MASTER'S THESIS

An analysis of quality within an IT-sourcing relation through the ArchiMate value pattern language.

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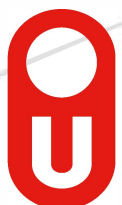
Een analyse van de kwaliteit binnen een IT-sourcing relatie door middel van ArchiMate waardepatronen.

An analysis of quality within an IT-sourcing relation through the ArchiMate value pattern language.

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Abstract

The sourcing of IT services is commonplace nowadays. Our research focuses on the perceived value of such services within IT-sourcing relationships and how these can be measured in order to create value for both client and provider. A modelling language within the field of Enterprise Architecture has been previously presented by Sales et al., called ArchiMate Value Pattern Language, and allows for the measurement of quality and visualisation hereof within a particular practical setting. Practical applicability of this modelling language is currently still lacking. Our research builds on the research of Sales et al. and through the use of Design Science Research Methodology aims to show a more practical application by presenting a case study. Our case study focuses on a IT-sourcing relationship within a Cloud solutions context where the provider offers the service of process mining.

A literature review is first conducted to create a framework of relevant quality dimensions within IT-sourcing relationships. The top dimensions for the analysis of perceived value were benefit/risk sharing, commitment, conflict management and the Service Level Agreement. These aspects are used in measuring the client's value perceptions regarding the service provided in the IT-sourcing relationship and are analysed and visualized through ArchiMate VPL. From our research we can conclude that using ArchiMate VPL is useful in analysing value in an IT-sourcing relationship and can benefit both client and provider by creating understanding of how value is added to the offering in the exchange.

Key terms

Enterprise Architecture, ArchiMate, Value Pattern Language, value modelling, IT-sourcing relationship, Cloud solution services

Summary

Understanding how value is created within an IT sourcing relationship and how involved parties perceive and measure this, can play a significant role in doing business for all stakeholders. It can contribute to a better alignment and understanding among involved parties and ensure a better end-to-end experience of the service provided. The challenge lies in the measurement hereof, since value is connected to quality, which in turn is not easily defined.

The modelling language ArchiMate is a standard within Enterprise Architecture and allows for the visualisation of complex business landscapes and processes. In this modelling language, the ArchiMate Value Pattern Language is designed for the modelling of value, which can be used for analysis and visual representations. Since the Design Science Research Methodology has guided the development of ArchiMate Value Pattern Language in the research of Sales et al., our research builds on a specific phase of this methodology, namely the build and evaluate loop. We realize this by the design of a case study, which enables us to analyse quality within an IT- sourcing relationship in a real life setting.

The objective of this research is to improve the understanding of the practical applicability of ArchiMate Value Pattern Language within IT-Sourcing, which currently is lacking.

We start our research with a literature study whereby we gather the main quality dimensions in the field of IT-sourcing. We have then used these quality dimensions in our case study to gain an understanding of their perceived importance by the client interviewees. Our case study consists of a process mining service being provided via Cloud to the client to analyse one of their financial business processes. Through the case study method along with 4 rounds of interviews for information gathering, we can apply ArchiMate VPL to depict perceived value in our IT-sourcing relationship between on one hand a provider of a Cloud-based service, and on the other hand the client. The first 3 interviews provided information to incorporate into our value patterns. Through these value patterns and analysis of different pattern components, we were able to conclude a 76,2% score as the experience value for the IT sourcing relationship given by the client.

Following interview 3, the interviewees of the case study (both client and provider) finally evaluate the application and use of ArchiMate VPL through a set of questions that measure "Perceived Ease of Understanding", "Perceived Semantic Quality", "User Satisfaction", and "Perceived Usefulness". Both client and provider acknowledged the benefit of using ArchiMate VPL and experienced no challenges understanding the patterns. This was mainly due to the familiarity of the topic of Enterprise Architecture. Further they concluded that ArchiMate VPL is a good tool to identify opportunities where value can be improved in the IT sourcing relationship.

Since we were only able to carry out a single case study, we cannot yet make any generalizations. As research progresses in this field in the future, more Cloud specific quality variables will arise, and as a result, will make our patterns more Cloud specific and hopefully generate reusable value patterns.

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1. Introduction

1.1.   Background

Traditionally, organizations were forced to acquire costly information technology (IT) resources on-site, which consisted of a platform and infrastructure for the testing, development and maintenance of software applications. Nowadays, as a result of ongoing technological innovations, organizations aim to avoid such large investments with uncertain returns (Lacity, Khan, Yan, & Willcocks, 2010).

Consequently, over the years, IT-sourcing has become a general discipline in the field of management. Many corporations and government agencies allocate the majority of their IT expenditure to IT-sourcing (Lacity et al., 2010). Reasons for organizations to choose a form of IT-sourcing, and to partner up with such companies, often has to do with lowering costs, exploiting core competencies, accessing expertise, or strengthening competitive advantage (Alborz, Seddon, & Scheepers, 2003). More recently, increased adoption of cloud computing is creating rapid changes in the IT services industry. The way in which organizations pay for and access IT services has shifted greatly through Cloud computing (Dhar, 2012). These IT services and resources refer to infrastructure (IaaS), development platforms (PaaS), and applications (SaaS) that are accessed remotely by customers through the internet (Schneider & Sunyaev, 2016).

Literature shows that IT-souring and cloud computing share many common characteristics and users enjoy many similar benefits. To a very large extent, research findings on the adoption of IT-sourcing therefor apply to the adoption of cloud computing (Schneider & Sunyaev, 2016).

The global growth of IT-sourcing has led to much research and the identification of many factors indicating related successes and failures. Understanding how IT-sourcing client-vendor relationships are influenced, and by which factors, is very useful for companies to understand outcomes of such projects. The quality of the service provided by IT-sourcing vendors, influences the quality that the client can produce when it comes to their business processes. Goetsch and Davis (2010) state that quality can be associated with products, services, people, processes, and environments. Quality produces value when customers' needs and expectations are met in regards to costs, service and quality (Goetsch & Davis, 2008). This definition of quality was taken as a starting point when searching for quality aspects in an IT-sourcing setting, as will be presented in chapter 2.

1.2.   Exploration of the topic

The concept of IT-sourcing and the outsourcing of IT are not fully interchangeable. Sourcing includes outsourcing yet covers a wider range of relationships than traditional outsourcing. Sourcing can be defined as "an arrangement in which one company provides services for another company that could also be provided in-house"(Kumar et al., 2002, p.12). IT-sourcing services include for instance designing technology infrastructure (Kumar et al., 2002), and the more recent Cloud services. Cloud services refer to services such as software and platforms, provided to clients through the internet.

IT outsourcing has been defined as "a decision taken by an organization to contract-out or sell the organization's IT assets, people, and/or activities to a third party supplier, who in exchange provides

and manages assets and services for monetary return over an agreed time period" (Lacity et al., 2010, p.396). This exchange requires a relationship between client and supplier, at least for the duration of the outsourcing contract. According to Henderson (1990), an effective relationship is a key solution to the success of any IT infrastructure integration. This paper focuses on quality within such IT-sourcing relationships.

Scholars have studied the risks and advantages of IT-sourcing and thereby have also analysed factors that influence IT-sourcing relationships. Alborz, Seddon and Scheepers (2003) for instance, have integrated the work of different authors and developed a model, which includes different factors and attributes, to explore IT-sourcing relationships at an operational level. Understanding how these factors can produce the desired effects of IT-sourcing, and measuring these outcomes, is valuable for management.

A limiting factor for the studies used by Alborz, Seddon and Scheepers (2003), is that they have been rather static in their nature. Analysing quality and value perceptions, are of a dynamic nature according to Goetsch and Davis (2010). Quality is seen as continual improvement in their perspective and needs to be managed. This perceived quality can be modelled through different means.
IT-sourcing affects an organization's Enterprise Architecture (EA) and vice versa. EA is concerned with the relationship between an enterprise and its IT resources, and their alignment (Lankhorst, 2013). Since this paper builds on research within the field of EA, the means of modelling value will be explored within this same field of EA. Specifically within the business layer of the EA modelling standard ArchiMate, since we are interested in how value is created for businesses, and this layer allows for the linking of an organisation's operations to its business goals through the concept of value (Sales et al., 2019).

ArchiMate is a uniform and straightforward language for modelling and visualising EA within six layers, namely Strategy, Business, Application, Technology, Physical and Implementation & Migration (Sales et al., 2019). As mentioned, the business layer within ArchiMate can be used to model value patterns, as this layer includes professional services being offered to customers (such as IT-sourcing services), which are being realized through business processes.
The use of ArchiMate in general is not bound to a particular context, yet will only be used in this paper within the context of IT-sourcing (*Open Group Standard (ArchiMate)*, 2017). Sales et al. (2019, p.2) have identified a growing interest in modelling value within EA and explain in their research that "the notion of value enables the alignment of the Architecture Vision with the Business Architecture of an organization, which is needed for a company to deliver a positive end-to-end experience to their customers".
This research will therefor analyse value perceptions within an IT-sourcing relationship through ArchiMate Value Pattern Language (VPL) (Sales et al., 2019). The patterns, as part of the proposed ArchiMate VPL, can be combined and connected within a particular context, thus creating a pattern language, which can be used to visualize value. Value creation for stakeholders can be represented in this way.

1.3.   Problem statement

ArchiMate VPL has been theoretically established, yet what seems to be lacking in existing literature is the evaluation of its practical applicability (Sales et al., 2019). The development of ArchiMate VPL follows the Design Science Research Methodology (DSRM), which includes specific guidelines and, more specifically, allows for the development and evaluation of the pattern language. Within the Information Systems (IS) discipline, the design-science paradigm allows for the creation of new and innovative artefacts. These artefacts, such as ArchiMate VPL, can be assessed and refined through for instance research conducted via case studies within an IS research framework. This refinement will increase and improve knowledge about the practical applicability of ArchiMate VPL. This will add value to the knowledge base about the usefulness of ArchiMate VPL and contribute to the iterative process of the design and evaluate loop in the DSRM (Hevner, March, & Ram, 2004).

In summary, this paper seeks to reduce this gap in existing literature by answering the following research question: *"How is ArchiMate VPL applied and evaluated within a practical Cloud Solutions context?"*

1.4.   Research objective and questions

The objective of this research is to investigate the practical applicability of ArchiMate VPL within IT-sourcing, more specifically, in a Cloud solution setting. Currently this knowledge is limited and needs further research. A case study will therefore contribute to this research. ArchiMate VPL allows for different analyses to be done whereby value creation is identified (Sales et al., 2019). Managers will be able to better understand how value is created for all stakeholders involved.

Through a literature review we first need to identify which factors influence the quality of IT-sourcing relations in a Cloud solutions context. The following research question is derived from the main research question and will guide the theoretical framework in this paper.

"Which aspects are relevant to analyse the quality of the IT-sourcing relationship in a Cloud solutions context?"

The usefulness of ArchiMate VPL will be researched through a case study where the client outsources the analysis of their Procurement-to-Pay (P2P) process. This analysis is done through the process mining of the ERP data of the client by means of Cloud computing. The goal for the client is to discover bottlenecks and gauge the efficiency of the current process. This will impact the business and will support the department's strategy of minimizing costs and process optimization. The provider of this service aims to deliver high quality and a reliable analysis. The case study is set in the final stage of the IT-sourcing relationship. The client will judge the quality of the service delivered. This perceived value will be modelled by ArchiMate VPL and its usefulness will be judged by the provider. This leads to the following sub-question that will be answered in this research:

"How can ArchiMate VPL be used in modelling value perceptions within the context of a Cloud-sourcing relationship?"

1.5.   Motivation/relevance

Researching the problem statement presented in 1.4, we have found there to be a theoretical as well as practical relevance. Theoretically, as touched upon in 1.3, ArchiMate VPL is strongly substantiated, whereas little evidence of its practical applicability exists. This research contributes to the latter by evaluating the pattern language through a case study.

Only recently, the modelling of value in the context of EA gained interest. The theoretical relevance of our research lies in the fact that the concept of value, bridges the gap between on one hand the goals that an organization has, and on the other hand the processes that are needed for these goals to be met (Sales et al., 2019). Companies invest in IT-sourcing to contribute to attaining their goals. There are different reasons why IT-sourcing relations oftentimes fail rather than succeed (Alborz et al., 2003). Understanding how different factors influence the value added by such services and the extent to which these relationships are considered successful, is valuable for all parties involved.

From a practical standpoint, businesses would gain from understanding what influences the client's perceived value and what can be done to lower the failure rate.

Further, the findings of the demonstration through the case study can in a practical sense facilitate the improvement of the relationship between involved parties in the IT-sourcing context. This in turn can improve the delivered service to the end user and contribute to overall outsourcing success (Vorontsova & Rusu, 2014). Gaining an understanding of this in the context of Cloud-sourcing will be valuable in this current technological climate and will help companies make more effective decisions. In recent years Cloud computing has represented a new and advanced means to outsource IT resources. Existing literature shows that there is not much written about Cloud-sourcing as an alternative form of IT-sourcing, though it seems to have great potential. A comparison between the two in regard to analyzing value perceptions, especially in the different stages of the IT-sourcing relationship, would be of great value for future studies to build on.

1.6.   Main lines of approach

In order to become familiarized with existing theory and to gain an understanding of which aspects are relevant to analyse quality in IT-sourcing relationships, a literature review will be conducted and discussed in chapter 2. Next the methodology of this research will be outlined in chapter 3 and a case study will be set up within the Design science research guidelines. The results of the case study will be discussed in chapter 4. Here we will demonstrate the use of the ArchiMate VPL and evaluate its application. Finally, chapter 5 will present a conclusion to the research questions. We will also present recommendations for future research.

2. Theoretical framework

In this chapter, through existing scientific literature, we explore specific aspects of quality within IT-sourcing relationships, which form our theoretical framework.

2.1. Research approach

In developing a theoretical framework, an evaluative review of the current literature is necessary to provide an in-depth understanding of previous scientific work, relating to the research subject and objectives chosen (Saunders, Lewis, & Thornhill, 2008). The main question driving this research is *"How is ArchiMate VPL applied and evaluated within a practical Cloud Solutions context"?* More specifically in this theoretical framework we focus on the following sub-question: *"Which aspects are relevant in order to analyse the quality of the IT-sourcing relationship in a Cloud solutions context"?*
The aim of this section is to first explore existing literature surrounding IT-sourcing relationships and quality aspects, as this will allow us to establish what research has been previously done and to see how to relate this to our own research. This literature search will result in an understanding of which quality aspects are believed to be relevant in terms of IT-sourcing relationships and the success thereof.

In conducting the literature review, a search strategy is an important first step in the process. A systematic search according to Moher et al. (2009), and their flow diagram was adopted. The use of this flow diagram allows the number of literature pieces reviewed, to pass through four different stages, in order to come to a final selection (Moher, Liberati, Tetzlaff, Altman, & Grp, 2009). This process has resulted in the final selection discussed in chapter 2.3.

Stage 1	Stage 2	Stage 3	Stage 4
Identification of # of records	Screening of # of records	Eligibility of assessed articles	Included # of studies

Figure 1 Flow diagram stages for reporting a Systematic Review (adapted from Moher et al. 2009)

For the identification stage, the selection of a main electronic database, Google Scholar in our case, is the starting point, as this allows one to search in a wide variety of journals, books, manuscripts, and conference proceedings. Parameters were not specifically set, in order to get a broad search, however the language was set to English, as this is the internationally accepted standard language within the field of scientific research. The publication period of the past 20 years was considered (1999-2019), with the odd exception in the case of a more "general theory or philosophy". The purpose of this setting was to ensure a high level of relevance.

Next, search terms were then generated and grouped together, according to the building blocks method, to form several search queries and to find relevant literature. Even slight deviations in search term combinations generated some different results.
The search term "IT-sourcing" was paired with other search terms in Google Scholar to form two initial queries. As the search progressed, the third query was added to perform a narrower search and to check whether this would generate any new useful results. This query combination helps to understand links between the aspects of quality and IT-sourcing and how they influence IT-sourcing relationships.
We did not incorporate the search term "cloud computing" since research within that context is rather scarce still. Even recent articles identify a gap in the literature when it comes to analysing quality

within an IT-sourcing relationship in a cloud-computing context. Schneider and Sunyaev (2016, p.17.) have shown that most "determinant factors of sourcing decisions in the IT outsourcing context remain valid for the Cloud Computing context". They suggest Cloud Computing researchers should draw from research on IT outsourcing decision making but re-evaluate these concepts in light of the particularities of Cloud computing.

Combinations resulting in relevant literature were:
1"Quality" AND "IT-sourcing"
2"IT-sourcing" AND "quality determinants"
3"IT-sourcing relationship" AND "quality" AND "value"

The university's library was also utilized when a paper seemed to be relevant, yet was not fully available online. For the first query, used in Google Scholar, 27 papers were assessed for relevance. This query is the most general and resulted in a broad search with a lot of overlap with other queries. For this reason, the screening of articles for the other queries was done in a less structured manner and papers from those queries were just selected on the basis of perceived relevance in terms of title and highlighted search words shown by Google scholar.

After the selected set was screened, the papers were assessed according to the selection criteria chosen and were then narrowed down according to relevance. Besides the publication quality check (i.e. the name of the journal and conference proceedings should be known), the selection criteria consisted of the presence of these points and were answered with yes or no:
-are quality aspects covered in the paper?
-are the mentioned quality aspects measurable?
-is there a link present with the concept of value?
-can the paper be linked to IT sourcing in a Cloud context?

The above selection criteria ensure that the selected papers cover the aforementioned research questions and provide insights into which aspects are relevant in order to analyse the quality of IT-sourcing relationships in a cloud computing context. For a paper to be considered relevant, it had to at least cover three of the four selection criteria in order to be considered for the final set (see appendix 1). Further, papers that were not fully available for access were also omitted from the final selection.

Due to time limitations and vast quantities of papers offered by Google Scholar, so-called stop criteria had to be maintained in order to scope the literature search. Initially in Google Scholar the top 20 results per query were considered, depending on the number of results per query. This number would drop as the query would yield less than 20 papers.

2.2.   Implementation

Originally there were two relevant queries in the Google Scholar search. A third was added at a later stage with more specific search terms to narrow down the search. The search terms selected were derived from the research question and sub-questions.
The table below shows the number of papers generated per query and the number of papers used in the final selection.

Table 1 Implementation results of the search queries

Original search query:	# of papers generated	# Relevant papers used
"Quality" AND "IT-sourcing"	2940	6
"IT-sourcing" AND "quality determinants"	7	2
Additional search query:		
"IT-sourcing relationship" AND "quality" AND "value"	29	1

The papers that were selected based on the chosen selection criteria per search query can be found in the table below.

Table 2 Final set of papers used for the Theoretical Framework

Search query:	
"Quality" AND "IT-sourcing"	Lacity, Willcocks & feeny (1996)- *The value of selective IT-sourcing* Park & Kim (2005)- *The impact of IS sourcing type on service quality and maintenance efforts* Lee & Kim (1999)- *Effect of Partnership Quality on IS Outsourcing Success: Conceptual Framework and Empirical Validation* Chakrabarty, Whitten & Green (2008)- *Understanding Service Quality and Relationship Quality in is Outsourcing: Client Orientation & Promotion, Project Management Effectiveness, and the Task-Technology-Structure Fit* Alborz, Seddon & Scheepers (2005)- *The Quality-of-Relationship Construct in IT Outsourcing* Goo, Huang & Hart (2008)- *A path to successful IT outsourcing: interaction between service-level agreements and commitment*
"IT-sourcing" AND "quality determinants"	Linden, Schmidt & Rosenkranz (2017)- *Outsourcing 2.0: Towards an Innovation-Driven Process Model for Client-Vendor Relationships in Information Technology Outsourcing* Zhong and Myers (2016)- *Client-Vendor relationships in Cloud Computing: lessons from IT-Outsourcing*
"IT-sourcing relationship" AND "quality" AND "value"	Lane & Lum (2011)- *Examining client perceptions of partnership quality and the relationships between its dimensions in an IT outsourcing relationship*

The selection criteria scores per selected paper are shown in Appendix 1.

2.3.   Results and conclusions

The final selection, chosen for the basis of our theoretical framework, is discussed in this part of the chapter. Per paper, the quality aspects found are discussed and elucidated. The measurability and degree thereof, as part of the selection criteria, is put forth in this section as well. We also look at how the quality aspects can specifically be linked to the concept of value. In this respect, Sales et al. propose an analysis requirement for the ArchiMate VPL, which includes that the modeling language should allow for a manual or automated analysis of what the user is trying to realize. More specifically, design-time value analysis, allows for value creation maximization by providing the organization an understanding of how its offerings can be improved so that value is created for its stakeholders. Besides this, a run -time value analysis refers to the requirement where an organization should "be able to identify which indicators it needs to monitor value creation for a given stakeholder, so that it can detect deviations from planned experiences, as well as identify opportunities for innovation" (Sales et al., 2019, p.6).

This will be especially important when, in the coming research phase, the practical use of the ArchiMate VPL will be examined further.

Lacity, Willcocks and Feeny (1996) have written about the value of selective IT-sourcing, meaning managers should not have an "all or nothing" approach, but activities should be carefully selected when it comes to IT-sourcing. Selecting the right type of contract, in regard to the sourcing scope, is imperative to the success of IT-sourcing. According to their research, this selective picking of activities, together with the length of the contract, choosing to involve a supplier or contractor (inbound or outbound), depends on the technical maturity of the activities, and the degree of integration with other systems and process throughout the organization (M. Lacity, Willcocks, & Feeny, 1996).

Their research expresses creating value in a financial sense whereby cost savings are measured and compared throughout the sourcing scope. Lacity, Willcocks and Feeny (1996) conclude, through a multiple case study approach, that selective sourcing results in the largest number of companies meeting or exceeding their estimated cost savings. Generally, for most companies this is a prioritized goal when opting for IT-sourcing, and value is created when this goal is attained.

This paper is included in the theoretical framework because Lacity, Willcocks and Feeny (1996, p.18) do mention the capability of monitoring and managing contractual relations as being a risk in certain types of IT-sourcing. Also, the importance of enterprise architecture is evident in this research as the article considers the contribution of the IT-sourcing activity on different levels. Even though this research is over 20 years old, its relevance could still apply to a current Cloud-solutions context, as this type of sourcing can be categorized, according to the finding of Lacity, Willcocks and Feeny (1996, p. 18) as a preferred supplier strategy, where the degree of technology integration is high and an incentive-based contract defines complementary goals. Deciding on selective IT-sourcing as a strategy and understanding how this would create value for stakeholders, together with the discussed factors that affect quality and success, means we can link this to the design-time value analysis requirement for ArchiMate VPL (Sales et al., 2019, p.6).

Park and Kim (2005) present in their research that service quality is seen as the difference between the user's expectation, and their perception of the service provided. Service quality together with maintenance efforts contribute to the effectiveness of IS-sourcing. Maintenance effort is measured

using the number of user requests for system maintenance on one hand, and the numbers of system maintainers logged into maintenance tasks on the other hand (Park & Kim, 2005, p. 265).

Park and Kim (2005, p.271) find that, depending on the type of IS-sourcing, meaning either insourced or outsourced systems, the differences in service quality were significantly larger than in maintenance efforts. Contributing factors to the level of service quality and maintenance efforts across system types were "system age" and "system size". In regard to the consistency in maintenance efforts, Park and Kim (2005) explain that software maintenance occurs closely to the development thereof, whereby maintenance costs can be reduced by clearly defining and documenting software architecture. This cost reduction in turn adds value (Park & Kim, 2005).

In principle, the aspects discussed by Park and Kim (2005) could be mapped into ArchiMate constructs and could prove to be interesting in a cloud-computing context. For the use of ArchiMate VPL, the quality aspects from this paper by Park and Kim (2005) could be useful for monitoring value creation through a run-time value analysis (Sales et al., 2019, p.6).

One of the main contributing works used in this theoretical framework is by Lee and Kim (1999). They have explored the effect of "partnership quality on IS outsourcing success" and see partnership quality as a dominant predictor. According to Lee and Kim (1999), partnership quality has two dimensions, namely "fitness of use", meaning the degree to which the outcome of a relationship matches expectations, and "reliability", meaning a partnership without deficiencies. In conducting their research, they tested a set of hypotheses on partnership quality among 74 IT-outsourcing relationships, from both client and provider perspectives.

Lee and Kim (1999, p.46) address five factors in their model of which partnership quality consists, these being trust, business understanding, benefit and risk sharing, conflict and commitment.

Their research adopts a more social rather than economic perspective and factors as participation, communication quality, information sharing, cultural similarity and top management support seem to positively influence partnership quality. Partnership quality is negatively affected by the age of the relationship and the degree of mutual dependency (Lee & Kim, 1999, p.53).

Since the factors mentioned can be used to monitor quality and value created for the stakeholders involved, a run-time value analysis could be performed by ArchiMate VPL (Sales et al., 2019, p.6).

Quality is a well-formulated topic in the work of Chakrabarty, Whitten and Green (2008). Their research distinguishes between service quality and relationship quality, how these relate to each other, and how these two dimensions of outsourcing relationships impact user satisfaction. This paper builds on findings by Lee and Kim (1999) and Park and Kim (2005) in conducting their own research in the field of outsourcing.

The paper by Chakrabarty, Whitten and Green (2008) refers to repeated interactions with the client in terms of face-to-face meetings, socializing with the client, communicating the virtues of one's services, as "client orientation and promotion", and this in turn positively moderates the causal effect of service quality on relationship quality.

Further dimensions that are said to impact the quality of the relationship include trust, commitment, communication quality, cultural similarity, and balanced interdependence.

Project management effectiveness is thought to mediate the positive causal effect of relationship quality on service quality. Project Management capabilities involve the "planning, execution, monitoring, and controlling of a project by the optimum use of tangible resources (time, finances, personnel, infrastructure, documented knowledge, etc) and intangible resources (tacit knowledge, tacit management skills, etc) to achieve the desired quality within the budgetary and schedule constraints" (Chakrabarty, Whitten, & Green, 2007,p.3).

Chakrabarty, Whitten and Green (2008, p.4-5) explain using two instruments to measure service quality, SERVPERF and SERVQUAL, and a scale was selected to measure relationship quality.

In regard to the ArchiMate VPL, the factors of relationship quality discussed in the paper by Chakrabarty, Whitten and Green (2008), can mainly be applied to existing relationships to monitor value created, and thus can be linked to a run-time value analysis (Sales et al., 2019, p.6).

Alborz, Seddon and Scheepers (2005) have studied the "quality -of-relationship" as a factor that influences the success of IT-outsourcing projects, since its effect has been widely argued. The "quality-of-relationship" is defined as "the degree to which both client and supplier managers regard the relationship as positive and constructive" and is seen as a management-controllable factor (Alborz et al., 2003, p.1121).

Alborz, Seddon and Scheepers (2005, p.1121) have collected 49 "quality of relationship attributes" from their literature review and have conducted interviews with 29 managers, from both client and vendor perspectives, to obtain a final set of 10 key attributes.

The ten key attributes of the concept "quality-of-relationship" that were chosen are: communication, trust, personal bonds, commitment, conflict resolution, flexibility, participation, information sharing, cooperation and listening. They argue that together with these key attributes, and the development of a scale for the measurement of "quality-of-relationship", relationships can be made more successful and value can be created (Alborz, Seddon & Scheepers, 2005, p. 1129).

Even though these attributes could technically be applied to different stages in the IT-outsourcing relationship, the research has tested and developed them from more established relationships. Therefor it would make more sense to use these aspects for a run-time value analysis by means of the ArchiMate VPL (Sales et al., 2019, p.6).

The study done by Goo, Huang and Hart (2008) explains a research model where the importance of commitment and understanding its dynamics in relation to IT-outsourcing relationships, is put forth. This article explains how commitment interacts with other control mechanisms, like Service Level Agreements, and how these can affect the outcome and success of IT-outsourcing (Goo, Huang, & Hart, 2008). The research model presented by Goo, Huang and Hart (2008) divides IT-outsourcing success into functional benefits, strategic benefits and technological benefits.

SLA characteristics, consisting of foundation characteristics, change characteristics and governance characteristics, are depicted as the independent variable in their research model. Commitment is viewed as the moderating variable and IT-outsourcing success and benefits are seen as the dependent variable in their research model.

Goo, Huang and Hart (2008, p.470) state that "commitment can guide the use of contracts to align actions in outsourcing relationships" and stimulates proactive behaviour by the outsourcing partners beyond what the contract suggests. Even though commitment is an important aspect in terms of IT-outsourcing success, companies can be too committed in IT-outsourcing relationships and additional investments made by the parties involved can cause difficulty in the ability to adjust to changing conditions and needs beyond initial SLA's.

The SLA characteristics in this model, together with the commitment factor, of which its degree can either add value or detract from the success of IT-outsourcing relationships, do cover different phases of the contract. In regard to ArchiMate VPL (Sales et al., 2019, p.6), the paper by Goo, Huang and Hart (2008) does speak of existing contracts and relationships, meaning the researched aspects can be used for a run-time value analysis.

Linden, Schmidt and Rozenkranz (2017) acknowledge the client-vendor relationship to be a key success factor for IT-outsourcing success. They explore a different direction when it comes to IT-outsourcing and focus on the "joint identification and exploitation of innovative, IT-based ideas to generate additional value for the organization and strengthen its market competitiveness" (Linden, Schmidt & Rozenkranz, 2017, p.39). Their research shows how the client-vendor relationship should be modelled, structured and managed to encourage innovations within IT-outsourcing (Linden, Schmidt, & Rosenkranz, 2017).

Linden, Schmidt and Rozenkranz (2017) explain different phases in their "ITO Relationship Process model", which are outsourcing strategy, contracting, transition, service delivery and an overarching phase, namely, outsourcing governance. The governance phase is said to be critical for the success of the client-vendor relationship. This particular phase enables a joint leadership whereby effective decisions can be made in reaction to changing business requirements.

The Innovation-driven process model for IT-outsourcing client-vendor relationships identify different factors per phase that drive innovation, with a total of 37 factors (Linden, Schmidt & Rozenkranz, 2017, p.49).

Innovation-driving factors for the outsourcing strategy phase consist of: compatibility of corporate cultures, communication between business and IT, strategic portfolio planning, innovation outsourcing strategy, innovation tendency, experience, complementary knowledge between client and provider, geographical distance, technological compatibility, focus, IT contribution to performance, company size (Linden, Schmidt & Rozenkranz, 2017, p.50).

Innovation-driving factors for the contracting phase consist of: a common vision, risk and reward sharing, contract setting, compatible roadmap, innovation agenda, use of evaluation catalogue (Linden, Schmidt & Rozenkranz, 2017, p.53).

Innovation-driving factors for the transition and service delivery phase consist of: knowledge absorption, network collaboration, proactivity, relationship flexibility, infrastructure provision, information sharing, client-provider mediation, and client's leadership (Linden, Schmidt & Rozenkranz, 2017, p.55).

Finally, the model identifies the following innovation-driving factors in the governance phase: trust, top management support, interfirm teams, evaluation of provider, IT innovations tracking, trainings, process specialists, common agreements, knowledge management, guidelines, and conflict management (Linden, Schmidt & Rozenkranz, 2017, p.57).

The factors discussed in this study cover different phases of IT-outsourcing relationships, which would mean all three types of analyses used for ArchiMate VPL could be linked to this paper. However, the paper does mention that the governance phase is critical to the IT-outsourcing relationship's success, so a focus should lie on the innovation driving factors for this particular phase, being linked to a run-time value analysis by means of the ArchiMate VPL (Sales et al., 2019, p.6).

Zhong and Myers (2016) have written about the client-vendor relationship in a cloud computing context. They address the notion that there is a divide in the way Cloud computing is perceived as some researchers have described it as a paradigm shift, while others have argued it to be another form of IT outsourcing (Zhong & Myers, 2016, p.4). Zhong and Myers (2016) position their starting point in the middle and believe in a combination of, on one hand cloud computing being a "new delivery model of IT resources", while also drawing from previous lessons taken from studies in outsourcing since cloud computing and IT-outsourcing share common characteristics. Their research uses two most common theories to explore IT outsourcing relationships, these being social exchange theory and relation exchange theory. In Social exchange theory, trust and commitment are viewed as central elements. Cooperation is seen as a key attribute (Zhong & Myers, 2016).

Zhong and Myers (2016) have drawn from existing studies that have sought to identify factors related to client-vendor relationships and have found four of those to be the most relevant for cloud computing. The factors are commitment, cooperation, cultural compatibility and trust (Zhong and Myers, 2016, p.6-8).

The factors mentioned in this study by Zhong and Myers (2016) are taken from previous studies where IT-sourcing relationships have been well established. However, in the context of Cloud computing, the relationships are not mature yet and these quality aspects are therefore useful for a design-time value analysis by means of the ArchiMate VPL (Sales et al., 2019, p.6).

Lane and Lum (2011) have empirically researched the "multidimensionality of partnership quality in IT outsourcing arrangements and the relationships between these dimensions of partnership quality" (p.5). Their research builds on that of Lee and Kim (1999), as discussed previously in this chapter, and focusses on the psychological dimensions as being the key determinants of partnership quality (Lane & Lum, 2011).

Lane and Lum (2011) performed a national survey from the perspective of the client organizations. The analysis technique "partial least squares" was used to identify significant relationships between the dimensions of partnership quality (Lane & Lum, 2011, p.5). The dimensions of partnership quality discussed in the research are Trust, Shared Business Understanding, Mutual Benefits and Risk sharing, Dysfunctional Conflict, Functional Conflict, and Behavioral Commitment and Temporal Commitment (Lane & Lum, 2011, p.15). The main relationship links established are that trust and shared business understanding are key drivers that ensure mutual benefits and risk sharing are attained and conflict is minimized. This leads to high quality and a successful partnership between client and vendor (Lane & Lum, 2011, p.27). Lane and Lum also conclude that an ongoing temporal commitment of the partnership is sustained through behavioral commitment to the contract (Lane & Lum, 2011, p.28).

The identified quality aspects can prove to be of use when conducting a run-time value analysis by the use of ArchiMate VPL, because as the paper by Sales et al. (2019, p. 6) explains, this type of analysis can be done for existing IT-sourcing relationships.

In conclusion, this literature search has led to an understanding of which factors are relevant in terms of analyzing quality in IT-sourcing relationships. In terms of relationship quality, different aspects have been identified. In appendix 3, a table of all factors can be seen. All factors that were found only once were eliminated in order to form the final set, which will be used for our future research in analyzing the quality of cloud-sourcing relationships.

Table 3 Final set of quality aspects for the theoretical framework

Contract type	Benefit & risk sharing	Communication quality	Mutual dependency	Innovation	Business understanding
Selective activities	Conflict management	Information/ knowledge sharing	Flexibility	Compatibility	Top management support
Trust	Commitment	Cultural similarity	cooperation	Participation	Service level agreements

It should be noted however that conducting this review, according to the flow diagram developed by Moher et al. (2009) mentioned in chapter 2.1, is an iterative process and this original review and quality aspects may need to be modified in the future with additional search queries, as the research progresses into the specific context of Cloud-computing.

2.4.   Objective of the follow-up research

The objective of this literature review has been to identify aspects that influence relationship quality in IT-sourcing. Now that this step is completed, we can use this list of aspects and gather information about the perception regarding quality in IT-sourcing relationships and identify to what extent these aspects are relevant in a practical cloud-computing setting, since, as we have posed in chapter 2.1, research surrounding this context is still quite scarce

The goal, as our research progresses, is to set up the methodology in chapter 3, in order to analyse the application of the ArchiMate VPL and to evaluate the results in a Cloud solutions context. A case study will be set up and the quality aspects identified in this chapter will be used to measure and to model perceived quality for the customer of the provided service. More specifically, the quality aspects will be used in the case study's first interview to identify the gap between perception and experience of those quality dimensions in our framework through using the SERVQUAL model. Further in the case study, these quality aspects are linked to our ArchiMate VPL models and the results of the gap analysis will be used to provide the supplier with additional information regarding the quality of the service provided within the IT-souring relationship.

The case study will provide a practical setting for the application of the ArchiMate VPL and will be presented in chapter 4.

3. Methodology

3.1.   Conceptual design: select the research method(s)

The objective of this research is the practical application and evaluation of ArchiMate VPL within a cloud-computing context. The reason behind this, is that the ArchiMate VPL is strongly theoretically substantiated, yet an evaluation of the practical application thereof is lacking. What we have done in chapter 2 is determine which quality criteria are relevant for an IT-sourcing context in order to analyse value created through a service for an organisation. In this particular chapter, the methodology for our research will be outlined.

According to Hevner et al. (2004) two paradigms, behavioural science and design science, lie at the foundation of research in the field of information systems. Sales et al. (2019) have used Design Science Research (DSRM) to design the ArchiMate VPL. They have set requirements for the ArchiMate VPL and have presented the use and combining of individual modelling patterns within an example case study. The reason that this paradigm fits our research, which builds on the previous research of Sales at al. (2019), is because we are exploring the use of the ArchiMate VPL as an artifact (see further explanation below), and we aim to show its utility through evidence obtained from real world examples. DSRM allows for practical evidence collection and the analysis of weaknesses of an artefact's design.

The design science paradigm seeks to solve problems and create "innovations that define the ideas, practices, technical capabilities, and products through which the analysis, design, implementation, management, and use of information systems can be effectively and efficiently accomplished" (Hevner et al., 2004, p81.). These so-called artifacts are defined in IT as "constructs, models, methods and instantiations" and are often complex in their design. IT artifacts enable researchers and practitioners to understand the issues connected to developing and implementing information systems. The ArchiMate VPL is considered an IT artifact, of which the final design is established by means of iterative cycles of "build-and-evaluate" (Hevner et al., 2004). Demonstrating its feasibility through instantiations, an artifact's suitability to its intended purpose can be assessed. This "build-and-evaluate" loop is useful as continuous evaluation to the practical usefulness of the ArchiMate VPL can be done.
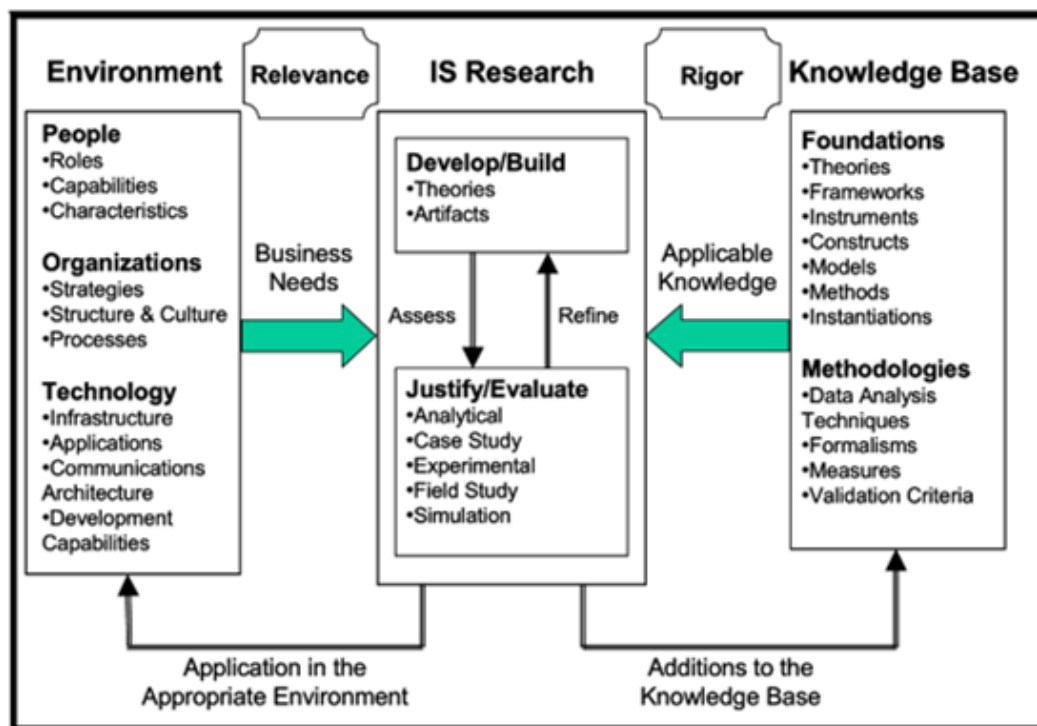
Figure 2 research framework adopted from Hevner et al., 2004, p80

Figure 2 shows the research framework presented by Hevner et al. (2004) which includes the "build-and-evaluate" loop explained earlier. The "justify/evaluate" part of this cycle shows how research assessment can be conducted and shows how these activities can result in exposing weaknesses in the theory or artifact and the need to refine as a result of these findings.

To understand how an IT-artifact, in this case ArchiMate VPL, affects a real-life business context, a case study is carried out, which is part of the evaluation stage in the build-and-evaluate loop of IS research. This is an observational design evaluation method, which is particularly useful as the objective of our research is to demonstrate how the ArchiMate VPL is applied to the IT-sourcing context, and how the end user perceives its usefulness.
The next sub-chapters will explain further how and what we have researched using the DSRM model and how the results can be used.

3.2. Technical design: elaboration of the method

As explained in 3.1, in DSRM, artifacts can be categorized as constructs, models, methods, and instantiations. In the ArchiMate VPL, a construct refers to an individual modelling element (e.g., a value object) within a pattern. As a model, ArchiMate constructs are connected through relationships and together show a value pattern. In terms of a method, this refers to the description of the sequence in which the value patterns should be applied. Instantiation refers to ArchiMate VPL patterns that are substantiated in a particular application context.

Peffers et al. (2007, p.46) propose a design science research methodology that "is consistent with prior literature, provides a nominal process model for design science research, and provides a mental model for presenting and evaluating design science research in Information systems". The design science process model includes the following six steps: problem identification and motivation, definition of the objectives for a solution, design and development, demonstration, evaluation, and

communication (Ken Peffers, Tuure Tuunanen, Marcus A. Rothenberger, & Samir Chatterjee, 2007). Figure 3 show how this process is represented by Peffers et al. (2007).
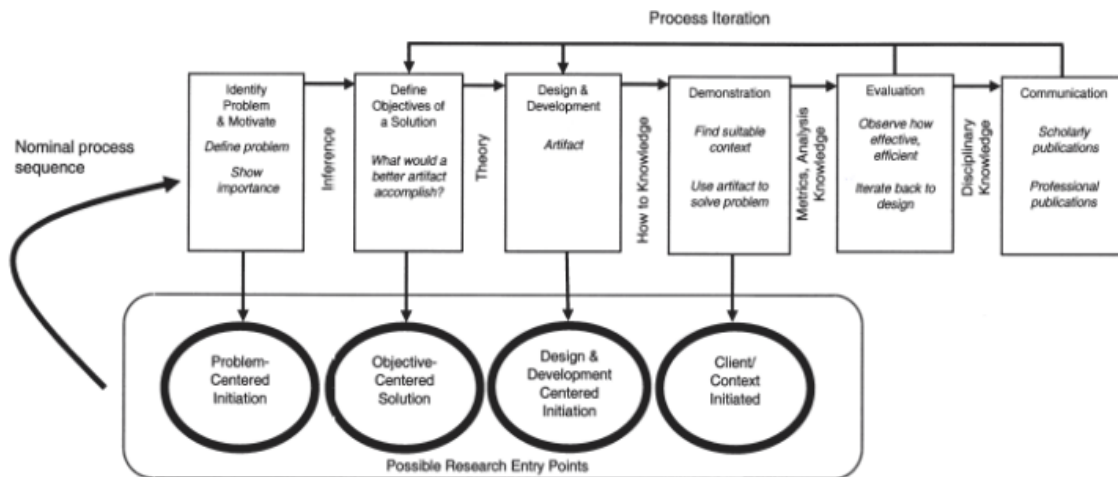

Figure 3 DSRM Process Model adopted from Peffers et al. (2007, p. 54)

Sales et al. (2019) have focused on the "core activity" of Design Science, which is third activity of the process depicted in Figure 3, namely the "Design & Development" part. The case study part of this research report especially, covers the demonstration phase, and also includes evaluation and communication. Both the design science process by Peffers et al. and Hevner et al.'s framework are used in this research. Simply put, Peffers et al. offers a sequenced process for the Design Science research framework presented in figure 2. For our research we build on the "Design & Development" phase and use the IT-sourcing relation in a Cloud setting as a suitable context to demonstrate the ArchiMate VPL. Through the "demonstration" we show the extent to which the ArchiMate VPL can be applied practically and where it fills previous gaps in earlier research. This phase leads us to the "evaluation" its usefulness in the chosen context, where the case study participants were questioned about their perceptions of this through questionnaires. All resulting findings will be presented through this report as part of the "communication" phase.

As discussed, we have opted for the case study method to build on and evaluate the research done by Sales et al. (2019). This case study method would fall into the "demonstration" and "evaluation" phase of Peffers' DSRM Process Model as here we present a client case, where we create context and demonstrate and evaluate Archimate VPL as an artifact. The reason for the use of a case study is the scope of our research, as a case study will provide qualitative information from a single real-life setting, allowing us to conduct our research within a real-life IT-sourcing relationship at one particular client at a time.

3.3.   Data analysis

Within the 'demonstration' and "evaluation" phase of the DSRM Process Model, the data needed for our research will be collected by means of a single case study. A case study is preferred when "why" or "how" questions (i.e. how can ArchiMate VPL be used in modelling value perceptions within the context of a Cloud-sourcing relationship) are being asked about a contemporary set of events over which the investigator has little or no control (Yin, 2003). The data gathered should demonstrate and provide information on whether the patterns can be applied to map the value perceptions within the

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Cloud-solutions context. Also, the data collected from the case study should expose the degree to which the demonstration of the ArchiMate VPL meets the set evaluation criteria. The following proposition will hereby be tested: The design of the ArchiMate VPL is suitable in analysing value perceptions within a Cloud-solutions context.

Further, the context of the analysis is of importance. The context chosen for our case study is an IT-sourcing relationship within a Cloud Computing context. In this IT-sourcing relationship the supplier offers the service of process mining through a Software-as-a-service (SaaS) solution, whereby the financial procurement-to-pay (P2P) process is analyzed. The software tool is packaged as a Cloud service with many pre-packaged options. The case study is used to investigate, according to information gathered from participants, the extent to which ArchiMate VPL can be adequately put into practice in order to analyze the quality of an IT-sourcing relationship.

Chapter 4 will further explain the actual results of the conducted case study and interviews . Details on what was analysed are portrayed below.

The case study has been divided into four stages of interviews. This first three rounds of interviews take place at the client's side, and the fourth interview will take place at both the supplier's side and the client's side. The two employees selected for the interviews at the client's side are the project's IT manager and the procurement lead. The reasoning behind interviewing an employee on a management level and on an operational level for this case study, is to allow for a better analysis of the IT-sourcing relationship, since both employees have been actively involved in the project. The interviewee selected on the supplier's side for interview four, is the main consultant on the project and has been the sole person of contact for the client. In total three people were interviewed over the course of three months in four different rounds of interviews.

More specifically, the first round of interviews explored the quality aspects that affect the relationship. This is done through a gap analysis with the use of the SERVQUAL model, originally emerged from the Parasuraman, Berry, and Zeithaml research (Parasuraman, Zeithaml, & Berry, 1985). This is a method to identify and measure the quality of a service experienced by clients. The analysis is done across the quality dimensions found in chapter 2, whereby statements about the quality dimensions are presented in the interview and are rated by the interviewees.

As the interviews progress, the focus should shift to collecting data about value patterns, and the evaluation thereof. For interview rounds 2 and 3 we have used canvas models (see appendix 5 & 6) to structure the collected information, which facilitated the conversion into value patterns of the ArchiMate VPL.

Maes and Poels (2006) discuss "User Evaluations Based Quality Model", which can be used in order to evaluate the quality of the ArchiMate VPL in a specific context through four variables. The variables consist of Perceived Ease of Understanding (PEOU), Perceived Usefulness (PU), Perceived Semantic Quality (PSQ), and User Satisfaction (US), and these are presented by Maes and Poels in predefined statements as shown in below table.

Table 4 Measurement instrument for the PEOU, PU, US and PSQ constructs

$PEOU_1$	It was easy for me to understand what ArchiMate VPL was trying to model	PU_1	Overall, I think ArchiMate VPL would be an improvement to a textual description of the quality of an IT sourcing relationship
$PEOU_2$	Using ArchiMate VPL was often frustrating	PU_2	Overall, I found ArchiMate VPL useful for understanding the quality of an IT sourcing relationship
$PEOU_3$	Overall, ArchiMate VPL was easy to use	PU_3	Overall, I think ArchiMate VPL improves my performance when understanding quality of an IT sourcing relationship modelled
$PEOU_4$	Learning how to read ArchiMate VPL was easy	PSQ_1	ArchiMate VPL represents quality of an IT sourcing relationship correctly
US_1	ArchiMate VPL adequately met the information needs that I was asked to support	PSQ_2	ArchiMate VPL realistically represents quality of an IT sourcing relationship
US_2	ArchiMate VPL was not efficient in providing the information I needed	PSQ_3	ArchiMate VPL contains contradicting elements
US_3	ArchiMate VPL was effective in providing the information I needed	PSQ_4	All the elements in ArchiMate VPL are relevant for the representation of quality of an IT sourcing relationship
US_4	Overall, I am satisfied with ArchiMate VPL for providing the information I needed	PSQ_5	ArchiMate VPL gives a complete representation of the quality of an IT sourcing relationship

By means of scoring these four variables, their median values are taken as a result of input given by the Archimate VPL users (Maes & Poels, 2007). This will be applied in the last interview for the data collection. Here we will demonstrate the ArchiMate VPL patterns and compare the aforementioned variables from both the perspective of the client and the provider. This will provide us with insight into the applicability of the ArchiMate VPL in practice.

A limitation of the use of a single case study is that statistical tests cannot be performed. For this reason, and to gain better insight into specific limitations or benefits, the numerical data of the evaluation will be supplemented with qualitative feedback collected during a semi-structured interview.

3.4. Reflection w.r.t. validity, reliability and ethical aspects

According to Yin (2003), when designing a case study, four aspects must be guarded. These are construct validity, internal validity, external validity, and reliability. Yin (2003) presents these four aspects as tests for judging the quality of research designs. These tests can be used for any empirical research, including the case study type (Yin, 1994). Together with these tests of construct validity, internal validity, external validity, and reliability, case study tactics are recommended per phase of research. Yin (2003) distinguishes for instance between the research phases data collection, data analysis, and research design, and attributes the aforementioned design tests to each phase in order to overcome quality and validity weaknesses in case study design.

Construct validity refers to whether our interviews capture and measure what is needed for the research. Construct validity can be promoted for instance by triangulation, so using multiple sources of evidence. For instance, using different sources, in our case different stakeholders across the client's hierarchy and having the findings per interview of this research being reviewed by these key stakeholders involved, increases construct validity. We would recap their answers to validate for completeness after each interview round, and the stakeholders were finally sent a draft of the collected data for review. Ensuring construct validity is especially relevant during the data collection phase (Yin, 2003). We were able to further guarantee construct validity by using validated and

predefined questions for the gap analysis with the use of the SERVQUAL model (interview 1) and the user evaluations based on the User Evaluations Based Quality Model (interview 4).

Internal validity refers to the accuracy of analysis of the results (Saunders et al., 2016). Solid causal relationships promote good internal validity, among many other actions. For our interviews we ensured face to face sessions, clear introductions and room for questions to be answered prior to and during the interview. We have conducted most presentations and demonstrations surrounding the interviews together with the interviewees at once. The reason for this is to avoid any deviating circumstances for the interviewees and to make sure the same context is provided for all. Answers given by interviewees and the end evaluations were executed separately to avoid external influence. The interview questions were kept concise, to limit wrongful interpretations, and often a numeric scale was used to indicate answers. In interview 1 for instance interviewees gave their scores according to the Likert scale to measure quality aspects. Another example of the utilization of numeric answers is the user evaluations in the final interview, where a percentage represents the perception of the end users. Further, the interviews were conducted in separate quiet rooms. Details on interviews can be found in appendix 4, 5 and 6.

External validity is described by Yin (2003, p.33) as a test to establish "the domain to which a study's findings can be generalized". This will be very limited for our research since we will use a single case study. Future research that replicates the proposed case study in this particular domain can help to strengthen the external validity of the findings.

According to Saunders et al. (2016, p. 129) reliability is "the extent to which data collection technique or techniques will yield consistent findings, similar observations would be made, or conclusions reached by other researchers or there is transparency in how sense was made from the raw data." Reliability is promoted by allowing repetition to occur in the study. By using predetermined statements and questions as part of the semi-structured interviews and by using canvas models in the data collection phase, the operations of this study can be repeated, which promotes reliability of the study. Further, canvas models were used for interview 2 and 3 to structure the data collected. These canvas models allow for easier translation from gathered information to value patterns of the ArchiMate VPL, also increasing reliability of this research.

In terms of ethical aspects during this research we have taken measures to protect the privacy of our interviewees. We have agreed to only mention their job titles within the organisations as this is of significance for our data collection phase. Further, a confidentiality agreement with both the client and provider has been arranged and upheld. Also, all interviewees will have access to the final results of the report, before the report is made public in the research portal of the Open Universiteit.

4. Results

Our research has been performed through means of a case study. Mostly through the use of semi-structured interviews have we been able to collect our data. As discussed in chapter 3, we have used a single organisation as case study context, which is the client organisation within an IT-sourcing relationship. In total, 3 interviewees were involved in this case study, one on the provider's side and two on the client's side. On the client's side we conducted interviews with the IT-manager and Procurement lead. On the provider's side the lead process mining analyst was involved. Due to time constraints, since the interviews took place during working hours, interviews took no longer than an hour at a time and were all held at the client's office.

In total, four interview rounds have taken place, of which the first three rounds were done between the period of 25-06-2020 and 29-09-2020. The evaluation part of the case study, through interview round 4, was executed around six months later due to external factors and circumstances.

The goal of *interview 1* is to measure the quality aspects of the IT-sourcing relationship and identify the gap between perception and experience hereof by its stakeholders. The questions are centered around the eight most prominent dimensions of quality found in our theoretical framework, outlined in chapter 2. The interview will identify quality from the perception of the IT-sourcing client through the use of the SERVQUAL model (see appendix 4). This model is a method to identify and measure the quality of a service experienced by clients, as explained in chapter 3.3. This gives insight into the difference in the client's expectations and perceptions of the provided service.

The interview is conducted by presenting the interviewees with two statements for each quality dimension from our framework, where the first statement measures expectations about firms in general within the IT-sourcing service category, and the second measures perceptions about the particular firm whose service quality is being assessed. A seven-point Likert scale is used, ranging from "low importance" (1) to "high importance" (7). Finally, the formula 'Q=P-E' is used to score each quality dimension.

Table 5 Results of interview 1

Quality dimensions	Interviewee 1 expect	Interviewee 1 perceive	Interviewee 1 gap	Interviewee 2 expect	Interviewee 2 perceive	Interviewee 2 gap
Trust	6	6	0	7	6	-1
Commitment	6	6	0	7	7	0
Information / knowledge sharing	5	6	1	6	5	-1
Conflict management	7	7	0	6	6	0
Communication quality	7	4	-3	7	6	-1
Cultural similarity	1	7	6	5	5	0
Contract type / SLA	7	6	-1	7	7	0
Benefit / risk sharing	6	7	1	7	7	0

Table 5 shows the gaps found during this interview, and these are outlined below.

A small negative gap was measured for **Trust**. Interviewee 2, the project's IT-manager, mentioned that due to the supplier being a very young company, there was no advanced IT security in place. The interviewee did however feel very confident that there was strong awareness of handling sensitive data and information on the supplier's side.

Interviewee 1, the procurement lead, expressed to have experienced getting more explanation throughout the process of analyzing the P2P process than expected. This explains a positive gap for **Information/knowledge sharing** for interviewee 1. However, for interviewee 2, a small negative gap has been measured. Interviewee 2 expressed that sharing more information during the process-mining process would have likely led to better validation of the data used.

The gap for **communication quality** for both interviewees is negative and is solely attributed to a lack of timely communication on the supplier's side when the projected needed to be extended.

For **cultural similarity,** a large positive gap has been measured for interviewee 1. This interviewee did not think that, for this type of service, it would be of great significance to be culturally similar. However, this interviewee experienced great cultural similarity, and this significantly affected the ease of working together on this project.

Contract type/SLA shows a small negative gap for interviewee 1. This interviewee expressed having expectations of what the end result of the service would include, yet came to experience some small, unexpected differences in the SLA which had not been transparent to this interviewee.

The small positive gap for **benefit/risk sharing**, as measured for interviewee 1, is caused by how the supplier handled the project being delayed.

Interview 2 is aimed at the process of instantiating the ArchiMate Value Pattern models. This interview had 3 parts to it, the questions, the canvas models and the value modelling patterns. The questions and canvas model can be found in appendix 5. As explained earlier and in Sales et al. (2019), our starting point will commence at the "value subject", since the IT-sourcing relation consists of a service being provided. The questions in appendix 5 have been formulated around the components of the ArchiMate VPL. These questions helped identify the content of the canvas, which in turn is used to compose the value modelling patterns (all included in the same appendix). Through the analysis of this interview round, the value patterns for the "value subject", "value object", and "value experience" were produced from the perspective of both interviewees on the client's side.

Figure 4 below shows a "value subject" value pattern example composed from the perspective of the IT project manager. This pattern represents the main goals of a stakeholder and identifies their importance through a score out of ten, identified as the reward. From this pattern we can understand what creates value for the IT project manager and what the motivation is that drives this. It also shows which quality goals contribute to the functional goal. In more detail, the functional goal is to analyze the financial Procurement to Pay process in the client's ERP system. This is the most important need of the client (reflected in reward = 10), which has led to the decision for process mining outsourcing. The quality goal "improve/optimize P2P process" has the highest reward since this process mining project was initiated to understand how to make the P2P process more efficient and reduce mistakes made. The information generated by process mining can be used for management to take necessary actions within the P2P team, as reflected in the top right Quality Goal. By using existing company data

in the act of process mining, the use of company data is increased (a quality goal) and this adds to the functional goal in this value subject pattern.
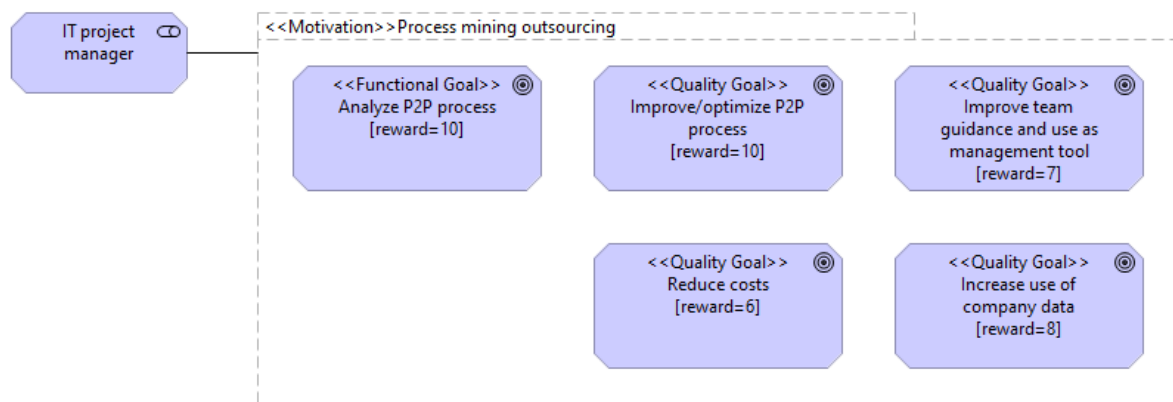

Figure 4 value subject pattern

In appendix 5 we have included the value patterns for the procurement lead as well. As a result of this interview round we were also able to compose patterns for "value object" and "value experience, as shown below.
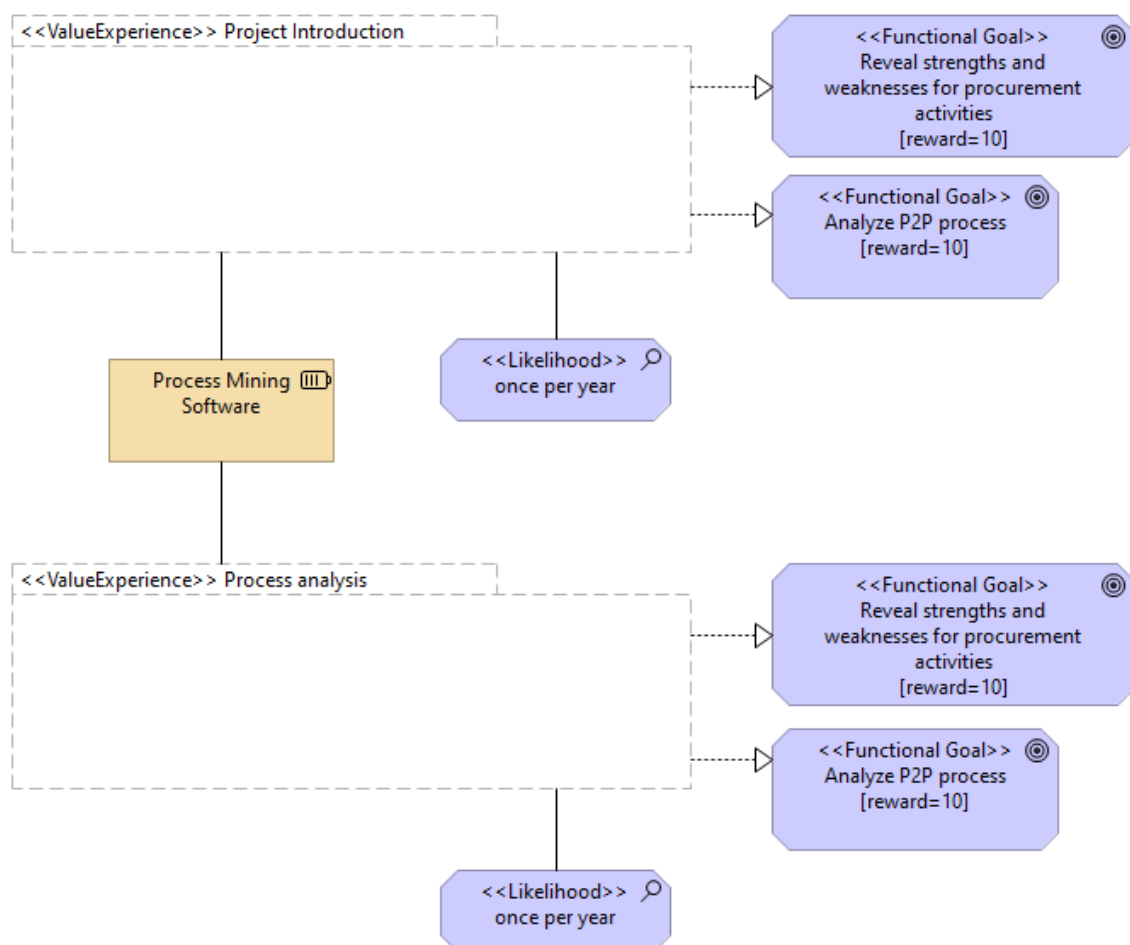

Figure 5 value object pattern

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Figure 5 shows the process mining software as the value object, i.e.. the focus object of the valuation. Further it depicts the experiences the object enables, the functional goals that are being served, and the frequency with which they are likely to occur. The value experiences in this case study represent the different phases of the project, such as the introduction of the project and the analysis part which both take part once. The additional functional goal in the pattern "reveal strengths & weaknesses for procurement activities" shows what the project phase, through the use of process mining software should bring about.

Finally, as a result of interview 2, we could produce the "value experience" pattern. Figure 6 below shows the three value experience components grouped with their functional goals from the perspective of the IT project manager, otherwise known as the "value subject". This pattern includes a third phase of the project, the wrap-up phase, which is made up of different value event, just like in the other two project phases. The value experience "project introduction" is made up of 3 value events where firstly the client and provider sit together to discuss and identify the Client's needs. Then the provider gives a presentation on the process mining service they offer and its possibilities, and as a last step the client gives access to and supplies data from their ERP system. The second phase, the "process analysis" value experience starts with the value event where the provider uses the client's data to load into their process mining software and start the analysis of the P2P process. The judgement is then made whether additional data is necessary. To keep the analysis up to date this is done twice per year. Finally the provider offers the client a provisional summary of findings and progress.

For the project wrap-up, the final value experience, the final analysis produced by the process mining software, is presented to the client. At the same time the PowerPoint presentation and analysis report is shared with the client.
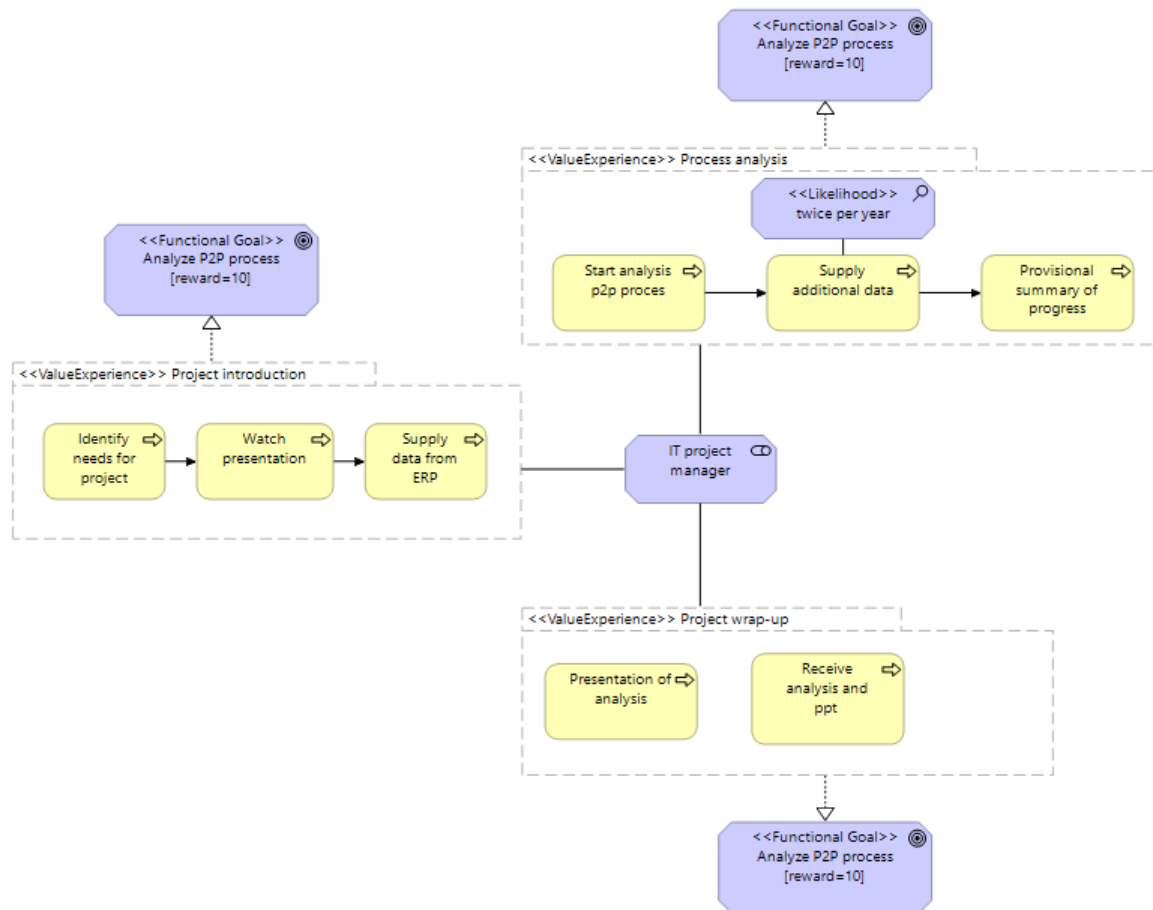
Figure 6 value experience pattern

Interview 3 is conducted in a similar manner as interview 2, whereby the interviewees are presented with questions, a canvas is used to bring structure and order to the answers, and finally value modelling patterns are formed for "value event", and "experience valuation". Again, the ArchiMate value patterns are set from the client's perspective (see appendix 6).

Figure 7 value event pattern

The "value event" pattern shows the receiving of the process analysis as the value event that affects the quality goal of process optimization. Here data quality, as the quality driver, and the degree of

completeness of the data used for the process-mining by the consultant, will positively influence the goal of optimizing the P2P process.
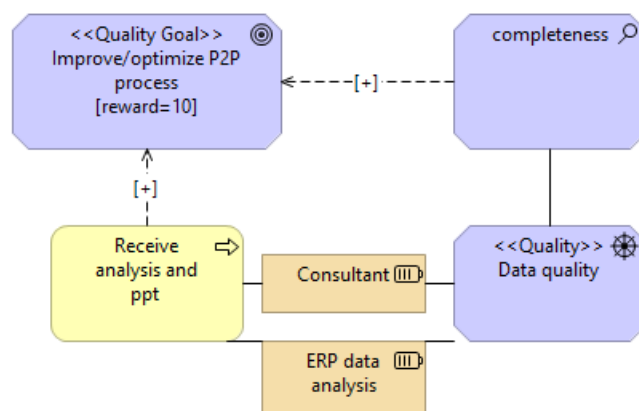
For "experience valuation", the valuation focuses on the service provided by the supplier and is used to represent its value for the "value subject", in this case the procurement lead. The "value assessor", the person interviewed, is in this case the IT manager. She has based her judgement on feedback from the procurement lead. The "experience value" is taken as a percentage on a discrete scale, and rates performance of the supplied service in term of functional goals and quality goals, with scores ranging from 1 to 10 (see appendix 6).

The valuation for the entire process, as a sum of the three experiences for the project introduction, project analysis and project wrap-up stage, resulting in 76,2%, is modelled in the pattern below in figure 8 (see appendix 6 for all individual patterns). This represent the full experience of being a customer in this IT sourcing relationship. The "likelihood" for all these valuation patterns is limited to once per year.
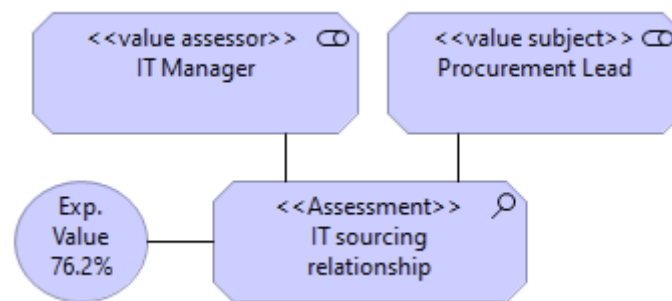

Figure 8 Final experience valuation of IT sourcing relationship with SaaS provider

Finally **interview 4** is conducted to analyze the practicality of modelling value through ArchiMate VPL. This was done through a detailed presentation of the drafted patterns. A set of statements was then rated by the client to identify gaps between expectation and perception of using the value patterns. This was then compared to the perception of the supplier, where the same set of statements were rated. The quality of the ArchiMate VPL models is evaluated by measuring user perceptions, through the use of User Evaluations Based Quality Model (UEBQM) by Maes and Poels (2007) as seen below in table 6.

The client and supplier used the Likert scale below to score their answers to the statements in table 6. The client scores show the average of both client interviewees scores given. The results are presented below.

Strongly disagree			Neither Disagree/agree			Strongly agree
1	2	3	4	5	6	7

Table 5 Results of the UEBQM statements

	Scores supplier	Scores client
PEOU	6	6
US	5.5	6
PU	5	6
PSQ	6	6

This table shows the median results. For full details see appendix 7.

The feedback received from the **supplier** with respect to statement US2 includes the supplier would like to see how the model could be improved. For US3 he added that the model was quite straight forward. This was partly due to the familiarity of this topic to the supplier and his knowledge of Enterprise Architecture. For US4 the supplier stated that the information could have been more "complete". He did not give a concrete example but the message was that there is room for improvement. In addition to PU1 the supplier explained that he did believe the potential of the conceptual model would be an improvement, but that at that moment it would form a good addition to the textual description, not necessarily essential. Even though the supplier agreed with the statement for PU3, he also added that it emphasizes the factors for the client, since the models were composed from a client's perspective. The supplier thought that there we no contradicting elements in the model. With some additional improvements, the supplier could see themselves using this way of modelling value and use it to improve services offered.

The main feedback received from the **client** included the following. The IT manager on the client's side expressed that the ease of understanding was relatively high, since she was involved in the process of instantiating the value patterns throughout interview 2 and 3. For US1, the manager was very satisfied but also added being aware of the level of detail that could be added to the patterns if desired in order to improve accuracy further.

Both parties acknowledged the importance of understanding how value is created within their working relationship. They agreed that, such as stated by Sales et al. (2019), ArchiMate VPL allows for the identification of opportunities to improve offerings in order to maximize value creation.

It is noteworthy to mention that both the consultant at the supplier's side and the IT manager on the client's side had some foundational knowledge of Enterprise Architecture and IT Architecture, which in all likelihood influenced their perceived ease of using and understanding the value patterns.

5. Discussion, conclusions and recommendations

5.1.   Discussion – reflection

The research objective for this paper was centred around exploring the practical usefulness of ArchiMate VPL, by using it to analyse and to model value demonstrated within an IT- sourcing case study. We started investigating our research questions by building a framework of quality aspects that seemed most significant within the context of IT sourcing relationships. After establishing the methodology and using the 'demonstration' and "evaluation" phase of the DSRM Process Model, we were able to collect data and perform our analysis of ArchiMate VPL. The end goal, through this research paper and case study, is to contribute to the practical refinement of this modelling language of value patterns by applying, demonstrating and evaluating it. Furthermore, we add to the number of application contexts in which the pattern language is researched.

Our approach to conducting the research was mainly guided by the methodology of DSRM, as was the case for the research done by Sales et al. (2019). For the theoretical framework, we found out that there was fairly limited research material to draw from for our particular Cloud context. With time this framework can be built upon in order to give a more accurate reflection of cloud specific quality dimensions. For instance, "contract type" was one of the main quality dimensions of an IT-sourcing relationship. The research that presented this variable was not specifically focused on IT-sourcing relationships in a Cloud context. A typical contract for a cloud service is short term, usage based, has minimal upfront costs, and has fairly standardized terms. Using more cloud specific quality dimensions will improve the appropriateness of the measure used and will in turn improve construct validity of the data gathered from the interviews. With respect to construct validity, we also let the key people involved in the IT-sourcing relationship review the draft version of our findings.

Since we have performed a single case study, there is no evidence yet that the findings can be generalized across the research field. In order to build this type of external validity, and to increase reliability, this study should be replicated and many more case studies in similar Cloud settings should be performed. For our research, the "demonstrate and evaluate" loop has only been performed once.

To preserve the internal validity, we have also aimed to create settings that ensure our interviewees were able to be questioned and answer in full honesty.

Through the quality dimensions that formed our framework we were able to perform a gap analysis (see chapter 4) and form an understanding of the importance of these quality dimensions in our case study. Further, we were able to translate business needs into quality and functional goals fairly easily. By assigning scores to the goals based on perceived importance by the client, we are able to represent reward attributes to different types of value patterns, such as the value experience patterns. The value experiences are broken down into smaller events, whereby relationships of influence between the pattern elements are visualized and display how value can be increased or decreased. The more an experience is detailed, the more accurate the description is of how value is created, and thereby, more insights can be obtained.

When analyzing the usefulness of the ArchiMate VPL through the answers given during interview 4, we recognize that the interviewees had some form of knowledge of Enterprise Architecture and ArchiMate. The level of pre-knowledge and understanding of the value patterns demonstrated by the researcher will greatly impact the perceived usefulness of the ArchiMate VPL. Also, the client in our interview process was much more involved in the instantiation of the value patterns, which inevitably

strengthened their understanding of the language. Further discussion during interview 4 was about the process of gathering the data for the assembling of the value patterns being rather time consuming. We do not see much room for improvement here, since there was a clear plan of action, however expectations could have been managed somewhat better so that all parties would have a good understanding of the actual extent of the process. This will be even more important in settings where the stakeholders have no prior knowledge of Enterprise Architecture. Nevertheless, both the client and the provider see great value of using ArchiMate VPL, but a more standardized and efficient way of assembling the patterns would be very much welcomed.

Finally, it is also noteworthy to mention that both parties did not have the same involvement regarding our case study analysis. The provider of the service was exempted from partaking in the first three rounds of interviews. This had an effect on the internal validity of the case study results due to this inconsistent condition.

5.2. Conclusions

By analyzing quality within our case study through Archimate VPL we are able to form conclusions about the set sub research questions presented in chapter 1.4. The questions included:

-Which factors of quality are significant in analysing perceived value in an IT-sourcing relationship?

In chapter 2 we have outlined in our theoretical framework quality aspects, and in table 3 we presented eight of the most prominent dimensions of quality that we found in IT-sourcing relationships. As explained previously, since we were not able to find particular aspects pertaining to our specific Cloud context, we used the more "general" aspects from the current literature. In our case study the top factors for the analysis of perceived value were benefit/risk sharing, commitment, conflict management and the SLA.

-How can ArchiMate VPL be used in modelling value perceptions within the context of a Cloud-sourcing relationship?

ArchiMate VPL can be used in modeling value perceptions by allowing for the measurement of value determinants and visual representation of the whole experience.
Through our case study we have also researched the usefulness of ArchiMate VPL in analysing value in a practical IT-sourcing relationship in order to find an answer to our main research question.
Finally, we can conclude that from our research ArchiMate VPL is useful in analysing value (perceived mainly by the client in our cases study) in an IT-sourcing relation. This can benefit both sides in the relationship but is especially useful for the provider by understanding how to add value to the offering in this exchange. The usefulness of ArchiMate VPL has been confirmed by both client and provider in our case study through the UEBQM. Practically, ArchiMate VPL can expose ways for stakeholders to improve elements of their collaboration and services offered, to ultimately improve value created.

5.3.   Recommendations for practice

Understanding which quality factors are important to the client helps the provider in forming a strategy, yet it also ensures proper management of expectations during the provider's relationship with the client. More transparency can be created by using ArchiMate VPL, this means that for the provider this gives insight into fulfilling which goals give the highest reward or get the highest importance. By better understanding the client through this information of value assessments for instance, better stakeholder alignment can be created.

In order to use ArchiMate VPL it is important to include a good level of detail in the patterns in order to understand how value is created. If this is not done adequately, the quality of the models will be affected. We recommend from own experience that someone should guide the process of composing the patterns and explaining these to business stakeholders. Without any prior knowledge of ArchiMate VPL or any previous training we do not see people using this on their own. Our interviewees agreed with this conclusion as well due to its complexity and time-consuming process.

For our research, the interviews, analysis, and patterns were done after the service had been provided. It would be interesting, and quite possibly more beneficial to use ArchiMate VPL at different stages in a project so that the provider can adjust or redirect the strategy regarding any identified quality dimensions.

In ArchiMate VPL, its use in relationships and perceived value is mainly focused on the perspective of the client, only as a value assessor and value subject. To get a fuller picture in terms of the IT-sourcing relationship, it would be interesting to involve the provider more in the end-to-end process and get a good understanding of their side and see where both parties are strongly aligned and where there is room for building a stronger relationship.

5.4.   Recommendations for further research

Our research builds on the research presented by Sales et al. (2019) and still has many limitations. For instance, the number of case studies conducted have been very limited. This makes any form of generalization impossible at this stage. By conducting more case studies in a Cloud specific context, we can extend the findings and draw more generalized conclusions.

Further we believe it would be beneficial to research perceived value through ArchiMate VPL through different stages of IT-sourcing relationships and get a better understanding on the impact on evaluation results when the timing is different.

In paragraph 5.1, the example of contract type was given as a quality dimension of which the details will differ when specifically looking at the Cloud context. Schneider and Sunyaev (2016, p. 17) have shown that most "determinant factors of sourcing decisions in the IT outsourcing context remain valid for the Cloud Computing context". They suggest Cloud Computing researchers should draw from this previous research but should re-evaluate these concepts in light of the particularities of Cloud computing. As research progresses in this field, more Cloud specific quality variables will arise and as a result will make our patterns more Cloud specific. This could eventually lead to producing more

generic and reusable value patterns. Also, it would be interesting to research the process itself of realizing pattern instantiation and whether we can standardize this process. Questions like is the way we have followed the process the best and most efficient way? Are there better ways to for instance go from identifying business needs to translating these two types of goals and assigning quality dimensions? Are there other or better ways to measure scores or weights assigned, or should the current method be revised? If we want to make this pattern language more user friendly and easier to use, then these questions are worth analysing.

Since we have used ArchiMate VPL in conjunction with other models or methods like UEBQM, it would be interesting to research which other models or frameworks can be used in combination with ArchiMate VPL to increase its usefulness.

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Appendix 1

These papers were **used** for our framework

Query: "Quality" AND "IT-sourcing"	authors	year	quality aspects	aspects measurable	link with value	link with Cloud context
The impact of IS sourcing type on service quality and maintenance efforts	Park & Kim	2005	yes	yes	yes	x
The value of selective IT-sourcing	Lacity, Willcocks, Feeny	1996	yes	x	yes	x
Effect of Partnership Quality on IS Outsourcing Success: Conceptual Framework and Empirical Validation	Lee & Kim	1999	yes	yes	yes	x
Understanding Service Quality and Relationship Quality in is Outsourcing: Client Orientation & Promotion, Project Management Effectiveness, and the Task-Technology-Structure Fit	Chakrabarty, Whitten and Green	2008	yes	yes	yes	x
The Quality-of-Relationship Construct in IT Outsourcing	Alborz, Seddon and Scheepers	2005	yes	yes	yes	x
A path to successful IT outsourcing: interaction between service-level agreements and commitment	Goo, Huang & Hart	2008	yes	yes	yes	x
Query: "IT-sourcing" AND "quality determinants"						

Outsourcing 2.0: Towards an Innovation-Driven Process Model for Client-Vendor Relationships in Information Technology Outsourcing	Linden, Schmidt & Rosenkranz	2017	yes	yes	yes	x
Client-Vendor relationships in Cloud Computing: lessons from IT-Outsourcing	Zhong & Myers	2016	yes	yes	yes	yes
"IT-sourcing relationship" AND "quality" AND "value"						
Examining client perceptions of partnership quality and the relationships between its dimensions in an IT outsourcing relationship	Lane & Lum	2011	yes	yes	yes	x

Appendix 2

These papers were **omitted** from our framework for the first query

Query: "Quality" and "IT-sourcing"	authors	year	quality aspects	aspects measurable	link with value	link with Cloud context
A resource-based analysis of IT sourcing	Roy & Aubert	2002	x	x	yes	X
A MCDM approach for sourcing strategy mix decision in IT projects	Tsai et al.	2010	yes	x	yes	x
The Maturation of Offshore Sourcing of Information Technology Work	E. Carmel & R. Agarwal	2002	x	x	yes	x
Key Issues for Global it Sourcing: Country and Individual Factors	Rao	2004	x	x	yes	x
IT backsourcing: from 'make or buy' to 'bringing it back in-house'	McLaughlin & Peppard	2006	x	x	x	x
Changing IT skills: The Impact of Sourcing Strategies on In-House Capability Requirements	Bullen et al.	2007	x	x	yes	x
Trends, Implications, and Responses to Global IT Sourcing: A Field Study	Rao et al.	2006	yes	x	x	x
Drivers of IT Backsourcing Decision	Wong, Rahman & Jaya	2008	x	x	x	x
Developments in Practice XIV: IT Sourcing - How Far Can You Go?	Smith & McKeen	2004	yes	x	yes	x

Appendix 3

Quality Aspect	#
Contract type	3
Selective activities	2
Contract length	1
Technical maturity	1
Degree of integration	1
Service quality delivered	1
Maintenance efforts	1
Maintenance costs	1
System age	1
System size	1
Trust	6
Business understanding	2
Benefit and risk sharing	3
Conflict management	4
Commitment	6
Participation	2
Communication quality	4
Information/knowledge sharing	5
Cultural similarity	4
Top management support	2
Age of relationship	1
Mutual dependency	2
Repeated interactions with client	1
Client orientation & promotion	1
Personal bonds	1
Flexibility	2
Cooperation	2
Listening	1
SLA	2
Strategy	1
Innovation	2
Distance (geographically)	1
Compatibility (technological & vision)	2
Focus	1
Company size	1
Collaboration	1
Proactivity	1
Mediation	1
Leadership (client)	1
Interfirm teams	1
Evaluation	1
Trainings	1
Knowledge management	1

Appendix 4

Interview 1:
To which extent do you expect the supplier in an IT-sourcing relationship to possess the features described by each statement. If the statement is not important to you, circle number 1. If you attach a high importance to the statement, circle number 7.

Statements:

1a.Trust- *the degree of confidence and willingness between partners*

I expect a supplier in an IT-sourcing relationship to be trustworthy

Low importance			Average importance			High importance
1	2	3	4	5	6	7

2a. Commitment- *the degree of the pledge of relationship continuity between partners*

I expect a supplier in an IT-sourcing relationship to show commitment

Low importance			Average importance			High importance
1	2	3	4	5	6	7

3a. Information/knowledge sharing

I expect a supplier in an IT-sourcing relationship to share information and knowledge in regards to their expertise and service delivered

Low importance			Average importance			High importance
1	2	3	4	5	6	7

4a. Conflict management- *in terms of incompatibility of activities or goals*

I expect a supplier in an IT-sourcing relationship to manage conflict when problems arise

Low importance			Average importance			High importance
1	2	3	4	5	6	7

5a. Communication quality- *in terms of accuracy, timeliness, completeness*

I expect a supplier in an IT-sourcing relationship to communicate in a clear manner

Low importance			Average importance			High importance
1	2	3	4	5	6	7

6a. Cultural similarity

I expect a supplier in an IT-sourcing relationship to have a similar corporate culture

Low importance			Average importance			High importance
1	2	3	4	5	6	7

7a. Contract type(/SLA)- *in terms of scope, length, type*

I expect a supplier in an IT-sourcing relationship to understand the terms of the contract and the agreements made

Low importance			Average importance			High importance
1	2	3	4	5	6	7

8a. Benefit/risk sharing- *agreement on the sharing of costs accrued or benefits gained*

I expect a supplier in an IT-sourcing relationship to share risks and benefits proportionally

Low importance			Average importance			High importance
1	2	3	4	5	6	7

To which extent does the supplier in the IT-sourcing relationship possess the features described by each statement. If you strongly agree that the firms should possess the feature, circle number 7.

1b. Trust

The supplier in the IT-sourcing relationship is trustworthy

Strongly disagree			Neither Disagree/agree			Strongly agree
1	2	3	4	5	6	7

2b. Commitment

The supplier in the IT-sourcing relationship shows commitment

Strongly disagree			Neither Disagree/agree			Strongly agree
1	2	3	4	5	6	7

3b. Information/knowledge sharing

The supplier in the IT-sourcing relationship shares information and knowledge in regards to their expertise and service delivered

Strongly disagree			Neither Disagree/agree			Strongly agree
1	2	3	4	5	6	7

4b. Conflict management

The supplier in the IT-sourcing relationship manages conflict when problems arise

Strongly disagree			Neither Disagree/agree			Strongly agree
1	2	3	4	5	6	7

5b. Communication quality

The supplier in the IT-sourcing relationship communicates in a clear manner

Strongly disagree			Neither Disagree/agree			Strongly agree
1	2	3	4	5	6	7

6b. Cultural similarity

The supplier in the IT-sourcing relationship has a similar corporate culture

Strongly disagree			Neither Disagree/agree			Strongly agree
1	2	3	4	5	6	7

7b. Contract type(/SLA)

The supplier in the IT-sourcing relationship understands the terms of the contract and the agreements made

Strongly disagree			Neither Disagree/agree			Strongly agree
1	2	3	4	5	6	7

8b. Benefit/risk sharing

The supplier in the IT-sourcing relationship shares risks and benefits proportionally

Strongly disagree			Neither Disagree/agree			Strongly agree
1	2	3	4	5	6	7

Appendix 5

Interview 2 questions:

Customer / User *(Value subject)*
- Who is the customer in the IT-sourcing relationship?
  Customer= IT project manager
- Who is the main person of contact with the supplier at the client's side?
  IT project manager
- Who is the user at the client's side?
  Procurement lead

Quality goal (needs/wants/pains) *(Quality goal)*
Functional goal (needs/wants/pains) *(Functional goal)*
- What are the client's goals in this project?
  Gaining insight/analysis in the p2p process
  - Which positive things do you look to gain through this IT-sourcing relationship?
  - Which negative things do you look to minimize through this IT-sourcing relationship?

Importance *(Reward)*
- How important are the aforementioned goals?
- Could you identify the importance per goal on a scale of 1-10?

Product / Resource *(Value object)*
- What are objects (products) or resources that are relevant for this sourcing relationship?

Customer / user journey / experience *(Value experience)*
- What are the most important experiences/interactions that user X has with the product within this sourcing relationship?

Frequency
- How often do the above mentioned experiences/interactions take place?

Customer / user interactions / activities *(Value event)*
- What are (per experience) the specific activities/tasks that are carried out within the experience by both client and supplier?
  - Which interactions take place at which point during the experience?
  - Which activities/tasks take place at which point during the experience?

Order (Predecessor/successor)
- What is the order of the activities / tasks / interactions mentioned above?
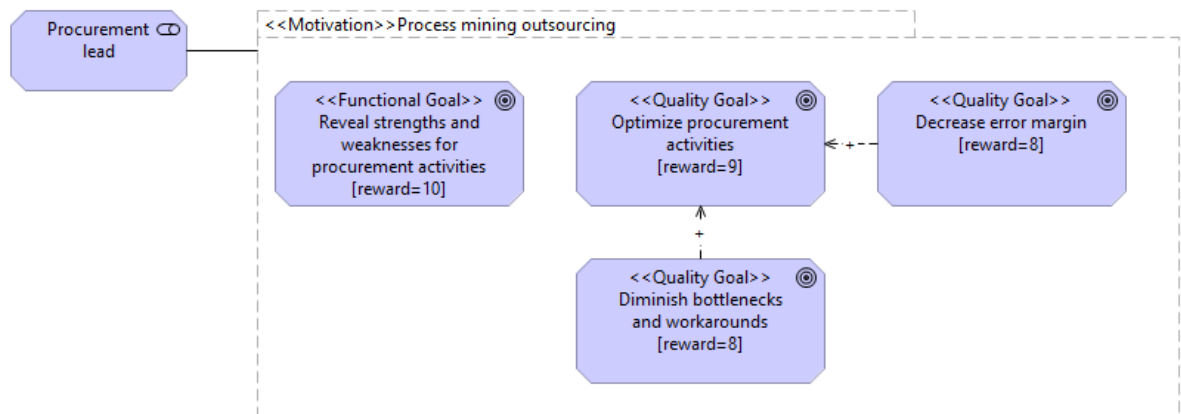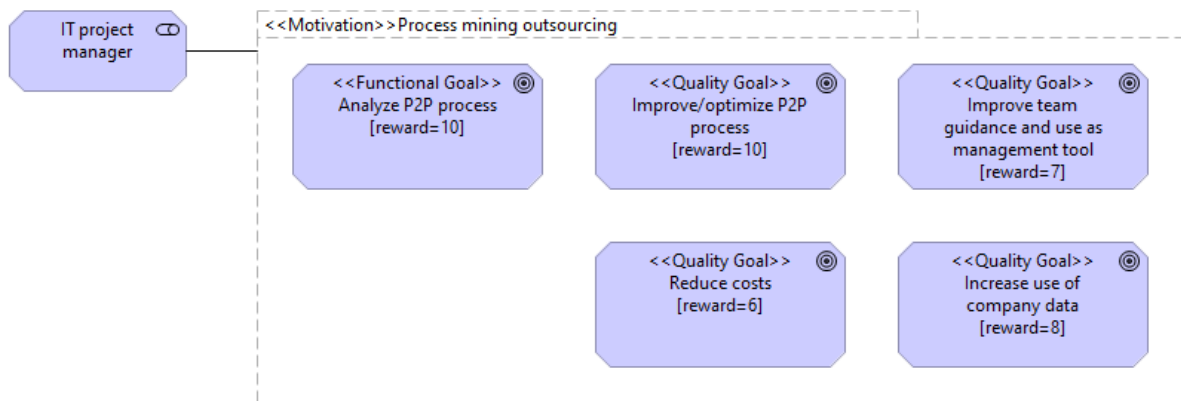
Interview 2 canvas

Customer/User	Quality Goal (needs/wants/pains)	Importance
IT project manager (customer)	Improve/optimize the P2P process	10
Procurement lead (user)	Optimize procurement activities	9
	Reduce costs	6
	Diminish bottlenecks and workarounds for tasks	8
	Decrease error margin	8
	Improve team guidance and use as management tool	7
	Increase use of company data	8

	Functional Goal (needs/wants/pains)	Importance
	Analyze P2P process through data use	10
	Reveal strengths and weaknesses for procurement activities	10

Product/Resource	Customer/user journey/experience	Frequency
Process mining software ERP data analysis	Project introduction	Once per year
	Process analysis	Once per year
	Project wrap-up	Once per year

	Customer/user interactions/activities	Order (Predecessor/successor)
	(1)Identify needs for project	1
	(1)Watch presentation	2
	(1)Supply data from ERP (IT project manager)	3
	(2)Start analysis p2p process (supplier)	4
	(2)Supply additional data	5 & 7
	(2)Provisional summary of progress	6
	(3)Presentation of analysis	8
	(3) Receive analysis and ppt	9

Black = same answers given by user and customer
Blue = answers given by user
Grey= answers given by customer

Value subject patterns:
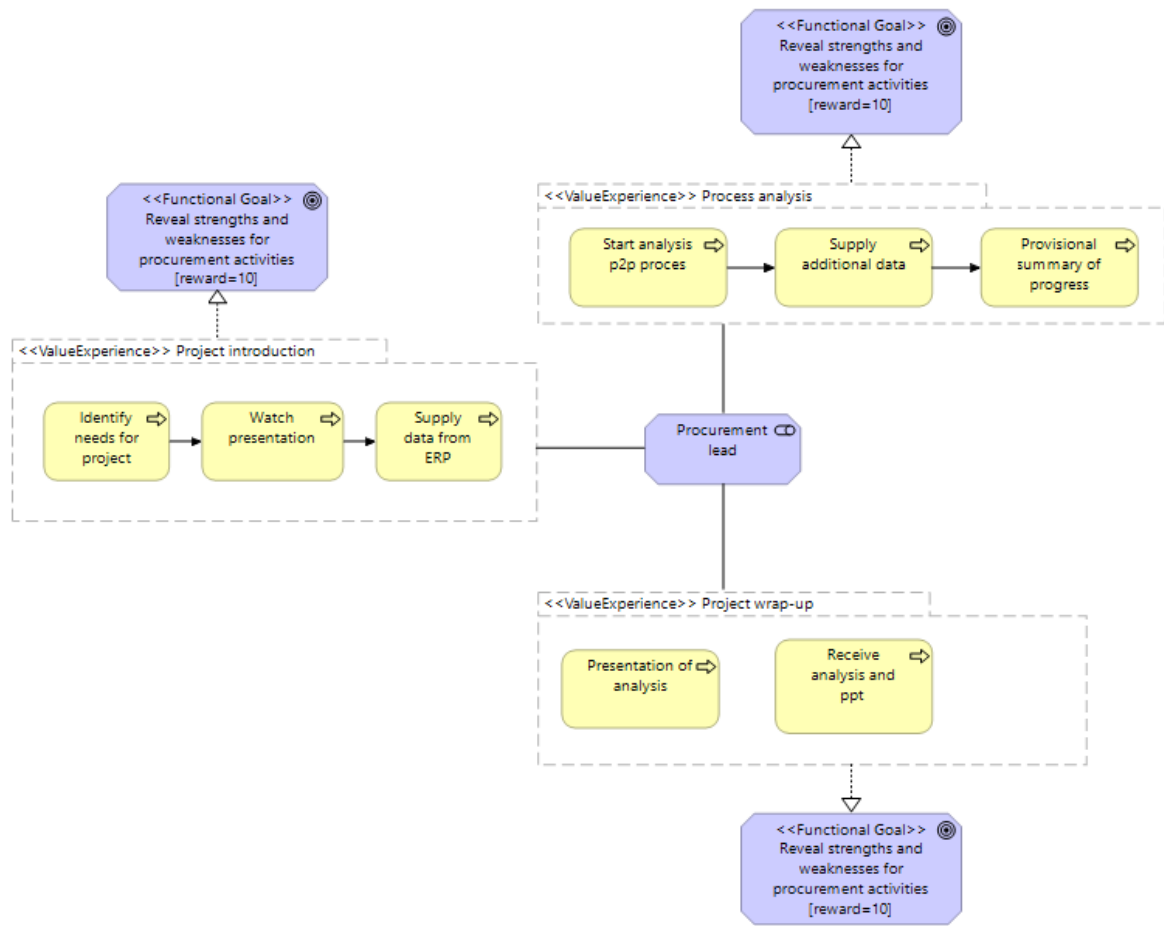
IT project manager

<<Motivation>>Process mining outsourcing

<<Functional Goal>>
Analyze P2P process
[reward=10]

<<Quality Goal>>
Improve/optimize P2P
process
[reward=10]

<<Quality Goal>>
Improve team
guidance and use as
management tool
[reward=7]

<<Quality Goal>>
Reduce costs
[reward=6]

<<Quality Goal>>
Increase use of
company data
[reward=8]

Procurement lead

<<Motivation>>Process mining outsourcing

<<Functional Goal>>
Reveal strengths and
weaknesses for
procurement activities
[reward=10]

<<Quality Goal>>
Optimize procurement
activities
[reward=9]

<<Quality Goal>>
Decrease error margin
[reward=8]

<<Quality Goal>>
Diminish bottlenecks
and workarounds
[reward=8]

Value object patterns:

Value experience patterns:
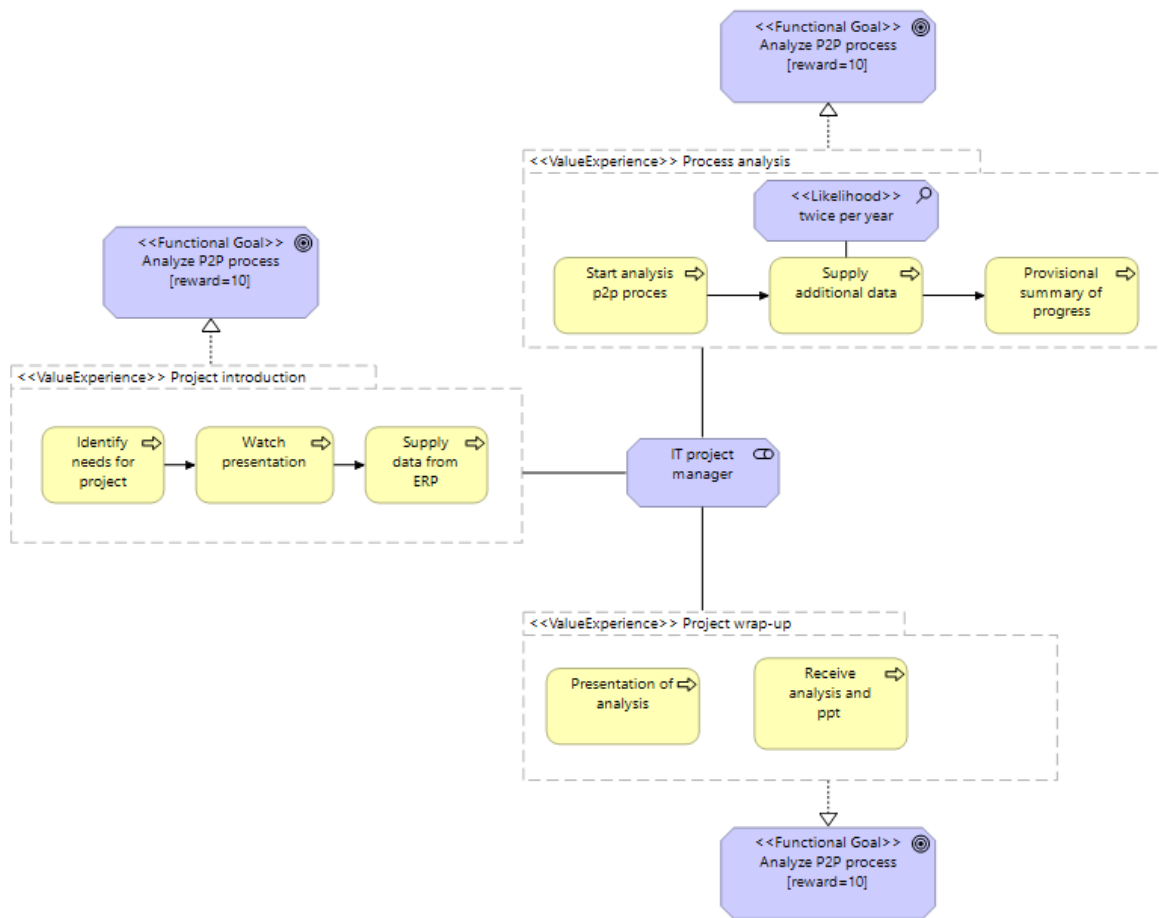
Appendix 6

Interview 3 questions:

Value Event patterns (- how do parts of an experience affect goals, thus increase or reduce its value? A Value event realizes a functional goal. A Value event influences a quality goal through one of its qualities. Quality satisfying a goal inheres in a value object)
- o *(Quality Driver)* How do value events influence the attaining of quality goals? Which quality influences the quality goal? What efforts and costs are triggered by the event?
- o *(Quality Assessment)* How are characteristics/aspects of the involved resources/employees assessed/measured and what influence does this have on accomplishing quality goals?

Valuation patterns
- o Per goal collect a score form 1-10 that represents the supplier's performance. Do this in terms of value experience and value object

Interview 3 canvas:

Customer/user interaction/activity *(value events)*	Functional Goal (needs/wants/pains)
(1)Identify needs for project (2)Watch presentation (3)Supply data from ERP (IT project manager) (4)Start analysis p2p process (supplier) (5)Supply additional data (6)Provisional summary of progress (7)Presentation of analysis (8) Receive analysis and ppt	**(4) Analyze P2P process through data use** **(7) Reveal strengths and weaknesses for procurement activities**

Customer/user interaction/activity *(see above)*	Resource/employee *(value object/enabler)*	Property/aspect *(quality driver)*		Quality Goal (needs/wants/pains)
(1) (2) (3) (4) (5) (6) (7) (8)				Improve/optimize the P2P process Optimize procurement activities Reduce costs Diminish bottlenecks and workarounds for tasks Decrease error margin Improve team guidance and use as management tool Increase use of company data

Customer/User	Value Assessor (if different) *(based on feedback from procurement lead)*	Customer/user journey/experience *(value experience)* Project wrap-up	Value of Experience:	
			Functional/Quality Goal	**Score**
IT project manager (customer) **Procurement lead (user)**				

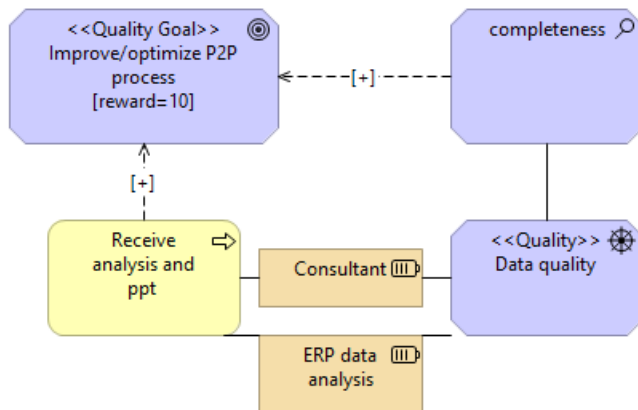*Black = same answers given by user and customer*
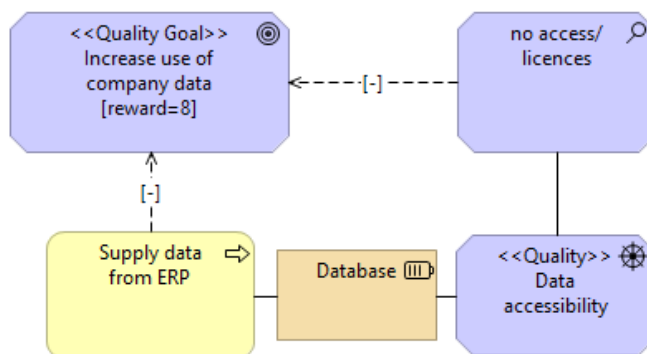*Blue = answers given by user*
Grey= answers given by customer

**Interview 3 value patterns:**

Value Event Patterns

The degree of completeness of the data used for the process-mining by the consultant will influence the goal of optimizing the P2P process


The IT manager has expressed a desire to make more use of ERP data for management purposes. Supplying ERP data to the hired consultant for the use in process mining decreases value for this goal, unless effort has to be put in to make the data files compatible for use, or when this event happens more often and client's effort increases.
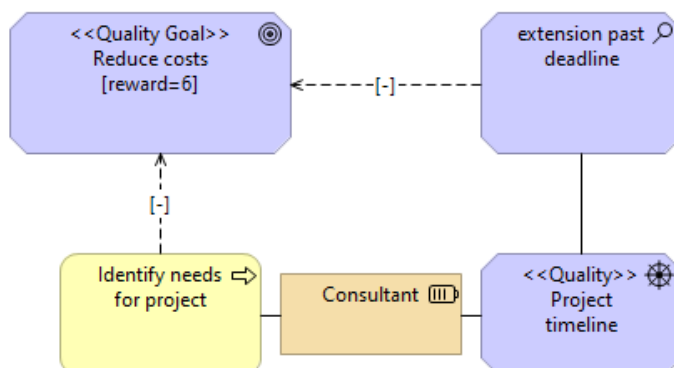

The IT manager mentioned timeliness as being an important influence on the goal for reducing costs. Managing expectations in terms of outcome of cost reduction was also discussed.
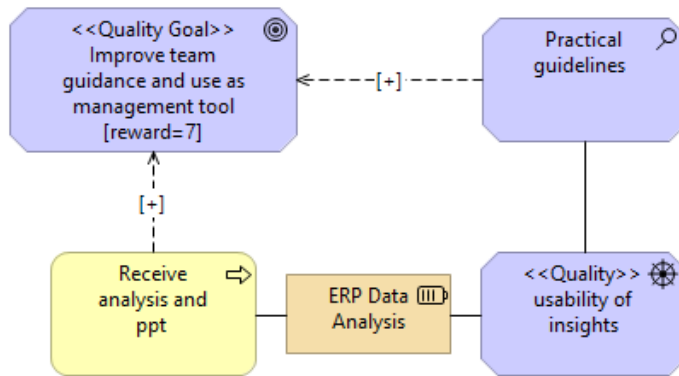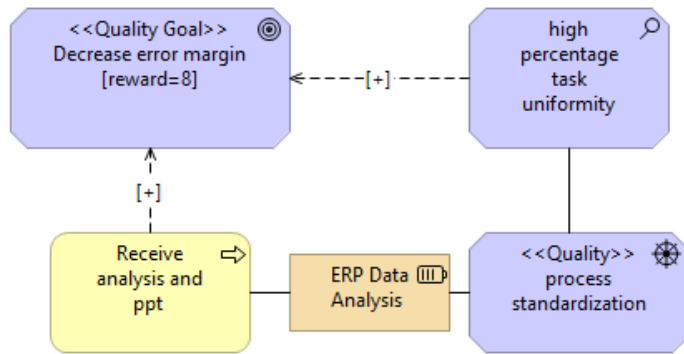
The value event of receiving the end analysis, and in particular it's degree of usability through practicality, influences the goal of using the findings as a management tool.
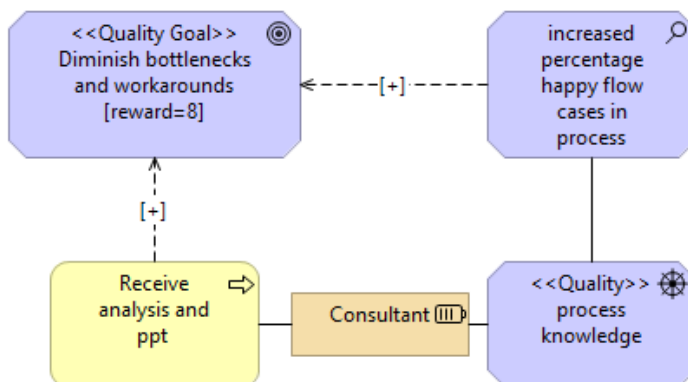
Receiving the end analysis positively influences the goal of diminishing bottlenecks in the process when the consultant on the supplier side possesses adequate knowledge of the P2P process in order to increase percentage of "happy flow" cases.
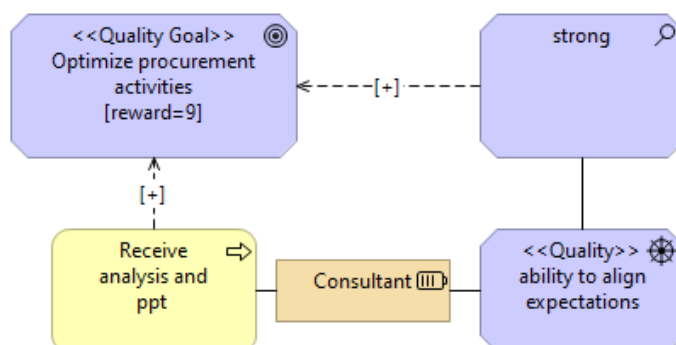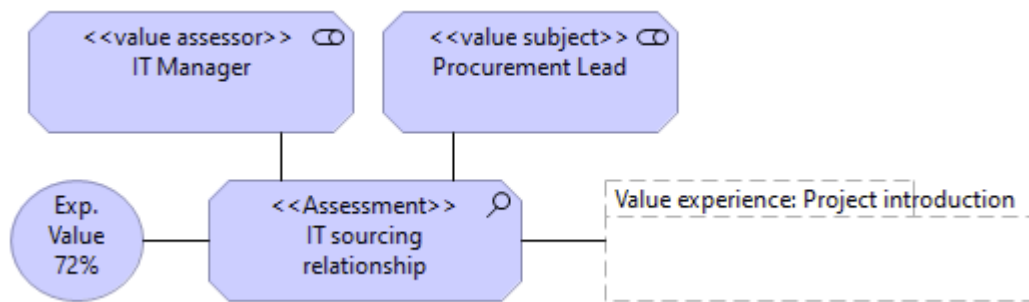

When receiving the end analysis, the consultant's ability to align expectations affects influences the goal of optimizing procurement activities.
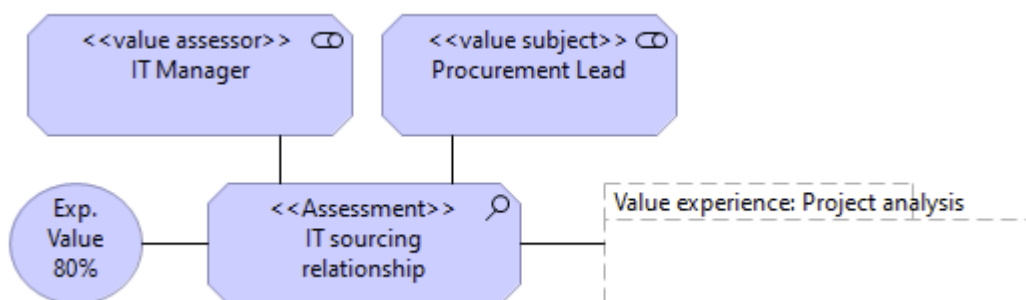
Receiving the end analysis, positively influences the goal of decreasing error margin in the ERP system when a high percentage of task uniformity can be realized.
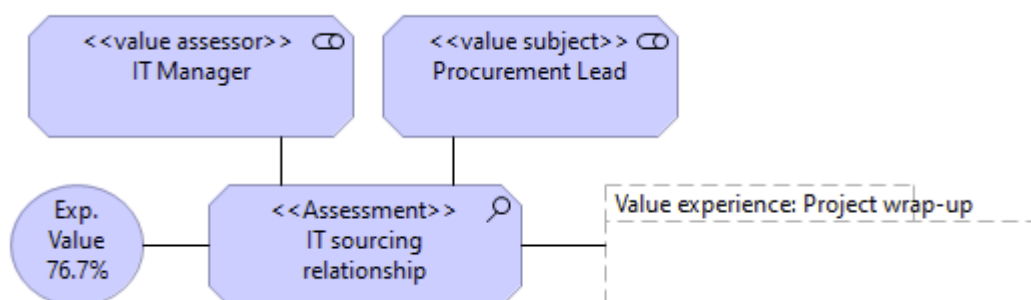

Experience valuation calculation:

Value experience- Project introduction Value Assessor- IT manager	Score goal 1-10 How does the supplier perform in terms of identified goals	Reward goal 1-10 How important is the goal	Valuation score= Score * reward
Functional goal: *Analyze P2P process through data use*	7	10	**70**
Functional goal: *Reveal strengths and weaknesses for procurement activities*	7	10	**70**
Quality goal: *Reduce costs*	7	6	**42**
Quality goal: *Increase use of company data*	8	8	**64**
Sum valuation scores		**34**	**246**
Maximum score			**10*34=340**
Value (sum/max)			**246/340=72%**

Value experience- Project Analysis Value Assessor- IT manager	Score goal 1-10 How does the supplier perform in terms of identified goals	Reward goal 1-10 How important is the goal	Valuation score= Score * reward
Functional goal: *Analyze P2P process through data use*	8	10	80
Functional goal: *Reveal strengths and weaknesses for procurement activities*	8	10	80
Sum valuation scores		20	160
Maximum score			10*20=200
Value (sum/max)			160/200=80%

Value experience- Project wrap-up Value Assessor- IT manager	Score goal 1-10 How does the supplier perform in terms of identified goals	Reward goal 1-10 How important is the goal	Valuation score= Score * reward
Functional goal: *Analyze P2P process through data use*	9	10	**90**
Functional goal: *Reveal strengths and weaknesses for procurement activities*	8	10	**80**
Quality goal: *Improve/optimize the P2P process*	8	10	**80**
Quality goal: *Optimize procurement activities*	8	9	**72**
Quality goal: *Reduce costs*	6	6	**36**
Quality goal: *Diminish bottlenecks and workarounds for tasks*	8	8	**64**
Quality goal: *Decrease error margin*	7	8	**56**
Quality goal: *Improve team guidance and use as management tool*	7	7	**49**
Quality goal: *Increase use of company data*	7	8	**56**
Sum valuation scores	**68**	**76**	**583**
Maximum score			**10*76=760**
Value (sum/max)			**583/760=76,7%**

Appendix 7

Interview 4

	Scores supplier	Scores client
PEOU1	6	6
PEOU2	4	2
PEOU3	6	6
PEOU4	6	5
US1	6	6
US2	3	2
US3	6	6
US4	5	6
PU1	5	6
PU2	5	6
PU3	6	5
PSQ1	6	6
PSQ2	6	6
PSQ3	1	2
PSQ4	7	6
PSQ5	6	6