making

2. Transformation

3. Provision of services

During these phases the most important decisions are taken and the most advanced changes in the provision of services take place. The most important activity of the decision-making phase is activity A1: 'Evaluate architecture maturity of the outsourcer'. The transformation phase and the provision of services are significant because they provide excellent opportunities to focus on innovation and improve the quality of the provision of services.

5.1.3 Consultancy Firms

Verdonck, Klooster & Associates

I have spoken with Jaap Schekkerman, principal consultant at VKA and a specialist on the subject of enterprise architecture. Jaap Schekkerman recognizes the positions of the architects and the activities mentioned in the model but indicates that for a successful application of the model the activities should be filled-in in more detail. He would like to see the principles, rules, guidelines and

standards that architects should employ during the phases of the Sourcing Life Cycle in order to manage an outsourcing deal in the most successful way. According to Jaap Schekkerman architects fulfill the most important role during the following phases of the Sourcing Life Cycle:

1. Decision-making
2. Transfer
3. Transformation

During the decision-making the architects provide a map of the existing situation that is very important for the definition of the scope of the outsourcing. During the transfer phase the architects of the outsourcer provide the architects of the service provider with the relevant know how needed to continue the provision of services. During the transformation phase the architects of the outsourcer and service provider work together to improve the quality of the provision of services.

Undisclosed strategy consultancy firm[9]

I have spoken with a consultant of one of the largest internationally operating strategy consulting firms. She recognizes the positions of the architects and the activities in the model but like Henrik Jacobsson she indicates that the model describes a desired situation. In practice many decisions are often already made by the higher management of an organization before architects are involved in the sourcing process. According to her, architects fulfill the most important role during the following phases:

1. Decision-making
2. Selection
3. Transformation

During the decision-making phase the architects of the outsourcer are forced to bring the architecture of their organization to a mature level in order to be able to successfully manage the outsourcing. During the selection phase the architects of the outsourcer assess if the architecture level of the service provider is mature enough. During the transformation phase the quality of the provision of services is improved. In order to successfully improve the quality of the provision of services it should fit with the architecture of the outsourcer as well as the service provider. Therefore, close collaboration between the architects of the outsourcer and the service provider is necessary.

5.2 General conclusion of the validation

All interviewed persons recognize the position and activities of the architects described in the model. There are however two significant remarks which need to be taken into account:

- Henrik Jacobsson emphasizes that there is a difference between the model, which describes the desired situation, and the actual practice.

[9] Both the name of this firm and the person interviewed are known to my supervisor.

- Jaap Schekkerman underlines that for a successful application of the model the activities should be filled-in in more detail.

Since I fully understand the importance of both remarks I underline them in the résumé of my research.

Based on the results of my validation I cannot make a strong distinction between the importance of the role that architects fulfill during the different phases of the Sourcing Life Cycle. All phases of the Sourcing Life Cycle are mentioned at least two times by the persons that I spoke with during the validation. The decision-making phase and the transformation phase are mentioned the most often. This at least indicates that the role that architects fulfill during these phases is of utmost importance for a successful outsourcing and should not be neglected by the higher management of the organizations concerned. Moreover I get the idea that this validation has to be extended to a much larger population. I expect to see a difference in opinion between the different parties involved in an outsourcing deal.

6. Résumé

In the introduction of my research I have formulated the main and sub questions of my research. In this chapter I provide a résumé of the answers on these questions. Later in this chapter I formulate general recommendations for the use of digital architecture during the sourcing process which came to my attention during my research. I conclude this chapter with suggestions for further research.

6.1 Answers on the research questions

The main questions of my research are:

- *How is the architect population to be shaped if an organization decides to outsource one or more services?*

And

- *About which subjects do these architects communicate with each other?*

In order to provide an answer to these questions they were subdivided into five different sub questions. The answers on the sub questions provide the answers to the main questions of my research. Sub question 1 is necessary for the answer of both the main questions. Sub question 2, 4 and 5 provide an answer to the first main question, sub question 3, 4 and 5 provide an answer to the second main question.

6.1.1 Sub question 1

Which architect types exist and which activities do they perform?

At the moment there is no generally acknowledged standard that describes the different architect types. Many of the discussions about architect types elapse with great difficulty because no party is willing to adjust its convention. A discussion that stands in close relation to the discussion of the architect types deals with the definitions of the term architect and the term engineer. The opinions on these discussions differ from specialist to specialist and from organization to organization. For my research I have studied the ideas and opinions of three specialists, namely Martin van den Berg, Roel Wieringa and Daan Rijsenbrij. Based on their ideas I have decided to use the following division in architect types and engineers for my research:

Scoping architects

- Enterprise architect
- Domain architect

Solution architects

- Application architect
- Workspace architect

Engineers

- Infrastructure engineer
- Security engineer

These architect types and engineers are further described in § 2.5.

6.1.2 Sub question 2

Where should the architect types be positioned during the different phases of an outsourcing deal?

In chapter 4 a model is presented which shows the positions and activities of the different architect types and engineers during the phases of the Sourcing Life Cycle. The positions of the architect types and engineers during the Sourcing Life Cycle are summarized in the following figure:

Phase	Decision making			Selection		
Outsourcing type	All			All		
Location	O	S	C	O	S	C
Enterprise architect	x		x	x	x	x
Domain architect	x		x	x	x	x
Application architect	x		x	x	x	x
Workspace architect	x		x	x	x	x
Infrastructure engineer	x		x	x	x	x
Security engineer	x		x	x	x	x

O: Outsourcer
S: Service provider
C: Consultancy firm

Phase	Transfer			Transformation			Transformation		
Outsourcing type	All			Integration			Transformational		
Location	O	S	C	O	S	C	O	S	C
Enterprise architect	x			x			x	x	
Domain architect	x			x			x	x	
Application architect	x				x			x	
Workspace architect	x			x			x	x	
Infrastructure engineer	x				x			x	
Security engineer	x			x			x		

Phase	Provision of services			Provision of services			Provision of services		
Outsourcing type	As is			Integration			Transformational		
Location	O	S	C	O	S	C	O	S	C
Enterprise architect	x		x	x		x	x	x	x
Domain architect	x		x	x		x	x	x	x
Application architect	x		x		x	x		x	x
Workspace architect	x		x	x		x	x	x	x
Infrastructure engineer	x		x		x	x		x	x
Security engineer	x			x			x		

Phase	Termination			Termination		
Outsourcing type	As is			Integration / Transformational		
Location	O	S	C	O	S	C
Enterprise architect	x			x		
Domain architect	x			x		
Application architect	x				x	
Workspace architect	x			x		
Infrastructure engineer	x				x	
Security engineer	x			x		

Figure 8: Positioning of architect types and engineers during the phases of the Sourcing Life Cycle

6.1.3 Sub question 3

About which subjects do the architect types report during the different phases of an outsourcing deal?

In chapter 4 a model is presented which shows the positions and activities of the different architect types and engineers during the phases of the Sourcing Life Cycle. The model consists of the following activities:

A1: Evaluate architecture maturity of the outsourcer.
A2: Define the scope of the outsourcing.
A3: Map the interfaces and services of the parcel.
A4: Give advice on the feasibility and the risks of the outsourcing.
A5: Formulate requirements for the service providers.
A6: Formulate response on the requirements of the outsourcer.
A7: Assess service providers by means of knock-out criteria.
A8: Evaluate architecture maturity of the service provider.
A9: Formulate migration plan.
A10: Facilitate the migration.
A11: Formulate transformation plan.
A12: Define and communicate/discuss changes of the architecture.
A13: Perform regular inspections.
A14: Focus on innovation.
A15: Evaluate past outsourcing period.
A16: Perform final assessment of the architecture compliance.
A17: Support the final assessment of the architecture compliance.

These activities are further described in § 4.2.

6.1.4 Sub question 4

Is the positioning of the architect types and the subjects that they discuss during the different phases of an outsourcing deal dependent on the type of the outsourcing?

For my research I have made a distinction between three types of outsourcing, namely an 'as is' transition, the integration of the processes and tooling to the standards of the service provider and transformational outsourcing. The first three phases of the Sourcing Life Cycle are applicable to all three types of outsourcing. The utilization of the subsequent phases is dependent on the type of outsourcing. The model in chapter 4 is therefore subdivided into general phases and phases which are dependent on the type of outsourcing:

General phases

1. Decision-making (§ 4.3.1)
2. Selection (§ 4.3.2)
3. Transfer (§ 4.3.3)

Subsequent phases
As is transition
4. Not applicable in this situation
5. Provision of services (§ 4.3.6)

Integration
4. Transformation (§ 4.3.4)
5. Provision of services (§ 4.3.7)

Transformational outsourcing
4. Transformation (§ 4.3.5)
5. Provision of services (§ 4.3.8)

Termination
As is transition
6. Termination (§ 4.3.9)

Integration or transformational outsourcing
6. Termination (§ 4.3.10)

6.1.5 Sub question 5

Does the situation change if the outsourcer simultaneously uses the services of multiple service providers?

In § 4.5 two options to manage outsourcing relations with multiple service providers are described. Outsourcers can choose to coordinate the service providers on a one-to-one basis or make use of a service integrator or prime contractor. If the outsourcer decides to coordinate the service providers on a one-to-one basis the outsourcer needs to make sure that all service providers are acquainted with all changes in the architecture. This emphasizes the importance of mature architecture capabilities of the outsourcer. If a service integrator or prime integrator is used to coordinate the different service providers their architects need to help to streamline the provision of services and focus on innovation. The reliability and maturity of the service integrator is thus of major importance for the success of the sourcing deal.

6.2 General recommendations

In order to achieve a successful outsourcing deal all parties need to cooperate on a very mature level. Architecture is an indispensable tool for the outsourcer as well as the service provider(s). The maturity of the architecture of the service provider becomes even more important if the processes and tooling are integrated to the standards of the service provider or in the case of a transformational outsourcing, because in these cases the outsourcer delegates (part of) the organization of the provision of services to the service provider. Based on the results of my research I would like to make the following recommendations:

- All organizations that have participated in the interviews or the validation recognize the importance of digital architecture, but some of them indicate that in practice many decisions are made before the architects of an organization are consulted or even informed. It is very important that the architects can dispose of a clear mandate and are actively involved in the different phases of the Sourcing Life Cycle.

- Service providers need to be careful not to look at architecture and innovation from a pure commercial point of view. Although it is natural that both parties want to profit from the outsourcing deal, service providers should be willing to embed the provision of services on a high level within their own organization. The use of a mature architecture and the focus on innovation should be rewarding for both parties of the sourcing deal. The outsourcer and the service provider(s) need to make clear arrangements about these subjects during the selection phase.

6.3 Suggestions for further research

- This research is based on a relative small number of interviews with open questions. In order to enhance the cogency of the research the interview should be performed on a (much) larger scale. The results of this research can be used to formulate the questions of the larger scale research.

- This research discusses the position of the different architect types and provides a summary of the activities that the architects perform in the process of outsourcing. In a follow-up research the subjects about which the architects discuss with each other, horizontally as well as vertically, during the phases of the Sourcing Life Cycle should be filled-in.

Terminology

Backsourcing	The outsourcer brings the provision of services back within his own organization after the termination of the contract.
BAFO	Request for Best and Final Offer. After the RFP the two best service providers are asked to make a definitive, final offer. This offer is used to make the final choice for a service provider. [TAX06]
BPO	Business Process Outsourcing: the outsourcing of non IT-services that include a large administrative component.
Consultancy firm	An external organization that is hired by the outsourcer or service provider that has knowledge and experience of the field of sourcing (hopefully also about digital architecture) and advises the outsourcer and the service provider during the phases of the Sourcing Life Cycle.
Deal	A partnership between an outsourcer and one or multiple service providers during the length of a contract against an agreed quality level and financial compensation structure.
Demand Office	A department of the outsourcer that is responsible for the communication with the service provider and with the business units of the outsourcer. It acts so to say as the bridge between the external provider and the internal organization.
Digital Architecture	A coherent, consistent collection of principles, particularized into rules, guidelines, and standards which describe how an enterprise, the information supply, the applications, and the infrastructure are shaped and behave in their usage. [RIJ04a]
Domain	A collection of services. [GRA06]
Due Diligence	A thorough examination that takes place at the end of the selection phase. The outsourcer uses the Due Diligence to assess the quality, maturity and durability of the service provider. The Service provider uses the Due Diligence to assess the quality and value of the provision of services, and if applicable, the accompanying employees and resources of the parcel. [TAX06]
Environment	The set of forces surrounding an organization that have the potential to affect the way it operates and its access to scarce resources. [JON04]
FMO	Facility Management Outsourcing: the outsourcing of non IT-services that do not include a large administrative component.

Follow-up sourcing	The outsourcer transfers the provision of services to another service provider after the termination of the contract.
Front office	A department of the service provider that is responsible for the communication with the outsourcer.
ITO	Information Technology Outsourcing: the outsourcing of IT-services.
Multiple Sourcing	A deal in which the provision of services is outsourced to multiple service providers. [TAX06]
Organization	A social arrangement for achieving controlled performance in pursuit of collective goals. [JON04]
Outsourcer	An organization that outsources (a part of) her provision of services, and if applicable, the accompanying employees and resources, to a service provider.
Outsourcing	The transfer of the provision of services, and if applicable, the accompanying employees and resources, to a specialized service provider followed by the reception of services during the length of the contract against an agreed quality level and financial compensation structure. [TAX06]
Parcel	A collection of services within a domain. [GRA04]
Prime contractor	A service provider that can subcontract parts of the provision of services to other service providers and thus acts as a service integrator. The prime contractor stays responsible for the enforcement of the quality level and the terms of the contract.
Principle	A guiding statement for the purpose of essential decisions. [RIJ04a]
Resourcing	The outsourcer renews the contract with the current service provider after the termination of the initial contract.
RFI	Request for Information. The outsourcer approaches potential service providers to inquire into their willingness, their ability and their proven experience to take on the service in question. [TAX06]
RFP	Request for Proposal. The outsourcer asks potential service providers for a proposal and an offer for the provisioning of the services. [TAX06]
Service	An ordered set of activities with a specific goal. [GRA04]
Service integrator	A service provider that provides the coordination and integration between the different service providers in the case of multiple sourcing.

Service provider	An organization that delivers services to one or multiple outsourcers during the length of a contract against an agreed quality level and financial compensation structure.

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Appendix A Personal reflection

Start of my research

During my study Information Sciences I have always tried to focus on the crossroad of Information Technology and organizational management. I have complemented the curriculum of my study with electives of the faculty of management which in my opinion constituted a valuable addition to the more technical oriented subjects of the faculty of science.

Although the subject of outsourcing was not included in the curriculum of my study it did draw my attention during my Master because of the newsworthiness of the subject and the impact that outsourcing deals have on the provision of services of large international organizations. During the lectures about the subject Information Architecture It came to my attention that Daan Rijsenbrij was at that moment engaged as Vice President Outsourcing of Capgemini. After I finished the examinations of Information Architecture I decided to contact Daan Rijsenbrij to see if it would be possible to perform my final research under his supervision. It was my intention to perform a research which combines the subjects of digital architecture and outsourcing.

I have started my research with the formulation of a preliminary research plan in which I outlined my research questions, the research method, the chapter list and the time schedule of my research. The research questions and the chapter list have been maintained during my research process. This provided a sound basis and I found it very comforting to be able to hold on to this structure during my research. For most parts the research method has also been maintained, although the number of interviewed organizations was increased from 11 to 17. The time schedule on the other hand has been altered several times during the process of my research. My research has taken considerably longer than I had expected. This research was the first research of this size that I have performed on my own, and I found it difficult to make a realistic estimate of the time needed for the different parts of my research. Especially the time needed in order to make an appointment for an interview proved to be much longer than I had expected, due to the very busy schedules of the interviewed persons.

Literature study

I have started my literature study by searching for relevant articles and publications which focus directly on my research questions in order to see if prior research had been done and if the results of this research could be utilized for my own research. This was not the case, so I decided to focus on the separate subjects of digital architecture and outsourcing. The role of the literature study was not to provide a very extensive report on these subjects, but to provide an introduction which could be used as the foundation for my research. I think that I have succeeded in this, since the results of my literature study have been used to formulate the introductory chapters and formed the basis for the interviews.

Interviews

I have experienced the interviews as extremely instructive and enthusing. These interviews were an exceptional possibility to come into contact with persons that possess a huge amount of knowledge and experience of the subjects of digital architecture and/or outsourcing. In the course of the interview process I noticed that I became more and more able to serve as a mature conversation partner for the interviewees. At the end of the first round of interviews I was not only able to

discuss the questions of my interview, but I could also provide a substantiated opinion on the challenges that both subjects experience. The interest and the positive reactions of the interviewees proved the importance of my research and have stimulated me to annul a possible setback during the different phases of my research.

Formulation of the model

The formulation of the model proved to be the most difficult part of my research. The interviews had provided me with a wealth of information, but the nature of this information differed from interview to interview. A negative effect of the use of open questions is that the gathered results are more difficult to process and compare to each other than the results of closed questions. During the later interviews I started to see more and more consensus between the different interviewees and I could start to shape the model. Most of the interviewed persons told me that I could always contact them if I had any questions after the interview. During the formulation of the model I have utilized this offer and I have contacted several of the interviewed persons in order to ask them a question or consult them for clarification on a specific issue. This provided me the certainty that the model correctly represents the opinion of the interviewees.

Validation

Although the model was based on the results of the first round of interviews and I had held contact with several organizations during the formulation of the model, I still found it quite exciting to present the results of my research to a separate group of specialists. However, the discussions which took place during the validation were very interesting. I noticed that I had a more thorough knowledge of the subjects of my research and the model proved to be a solid basis for a constructive discussion. Next to that I found it very pleasing that the model turned out to be recognizable for a wide spectrum of organizations.

Writing of the thesis

The writing of a paper with the dimension of this thesis was a whole new experience. I had written a Bachelor thesis as conclusion to my Bachelor of Sciences, but that research and timeframe was much more restricted then this research. Halfway during my research I have decided, in accordance with Daan Rijsenbrij, to write my thesis in English and limit the size of my thesis excluding appendices to about fifty pages in order to make it accessible to a broad audience. Although I have no difficulties with the reading and understanding of scientific English I noticed that it took me considerable efforts to write my thesis in English. Eventually I chose to write the chapters of my thesis in Dutch and later translate these chapters to English. Every translation forced me to revise my writing and I often noticed that it was better to shorten or rephrase certain sentences and constructions in order to improve the readability of my thesis. This has significantly improved the quality of my writing.

Guidance and supervision

During my research I have been guided by several persons. First of all I have been guided by my supervisor, Daan Rijsenbrij. Despite his (very) busy schedule it was almost always possible to speak with him on a short notice about my research or the writing of my thesis. Furthermore Daan has read my thesis several times and provided me with a vast amount of valuable comments and advices. Reflecting on my research I found it very comforting to be guided by someone with such great experience of digital architecture as well as outsourcing.

Furthermore I have always experienced the attitude of the Computing Science department of the Radboud University (NIII/NICI) as very open and informal. Just like during the rest of my study I have always appreciated the open door policy of the institute. In special I would like to thank Sietse Overbeek, with whom I have had several talks during the formulation of the model about the position of the workspace architects and the activities that these architects perform.

My fellow students and friends were more than once prepared to read the draft versions of my thesis and have made a lot of valuable suggestions concerning my research and the correct usage of (the English) language. Their efforts were of great help to me.

Study experience

The most instructive experience that I gained during my research and the writing of the thesis was the independency that was expected of me. Although regular contact took place between me and my supervisor I have always been responsible for my own progress and for the formulation of my own targets. The contrast between performing this research at one hand and attending lectures and taking examinations on the other hand was in my opinion very high.
Reflecting on my research period I have to conclude that I found it to be the most intensive, but also the most instructive and rewarding period of my study.

Appendix B Specialists about the different architect types

Daan Rijsenbrij

Rijsenbrij makes a distinction between four architect types which he classifies into two groups:

Scoping architects

- Enterprise architect
- Domain architect

Solution architects

- Application architect
- Workspace architect

Rijsenbrij explicitly mentions the importance of a solid security architecture. The formulation of this architecture is the sole responsibility of the architects which can be supported by security engineers if needed.

Enterprise architect

The enterprise architect deals with the organization in its whole, the relation of the organization and its environment and the division of the organization in different domains. The enterprise architect focuses on the world of information exchange[10] and information traffic (I-world). The goal of the enterprise architect is to organize the information streams in such a way that the organization can optimally function. For this purpose the enterprise architect maps the products, services and processes of the organization and investigates which information should be available when and where. Using architecture principles the enterprise architect ensures that the information streams of an organization run in an efficient and effective manner.

Domain architect

The domain architect formulates the architecture of a specific domain. The domain architect will focus primarily on the business world (B-world). For the formulation of the architecture of a domain the architect will focus on the products, the services, the processes and the organization of the domain. The architect is able to (re)design the domain in order to transmute the domain to the architecture of the organization. In order to formulate the principles needed to transmute the domain the domain architect needs to understand the business, look at the best practices and dispose of a good share of business knowledge and experience.

Application architect

The application architect deals with the architecture of the applications of the organization (the A-world). The architecture defines the architecture principles for the applications at the organization level, the domain level and the level of the individual applications. In the case of individual applications the architecture will consist of a subset of the principles of the scoping levels. Architecture principles of the scoping levels can be adjusted by new insights in the field of software

[10] Knowledge included

engineering, new technological possibilities, changing user requirements and experiences of earlier projects.

Workspace architect
The workspace architect deals with the architecture of the digital workspace. In order to formulate this architecture the workspace architect has to pay attention to the perception and the experience of the users. He needs to find the right balance between the interest of the organization and the interests of the individual users.

Martin van den Berg

Martin van den Berg and Serge Bouwens have conducted a series of interviews with a number of architects and architecture managers of large organizations. Based on these interviews Martin van den Berg makes a distinction between three architect types. The position of these architects is showed on the following figure:

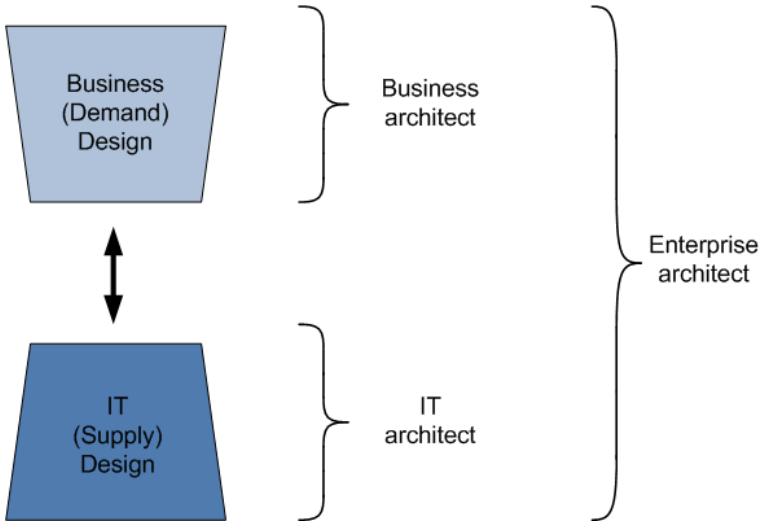

Figure 9: Architect types according to Martin van den Berg. [BER06]

Business architect
The main activity of a business architect is the accommodation of complexity. The business architect focuses on business specific matters, like organization rules, customer agreements, transactions, etc. Furthermore the business architect is responsible for the (re)design of the business domains in order to formulate a business architecture that facilitates the ambition of the organization.

IT-architect
Like the business architect the IT-architect accommodates the complexity. The IT-architect focuses on IT-specific matters like application, software and hardware. Furthermore the IT-architect is responsible for the (re)design of the IT-domains and the formulation of an IT-infrastructure. Like the business architect the IT-architects formulates an architecture that facilitates the ambition of the organization. A good cooperation between both architects is thus necessary.

Enterprise architect
The enterprise architect focuses on matters which affect the whole organization, like the common facilities, the overall business model or the organization, the delineation of the organization into

different domains and the management of the relation between business and IT. The enterprise architect divides the domains in business and IT-domains. The interface between these domains should be as clear as possible which provides both the business as the IT the possibility to optimally develop their own domains. The enterprise architect is responsible for the cooperation between the business and the IT-architects. Together with these architects the enterprise architect focuses on innovation and new opportunities. [BER06]

Roel Wieringa

According to Roel Wieringa architects perform their activities within three layers of their organization:

- **Enterprise:** the organization in its whole, which consists of different domains.
- **Enterprise systems:** the applications that support the enterprise.
- **Software infrastructure:** the IT-infrastructure which supports the enterprise systems.

Each layer consists of different aspects. According to Wieringa architects are involved in the following four aspects of the layers:

- **Services:** the services that the layer provides
- **Behavior:** the way in which the services of the layer behave.
- **Communication:** the way in which the services of the layer communicate.
- **Data:** the way in which the information streams of the services are shaped.

Furthermore Wieringa makes a distinction between 'users' like banks and insurance companies and 'vendors' like consultancy firms and service providers. Users often make a distinction between four architect types:

	Services	**Behavior**	**Communication**	**Data**
Enterprise	***Domain architect***			
Enterprise systems	***Enterprise architect / Application architect***			
Software infrastructure	***Infrastructure architect***			

Figure 10: Architect types as seen from the user perspective. [WIE05]

Domain architect

The domain architect creates organization solutions for organization issues and organization goals. These solutions consist of processes, structures and information streams. The domain architect does not focus on the specific IT-parts of the solution. Often a domain architect is a domain specialist with a talent for architecture.

Enterprise architect
The enterprise architect designs enterprise systems in order to solve organization issues or reach organization goals on a global level. The enterprise architect will never design the internal structure of a single software system.

Application architect
The application architect designs the individual applications within the enterprise systems that are designed by the enterprise architect.

Infrastructure architect
The infrastructure architect designs infrastructures in order to solve organization issues or reach organization goals. These infrastructures are often bought 'out of the box' from third parties.

According to Wieringa vendors often make a distinction between seven architect types. The Enterprise architect formulates an architecture on a global level for all layers and parts of the organization. The enterprise architect provides the connection between the enterprise software and the organization.

<table>
<tr><th></th><th>Services</th><th>Behavior</th><th>Communication</th><th>Data</th></tr>
<tr><td>Enterprise</td><td colspan="4" rowspan="3">Enterprise architect</td></tr>
<tr><td>Enterprise systems</td></tr>
<tr><td>Software infrastructure</td></tr>
</table>

Figure 11: Architect types as seen from the vendor perspective, part 1 [WIE05]

Apart from the enterprise architect Wieringa recognizes six other architect types, which are positioned on different layers of the organization:

	Services	Behavior	Communication	Data
Enterprise	***Business architect***	***Process architect***		***Information architect***
Enterprise systems	***Application architect***		***Integration architect***	**Data designer**
Software infrastructure	***Infrastructure architect***			

Figure 12: Architect types as seen from the vendor perspective, part 2 [WIE05]

- **Business architect** models the services of the organization.
- **Process architect** models and designs business processes.
- **Information architect** models and designs Information streams.
- **Application architect** designs application architectures.
- **Integration architect** designs the interfaces between the different enterprise systems.
- **Infrastructure architect** designs infrastructures. [WIE05]

Appendix C Summaries of the interviews held[11]

ABN AMRO

Denis Hageman

ABN AMRO started with the active formulation and implementation of a digital architecture in 1996. The organization makes a distinction between the infrastructure, which is managed at a global level, and the applications and data, which are managed by the individual business units. The organization is subdivided into business units by region as well as by product group, which creates a complex matrix structure. Denis Hageman is Head of IT Strategy & Architecture of the business unit 'IT Group Functions'. IT Group Functions is accountable for the delivery of IT services and solutions to Group Functions. IT Group Functions is leading the development of the IT strategy and is actively contributing to the business strategy for each function. The architecture department of the business unit consists of four enterprise architects and eight domain architects.

1. **Which architect types exist and which activities do they perform?**

Denis Hageman does not draw a parallel between the architects of the digital and the physical world. From his point of view digital architecture should be compared to the town and country planning of the physical world. Denis Hageman does not recognize the role of the workspace architect. According to him this role should be called 'workspace designer'.

2. **Where should the architects be positioned during the phases of the Sourcing Life Cycle?**

Decision-making
The enterprise architects play an important role during the Decision-making phase. They do not only play an advising, but also a decisive role. In consultation with the Enterprise Architects the CIO and the managers of the project organization formulate the conditions for the outsourcing and decide whether the outsourcing is feasible. Next to that enterprise architects play an important role in the delineation of the scope of the outsourcing.

Selection
The enterprise architect is indirectly connected to the selection of the service provider. His main function is to determine the architecture capabilities of the service provider. The result of this examination is considered during the final decision.

Transition
During the transition phase ABN AMRO utilizes a standard document in which the architecture of every system that is outsourced is defined in a uniform way; the Current State Architecture. Not only the enterprise architect but also the domain architects play an important role in the formulation of the Current State Architecture. All architects concerned need to check and sign the CSA. At the current moment most applications of ABN AMRO are transferred to the service provider 'as is'. The architects of the service provider operate according to the models, conditions and support functions of ABN AMRO.

[11] All summaries of the interviews have been sent back to the interviewees after the interviews took place. This provided the interviewees the possibility to verify the summary and provide changes or comments.

Provision of services

During the provision of services the service provider operates according to the models, conditions and support functions of ABN AMRO. Every year ABN AMRO provides new insights to the service providers, which will then attune the provision of services to these insights. At the global level regular consultations take place between the architects of ABN AMRO and the architects of the service providers. These consultations focus mainly on innovation and trends. At the level of the individual Business Units these consultations are defined but not yet operational.

3. Does the situation change if the outsourcer uses the services of multiple service providers?

In the past most service providers were contacted on a one-to-one basis. Currently the major part of the IT-infrastructure is outsourced to IBM (except the IT-infrastructure of the Business Unit Wholesale Clients which is still outsourced to EDS), which is also responsible for most of the contracts with third parties. However, separate contracts exist with for example Verizon and Avaya, respectively for the network and the telephony connections. According to Denis Hageman this multivendor strategy can give rise to problems during complicated deals, particularly in the case of a transformational outsourcing.

In the magazine 'Chief Information Officer' the group CIO of ABN AMRO, Rob de Haas, stated that ideally the management of the IT-infrastructure as well as the development of applications would be outsourced to a single service provider. However, at the current moment the industry is not mature enough to accommodate these types of deals. [CIO07]

Atos Origin

Peter Verkoulen

1. Which architect types exist and which activities do they perform?

Peter Verkoulen endorses that it is important to consider an architect type as a role, and not per definition as a person. From his point of view only one person is responsible for the complete architecture of the organization. Dependent on the size of the organization additional architects can be assigned to certain functional subfields. According to Peter Verkoulen an architect is a person who creates a design. Engineers are responsible for the translation of this design to a more concrete implementation.

2. Where should the architects be positioned during the phases of the Sourcing Life Cycle?

Decision-making

During the decision-making phase the enterprise plays an important, advising role. If necessary he can be assisted by one or multiple domain architects. Important questions that these architects need to answer are: What do we want to outsource (what is the scope) and under which conditions?

Selection

During the selection phase more architects are involved in the outsourcing. The number of architects is dependent on the size of the deal. Peter Verkoulen explicitly mentions the importance of the security engineers. Their role becomes even more important due to legislations like Sarbanes Oxley and the Tabaksblat commission.

Transition

According to Peter Verkoulen an as is transition will never yield noticeable cost savings or innovation and can therefore never be called a success. The goal of outsourcing should at least be the integration of the provision of services of the outsourcer into the provision of services of the service provider. The question that architects need to answer is: 'How do we get from A to B?'. Architects from both the outsourcer as well as the service provider should be involved in this process.

It is Peter Verkoulen's opinion that the outsourcer should be able to let go of certain tasks and should distance itself from the contents of the provision of services. Ideally an IT-outsourcing should be comparable to the outsourcing of the cleaning of the office space. Practical experience shows us that organizations are afraid to let go of their IT. In this case consulting firms can play a mediating role between the outsourcer and the service provider.

Provision of services

During the provision of services it is the task of the enterprise architects to manage and guard the interface between the outsourcer and the service provider. It is very important that both the outsourcer as the service provider are stimulated to invest in improvements and innovation. Both the outsourcer as the service provider need to profit from these investments, for example by the use of 'gain-sharing'. Innovation boards, in which architects from both the outsourcer as the service

provider take place, can also help to focus on innovation.

HP Outsourcing Services

Gerrit van Asch
Cor Halling

1. **Which architect types exist and which activities do they perform?**

The activities of an enterprise architect do not belong to the core-business of HP Outsourcing Services. If a sourcing deal requires the knowledge and experience of an enterprise architect HP Consulting or business partners like Capgemini, Accenture, Ordina or LogicaCMG are consulted.

'Outsourcing solution consultants' (formerly called Solution architects) play an important role during the different phases of an outsourcing deal. It is the task of the solution consultants to align the solutions that HP offers to the business requirements, wishes, demands and possibilities of the customer. Solution consultants also play an important role during the formulation of a Business Case, the assessment of the costs of the offered services and the placement of the offered services in the HP delivery organization.

Solution consultants can use the knowledge and experience of several specialized divisions, called towers. There exists for example a service desk, an infrastructure and an application management tower.

2. **Where should the architects be positioned during the phases of the Sourcing Life Cycle?**

Decision-making
There are cases in which the outsourcer already knows which service provider will eventually take over the provision of services. In this case the service provider will often already be contacted during the decision-making phase. The service provider can provide a presentation or formulate a detailed Business Case. It is also possible that a random service provider is asked to provide a presentation about for example different types of outsourcing, trends and experiences of the past. These presentations can provide the outsourcer with valuable input and more information about the pros and cons of outsourcing.

Selection
The answer on the RFI consists of a commercial document in which the knowledge and skills of the service provider are presented. For the formulation of the answer on the RFP the number of employees that work on the project is scaled up significantly. During the formulation of the answer a lead outsourcing solution consultant is assigned to the project. This consultant is in charge of the architecture of the provision of services. During the phases of the outsourcing the consultant will be assisted by architects of the different towers.

During the Due Diligence assessment HP often notices that the architecture of the customer is scarcely documented. It is the responsibility of the solution consultants and the architects of the different towers to document the architecture of the customer and to assess the maturity of the architecture. Consulting firms can play a supporting role during this process.

Transition
According to HP a total 'as is' transition is impossible to achieve. There are always employees that resign or transfer to another position in the organization of the outsourcer. The role of architects

becomes more important if the provision of services of the outsourcer is integrated in the provision of services of the service provider. The importance of the architecture is also subject to the contents and the impact of the outsourcing.

In the ideal case the architects of the business processes should stay with the outsourcer while the architects of the more technical processes should be transferred to the service provider.

Provision of services
During the provision of services it is the task of the architects to manage the uniformity of the provision of services according to the business requirements of the outsourcer. Architects of the service provider need to pay special attention to the principles and standards of the outsourcer. In order to focus on innovation special innovation boards are set-up in which architects from both the outsourcer as the service provider take place.

Consulting firms can be contracted to provide an objective assessment of the provision of services.

Termination
Agreements about the termination of the contract should be already made during the first phases of the outsourcing. According to HP the initial contract terms of outsourcing deals become increasingly shorter. It becomes however more common to prolong the initial contract after the first term.

3. Does the situation change if the outsourcer uses the services of multiple service providers?

In case multiple service providers are involved in the outsourcing all parties need to cooperate in order to accomplish a successful deal. The activities and results of service provider A can influence the activities and results of service provider B and vice versa. The satisfaction of the outsourcer is dependent on the activities and results of all service providers. Regular contact between all parties is necessary in order to successfully manage the deal.

IBM

Jeroen van der Meer

1. Which architect types exist and which activities do they perform?

The governance of an organization plays a very important role in the case of outsourcing. According to Jeroen van der Meer the governance cannot be guaranteed by the enterprise architects of an organization. In order to guarantee the governance a governance layer should be placed crosswise on top of the architecture layers. This governance layer can be used to split the architecture of the organization into smaller parts. In order to guard the coherence of the architecture, a holistic point of view is necessary.

According to Jeroen van der Meer the governance layer is used by so-called product managers or solution architects to take decisions about services and service level agreements. These product managers or solution architects are located in the demand-office of the outsourcer and the front office of the service provider.

2. Where should the architects be positioned during the phases of the Sourcing Life Cycle?

Jeroen van der Meer does not see an important role for the different architect types during the decision-making and the selection phase of the sourcing process. Architects are often only involved in the process if the decision to outsource is already taken by the highest management level of the organization. Sometimes the architects are asked to give advice on the definition of the scope of the outsourcing.

It is Jeroen van der Meer's experience that the provision of services is usually transferred to the service provider on an 'as is' basis. During the provisioning of services a possible transformation can take place.

The service provider mirrors the architect types of the outsourcer. The architects of the service provider are however not committed to a single organization but organized in industry or competence practices.

The communication between the architects of the outsourcer and the architects of the service provider takes place in so-called 'architecture boards'. These boards consist of architects from the outsourcer, the service provider, and occasionally of architects from third organizations (for example telephone or internet providers). In board meetings the architects focus on innovation and deliberate about new services or improvements for existing services. These boards often have an advising role. The final decisions are taken by the product manager or solution architect of the outsourcer.

3. Does the situation change dependent on the type of outsourcing?

The impact and the use of knowledge and experience of the architects of the service provider is strongly dependent on the type of outsourcing. In the case of a low-impact 'as is' outsourcing the role of architects from the service provider will be very limited. In the case of transformational outsourcing there will be more need for contact between the architect types of the outsourcer and the service provider.

4. Does the situation change if the outsourcer uses the services of multiple service providers?

It is theoretically possible that architects from multiple service providers take place in an architecture board, but according to Jeroen van der Meer's practical experience this is very uncommon. In the case of multiple sourcing most service providers communicate directly with the outsourcer. Communication between the different service providers is rare.

ING

Herbert van de Wetering

1. **Which architect types exist and which activities do they perform?**

At the moment ING is further professionalizing the classification of the different architect types. For this purpose they make use of the open TOGAF standard, which recognizes the following architect types: business architects, data architects, application architects and technology architects. It is the intention of ING to position these architect types across the entire organization and within the different Lines of Business. Although the functional areas are dependent on the architect type, the scope and the abstraction level of their activities is dependent on the position of the architect within the organization.

2. **Where should the architects be positioned during the phases of the Sourcing Life Cycle?**

Decision-making

Within ING the decision-making phase is split up in two different phases, namely the preparation and the assessment phase. The target of the preparation phase is the setup of a project organization with delegates of the different branches of the organization. During the assessment phase this project organization looks into the different ways that the outsourcing can be shaped.

Preparation

First of all it is important that the management is acquainted with the services that the architects can provide during the different phases of the outsourcing. Subsequently the needed capacity and availability of the architects is determined.

One of the most important activities of the decision-making phase is the definition of the scope of the outsourcing. The enterprise architecture of the organization is an important tool for the definition of the scope. The architecture can also be used as a tool to determine the feasibility of the outsourcing. The architects play an important advising and supporting role during the activities of the preparation phase.

Assessment

During the assessment phase the borders of the parcel are defined with help of the enterprise architecture of the organization. Subsequently a map is made of the services of the parcel and the interfaces between the parcel, the internal organization and the external service providers.

Selection

The selection phase is also split up in multiple phases, namely the selection, the negotiation and the contracting phase. During the selection phase service providers are asked to submit their answers to the RFI and the RFP. During the negotiation phase the negotiations and Due Diligence examinations take place. The final contract discussions take place during the contracting phase.

Selection

Based on the architecture of the organization the requirements of the RFI and RFP are formulated. These requirements are used to give an advice on the suitability of the different service providers.

Negotiation
During the negotiation phase it is the task of the architects to validate the service provider's answers on the RFP, for example by means of a visit to the service provider. Based on their experiences the architects give an advice on the suitability of the service provider.

Contracting
By means of the enterprise architecture a list of requirements is formulated for the outsourcing and the accompanying Managing Service Provision (MSP); the demand office of the outsourcer and the front office of the service provider. Simultaneously a specific migration plan is formulated for the transition of the services and the accompanying resources and employees.

Transition
The architects manage the transition in order to migrate the provision of services to the desired state. They make use of the migration plan which was formulated during the contracting phase. At the end of the transition phase the architects evaluate the current architecture of the provision of services and give advice on how to further improve the provision of services in the future.

Provision of services
ING has not yet determined its position on the specific role of architects during the provision of services.

Microsoft B.V.

Alfred de Jong
Sjors Dignum

1. **Which architect types exist and which activities do they perform?**

Microsoft B.V. has no practical experience with the roles of the domain architect and the workspace architect. Alfred de Jong and Sjors Dignum do however understand the roles and activities of these architect types.

It is very important that the different architect types dispose of a far-reaching mandate for their activities. Their role and position in the organization should be clearly described. Without such a mandate the role of architects is often wrongfully considered redundant, while their activities are in fact of big importance for the organization. Due to the lack of such a mandate architects often become involved in the sourcing process when the main decisions have already been made. Architects are often staff members who have no direct influence in the budgeting of the organization. Due to this they constantly need to prove the concrete advantages of the use of architecture in order to reserve the budget and manpower needed to implement their advices. In most organizations architects fulfill an advising role to the higher management.

2. **Where should the architects be positioned during the phases of the Sourcing Life Cycle?**

Decision-making
Architects play an important advising role during the definition of the scope of the outsourcing. They are responsible for the management of the continuance of the architecture of the organization. The 'blueprint' of the outsourcer should be guiding during the different phases of the Sourcing Life Cycle. If an organization already utilized a clear architecture before the outsourcing, little happens to the position and activities of the architects during the decision making phase.

Selection
The requirements of the RFI and the RFP are based on the existing architecture of the organization of the outsourcer. The architects play an important role during the selection and evaluation of the different service provider. If the architecture of the outsourcer contains serious shortcomings, this will often be revealed during this phase.

During the Due Diligence examination the architects of the service provider will test if the delineation of the parcel is clear enough. Simultaneously they will also test the maturity of the architecture of the outsourcer.

Transition

- Microsoft does not see a specific role for the architect types during an as is transition.
- If the provision of services of the outsourcer is integrated into the provision of the services of the outsourcer it is the task of the architects to manage the connection between the different architectures. A strong governance function is important in order to manage this type of outsourcing.
- In the case of a transformational outsourcing the architects of the outsourcer and the service provider will need to actively work together in order to safeguard the success of the outsourcing.

Termination

Architects should always be consulted during the termination of the sourcing deal. If no resourcing takes place the service provider will need to hand in his documentation. At the end of the termination phase the architecture of the provision of services should match the architecture of the outsourcer. This should be guaranteed by the architects of the outsourcer before resourcing, follow-upsourcing or backsourcing takes place.

PA Consulting

Willem van Asperen
Ruud Brink

1. Where should the architects be positioned during the phases of the Sourcing Life Cycle?[12]

Decision-making

Theoretically enterprise architects should be involved during the decision-making phase. It is however Willem van Asperen's practical experience that the decision to outsource is often already made by the highest level of management of an organization before architects are involved in the outsourcing process. Usually the outsourcer makes use of two separate teams during the decision-making phase: a background-team and a front-team. The front team takes the actual decisions for which they use the knowledge and experience of the background-team. In practice these teams are often put together as follows:

Background-team	*Front-team*
Enterprise-architect	Purchasing
Experts	Legal
HRM	Controlling

The activities of the enterprise architect in the background-team consist of the definition of the scope of the outsourcing and the observation of risks that can impact the phases of the Sourcing Life Cycle. The enterprise architect has an advising role, and it is of vital importance that he takes the political nuances of the organization into account. In order to be taken seriously by the boardroom and the front-team the right position of architects within the organization is of great importance. Architects should make sure that they are not just seen as an extension of the IT-department. Architects should provide a connection between the system analysts of the IT-department and the domain experts of the Business. Enterprise architects can be supported by the specific business knowledge of the domain experts. In practice this does not always happen because of the private and often even secret character of the possible outsourcing during the decision-making phase.

Selection

During the selection phase more architect types are involved in the sourcing process. This provides the enterprise architect with the possibility to consult other architect types within the organization. The primary activity of the architects during the selection phase is the examination of the architecture capabilities of the service provider during the Due Diligence examination. During this examination contact takes place between the enterprise architects and the engineers of the outsourcer and the service provider. The enterprise architects use the information and experience of the domain architects that are relevant for the scope of the outsourcing. These domain architects

[12] Because of unexpected time constraints of the interviewees the time in which this interview could take place was very limited. Unfortunately, not all questions and phases of the Sourcing Life Cycle could be discussed.

use the information and experience of the application architects that are entirely or partly involved in the outsourcing.

Twijnstra Gudde

Frank Willems

1. **Which architect types exist and which activities do they perform?**

The function of architects in the digital world can be compared to the function of architects in the physical world. The function of the workspace architect is often underestimated. A good architecture of the digital workspace is very important for the functioning of the organization and can strongly simplify the use of information systems for the end users.

Frank Willems finds it very important that the IT-department of an organization understands that the function of information systems is to support the processes and the employees of the organization. The use of IT should never be ultimate goal of an organization. IT is not the center of the world. The complexity of many Information systems is very high while the standardization level is very low. This shows that IT is still far from mature.

2. **Where should the architects be positioned during the phases of the Sourcing Life Cycle?**

Decision-making

Important questions that organizations need to ask during the decision-making phase are: What is the scope of the outsourcing? Where do we delineate the parcel? What are the risks of the outsourcing? What is the feasibility of the outsourcing?

It is important to consider that some solution architects are reluctant to participate because they are afraid that their own position will change due to the effects of the outsourcing.

Selection

The architects test if the responses of the service provider on the questions asked in the RFI and RFP are true and embedded in its organization. The quality of the service provider is of course very important, especially if the provision of services is integrated into the provision of services of the service provider. Architects play an important advising role during the selection phase.

Transition

Transfer

During the transfer phase a plan is formulated that describes the migration of the provision of services from the outsourcer to the service provider. The plan describes who is responsible for which part of the provision of services. It also describes all the interfaces between the parcel and the rest of the organization.

Transformation

During the transformation phase architects should pay special attention to the standardization of the provision of services. Dependent on the impact of the deal architects of the outsourcer and the service provider will have to work together in order to improve the provision of services.

Provision of services

During the provision of services the architects will introduce and assess changes in the provision of services. They should continually focus on innovation and standardization.

Termination

During the termination phase the architects will again evaluate the risks and feasibility of the different choices that the outsourcer can make: resourcing, backsourcing or follow-upsourcing.

UWV

Jacob de Boer

1. **Which architect types exist and which activities do they perform?**

Jacob de Boer describes architecture as: 'the expression of the thoughts about the IT provision'. The architecture of an organization needs to be clear and unambiguous in order to facilitate the dialogue between the policies and the actions of the organization. UWV does not make a sharp distinction between the different architect types. Jacob de Boer recognizes the described architect types but does not encounter all architect types within the organization of UWV. Because of the functional division of the organization of UWV the enterprise architect does not have the right mandate needed for the correct realization of his function.

Jacob de Boer explicitly states the importance of the infrastructure engineer. A common architecture is very important for the technical infrastructure. It is his practical experience that this architecture often missing, which can cause difficult problems.

UWV has chosen to employ a security architect. This security architect is directly responsible for the security of the organization.

2. **Where should the architects be positioned during the phases of the Sourcing Life Cycle?**

Decision-making
Architecture is a very important tool during the decision-making phase of the sourcing process. By means of principles and rules the architects safeguard the embedment of the outsourcing into the architecture of the organization. Architecture is not meant to enforce the service provider to use a specific implementation of the provision of services. It can however dictate requirements like: 'the service provider needs to use solutions supported by Microsoft or Oracle software'.

Selection
The selection phase of a European Tender consists of a very regulated, transparent and bureaucratic process. Because of the public and transparent character the RFI and RFP documents are very extensive. Within UWV architects do not play an important role during the formulation of these documents.

Transition
The costs of the migration and the implementation are for the account of the outsourcer. Architects of the outsourcer fulfill an important role. It is Jacob de Boer's practical experience that the architects of the service provider are often not involved in the outsourcing, among other things because a lack of quality. Service providers often omit to embed the provision of services at a high level within their own organization. Risk analysis and control is much more important for the service provider.

Provision of services
Due to the regulated and bureaucratic nature of a Europe Tender it is uncommon to change the provision of services during this phase. Contracts do provide the opportunity to alter the scale of the provision of services. Innovation and optimization however often only takes place at the end of the Sourcing Life Cycle. Because of this reason contract terms become increasingly shorter.

Termination

The termination phase is one of the most important phases of the Sourcing Life Cycle and should already be taken into account during the decision-making phase. The contract has to contain clear exit terms and conditions.

Undisclosed consultancy firm[13]

1. **Which architect types exist and which activities do they perform?**

Architects should make sure that their function does not become too theoretical. It is the firm's experience that architects often only provide fancy pictures, while the rest of the organization does not consider the architecture important for their activities. A good example of the successful use of architecture in the process of an outsourcing deal is the use of a 'Project Start Architecture' (PSA)[14] which embeds the provision of services into the existing architecture of the service provider.

Workspace architect
The parallel between the physical and the digital architecture is exaggerated in the case of the workspace architect. The function of the workspace architect does not fit the functions of the other architects within the organization. Instead the activities of the workspace architects should be performed by experts on the area of Human Computer Interaction. The activities of the workspace architect do not play an important role during the phases of the sourcing process.

Security engineer
Security is the responsibility of the enterprise architects. In some organizations this responsibility is detached from the enterprise architecture and embedded into a separate 'security office'.

2. **Where should the architects be positioned during the phases of the Sourcing Life Cycle?**

Decision-making
The main activity of the enterprise architect during the decision-making phase is the definition of the scope of the outsourcing. The enterprise architect has an advising role to the outsourcing team. If necessary the enterprise architect can be supported by one or more domain architects which can help with feasibility and risk analyses. It is however the firm's experience that this does not occur very often.

Selection
During the RFP the enterprise and domain architects of the outsourcer fulfill a strong advising role during the evaluation of the different service providers. During this evaluation they can make use of so-called 'knock-out' criteria. Dependent on the scale of the provision of services the service provider can put one or more solution architects into service which present the knowledge and experience of the service provider. During the Due Diligence examination engineers from both the outsourcer as the service provider will help with the risk analysis. They examine the assets of both organizations as well as the maturity level of the provision of services of the service provider. These engineers work under the supervision of the architects of the organization.

Transition

- In the case of an 'as is' outsourcing architects of both the outsourcer as the service provider fulfill only a limited role during the transition phase.

[13] Both the name of this firm and the persons interviewed are known to my supervisor.
[14] PSA is a concept within DYA of Sogeti.

- If the provision of services is integrated into the provision of services of the service provider the solution architects of the service provider play an important role.
- In the case of a transformational outsourcing regular contact takes place between the enterprise architects of the outsourcer and the service provider. Each enterprise architect stays into close contact with the domain architect and the solution architects of their own organization.

Provision of services

During the provision of services the architects fulfill a supervising role in which they focus on innovation and strategic plans. The architects can be supported by an external and independent party like a consultancy firm.