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TNO report

**Assessing business transaction standards and their
adoption**

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Abstract

Nowadays businesses organisations increasingly want to be interoperable so that they can collaborate with other organizations. This interoperability can be achieved through the use of business transaction standards, by which those organizations that use these standards collectively form a value added network. However the effectivity of these standards is largely dependant on the number of organizations that have adopted them, and thus it is very important that the standards conform to the conditions that organizations have towards adopting these standards. This thesis describes the search for aspects that influence the adoption of business transactions standards. As well as identifying methods through which an Standard Development Organization (SDO) can influence these aspects so that more organizations will adopt the standard and subsequently higher interoperability is achieved.

Building on recent literature, describing technical standards (Kaa, 2009), we have constructed a model through which standard aspects can be compared with the adoption conditions that organizations have. Subsequently methods were identified by which an SDO can influence standard adoption through their aspects. This was done by using cross case analysis methods whereby aspects that influence the adoption conditions of business transaction standards were identified. The cases used were analyzed using a multiple data collection set up ensuring a stronger hypotheses building process. In order to assure that every aspect involved in standard adoption is identified we have used cases describing standards that are used in different domains.

The cases used in this thesis demonstrated that early involvement of organizations having high market powers (preferably in the form of a federation) is important for the adoption whereby the development and maintenance of the standard should preferably be funded by those organizations that have most to gain from broad standard adoption. Furthermore open characteristics, modularity and efficient business processes which subsequently yield cost advantages are perceived imperative for the adoption of business transaction standards. However the most striking results from the analysis was that the institutional forces driving organizations into adopting business transaction standards are mostly dependant on the powers differences that exist amongst organizations that reside in the specific domain. When there are large power differences then aspects that reside in the competitive environment are of more importance, whenever there are low differences more emphasis is towards the technical (IT resource) aspects of the standard. The results from this thesis can be used by SDO's in order to assess which standard aspects are of importance during specific intervals of the standard dominance process in order to ensure it's adoption. Furthermore managers can use the model described in this thesis to assess every aspect with their domain and subsequently choose a standard that they should or should not support.

Preface

The subjects of this thesis have also been discussed during several courses given at the School of Management and Governance. These courses discussed the complexity and importance of business process for instance on an organizational, e-Business, e-Commerce, inter-organizational level as well as discussing methods of deploying and maintaining these collaboration methods. I was lucky to find an internship at a well respected knowledge institute that is actively involved in the development and deployment organizational collaboration methods.

This thesis has been made possible through my internship at TNO Information and Communication Technology located in Enschede, the Netherlands. TNO can be considered as a well respected Dutch knowledge institute that acts as an independent ICT innovation partner for all kinds of organizations. I specifically would like to thank my supervisors, Dennis Krukkert, Erwin Folmer and Raymond Loohuis. Through their active involvement by giving recommendations, suggestions, constructive criticism and by creating a constructive atmosphere, this thesis would not have been accomplished. Furthermore I would also like to thank the employees at TNO ICT Enschede who have patiently helped me during my graduation project, as well as creating a professional and inviting working atmosphere. At last I would like to thank my family and friends who have supported me, during the last months, on a social level and have also given me practical tips and recommendations which were very helpful towards the successful completion of this thesis.

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1 Introduction

Organizations have an increasing need of having systems that are interoperable so that they can efficiently collaborate with other organizations, this interoperability is defined as “the ability of two or more socio-technical systems to exchange information, to interpret the information that has been exchanged and to act upon it in an appropriate and agreed upon manner” (Rukanova, 2005). This ability of efficiently exchanging information can facilitate collaborations between different organizations and this “opening of organizational borders” must be seen as an opportunity with strategic importance (Kanter, 1991). Interoperability can exist on the technical field where technical interoperability indicates that information systems can interact with each other (e.g. systems can exchange data including the meaning and context of the data). Interoperability can also be viewed as business process interoperability which indicates that business processes from multiple organizations are able to interact with each other. The level of interoperability can be attributed to the number of systems that are able to exchange and interpret information that has been exchanged and to act upon it in an appropriate and agreed upon manner (Rukanova, 2005). The problem with interoperability is that when systems have low levels of interoperability, it is less attractive for other organizations to adopt the system then when the system has high levels of interoperability. Thus interoperability can only be achieved when a group of organizations can find consensus regarding the manner in which information is shared amongst each other, reaching this consensus is often very difficult because every organization has its own reasons for wanting to be interoperable. Besides that enterprises are fundamentally inoperable due to barriers / incompatibilities of various kinds at the various enterprise levels (Chen, 2007).

Business transaction standards are used by information systems to increase the level of interoperability amongst collaborating organizations. They provide organizations a manner through which to link relation specific resources (like knowledge and business processes). Standards are “a set of definitions, specifications and guidelines developed by a Standard Development Organization (SDO), which aim at defining some aspect of business communication” (Rukanova, 2005). Most research has focussed on technical standards that achieve technical interoperability by which it is unclear whether these findings can be generalized towards business transaction standards. Whenever all aspects (that are of influence on the adoption of the standards) are known, the SDO is in a better situation in placing the standards in the domain in such manners that high adoption degrees are achieved. This thesis serves to identify methods through which the SDO organization can ensure higher adoption of business transaction standards.

1.1 Goal of the study

There is a great governmental interest within the European Union and in the Netherlands (Min_EZ, 2007) to stimulate business transaction standards that result in high degrees of interoperability. This interest is also present at SDO's which need to develop standards that are capable in achieving high interoperability degrees. There are however several problems with achieving high interoperability degrees, for instance the lack of knowledge in the factors that influence organizations to adopt business transaction standards (i.e. there is no clear overview of those factors that drive organizations to adopt business transaction standards). These reasons for adoption can

be practical (e.g. for efficiency improvements) but can also be initiated on strategic reasons (e.g. organizations can form collaborations that result into network advantages). And thus it is also difficult for SDO's to assess whether their developed standard will be easily adopted. This is why TNO (an organization that supports SDO's in the development of standards) needs a deeper understanding into those aspects that are of importance for the adoption of business transactions standards and subsequently how these aspects can be changed in such a manner that the SDO can ensure higher adoption degrees. Following these problems the goal of this study is:

“To identify aspects that influence business transaction standard adoption and how these aspects can be influenced so that higher interoperability is ensured.”

1.2 Problem definition

This paragraph is divided in two parts, first the main-research question will be given and second the (sub) research questions. The research questions serve to solve the primary problem and therefore will be discussed first in the report. Following the goal of the study, the main-research question is defined as:

“Which aspects of business transaction standards can influence the adoption conditions that organizations have for using these standards, and how can they be influenced so that higher interoperability is ensured?”

In order to answer the main-research question several research questions are formed, first a determination should be made which adoption conditions are present, research question one states:

“Which adoption conditions exist for organizations when using business transaction standards?”

Second a determination should be made which aspects are present when dealing with business transaction standards, whereby these aspects should be structured in such manners that patterns between aspects can be identified which can help form conclusions, the second research question states:

“Which aspects do business transaction standards have and how can they be categorized so that generalizations can be made?”

Third the aspects and the adoption conditions should be related in such manners so that a determination can be made regarding the important business transaction standard aspects, research question three states:

“Which aspects, that are important for the adoption of business transaction standards, can be related with the adoption condition, and which aspect generalizations can be made?”

Fourth methods should be identified that can be used by SDO's in order to increase standard adoption, the fourth research question states:

“How can the identified aspects be influenced so that higher interoperability is achieved?”

These research questions are related to one and other and have a sequential order in which they have to be answered. The relations between the research questions and the main-research question is shown by figure 1.

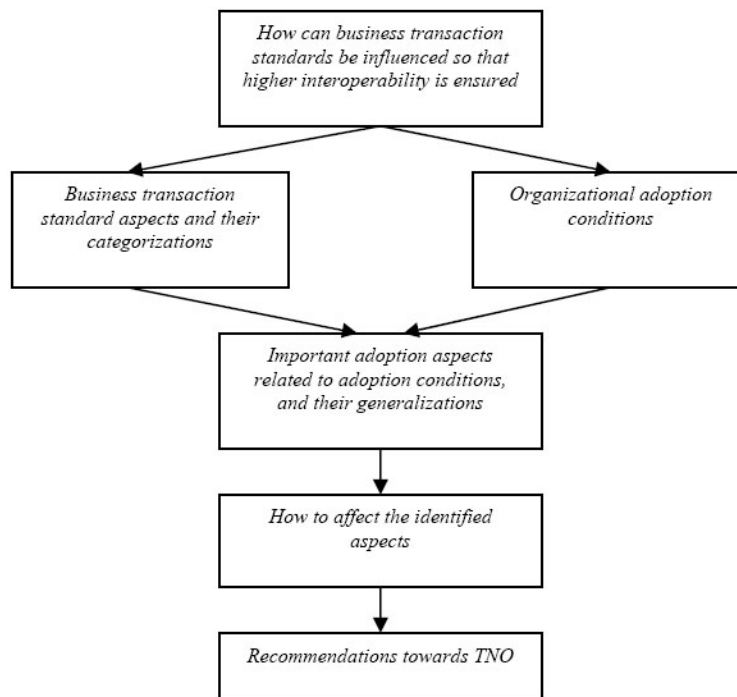


Figure 1 – Research model

1.3 Research approach

As shown by figure 1, the main-research question will be answered by structurally answering the research questions. In order to do so the first task has been to form a literature base that can be used throughout the project. This literature review was based on a method described by Linde (2004) which resulted in an article list from top scientific journals which has been extensively used during this research (appendix A shows the steps taken during the literature search). Using this literature a synthesis is made regarding the factors that can be of influence on the adoption of business transaction standards. Last case study techniques were used to determine which aspects influence on the adoption conditions of business transaction standards and how these aspects can be altered.

1.4 Thesis structure

Figure 2 shows how this document is structured and also how the sections will be used to answer the (main) research questions.

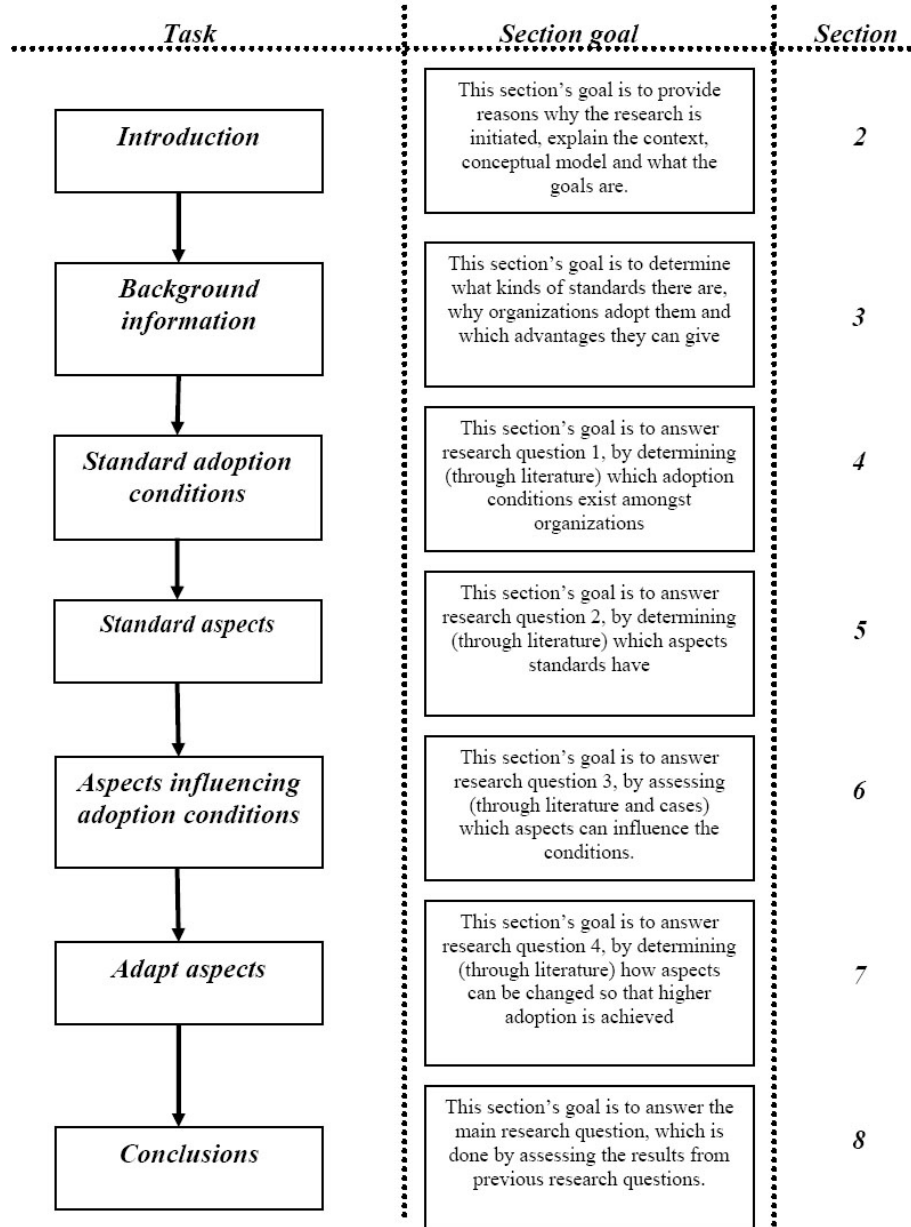


Figure 2 – Document structure

2 Background information

The purpose of this section is to give a complete overview why the use of standards can give organizations such advantages that they can attribute to the goals that the organizations have set for themselves. The factors involved in the adoption of business transaction standards are shown by figure 3.

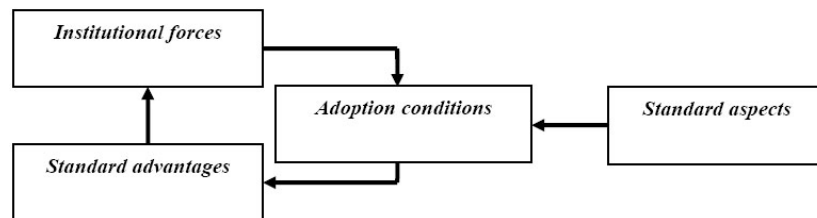


Figure 3 – Conceptual model

Figure 3 shows that institutional forces (e.g. coercive powers, response to uncertainties, professionalization (DiMaggio, 1983)) drive organizations into adopting business transaction standards, by which the adoption conditions (those conditions that the standard must comply to) limit organizations into adopting the standards. Whenever an organization has adopted a standard, several advantages can arise as a result (e.g. efficiency enhancements, increased knowledge). These advantages in turn influence the institutional forces, which initially caused the organization to adopt, and thus further adoption is influenced by previous adoptions. Whenever the SDO wants to alter the adoption levels a standard, the standard aspects should be changed. By changing these aspects, the standard can be made better suited towards the organizational adoption conditions and in turn decrease the forces against adoption.

The remainder of this section will give more detailed information regarding business transaction standards, the institutional forces and standard advantages that have been described in the conceptual model (figure 3).

2.1 Business transaction standards

Business transaction standards are used by Inter - Organizational information Systems (IOS) to increase the level of interoperability amongst collaborating organizations. These IOS systems can have multiple forms, Lu (2006) sums them up as follows: extranets, EDI, Internet EDI, B2B e-commerce and e-SCM. Collaborative business (C-business) describes the interlinked collaboration of all participants in a value added network (Scheer, 2003). Interoperability is an essential tool for enabling collaborative business, whereas organizations agree to work together as a method for achieving their common goals. These collaborations can be achieved between horizontal businesses as well as vertical businesses.

- Vertical collaboration ensures that there is a better synergy within the value chain, i.e. ensuring that there are better synergies between competitors and customers.
- Horizontal collaboration ensures that organizations that reside at the same 'level' in the value chain, i.e. competitors work together.

When collaborative business is strived after, the systems of every party involved must be able to interoperate. Achieving this interoperability can be through a standard that is recognized by all involved parties, this interoperability can also be viewed from multiple levels. The level of interoperability that is usable for business transaction standards can be categorized as interoperability at the institutional level. However because of political, organizational, and economic complexities, standard development and accreditation schemes for interoperability at the institutional level is much more difficult than developing technical standards (Backhouse, 2003). This also stresses the broad adoption of the standards and the standard dominance process which generally consumes considerable time. This general background information will be used during the next paragraphs so that the reader can form a complete picture why organizations adopt business transaction standards.

2.2 Institutional forces

During the last decade organizations increasingly have to compete in larger domains due to the globalization of markets. As a result the cooperation between organizations also has increased, and organizations utilize current advances in (information) technology to facilitate this. Business processes are being altered in such manners that they can facilitate collaborations between other organizations. Having effective business communications can be extremely beneficial for every organization and can have tremendous influence on e.g. the effectiveness of business processes and knowledge management. Organizational collaboration enables “buyers to improve their own production plans and delivery schedules. Correspondingly suppliers can use the buyers real time store level data to plan their inventory levels and production levels” (Kelle, 2005). Information technology can enable such collaborations between firms whereby information exchange takes place at the inter firm level and within organizations between departments.

The ability to be able to interoperate can be an important factor for organizations, these organizations can have several reasons for striving for a higher interoperability degree. Elgarah (2005) has identified several reasons:

- Necessity: Interorganizational relationships are established to meet legal or regulatory requirements.
- Asymmetry: Interorganizational relationships are established in response to power or control of another organization.
- Reciprocity: Interorganizational relationships are based on cooperation, collaboration and coordination among organizations
- Efficiency: Interorganizational relationships are prompted to improve the internal input/output ratio of an organization and internal efficiency.
- Stability: Interorganizational relationships formation is an adaptive response to environmental uncertainty
- Legitimacy: Interorganizational relationships are established to appear in agreement with the prevailing norms, rules or expectations of external constituents and/or to improve the image, reputation, prestige.

These institutional forces identified by Elgarah (2005) are the underlying reasons for organizations form strategies that lead them to adopt business transaction standards. The next paragraph will give more in depth explanation which advantages organizations they can achieve from using these standards.

2.3 Advantages resulting from standard use

The overall goal of business transaction standards is that documents and messages are delivered to the target organization in such manners that they can automatically be processed through their business processes. By which “business processes are the activities underlying the value creating process and provide a context from which one can examine the direct resource exploitation. It is a specific ordering of work activities across time and space, with a beginning, and an end, and clearly identified inputs and outputs” (Davenport, 1993). In other words when ensuring that the business transaction standard is effective amongst the participating organizations it will have positive influence on the value creating process. Organizations develop strategies that are based upon rents, which means that positive effects (e.g. revenues) are derived through certain strategies. Moser (2007) identified four different strategies within the purchasing and supply management field from which standard use can be directly related to relational rent strategy which he defined as follows:

“Build up idiosyncratic (a behaviour that is specific for a group) intercompany linkages through relation specific invest-elements and the combination of resources in unique ways”.

However, when business transaction standards are implemented, the organization automatically becomes more dependant upon third parties. This is because the manner in which processes are conducted is defined by the SDO organization. According to Benner (2003) this can result in a lesser responsiveness to market trends and thus negatively affects the competition powers of the organization. Hence the adoption of business transaction standards can result in increased process performance but also in a lesser responsiveness on market trends

It is common that the advantages resulting from software implementations are expressed through the resource based view e.g. (Rumelt, 1984) & (Melville, 2004). However a result from interoperability is that competitive advantages are achieved without necessarily owning and controlling the asset (which is a typical characteristic of the resource based view). “Firms who combine resources in unique ways may realize an advantage over competing firms. Thus unique interfirm linkages may be a source of relational rents and competitive advantage” (Dyer, 1998). Because standards enable interfirm linkages the relational view as described by Dyer (1998) will be used. He has identified several advantages resulting from interconnecting resources:

- Relation-specific assets
- Interfirm knowledge sharing routines
- Complementary resources and capabilities
- Effective governance

Dyer (1998) has also identified several mechanisms that cause these advantages:

- Causal ambiguity: The aspect cannot be decomposed into identifiable "building blocks" i.e. it is hard to assess how the advantage can be reproduced by third parties.
- Time compression diseconomies: Advantages can be maintained because "trust or partner-specific absorptive capacity" is built over time and thus can be hard to imitate.
- Interorganizational asset interconnectedness: "Reduces the difficulty of increasing one stock when stocks of other assets are high" e.g. whenever an organization has high "stocks" of knowledge, they can be utilized to diminish the "stocks" of customer doubts. (Volberda, 2001)
- Partner scarcity: Whenever there are low amounts of partners that can ensure a particular advantage then it is hard to imitate when those partners are already committed. A firm's ability to find a partner with complementary strategic resources and a relational capability (i.e. a firm's willingness and ability to partner).
- Resource indivisibility: Whenever resources are constructed by partners it is possible the resource cannot be divided and over time it becomes difficult to imitate.
- Institutional environment: Some advantages are derived from the environment where the organization resides, this can be country, domain etc.

This paragraph has given explanations which strategies organizations follow when adopting business transaction standards and which advantages they can expect. These advantages in turn can change the institutional forces and subsequently initiate another organizational strategy (these steps are also shown in figure 3).

2.4 Section summary

This section provides the reader an indication regarding the cause and effect of business transaction standard use, by which the institutional forces and standard advantages that are present in the causal model have been examined. This section has shed a light on the reasons why organizations might adopt standards, which differences exist between business transaction standards and other (technical) standards, and what kind of advantages organizations might have from adopting business transaction standards. When analyzing these steps the following observations can be drawn from this section:

- Literature regarding technical standards cannot be generalized towards business transaction standards, by which Backhouse (2003) states that the development of business transaction standards is much more difficult.
- Whenever an organization perceives effective chain integration as a competitive advantage then the decision to adopt business transaction standards should be a direct result from the strategy the organization has set itself.

3 Organizational adoption conditions

This section is used to answer research question one, which is: “Which adoption conditions exist for using business transaction standards?” This section will give determinations which viewpoints are of importance when dealing with the adoption of business transaction standards and how they can be judged.

As stated in the previous section (paragraph 2.2) organizations can have different reasons for adopting standards. This can also be said about organizational types. These differences can be drawn from e.g. the organization type in the supply chain, network position, organizational goals, profit versus non-profit orientation of the organization, resource dependency, etc. In order to build a business transaction standard adoption model multiple factors have to be identified amongst the organizational types that are influenced by the standard. Fenton (1998) states that “An effective standard is one that should help developers, assessors and users of such systems. For developers, the standard should help them build the system cost-effectively, and it should be clear what is required in order to conform to the standard. For assessors it should be possible to determine, objectively, compliance to the standard. Users and society at large should have some assurance that a system developed to the standard has quantified risks and benefits”. This shows that there are a lot of different ways of looking at the adoption of a standard and these should be accounted for in the model. Krechmer (2009) discusses three types of organizations (creator, implementer, user) with possible different interests and views regarding standards. In the following paragraphs these interest and views will be discussed, based on a literature review, for each organizational type.

3.1 End user organization

The end user organization (i.e. focal firm or user) will benefit from the business transaction standard because the application of IT and complementary organizational resources can improve business processes or enable new ones and may ultimately impact organizational performance (Melville, 2004). Zhu (2006) identified two aspects that are of key influence to the adoption of an end user organization when dealing with business transaction standards. These aspects are:

- Network effects (network externalities) are of significance because when there are more adopters of a standard then the value of a standard will also increase. This means that when the adoption of the standard is high the higher the network effects. The model developed by Zhu identifies two aspects by which “expected benefits” can be considered as a subset of network effects.
- Switching costs are those costs which should be made in order to make the standard work. Examples are training costs, hardware and software changes etc.

3.2 Implementation organization

The implementation organization (i.e. implementer) is the organization that makes software (in-house or outhouse) and is compliant to the standard which is developed by the SDO. Whereas an in-house software implementation organization is essentially a department within the end user organization that develops the software that will be used, the outhouse software organization is a separate organization that is hired in order to fulfil the software needs of the end user organization. The implementation organization ensures that the end user is able to use the standard.

Since our goal is not to assess the quality of a specific software solution but the standard that is used by that specific software solution, a (software) supplier and a (software) maintainer view will be used and not a (software) developer view when identifying measures. Two measures were identified that are applicable with the implementation organization namely maintainability and portability (Losavio, 2004).

- Maintainability: Entails the ability of a system to be altered in order to conform to environmental changes. Losavio has identified several sub-characteristics that can be used in order to give a clear view of this effect (analyzability, changeability, stability, testability and compliance).
- Portability: Entails the ability of a system to be implemented at the end user organization. Losavio has also identified several sub-characteristics that can be used in order to give a clear view of this effect (adaptability, install ability, co-existence, replace ability and compliance).

3.3 Standard development organization

The Standard Development Organization (SDO) usually is a non-profit organization that is comprised with members that have common goals. These members can originate from different sources like producers, distributors, retailers, non-profit industry interests groups, universities and other governmental units (Nelson, 2003). The goal of a SDO is the development and maintenance of a standard that services their common interests. The articles written by Nelson (2003) and Zhu (2006) describe that for the SDO one measure is key for adoption and diffusion which is deployment. The deployment of the standard will be judged based upon three measures (Nelson, 2003):

- Volume: Refers to the number of implementations of the standard.
- Diversity: Refers to the number of different standard modules which are implemented.
- Breadth: Refers to the number of different trading partners.

3.4 Section summary

This section discussed the conditions that each organizational type has when adopting a business transaction standard. The importance of this is that most literature (IT and business related) is written from the view of the focal firm. This rather atomistic view on organizations neglects the interorganizational characteristics and dynamics of business transaction standards. We have observed in our analysis that different organizational types have other requirements towards the standard, and thus also influence the successful adoption of business transaction standards. When analyzing the adoption conditions that different organizational types have the following observations can be drawn from this section:

- The adoption conditions of adopting business transaction standards can best be drawn from those (types) of organizations that want to adopt it.
- Although the organizational adoption conditions are derived from literature they can also be derived from their organizational goals whereas:
 - The End user organization has adopted the relational rent strategy (Moser, 2007) by which efficient inter-company linkages are made, which can be categorized through high network effects and low switching costs.
 - The implementation organization has as goal as to service the end user organization as efficiently as possible, which is achieved through easy implementation and maintenance.
 - The SDO's goal is the development of a standard that yields the highest interoperability level as possible, which is achieved through broad adoption (which is categorized by volume, diversity and breadth).

4 Standard aspects

This section serves to answer research question two, which goal is to identify all business transaction standard aspects that literature has described and categorize these aspects in such manners that later on in this thesis “within case” conclusions can be made, which makes sure that conclusions can be drawn for each case before looking for “cross case” patterns (Eisenhardt, 1989).

4.1 IT business value model

With the relational view used as a framework for capturing the interrelations of organizations the full potential of the standard also will have to be assessed. Thus it is important to present a model that encompasses the entire organizational domain (and is compliant to the relational view framework) from which all aspects that are important for business transaction standards can be derived. The model developed by Melville (2004) supports this. He conducted a comprehensive review from 202 IT business value articles on the IT function and how they relate with organizational performance and resulted in an IT Business Value model (figure 4). The reliability of the model can be considered as very high, the Melville article was published in Management Information Systems Quarterly and the article has a high citation count. This framework will be used in order to categorize the aspects found later on in this section.

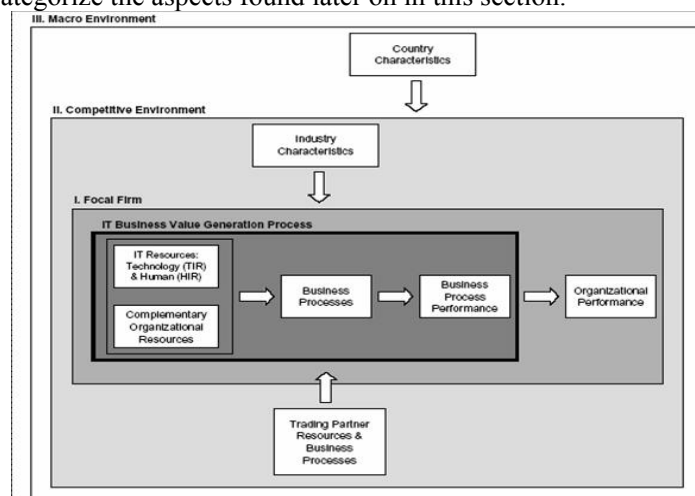


Figure 4 – The IT Business Value Model by Melville (2004)

The IT business value model (Melville, 2004) is especially important in the context of this thesis, for it emphasizes every dimension that a business transaction standard can influence (the focal firm, competitive environment and the macro environment). When assessing these standards, this model can be very useful for categorizing standard aspects. The dimensions mentioned by the model are explained as follows:

- Focal firm: The focal firm is the dimension where the information technology organization resides, and is responsible for IT deployment and complementary organizational resources. Since every organization has a different IT organization these resources vary per organization. When following the relational view some of these resources can give a competitive advantage. This should improve business processes or enable new ones, which ultimately

- should impact organizational performance. The focal firm can be subdivided by three sub-dimensions:
- IT Resources: Business transaction standards can be used by multiple applications that span departments and organizations in order to supplement business processes. These standards have certain resources that supplement their capabilities so that these departments and organizations are best served.
 - Complementary Organizational Resources: Introducing standards in organizations usually brings forth (significant) organizational changes. These changes can affect resources that are not directly linked with the standard. The changes, although not directly linked to the standard, can however be significant for the performance of the organizational processes, and thus complementary organizational resources are important standard aspects.
 - Business processes (performance): Business processes are the activities underlying the value creating process, it is a specific ordering of work activities across time and space, with a beginning, an end and clearly identified inputs and outputs (Davenport, 1993).
- Competitive Environment: This part of the IT business value model shows the direct environment where the organization resides, and should examine the performance synergies of cross unit or multi-business firms. This is complicated because the organizations not only have business units (with its underlying IT synergies) operating in different industries but also can operate with multi-business firms (Tanriverdi, 2006).
- Industry characteristics: Industry characteristics shows the market factors that determine how organizations can achieve rents. According to Tanriverdi (2006) organizations diversified in multiple businesses will encounter a moderated relationship between IT and corporate performance.
 - Trading partners: Trading partners such as buyers or suppliers are significant when the IT function spans the boundaries, and thus plays a role in the business value creation process of the focal firm Melville (2004). Whenever the organization has high powers with respect to its trading partners this can have significant influence on the organizational performance, and thus can be viewed as an important dimension.
- Macro environment: The macro environment are those environmental factors that are able to influence the organization. But the organization cannot influence the macro environment Typical examples of factors from this dimension include technology levels, basic infrastructure, societal factors and government. This environment was added to the IT business value model because it has significant influence on the attainment of business value, and thus influences standard adoption.

4.2 Aspect identification and categorizing

In order to establish a complete overview of those aspects that are of influence on the adoption of business transaction standards, articles have been examined that were found during the literature search (appendix A). By means of these articles aspects have been identified that characterize business transaction standards. Starting point was an article by van de Kaa (2009) who has made a similar model describing factors for standard dominance specific for network (technical) standards. With the standards described by Kaa (2009) additional factors were identified through other literature sources. These other literature sources were first ascertained by examining the top25 articles on relevant aspects (which yielded most literature sources). Second articles that discussed business transaction standard case studies as well as those articles that stood out (which were not published in top scientific journals) were also omitted (e.g. the article written by Lampathaki (2009)).

Kaa (2009) has divided the aspects in four main “categories” (characteristics of the standard supporter, characteristics of the standard, standard support strategy, other stakeholders). This classification method was not adopted in this report because it lacked one crucial dimension of business transaction standards: the external environment.

The identified aspects are subsequently sub-divided into identifiable categories as defined by the IT Business Value Model defined by Melville (2004), the results of this search is shown in figure 5.

Standard aspects	Balachandran 2003	Balachandran 2005	Bolin 2005	Chen 2003	Chen 2006	Eichenseher 2008	Fenton 1998	Foster 2004	Hess 2004	Kap 2009	Lampathaki 2009	Luczak 2006	Markus 2006*	Nelson 2008	Nelson 2003	Owen 2001	Samped 2005	Syghis 2006	Zhao 2007	Zhu 2006	
1. Focal Firm - IT Resources																					
1.1 Technological superiority				√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	
1.2 Compatibility of standard			√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	
1.3 Open standard			√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	
1.4 Complete set of functionalities			√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	
1.5 Customization capabilities			√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	
1.6 Ease of use			√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	
1.7 Deployment strategy			√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	
2. Focal Firm - Complementary Organizational Resources																					
2.1 Financial strength																					
2.2 Complementary goods and reputation			√	√																	
2.3 Learning orientation			√																		
2.4 Participation in standard consortia			√																		
2.5 Pricing strategy that attracts customers																					
2.6 Customer expectations																					
2.7 Pre-emption of scarce assets																					
2.8 Management support			√																		
2.9 Operational supremacy																					
3. Focal Firm - Business processes (performance)																					
3.1 Process management is increased																					
3.2 Business model is extended																					
4. Competitive Environment - Industry characteristics																					
4.1 Vertical integration																					
4.2 Horizontal integration																					
4.3 Market is ready																					
5. Competitive Environment - Trading partners																					
5.1 Network externalities			√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	
5.2 Big Fish			√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	
5.3 Stakeholders in standard build			√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	
6. Macro Environment																					
6.1 Legislation that encourages standard usage			√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	
6.2 Certification by independent auditors			√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	

* Whereas Markus2006 = Wigand2005 (describes the same case although not the exact same text)

Figure 5 – Identified business transaction standard aspects

4.3 Section summary

The purpose of this section was to identify aspects that can be used to improve the adoption of business transaction standards. This was conducted by first identifying the important categories that are applicable with business transaction standards (IT business value model derived from Melville (2004)). Second aspects that characterize business transaction standards were identified and subsequently subdivided in the distinct categories. This step has shown that current literature describing business transaction standards usually do not cover all domains that influence those standards furthermore these papers rarely describe critical success factors (Lu, 2006). This observation can be regarded as complementary to the findings of (Folmer, 2009) which states that there is a literature gap when dealing with business transaction standards. When analyzing the results the following observations can be drawn from this section:

- All identified aspects could be categorized into distinct categories.
- Through the categories generalizations can be made in the next sections.

Figure 5 shows a complete aspect list. In order to gain deeper insights in these aspects, including how they are perceived and understood by organizations, case studies will be conducted that should confirm the completeness of the aspect list as well as the relations of the aspects with the organizational adoption conditions which will be defined in section five.

5 Assessing aspects on standard adoption

This section will yield qualitative results by which an in depth understanding will be given which standard aspects influence the conditions that organizations have with adoption. This will be conducted through case studies that describe business transaction standards. The build up of this section is shown graphically through figure 6, which shows that two kinds of case studies will be conducted. First literature based case studies of different organization types have been conducted and second two field cases (SETU case and Vektis case) have been conducted. The reasons for following a multiple case study approach were:

- A multiple case setup gives more compelling evidence and reliability (Yin, 1984).
- Literature has suggested that the adoption of business transaction partly depends on the domain which can only be assessed through multiple cases (a case generally describes only one standard and one domain).
- A multiple case design is also preferred to answer research question three which asks for generalizations regarding the aspects.

The case evaluation steps (which are derived from Dyer (1998)) described in figure 6, show that for every standard a within case description is made and second cross case conclusion is drawn from multiple within case descriptions. Finally after completing the literature and field case conclusions these two conclusions will also be analyzed, this iterative process should yield those aspects that are truly important to standard adoption.

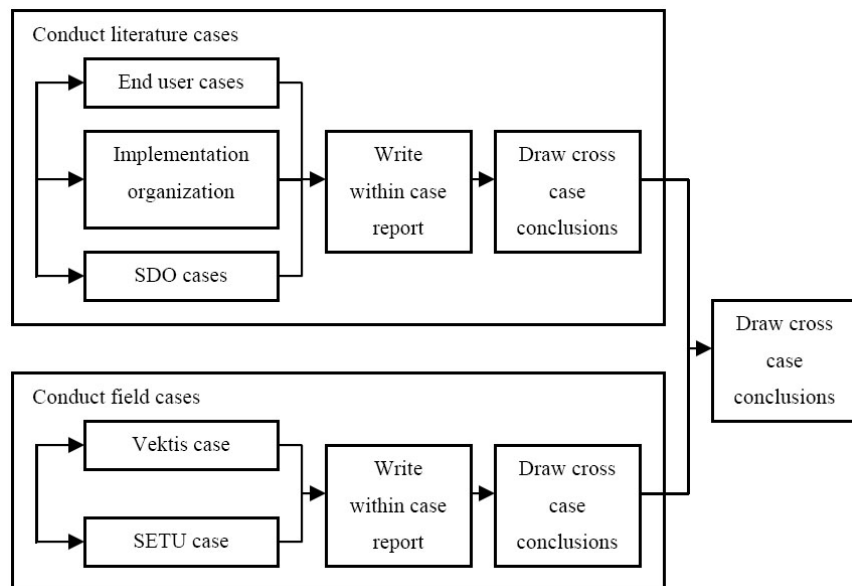


Figure 6 – Case evaluation steps

5.1 Literature case studies

The search for cases was first conducted within the literature that was found during the literature study (appendix A), and second a search was conducted through the internet sites of known standard consortia. These searches yielded six usable business transaction standard cases. The case studies that have been identified were grouped amongst the three organization types that were identified in section three, conditions for grouping the case studies towards one or more groups are the data gathering source from the article in question (i.e. when the data purely originates the SDO organization then the article will be grouped with the SDO). Cases can be written in three (sometimes overlapping) manners. When applying this grouping method it yields the following overview:

	<i>Author</i>	<i>Standard</i>	<i>End user organization</i>	<i>Implementation organization</i>	<i>SDO</i>
1	(Lu, 2006)	RosettaNet	√	√	
2	(Olsen, 2001)	RosettaNet	√	√	
3	(Boh, 2007)	RosettaNet			√
4	(Nelson, 2002-1) / (Nelson, 2002-2)	RosettaNet	√	√	√
5	(Spahni, 2007)	HL7		√	
6	(Wigand, 2005) / (Markus, 2006)	MISMO			√

Table 1 – Literature case studies

During the assessment of these articles special attention have been given towards the adoption conditions that were deemed important for the organizational types (as identified in section 3). I.e. an end user organization has two measures that are important for the adoption, network effects and switching costs. The following paragraphs will give an overview of the standards, whereas appendix B will give a more extended description.

5.1.1 RosettaNet

RosettaNet creates numerous standards that are applicable within the global supply chain and thus is active in multiple domains (e.g. the semiconductor, telecommunication and logistic domains). Their standards ensure open e-business process standards which cause reductions in cycle times, less inventory costs etc. It has a large installed base, which partly can be attributed to the fact that RosettaNet was one of the pioneers of (business transaction) standard development. This paragraph will give explanations regarding RosettaNet and the identified aspect groups.

- IT Resources: The RosettaNet standards are considered in the cases as being superior to other standards. Because the standards are developed so that they can be distributed through regional offices, the compatibility of the standards is high. The distribution method RosettaNet uses a decentralized diffusion strategy, whereas the standards are changed to local settings through an extensive network of regional offices (Lu, 2006).
- Complementary organizational resources: The standards will give organizations cost benefits (e.g. Cisco saved \$ 33,000 annually (Lu, 2006)). Furthermore the RosettaNet consortium places high importance in

organizations participating in the development of their standards (although participation is not for free).

- Business processes (performance): The articles report an improvement in business process performance. The business model is also extended because the standard has given the organization the possibility to outsource certain tasks towards other organizations (e.g. the responsibility for managing inventory).
- Industry characteristics: In multiple cases the authors mentioned that one of the reasons for initiating the implementation was to stay ahead of the competition, which indicates that the domain they reside in has become ready for collaborative business.
- Trading partners: Lu (2006) indicates that following partners will usually accept the standard proposed by the initiator. The initiator is reported in all cases to be a big-fish organizations (e.g. Cisco and Avnet). Domain powers are also reported as being important “The pressure from Cisco was the main reason why Xiao Tong agreed to implement IOS” (Lu, 2006).
- Macro environment: Boh (2007) indicates that one of the tasks of the regional offices is to change or leverage social and legal-regulatory environment of potential adopters.

5.1.2 *HL7*

Health Level 7 is a standard made for use within the (international) healthcare domain. The standards are used by medical information systems and distribute all kinds of medical information. The HL7 organization has affiliate offices in most countries where it is active.

- IT resources: Only one case have been found in literature (Spahni, 2007) and describe an implementation of the HL7 Rim module. This case described that the HL7 standards are very powerful and complete. However this had the side effects that the standards are more difficult to comprehend for the implementation organization. Furthermore the lack of documentation of the existing applications limited the implementation of several aspects of the standard. No additional information is given regarding aspects that reside in the other categories that have been identified.

5.1.3 *MISMO*

The Mortgage Industry Standards Maintenance Organization (MISMO) is developed for the American mortgage domain and is thus not internationally orientated (this standard is described in two papers written by the same individuals Wigand & Markus, and is thus treated as one paper).

- IT resources: The MISMO organization has set itself the goal to make it's standards as open as possible and to encourage user participation, whereas users from the entire mortgage industry can participate in the standard development process. Furthermore Wigand states that organizations are hesitant in adopting standards without having evidence that the deployment will progress smoothly. Thus many organizations are delaying adoption until they can observe actions of other organizations (Wigand, 2005).
- Complementary Organizational Resources: The standards have become mature which has as result that many software vendors have incorporated them into their solutions. This yields lower implementation costs for the end users and

since the standards are also with open characteristics the standards are even more attractive.

- Business processes (performance): The MISMO case states that there is an increased level of outsourcing resulting from the implementation across organizations in the mortgage domain.
- Industry characteristics: The case states that standards make both large and small organizations into nimble competitors; "Data standards help the smaller organizations play in the same ball field as the larger organizations, and they help the larger organizations be as nimble as the smaller ones" (Wigand, 2005). Furthermore the mortgage industry was very fragmented with considerable regulations. This yielded in high amounts of coordination problems in the domain making it ready for the introduction of a standard.
- Trading partners: The standards have grown very popular and have opened the door to new entrants and new types of intermediaries, whereas the big fish organizations continue to grow.
- Macro environment: This dimension is regulated strongly, which creates coordination problems and thus gives rise to the need of a business transaction standard.

5.1.4 Literature case conclusions

Using the literature cases, searches were made which aspects influence the adoption of business transaction standards. The identified aspects are shown in figure 7. Because there are not many literature cases, describing business transaction standards, no exclusion criteria have been set up during this step. The results of the case study comparisons are shown in figure 7 (a more extended overview is given in appendix B).

Standard aspects literature cases	End user organization		Implementation organization		SDO		
	1	2	3	4	5	6	7
1. Focal Firm - IT Resources							
1.1 Technological superiority	+	+		+			
1.2 Compatibility of standard	+		+	+	+		+
1.3 Open standard	+	+	+		+		
1.4 Complete set of functionalities	+			+	+		+
1.5 Customization capabilities	+	+		+			
1.6 Ease of use				+	+	+	
1.7 Deployment strategy	+			+	+		+
2. Focal Firm - Complementary Organizational Resources							
2.1 Financial strength	+				+		+
2.4 Participation in standard consortia	+				+		+
2.5 Pricing strategy that attracts customers		+					
2.6 Customer expectations					+		
2.8 Management support	+			+			
3. Focal Firm - Business processes (performance)							
3.1 Process management is increased	+				+		+
3.2 Business model is extended	+				+		+
4. Competitive Environment - Industry characteristics							
4.1 Vertical integration	+				+		+
4.3 Market is ready	+				+		
5. Competitive Environment - Trading partners							
5.1 Network externalities	+				+		+
5.3 Big Fish	+				+		
5.4 Stakeholders in standard build	+						+
6. Macro Environment							
6.1 Legislation that encourages standard usage					+		

(1 = Network effects, 2 = Switch costs, 3 = Maintainability, 4 = Portability, 5 = Volume, 6 = Diversity, 7 = Breadth)

Figure 7 – Important aspects drawn from literature cases

Figure 7 shows which aspects are important (according to the literature cases) for the adoption of business transaction standards. Furthermore figure 7 also shows which aspects are important per organizational adoption condition. These results show that six aspects identified in section four have been discarded entirely, by which most aspects have been mentioned more than once across an organizational type. Figure 7 also shows that the implementation organization is mostly concerned with the characteristics of the standard (IT resources) and not with other categories. Furthermore:

- For the end users network effects are most important.
- For the implantation organizations portability is most important.
- For the Standard Development Organization volume is most important.

5.2 Field case studies

This paragraph represents a second iteration of the aspect search and was used so that a triangulation (Eisenhardt, 1989) could be made on the aspects that are of true importance. This search will be conducted by means of the Vektis (<http://www.vektis.nl>) standard and the SETU (<http://www.setu.nl>) standard as a (field) case study. The goal of these activities is to identify the aspects that are of importance of standard adoption, and to determine how these aspects relate to the adoption conditions.

Case	Data collection method	Organizational viewpoints
Vektis	Literature	All
	Questionnaire	End user organization & Implementation organization
SETU	Literature	All
	Observations	Standard Development Organization

Table 2 – Field cases

For both the SETU case and the Vektis case a preliminary case description has been constructed using literature which has been provided by the SETU and Vektis organizations itself, the internet (site) and Dutch articles. These sources provided a basis from which an understanding was formed regarding the dimensions that exist when using the standards. Second more detailed information was drawn from SETU and Vektis. This information was acquired using separate methods these methods were:

- The Second iteration of the Vektis case study has been formed through a questionnaire (appendix E) that was sent to Vektis KEI members which are organizations that are both end users / implementation organizations and are involved with the standard build (43% response rate). This questionnaire had open ended questions which were derived from literature, aspect categories and the adoption conditions which were defined in sections three and four.
- The Second iteration of the SETU case was formed through observations, by which conversations were made with TNO employees who are involved with the building and maintenance of the standard.

The decision to use different data collection methods was based of time constraints however the use of different data collection methods can yield stronger hypotheses (Eisenhardt, 1989). The method of analysis has been the same as in the literature case evaluation by which the following paragraphs will give first a general description of the Vektis and SETU cases. Second using the case descriptions cross case analysis has been conducted that show similarities and differences between the two cases. And third using the aspect categories comparisons were made (steps two and three are drawn from Eisenhardt (1989)).

5.2.1 *Vektis case*

Vektis is a (research) organization that is funded by insurance organizations and ensures that appropriate information is available for health providers so they can perform their tasks in conjunction with their business (chain) partners. One of their activities is to provide standards for the declaration processes in the Dutch healthcare domain, by which standard users are insurers, health offices and health providers. The prime tasks of the standard are to provide mechanisms that show whether individuals are insured and by which insurer, as well as to provide mechanisms that enable electronic health declarations. Whenever an insured individual (i.e. patient) has used a service provided by health providers a billing process is initiated towards the insurer. These declarations are transmitted (by means of the standards) electronically towards the insurance organizations which in turn provide payment towards the health providers. The transmissions go through the VECOZO portal that ensures that the overall communication is conducted in a secure and safe manner (VECOZO is an independent organization funded by insurance organizations which ensures low thresholds for health providers). Vektis is also placed in the Dutch environment as an independent organization, by which it's partners, the Dutch health insurers, provide financial backing to the organization (despite this financial backing, the organization tries to be an independent body that tries to answer research questions in a "professional independent" manner (Vektis, 2009)).

5.2.2 *SETU case*

The SETU (foundation for electronic transactions in the staffing industry) was founded by the ABU (Algemene Bond Uitzendondernemingen or the Dutch society for the staffing industry) which serves the billing process on behalf of staffing organizations and those organizations that acquire personnel through the mediation of the staffing organizations. The general goal of the standard is to promote electronic transactions between the organizations within the Dutch staffing industry, to standardize the business process for compatibility reasons and to ensure continuity of the developed standards. The SETU standards are in existence since the beginning of 2007, since then the standards handle approximately 10 percent of the time sheets within its domain (SETU, 2009). Recently the standard has been added to a Dutch governmental list that shows open standards that are labelled as high quality. Through this standard list the government wants to promote the usage of such standards. The advantage for SETU is that the list "obligates" governmental organizations to a comply-or-explain regime with respect to the adoption of the standard. This means that whenever a (semi)governmental organization intends to hire employees on a temporary basis and / or wants to send a digital hour specification/ bill it has to comply to the standard and if not it will have to account with (good) reasons why it does not comply to the standard. The activities that the SETU conducts include (HR-XML, 2009):

- Facilitate standardization workgroups for participants
- Specify standards and guidelines for implementation
- Provide support to participants by means of a helpdesk and tools.

5.2.3 *Field case conclusions*

Using the case descriptions (appendix C) cross case analysis has been conducted whereby table 3 shows the similarities and differences between the two cases. The differences between the two cases can mainly be related to the competitive environment and the macro environment by which the health insurance organizations form such a

power base that other chain participants must follow. The consequences from the power differences are shown below:

- The Vektis standards are purely built to serve the declaration process towards the insurance organizations, and thus the characteristics of the standard are less important.
- The staff lending domain is not consolidated resulting on more emphasis on the IT resource dimension e.g. making the standard more compatible with other standards.
- Legislation towards health insurance organizations ensures that their domain powers are as high as it is this in turn ensures high standard adoption (legislation does not directly obligate organizations to adopt the standards).
- The Vektis installed base is as high as it is because the standard is being “forced” upon adopters.

	<i>Vektis</i>	<i>SETU</i>
<i>IT resources</i>	The standards are relatively open (by which only the insurance organizations pay contributions). The standards are built for specific occupational groups (which results in high recognition), the adoption of the standard has increased amongst those groups (this can stress the maintainability). Furthermore organizations have several modules to choose from and are not obligated to implement all. Furthermore the standards are built using ASCII and it is not compatible with other standards, however this has no influence on the adoption. The standards are also considered easy to use by which Vektis actively encourages the testing of the standards which is considered important for it gives a sense of confidence.	Although the standards are open the standards are not as widely used that software vendors have solutions ready "on the shelf" which are SETU compliant, this stresses the switching costs and portability. However many organizations / software solutions are already compliant to HR-XML which ensures that lower switching costs and portability is mediated and also linkages can be made to international organizations, The standards are built out of four complementary standards (which cover the entire employee lending process) by which organizations can choose to implement one or multiple standards and increases standard adoption.
<i>Complementary org. resources</i>	Broad adoption of the standards can mainly be attributed to cost savings organizations within the healthcare domain can make significant cost savings through the standards. The fact that Vektis and Vecozo is funded by insurance organizations does not affect the adoption of the standards. However the presence of the KEI within Vektis encourages good will and reduces misinterpretations and thus has positive effects on adoption.	The development of the standards is conducted in such a manner that organizations can participate in the development. This creates good will and reduces misinterpretations amongst industry players. Furthermore organizations within the staffing domain can make significant cost savings through the usage of the standards (economies of scale do apply).
<i>Business processes</i>	The standard ensures that the declaration process is conducted on an unambiguous manner which makes the adoption of the standard attractive because it can be used to enhance business processes. Furthermore insurance organizations also offer to collect the money that is not covered by the insurance, which creates good will and makes the declaration process simpler.	The standards ensure that no paper documents (e.g. hour specifications) will have to be sent towards other organizations that have converted to the standards. This will yield burden reliefs through increased processes which can attract organizations to adopt the standards.

<i>Industry characteristics</i>	The healthcare declaration processes is highly regulated within the domain which results in high adoption. By which health insurance organizations do not compete by means of an effective communication process between chain partners, they do compete through lower insurance fees and by having superior customer contacts etc. This means that the health insurance organizations can collectively endorse / develop the standards.	When adopting the SETU standards staffing customer organizations have the possibility of reaching more staffing organizations, and thus giving them more flexibility. This can have positive effects on the adoption of the standards. However the staffing industry is one where there is lots of competition (i.e. the domain is not consolidated) and thus organizations can choose not to convert because the organizations will be less flexible to domain changes.
<i>Trading partners</i>	Insurance organizations collectively have such powers that they can obligate (by means of contractual agreements) the usage of the standards, and thus health providers will have to implement the standards. The high adoption of the standards has ensured that the programs (that are compliant to the standards) are relatively cheap and thus lowers the switching costs.	At this point in time the installed base of the standard is not of such levels that other organizations automatically feel the need to adopt, there are several important organizations (e.g. Randstad, Adecco) within the domain that are actively working for higher adoption of the standards, however they cannot make the standard use compulsory towards their partners.
<i>Macro environment</i>	The standards are not obligated by law, however the healthcare domain is strongly regulated which is one of the reasons why the insurance organizations have such powers in the domain. Furthermore one respondent stated that when the government would have obligated the standards use the adoption would have gone quicker.	The SETU standards have been added to the comply-or-explain regime of the Dutch government which pressures (semi) governmental organizations to convert to the SETU standards, furthermore expectations are that this regime will encourage other organizations to follow.

Table 3 – Field case results

The cases have been used to discover which aspects are perceived important by which organizational types, figure 8 shows the aspects that have been deemed important after reviewing the cases (the aspects that have not been mentioned are discarded). Appendix D shows a detailed description of why these aspects have been chosen and they are also related to the organizational type measures.

<i>Standard aspects SETU & Vektis cases</i>	<i>End user organization</i>		<i>Implementation organization</i>		<i>SDO</i>		
	1	2	3	4	5	6	7
1. Focal Firm - IT Resources							
1.2 Compatibility of standard	+	+	+	+			
1.3 Open standard	+	+		+	+		
1.4 Complete set of functionalities	+		+	+	+		+
1.5 Customization capabilities							+
1.6 Ease of use				+	+		
1.7 Deployment strategy				+			
2. Focal Firm - Complementary Organizational Resources							
2.1 Financial strength	+				+		
2.2 Complementary goods and reputation	+				+		
2.4 Participation in standard consortia	+				+		
3. Focal Firm - Business processes (performance)							
3.1 Process management is increased	+				+		+
3.2 Business model is extended	+						
4. Competitive Environment - Industry characteristics							
4.1 Vertical integration	+						+
4.3 Market is ready	+				+		
5. Competitive Environment - Trading partners							
5.1 Network externalities		+			+		
5.3 Big Fish	+				+		+
5.4 Stakeholders in standard build	+						
6. Macro Environment							
6.1 Legislation that encourages standard usage	+				+		+

(1 = Network effects, 2 = Switch costs, 3 = Maintainability, 4 = Portability, 5 = Volume, 6 = Diversity, 7 = Breadth)

Figure 8 – Important aspects drawn from Vektis and SETU cases

These results show that eleven aspects which were identified in section four have been discarded, and most aspects have been mentioned more than once across organizational types. Furthermore appendix D also shows that the implementation organization is mostly concerned with the characteristics of the standard (IT resources) and not with the other categories. Appendix D also shows that network effects are most important for the end users, portability is most important for the implantation organizations and volume for the SDO's.

5.3 Relations literature cases and field cases

This paragraph will combine the results from the literature cases and the field cases using the results from paragraph 5.2 which mentions the aspects that were found to be significant during the SETU and Vektis cases and paragraph 5.1 which mentions the aspects that were found to be important during the literature cases. Figure 9 shows the results from this combination. Aspects that have been deemed important in both the field and literature cases, will be considered truly important and will be explained in more detail in the next section.

Standard aspects	End user organization		Implementation organization		SDO		
	1	2	3	4	5	6	7
Focal Firm - IT Resources							
1.1 Technological superiority							
1.2 Compatibility of standard							
1.3 Open standard							
1.4 Complete set of functionalities							
1.5 Customization capabilities							
1.6 Ease of use							
1.7 Deployment strategy							
Focal Firm - Complementary Organizational Resources							
2.1 Financial strength							
2.2 Complementary goods and reputation							
2.4 Participation in standard consortia							
2.5 Pricing strategy that attracts customers							
2.6 Customer expectations							
2.8 Management support							
Focal Firm - Business processes (performance)							
3.1 Process management is increased							
3.2 Business model is extended							
Competitive Environment - Industry characteristics							
4.1 Vertical integration							
4.3 Market is ready							
Competitive Environment - Trading partners							
5.1 Network externalities							
5.3 Big Fish							
5.4 Stakeholders in standard build							
Macro Environment							
6.1 Legislation that encourages standard usage							

Aspect described in literature & field cases
 Aspect described in literature cases
 Aspect described in field cases

(1 = Network effects, 2 = Switch costs, 3 = Maintainability, 4 = Portability, 5 = Volume, 6 = Diversity, 7 = Breadth)

Figure 9 – Aspects versus organizational types

5.4 Section summary

This section discussed a series of case studies that were used to establish which aspects are important for the adoption of business transaction standards, as well as which adoption conditions have influence on those aspects. The following result can be drawn from the cases:

- The aspects that were found important for the adoption of business transaction standards could all be related to the aspects identified in section four.
- Several aspects that were found in the section four did not return during the case studies, and thus will not be considered as important.
- The case studies have given confirmation to one of the conclusions that was made in paragraph 2.4, which states that the important aspects for technical standards cannot be generalized with business transaction standards. Technical standards focus on the IT resource domain, whereas business transactional standards have a more spread focus over the aspects (with a higher emphasis on the competitive environment).
- Following Suarez (2004) (groups of) organizations can significantly influence the adoption of a standard, by which especially in the early stages strategic manoeuvring is important and a standard support strategy can be followed that help firms to promote the standard and at the same time prevents the adoption of competing technologies.

6 Higher adoption through the aspects

This section serves to answer the fourth research question which is “How can the identified aspects be influenced so that higher interoperability is achieved?” The previous section identified aspects that are of special importance for the adoption of business transaction standards. This section will shed light on those aspects and also will give explanations on how these aspects can be influenced in order to increase the chance of adoption and thus achieving higher interoperability.

6.1 Standard dominance process

Before giving explanations how to influence standard aspects, it is important to define when these aspects can be changed. Figure 10 shows the standard dominance process, which is derived from Suarez (2004) and consists out of intervals by which different strategies that encourage adoption can be adopted. Naemura (1995) in turn identified which users are most involved at each of these phases.

<i>Phase</i>	<i>I</i>	<i>II</i>	<i>III</i>	<i>IV</i>	<i>V</i>
Description	R&D build-up	Technical feasibility	Creating the market	Decisive battle	Post-dominance
Involved organization	SDO	Implementation org.	End user org.	End user org.	End user org.

Figure 10 – Standard dominance process by Suarez (2004) & Naemura (1995)

During this section the aspects will be explained and also indications will be given at which phases from the standard dominance process these changes can best be made, and thus also by which organizational type.

6.2 Influencing standard aspects

Section five has identified several important aspects for the adoption of business transaction standards (figure 9), this paragraph will examine methods through which these aspects can be influenced in order to achieve higher standard adoption.

Compatibility of standard (1.2) – “Concerns the fitting of interrelated entities with each other in order to enable them to function together” (Kaa, 2009). This includes semantic mapping which “allows organizations with different data standards to exchange information seamlessly without having to change their proprietary data schemas” (Fodor, 2004). The SDO must choose early on in the standard design process (R&D build-up and the technical feasibility phase (Suarez, 2004)) whether or not the standard should be able to interconnect with other assets. If so, assets must be sought that can function with the standard. Assets can be drawn from the following characteristics:

- Most standards are based upon XML which is a technology that encourages web based information exchange, basing the standard on this technology should increase the compatibility of the standard.
- Standards can be a derivation of other “big” standards, e.g. the SETU standards are strongly related with the HR-XML standard making it more accessible.

The SDO can best determine the standard characteristics by assessing the needs of the organizations that are going to use the standard. This can be done by involving key players in the standard build.

Open standard (1.3) – The virtue of open standards is that they are built to be as available as possible towards others. There are several definitions of an open standard for instance by several countries. In this thesis the definition of Krechmer (2009) will be used, which states that there are ten open standard requirements. These requirements are: open meeting, consensus, due process, open intellectual property rights, one world, open change, open documents, open interface, open access and on-going support. The SDO must decide early on in the standard development process whether the standard will have to be open or not (or a degree of openness). When the SDO wants to change this aspect then a determination must be made which of the ten requirements to change. E.g. the participants in an SDO are usually drawn from multiple sources and thus early on in the development process agreements must be made whether the knowledge that one participant provides will not be bound on intellectual properties.

Complete set of functionalities (1.4) – Standards can be incorporated with multiple functionalities that can make the standards more attractive for organizations and thus can be important for their adoption Lampathaki (2009) identifies three characteristics of functionality:

- Expressiveness: Defines the process and document coverage by the standard, it makes sure that documents written in organization A can be interpreted in organization B.
- Cross country support: Whenever data transactions are cross country the standard should structure the data in such a manner that it can be interpreted in other domains.
- Multilingual aspects: Adding mechanisms that provide translation.

The SDO must choose early on in the standard design process (R&D build-up and technical feasibility phases (Suarez, 2004)) which standard characteristics and capabilities are needed so that it can function in its environment. Hence it is important for an SDO to develop a standard that conforms to the “must-have” criteria of potential adopters. However giving standards to much functionalities can make the implementation process more complex and the maintenance of such standards is also more difficult.

Customization capabilities (1.5) – Since no organization is ever the same and the requirements towards the standards changes per organization it is important that the standard leaves room for customization. Lampathaki (2009) identifies three aspects that define customization:

- Modularity: This entails that standards are built in logically separated modules which can be implemented and maintained separately. This ensures that organizations can implement parts of the standard, “modularity... reduced tensions between partners regarding non-core issues (Nelson, 2002-1)”.
- Expandability: The standard should provide the opportunity to define new business documents, rules or data constructs to cover the requirements each business may have.
- Composability: The ability to compose a document from existing components (e.g. the macro environment has passed a new law that requires changes in the standard in order to conform to that change).

The SDO must choose early on in the standard design process (R&D build-up and technical feasibility phases (Suarez, 2004)) whether the standard is composed out of identifiable building blocks and how these building blocks are related to one another.

Ease of use (1.6) – Whenever maintaining or implementing the standard it is important that no special knowledge is required for the use of the standard otherwise it can stress standard adoption. “Since the know-how of the data modelling standard should be obtained easily by anyone familiar to the field and not burden them during the implementation phase with unnecessary or complicated details” (Lampathaki, 2009). The SDO must determine during the technical feasibility phase and the creating of the market phase (Suarez, 2004) what is common within the standard domain and adjust the build up of the standard towards those communalities. One method is to ensure that the design team is in direct contact with the end users and with the implementation organization and thus makes use of their domain knowledge. Another important method is to make sure that the standard has clear documentation (comprehended able by all types of users).

Deployment strategy (1.7) – Whenever a standard is developed it is important that the deployment will be without problems. An important reason is that potential adopters can be influenced by horror stories regarding the implementation process. Methods for ensuring an effective deployment are:

- Testing the application on a small scale, i.e. trialability (Rogers, 1962).
- Having a solid release and configuration management method for new and updated standards (Automatiseringgids, 2006).
- Having a cross organizational implementation team(s). These teams can be constructed out of the organizations involved in the implementation and these teams can also be constructed out of functional requirements (e.g. technical teams, management teams).

Financial strength (2.1) – Software projects generally are expensive, and thus the “current and future financial condition of the group of standards supporters” is also important (Kaa, 2009). An important reason why many organizations convert to a standard is that their financial condition is increased through the standard (i.e. a cost reduction has appeared through the standards). This aspect is of influence during the majority of the technological dominance process (Suarez, 2004). The financial strength of the end user can be changed through process improvements and the financial strength of the SDO can be influenced by contribution fees of interested parties, however these changes take time before they become true assets.

Participation in standard consortia (2.4) – SDO’s are usually non-profit organizations that invite organizations to participate in the development process. This means that organizations have influence (in various degrees) on how the standard will be composed. The advantage that can be gained from this aspect is that all participating organizations interconnect their knowledge in order to establish consensus regarding the standard build up and maintenance. Zhao (2007) identified several sources of benefits associated with the standard development:

- Firms can orient the standard toward their own business practices.
- Most developers are immediate future adopters.
- Organizations also benefit from in-depth discussions in the development process with their peers, their better understanding of the standard reduces implementation costs.

This aspect is of influence during the majority of the technological dominance process (Suarez, 2004). The SDO can change this aspect by giving other organizations more influence on the standard build and maintenance. The degree of influence depends on the types of memberships that are made available by the SDO.

Process management (3.1) – Whenever a standard is implemented there will be changes in the (work) processes that the organization uses. “Processes are the essence of every enterprise. If business applications are viewed as a complex set of processes, then process management can be envisioned as the key to developing flexible, scalable applications that businesses need in today’s dynamic and collaborative market (Chen, 2007)”. During the development of the standards (the technical feasibility phase (Suarez, 2004)) the business transaction standard must be able to efficiently connect multiple parties within the business. If this standard is based upon best practices then it is possible that the processes are more effective, and thus enable more organizations to connect with more partners.

Business model (3.2) – By means of the standard the organization can be enabled to develop more products and services. During the technical feasibility phase (Suarez, 2004) the scope and functionalities of the business transaction standard is established and a general determination is made what organizations can establish with the standards. Whenever the SDO wants to change this aspect then it is best to determine the needs of the organizations in the domain (e.g. by enabling those organizations to participate in the standard build) and adjust the standard accordingly. When organizations want to extend their business processes they can adopt a standard which is based on a broad environment. (e.g. horizontal standards). Or they can choose a standard that can interconnect with other standards (e.g. SETU is based on HR-XML).

Vertical integration (4.1) – Vertical standards ensure interoperation between suppliers and buyers (Markus, 2006). These standards are built to serve specific domains like the HL7 standard (a healthcare information exchange standard). Wigand (2006) observed two trends by introducing the MISMO standards in the mortgage industry:

- Very large organizations are consolidating their domain and getting bigger.
- Many small organizations are emerging in niche markets.

During the market creation and decisive battle phases of the technological dominance process (Suarez, 2004) the standards can establish a high installed base across the vertical domain. The manner in which one can alter this aspect in ones favour strongly depends on the specific domain, for example if an organization has a lot of network power (partner scarcity) then it can force the standard upon business partners (e.g. Cisco case (Lu, 2006)). When network powers are not an issue then the SDO can be positioned as an independent organization that strives to service the needs of all organizations within a specific domain. This can cause consensus amongst the involved organizations (and thus encourage standard adoption) (Dyer, 1998).

Market is ready (4.3) – The point in time at which the standard is introduced in the market (Kaa, 2009). The timing of embracing a standard can be a strategic choice and is dependant on the relation with the competitors by which the company can choose to be a pioneer or a follower (Angelmar, 1990). This aspect can be influenced during the R&D build-up phase of the technological dominance process, where the scope of the standard is determined. If the scope yields scarce partners than it can be altered to a scope that yields more partners. Outside this first phase organizations must be sought that want to be a standard pioneer which could encourage other organizations to convert.

Network externalities (5.1) – Whenever a standard has a large installed base then the standard will be more attractive for others to convert to the standard. The more organizations that convert to a standard will yield a higher degree of interoperability. Chen (2003) has identified five “maturity” phases in which a standard can exist.

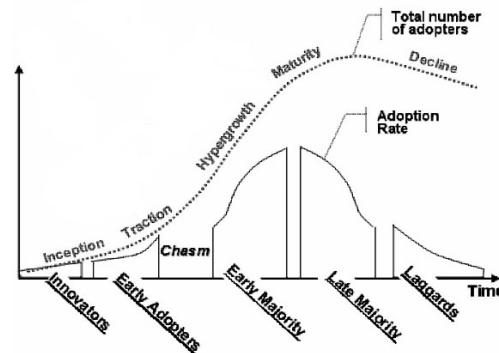


Figure 11 – Standard adoption phases by Chen (2003)

This aspect can be influenced during creating the market, decisive battle phase and post-dominance phases of the technological dominance process, and can be done by making the standard more attractive over an extended period of time. This can be done by embracing marketing techniques (like the marketing mix), one example is by making the standard accessible for a low price (Chen, 2006) (which is usually done when there are scarce partners).

Big Fish (5.3) – “A big fish is an end user organization that can exercise a lot of influence by either promoting or financially supporting a standard or by exercising buying power that is so great that it contributes strongly to the market position of the standard” (Kaa, 2009). This aspect can be influenced during the creating of the market and decisive battle phases of the technological dominance process. Big fish organizations need to be persuaded to adopt the standard, which can be done in a multitude of manners for instance by tailoring the standard towards the specific organization or by giving the organization rebates in use fees.

Stakeholders in standard build (5.4) – The extent to which relevant stakeholders are represented in the group of standard supporters (Kaa, 2009). The stakeholders are those (groups of) organizations that have great influence on the success of the standard. Thus it is imperative for the adoption of the standard that the standard accounts for the requirements that stakeholders find important (i.e. stakeholder analysis is important). This aspect can be influenced during the technical feasibility and creating the market phase of the technological dominance process. When stakeholders are incorporated in the standard build then their knowledge and skills are incorporated in the standard. Furthermore when multiple stakeholders are involved, across the value chain than, they can attract all types of organizations within that value chain.

Legislative deployment influence (6.1) – Regulations from specific countries, unions or states can help certain standards become dominant. This aspect can be influenced during R&D build-up and the technical feasibility phase of the technological dominance process, by which the SDO can make the standard conform to rules and regulations that influence the specific domain. Outside these phases this aspect is extremely difficult to influence and the only thing one can do is to collectively lobby within the environment for changes.

6.3 Section summary

This section has given explanations regarding the meaning of the aspects that have been identified in section five. Furthermore these explanations were complemented with methods on how these aspects can be changed to ensure higher adoption degrees. The following observations can be drawn from this section:

- Most aspects can best be influenced during phases II & III of the standard dominance process (Suarez, 2004).
- Most changes are preferably initiated by the SDO and federations that represent the organizations in the domain, whereby active end user participation is preferred.
- As Naemura (1995) stated the major tasks of an SDO organization is in the first phase of the standards build process. The implementation organizations are mostly involved during the second phase and the end users in the last (three) phases. This is consistent with the findings of research question three that showed that the implementation organization is mostly interested in those aspects that define the technical feasibility of the standard (phase II).
- Some aspects are (indirectly) related to one and other, for instance legislation can influence the market in such manners that certain types of organizations automatically become Big fish organizations. This is not a strange because this is also suggested by the Melville (2004) model (figure 4) which shows that all categories that house standard aspects are related.

7 End conclusions

This research served to examine how the adoption conditions that organizations have can be influenced through the aspects that business transaction standards have. This section is dedicated to give conclusions towards the research questions and formulate recommendations towards achieving higher business transaction standard adoption degrees.

7.1 Answers to the research questions

This paragraph will give conclusions towards the research questions which were derived from the main research question defined in section one, research questions 1-4 correspond to sections 3-6 respectively.

Research question 1 – “Which adoption conditions exist for organizations when using business transaction standards?”

Section three has shown that the adoption conditions are related to the institutional forces that organizations have for engaging in interorganizational relationships. Because organizational types are subject to different institutional forces we have identified the adoption conditions from those organizational types that are involved in the standard adoption process (end user, implementation organization and SDO). The identified adoption conditions from these organizational types are: network effects, switching costs, maintainability, portability, volume, diversity and breadth.

Research question 2 - "Which aspects do business transaction standards have and how can they be categorized so that generalizations can be made?"

A review of articles published in top scientific journals as well as articles that discuss business transaction standard cases have identified twenty six aspects. These aspects were subsequently subdivided into distinct categories in order to apply multiple case evaluation methods like pattern recognition. The model described by Melville (2004) has been identified as the best framework through which standard aspects can be categorized. These categories are: focal firm, competitive environment and macro environment.

Research question 3 – “Which aspects, that are important for the adoption of business transaction standards, can be related with the adoption conditions and which aspect generalizations can be made?”

The aspects identified in section four were related to specific adoption conditions by both literature cases and field cases. Through this process fifteen aspects were categorized as important for the adoption of business transaction standards (figure 9) which amongst others were: compatibility of the standard, ease of use, business processes and big fish organizations. This analysis also suggests that when diffusing business transaction standards there is relatively more importance towards the competitive environment when compared to technical standards and this is especially true when there are large power differences within the domain. Furthermore unlike end user and SDO organizations, implementation organizations are only interested in the technical aspects of the standard.

Research question 4 – “How can the identified aspects be influenced so that higher interoperability is achieved?”

All identified aspects have been defined and methods were given through which higher interoperability can be achieved, these methods are stated in section six. These descriptions have shown that most of the aspects can best be influenced by the SDO with close consultations with the implementation organizations (during phase II) and with end users organizations (during phase III). These descriptions also show that some aspects are (indirectly) related to each other. For instance, the Dutch government has passed a new health insurance law in 2005 that, amongst other things, enables them to "purchase" healthcare at specific health providers. This gives the health insurance organizations significantly more powers within the healthcare domain. Furthermore the aspect descriptions show that most changes can best be made during phases II and III of the standard dominance process.

7.2 Main research question and its interpretation

The research questions were used to assess which aspects effect the conditions that organizations have towards adoption, this was conducted through several cross case evaluations, by which patterns became apparent which were used to answer the main research question, the main research stated:

“Which aspects of business transaction standards can influence the adoption conditions that organizations have for using these standards, and how can they be affected so that higher interoperability is ensured?”

By evaluating how the standard aspects, described in figure 9, relate to the domain where the organizations are active in, managers (end users and implementation organizations) as well as SDO's can gain a deeper insight into their specific standard needs, and in what aspects are of importance. For managers such an evaluation can be of influence when choosing to support and implement standards. For SDO's such an evaluation can be important when assessing how to maximize standard adoption, and subsequently achieve higher interoperability (this will be covered in more detail in the next paragraph). During the case analysis it has become apparent that the institutional forces driving organizations into adopting business transaction standards are mostly dependant on the powers differences that exist amongst organizations that reside in the specific domain. When there are large power differences then those aspects that reside in the competitive environment category are of more importance, whenever there are low differences then the focus should be towards the IT resource category. The following distinctions regarding standard adoption and organizational power can be made:

- Domain with low power differences: Whenever there are integration efforts by organizations within this domain, these organizations will most likely have the following issues of concern: lack of domain knowledge, no synergy between organizations, and the cost of managing interorganizational exchange. These issues are also the drivers for organizations to adopt standards, whereby federations must represent these organizations without making differences in membership. Emphasis should be placed towards the IT resources whereby standard compatibility eases the synergy problems, standard functionalities provide domain knowledge and ease of use and effective deployment eases management costs.

- Domain with medium power differences: Larger organizations, which usually have high domain influence, are mostly drawn towards the standards because they can achieve large efficiency gains from using these standards. Smaller organizations are mostly drawn towards the standards because it can give them industry knowledge (which is embedded in the standard build), as well as the possibility of extending their business model. The standard deployment strategy is conducted through balancing the control of standard development between the big fish organizations and the organizations with less power, and thus standard development should balance on those aspects residing in the IT resource domain as well as the competitive environment.
- Domain with high power differences: The standard deployment is imposed by organizations with high domain powers whereby standard development is directed towards the big fish organizations and is mainly focussed towards achieving benefits through economies scale, and thus there is a focus on those aspects residing in the competitive environment. The disadvantage of standards in this domain is that they are unresponsive to domain trends and it is not in the interest of every organization.

In all cases it is important that the standard is developed and maintained by a federation and is based on open characteristics. This will give organizations a sense of ownership (including those organizations that have low domain powers) and makes the standard free to use, which is good for adoption. Furthermore the standard build should be modular whereby the modules should be based on best practice business processes, enabling organizations to only adopt those modules that are of importance for them.

7.3 Recommendations for TNO

As stated previously TNO supports SDO's in the development of standards, and thus TNO has the general goal of introducing standards that will be adopted by as many organizations as possible (volume), with lots of organizational types (breadth) and with as much as possible of standard modules (diversity). The following recommendations can be made towards TNO in achieving this goal:

Phase I standard dominance process, During this phase the SDO should assess the forces that exist within a certain domain (for instance through interviews amongst organizational groups) and whether the organizations with high domain powers have a need for a standard within the domain. If there are organizations that can exert significant powers within the domain, then the standard build should be focussed on these organizations so that they will adopt the standard. This places more emphasis on phase III of the standard dominance process. This also means that when these organizations are present, phase II of the standard dominance process is to a lesser extent important whereby the standard must conform to the must have criteria of big fish organizations.

Phase II standard dominance process, The SDO should approach software development organizations, ensuring that the standard conforms to those (technical) specifications that ensure easy implementation and maintainability. The important aspects concerned with this step are categorized in the IT resource domain (figure 4) and encompasses:

- Making sure that the standard is compatible to commonly used (horizontal) standards (like XML), and internationally orientated standards. For instance if the Dutch health insurance organizations would not have as much powers in their domain then it would be recommendable to make the Vektis standard compatible to the HL7 (international) standard, making it more attractive for adoption.
- Creating open standards enhances the ability to integrate standards in software solutions, furthermore because open standards are free to use there are no cost obstacles for implementation organizations.
- Making sure that the standards conform to the must-have criteria (based on interviews) as well as basing the processes on best practices (benchmarking), this will ensure that the standard conforms to essential functionalities and prevent that the standard becomes too complex.
- By making sure that a standard testing mechanism is in place (accessible for all parties), as well as the use of cross organizational implementation teams ensures effective standard deployment. These cross organizational teams can also ensure clear documentation which increases the standard ease of use.

Phases III, IV and V in the standard dominance process – The SDO combined with end user organizations should place the standard in the domain so that it has high network effects and low switching costs, which can be done by the following methods:

- Federations should be formed to coordinate the diffusion of the standards, which should be done by attracting those organizations that have great influence on the domain, for instance by giving them higher influence in the federation.
- Making standards open enhances it's accessibility to all organizational types, especially when they are free to use and organizations are involved in the standard build (this can prevent the sense that the standard is imposed on organizations). The funding of standard development and maintenance should be conducted collectively, preferably by those organizational types that have most to gain from broad standard adoption.
- During phase III of the standard dominance process the diffusion strategy should first focus on those processes / standard modules that are highly used and repetitive, as well as attracting those organizations that are most subject to scale benefits. This will yield the most cost savings, and creates an important installed base.
- By making sure that the standards are build using a modular design, whereby the modules are based on best practice processes (benchmarking) used between organizational types within the domain. This ensures that organizations will adopt only those modules that they perceive necessary and will ensure efficiency improvements.

7.4 Recommendations for further research

During my graduation project several (in my view) gaps in literature became apparent and should require more research in the nearby future, these gaps were:

- Using the conclusions from Folmer (2009) and this research, it has become apparent that previous literature has focussed on interoperability caused through technical standards and not on business transaction standards. This has been identified as literature gap and thus calls for further research.
- This research has not yielded a ranking of aspects that are important for the adoption of business transaction standards. Further research should do so, which will give the SDO's a greater insight into achieving higher adoption degrees.
- Cases regarding business transaction standards (implementations) in real businesses are scarce, especially those case studies that discuss critical success factors (Lu, 2006). Further research should be conducted towards these implementations covering multiple standards and also multiple domains.

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A Structured literature review

This section discusses the methods used when conducting the structured literature review, which has been the basis for the entire project and thus it is imperative that it is complete and compliant to scientific practices, the steps taken are:

1. Determine search engines – It is important to determine which search engines cover the most and also the best journals, therefore the most common search engines (Schwartz, 2004) were examined by means of their top journal coverage (top 25 CS/IS journals (Mylonopoulos, 2001) and top 25 International Business Journals (DuBois, 2000)). This resulted in the selection of two (out of eight) search engines that were deemed best, these are Scopus and EBSCO.
2. Determine queries – When conducting the literature search, queries will be used in the identified search engines, the following sequential phases have been used in order to construct those queries:
 - a. Select keywords and synonyms for use in the search engines.
 - b. Determine possible combinations of those keywords and synonyms.
 - c. Determine queries that can be used when entered in Scopus and EBSCO.
3. Conduct searches – The searches were conducted using the queries in the selected search engines, the results were all uploaded to one endnote document for administrative purposes and the prevention of duplicate entries.
4. Assess article abstract – After completing the searches in Scopus and EBSCO abstracts were assessed by two individuals and yielded several interesting articles.
5. Assess articles – The interesting articles all were collected digitally using services provided by TNO and University of Twente. After completing this articles were assessed entirely on relevance.
6. Extend search – References of those articles that were deemed of interest (step five) were searched, these additional articles were again assessed using the same procedure as described in step four and five.

The structured literature review discussed above is derived from scientific methods, through which the reference searches (2nd search iteration) ensures that no papers are lost even when the queries did not find specific articles, and the articles identified are a sound basis for the next steps in the research.

B Aspect search literature cases

Standard aspects	End user Organization						
	Network Effects			Switching costs			
	1	2	4	1	2	4	
1. Focal Firm - IT Resources							
1.1 Technological superiority	+	+		+			"RosettaNet standards are the fruit of rich experience.....the implementation of IOS in Cisco and Xiao Tong was very efficiently carried out and at low cost" (Lu, 2006) "RosettaNet is pioneering the development of such standards for many industry-wide business processes" (Olsen, 2001)
1.2 Compatibility of standard	+		+				"Both organizations would rank low compatibility with the old environment and high compatibility with the new environment." (Nelson, 2002-2)
1.3 Open standard		+			+		"Because open, Web-based standards were adopted, Avnet is now positioned to capture similar benefits on future projects from its newly enabled technology." (Olsen, 2001)
1.4 Complete set of functionalities			+				"The top two significant constructs in determining BI for the distributor were PU and economic." (Nelson, 2002-2)
1.5 Customization capabilities	+			+			"It permits users to self-define the process when there are no existing standards to meet their particular needs." (Lu, 2006)
1.7 Deployment strategy	+	+					"In order to reap mutual benefits each party should be actively engaged in setting up the implementation team." (Lu, 2006)
2. Focal Firm - Complementary Organizational Resources							
2.1 Financial strength	+	+	+				"The potential benefit from invoicing more quickly (as a result of implementing Web-based standards with all of the CMG suppliers) could be substantial." (Olsen, 2001)
2.4 Participation in standard consortia		+					"Early in 2000 Avnet, as a RosettaNet organization member with Board of Director level representation." (Olsen, 2001)
2.5 Pricing strategy that attracts customers				+			"Cisco promised to return some profits to Xiao Tong to compensate for the costs in IOS implementation." (Lu, 2006)
2.8 Management support	+	+					"Strong motivation was essential to gain and thereby guaranteed the commitment from partners." (Lu, 2006)
3. Focal Firm - Business processes (performance)							
3.1 Process management is increased	+	+	+				"The cycle from SO to PO was around 3 days...and the new process had reduced it to 2.5 days." (Lu, 2006) - "Process benefits from eliminating redundant activities, eliminating manual data entry, and automating information processing." (Olsen, 2001)]
3.2 Business model is extended	+	+					"In this way the supplier assumed responsibility for managing inventory, performing product integration, and managing shipping and outbound logistics." (Olsen, 2001)
4. Competitive Environment - Industry characteristics							
4.1 Vertical integration		+					"Another change...was a reduction in the number of customer relationship managers...such that Avnet became one of only two strategic partners with the supplier." (Olsen, 2001)
4.3 Market is ready	+	+	+				"At the same time, Avnet had previously established internal objectives for being an industry leader in implementing RosettaNet standards. The goal was to stay ahead of its competition and benefit from internal efficiencies early." (Olsen, 2001)
5. Competitive Environment - Trading partners							
5.2 Network externalities	+						"For companies belonging to the same supply chain, it makes sense for them to select the same standards when they are going to implement IOS." (Lu, 2006)
5.3 Big Fish	+	+	+				"As Cisco was the dominant player in this supply chain, Xiao Tong had to go along with the business strategy of its principal supplier Cisco." (Lu, 2006) - "The fact that several major organizations in the semi-conductor industry formed RosettaNet to establish XML-based IOS, was an important point in establishing the expectation of market trend". (Nelson, 2002-2)
5.4 Stakeholders in standard build		+					"Early in 2000 Avnet, as a RosettaNet organization member with Board of Director level representation". (Olsen, 2001)

1 = (Lu, 2006), 2 = (Olsen, 2001), 3 = (Boh, 2007), 4 = [Nelson2002-1&2], 5 = [Spahni2006], 6 = (Wigand, 2005)

Standard aspects	Implementation organization									
	Maintainability				Portability					
	1	2	4	5	1	2	4	5		
1. Focal Firm - IT Resources										
1.1 Technological superiority					+				+	"Thanks to the high quality of RosettaNet standards, the implementation of IOS in Cisco and Xiao Tong was very efficiently carried out and at low cost." (Lu, 2006)
1.2 Compatibility of standard	+		+		+				-	"Existing applications required compatible interfaces, limiting thus the interest of developing already in the initial phase HL7v3 messages." [Spahni2006]
1.3 Open standard		+								"Because open, Web-based standards were adopted, Avnet is now positioned to capture similar benefits on future projects from its newly enabled technology." (Olsen, 2001)
1.4 Complete set of functionalities									+	"This quite complex information model aims in particular at offering a structure for representing persons, things and organizations as well as patient encounters, etc." [Spahni2006]
1.5 Customization capabilities						+				"RosettaNet also has good practicability and flexibility. It permits users to self-define the process when there are no existing standards to meet their particular needs." (Lu, 2006)
1.6 Ease of use						+	+		-	"The potential disadvantage of this model is that aiming at being as exhaustive as possible makes it quite complex to grasp." [Spahni2006]
1.7 Deployment strategy						+	-			"The implementation was further complicated by the newness of Web-based standards; that is, ambiguous and untested standards resulted in multiple interpretations." (Olsen, 2001)
2. Focal Firm - Complementary Organizational Resources										
2.8 Management support							+			"Executive support was deeply committed to the project's business objectives" (Olsen, 2001)

1 = (Lu, 2006), 2 = (Olsen, 2001), 3 = (Boh, 2007), 4 = [Nelson2002-1&2], 5 = [Spahni2006], 6 = (Wigand, 2005)

Standard aspects	Standard Development Organization											
	Volume			Diversity			Breadth					
	3	4	6	3	4	6	3	4	6			
1. Focal Firm - IT Resources												
1.2 Compatibility of standard		+	+							+	"The top two significant constructs in determining BI for the manufacturer were PU and Compatibility (e.g. the extent to which the new technology standards will be complimentary with the users work environment and style of work)." [Nelson2002]	
1.3 Open standard	+		+								"More than 250 organizations and 1,000 individuals are involved in more than 30 MISMO work groups... MISMO employs an open and democratic approach to the development and maintenance of standards" (Wigand, 2005)	
1.4 Complete set of functionalities		+								+	"The top two significant constructs in determining BI for the manufacturer were PU and Compatibility (e.g. the extent to which the new technology standards will be complimentary with the users work environment and style of work)." [Nelson2002]	
1.6 Ease of use	+	+			+						"Technology. Improve the standard's technical performance by lowering the cost of implementation and increasing the ease of implementation and use." (Boh, 2007)	
1.7 Deployment strategy	+		+								"To assure the effectiveness of the standards at the time they're implemented, the people (champions) responsible for PIPs implementation in their organizations are often assigned to participate in the program." (Boh, 2007)	
2. Focal Firm - Complementary Organizational Resources												
2.1 Financial strength			+							+	"Lower costs do imply that more companies will adopt and implement standards-based technologies in the mortgage industry" (Wigand, 2005)	
2.4 Participation in standard consortia	+	+							+	+	"RosettaNet's approach is to bring business owners from member companies together to define and agree on common processes and to develop XML-based standards to support these processes"(Nelson, 2002-1)	
2.6 Customer expectations	+										"Promote awareness among potential adopters of the RosettaNet standard's capabilities and benefits and how they can be implemented in their organizations." (Boh, 2007)	
3. Focal Firm - Business processes (performance)												
3.1 Process management is increased		+								+	"Overall efficiency seems higher than in the past. Intet-viewees reported that credit scoring and automated underwriting had shortened the loan approval process from four to six weeks 30 years ago to a few minutes today." (Wigand, 2005)	
3.2 Business model is extended		+	+							+	+	"Yet another way that MISMO standards can promote industry structure change is by enabling new forms of individualized mortgage products, which may open the door to newer, more nimble competitors." (Wigand, 2005)
4. Competitive Environment - Industry characteristics												
4.1 Vertical integration			+							+	+	"At the same time that consolidation among the largest players is occurring, there is evidence of increased outsourcing, driven by the reduced coordination costs afforded by vertical IS standards" (Wigand, 2005)
4.3 Market is ready			+									"Value-chain fragmentation and other features of the mortgage industry (such as considerable regulation) create numerous coordination problems that electronic interchange via XML standards are expected to solve." (Wigand, 2005)
5. Competitive Environment - Trading partners												
5.2 Network externalities			+								+	"Widespread implementation of MISMO standards can be expected to open the door to additional new entrants, including new types of intermediaries." (Wigand, 2005)
5.3 Big Fish	+		+									"Co-opt key players (such as industry supply-chain masters, or dominant customers driving demand) to pressure their trading partners to adopt RosettaNet." (Boh, 2007)
5.4 Stakeholders in standard build										+		"A key aspect of standards consortia strategies for building a critical mass of adopters is to involve key players and a range of stakeholders in relevant industries. This increases a standard's legitimacy " (Boh, 2007)
6. Macro Environment												
6.1 Legislation that encourages standard usage	+											"Change or leverage the social and legal-regulatory environment in which potential adopters operate." (Boh, 2007)

1 = (Lu, 2006), 2 = (Olsen, 2001), 3 = (Boh, 2007), 4 = [Nelson2002-1&2], 5 = [Spahni2006], 6 = (Wigand, 2005)

C Vektis and SETU case description

C.1 Vektis case

IT Resources

The standards developed by Vektis are referred as the External Integration standard (EI-standard), whereas the standards that Vektis builds and maintains are based upon the ASCII format and thus is not based upon the XML format (with exception to the COV-messages, which checks whether individuals are insured) (Vektis, 2009). The fact that the Vektis standards are composed in the ASCII format is not considered by any party as a factor that limits the adoption of the standard. Another important aspect is that the standards are supported by most software packages that are used by health providers, but the standards itself do not have linkages to other standards (e.g. HL7) and is not reported as required. The standards provided by Vektis can be categorized as relatively open and is free for all that desire to use it, software vendors can download the specifications from the Vektis site and incorporate it in their software, which also has positive influence on adoption.

Complementary Organizational Resources

The Vektis standards are primarily funded by the Dutch college of health insurers (CVZ) which had positive effects on the adoption of the standard (i.e. there are lower thresholds for other organizations to convert to the standards). Furthermore the standards developed by Vektis and the VEKOZO portal are placed in the domain in such manners that they can be regarded as reasonably independent, which assures good market fit. The fact that the standards already have a large installed base also has positive effects on the adoption costs because many software developers already have made their software solutions compliant to the standards developed by Vektis. Vektis also controls the Algemeen Gegevensbeheer Zorgverleners registry (i.e. general data management health providers) which contains data of health providers in the Netherlands and it is used to efficiently transmit data, however the maintenance of this registry by Vektis does not influence standard adoption. The presence of a Vektis advisory commission (the KEI platform), which consists out of Vektis-standard users and places recommendations on the standard requirements and provide feedback towards the field, has conducive effects on the adoption of the standards by means of early problem detection, role modelling, early market trend detection and misconception prevention.

Business processes (performance)

In the old situation whenever an individual has received healthcare (e.g. a consult with a physiotherapist) then that individual would have received a bill that the person should pay directly towards the health provider, second the individual can hand in the bill at their insurance company in order to receive compensations in accordance with his insurance policy. In the new situation the individual received healthcare at a specific health provider, this provider can electronically check whether the individual is insured and if so the health provider can declare the services directly (and electronically) towards the insurance provider. The insurance agency will pay the health provider directly and if there is an amount that is not covered by the insurance (e.g. only 80 euro's is covered of a 100 euro bill) then the insurance company will collect that money in name of the health provider (Computable, 2003). This new process is made possible by the standard developed by Vektis and the Vecozo-connect portal, which is accessible by means of low thresholds (health providers do not have to pay use fees). The gains for the health insurance organizations are the burden relief of processing paper bills (the efficiency improvements will save the insurance organizations more money than that it

will cost). The gain for the health provider is the guarantee that the money will be paid immediately, there are less administrative hassles and outstanding bills are handled more efficiently. The patient gain is that they have to conduct fewer actions. (Computable, 2003)

Industry characteristics

The Dutch health provider society (Zorgverzekeraars Nederland) empowered Vektis to develop its own standard that is specifically tailored for use within the Dutch health care domain. Because the Dutch health provider society openly endorses Vektis use all health insurance organizations use the standards, these health insurance organizations in turn “encourage” other organizations within the value chain to convert to the standards by means of contractual agreements, which stipulates in which manners health providers should hand in their declarations. This can be done because there is within the healthcare value chain a high dependency towards insurance organizations. Furthermore the organizations within this domain do not perceive the declaration process as one where competitive advantages can be achieved, the competition is conducted on price packages and services.

Trading partners

Within the Dutch healthcare domain the insurance organizations can motivate their customers (patients) to get their treatments at specific health providers (based on the contracts mentioned above). This enables the insurance organizations to buy specific services for a particular price and thus this can ensure free market processes, this also ensures that the healthcare organizations have great domain powers and thus they can ensure that other organizations in the healthcare domain adopt the standards (i.e. adoption is enforced). Because the standards are predominantly built through the insurance organizations certain aspects that are of importance for health providers can be discarded and thus can have negative adoption effects, however this is countered by the fact that Vektis has developed standards for specific health providers. Furthermore a trend is rising by which health insurance agencies demand that for specific treatments different standards will have to be used by health providers, this is contradictory to the needs of health providers that want integrated bills and also implementation organizations will face difficulties implementing and maintaining these different standards and thus this trend is not inductive to the adoption.

Macro Environment

The Dutch healthcare domain is strongly regulated by law, for instance the declaration amounts are fixed, and specific laws dictate the manners in which bills are sent to the insured individuals and the manner in which organizations can retrieve insurance information from individuals. However the use of the standards has not been made obligatory by means of the government.

C.2 SETU case

IT Resources

At this point whenever an organization wants to be SETU compliant then the software vendor will have to make customization efforts to their program this is because the standards are not yet common enough that software vendors make their software solution SETU compliant by default. The SETU standards are based upon HR-XML SIDES (Staffing Industry Data Exchange Standards) which is an international standard for the human resource domain. The SETU standard can be seen as a HR-XML SIDES specification for the Dutch human resource market. The standards can be deemed open which makes the standard more accessible and no fees will have to be paid towards the SDO (which can increase the adoption of the standard). Next to producing an open standard the SETU is also involved in the development in the HR-XML standard, these collaborations ensures that the standard is up to date for the Dutch staffing industry and continues to be so in the future. The SETU maintains four standards which are based on distinct processes within the staffing industry, this gives the organization the ability to choose one or multiple standards to implement, and if multiple are selected the organizations can opt to choose e.g. a sequential implementation strategy. These modular functionalities also increase the maintainability of the standards.

Complementary Organizational Resources

The fact that the standard is deemed open (as defined by the Dutch College of Standardization) could give the adoption of the standard further impulses, for open standards generally has fewer adoption thresholds (e.g. software developers does not have to share intellectual property rights with SDO's). The SETU organization is funded primarily by means of the ABU which is complemented by participants and subscribers of the standard which commit them selves to fees (Flexservice, 082009).

Business processes (performance)

With the SETU standards the organization can opt to implement one or multiple standards that complement each other, the SETU standards consists out of four standards, these are explained below by which the relations between each standard is also explained (SETU, 2009):

- Standard for ordering and selection, The usual staffing business process is initiated by an organization that is in need of extra employee(s) which contacts the staffing organization by means of the standard for ordering and selection. The staffing organization will compose an offer that will cover the need of the lending organization. This offer will entail the staffing of specific individual(s) and the price that the staffing organization wants to receive for the services that will be provided through those individual(s) which is sent towards the lending organization by means of the standard for ordering and selection.
- Standard for assignment - If the lending organization agrees to the terms then the staffing organization will send the lending organization a placement order by means of the standard for assignment, and the temporary employee can begin work.
- Standard for reporting time and expenses, When the employee has completed working hours then that will be entered in the information system of the lending organization, after fixed intervals the worked hours are transmitted by means of the standard for reporting time and expenses towards the staffing organization.
- Standard for invoicing, Based on the working hours and agreements between the organizations a bill will be made and sent towards the lending organization by means of the standard for invoicing.

Whenever organizations adopt business transaction standards there will be changes to the business processes which should lead to efficiency improvements, these efficiency

improvements are potentially the highest with large organizations (these rely more on standardized processes and economies of scale). Whereas small organizations will be less motivated to convert to the standard because of the high switching costs and the impact of converting is lower. One of the evident advantages is that due to the adoption of the standard there will be less paper transactions between partners for these will be transferred electronically.

Industry characteristics

The industry cannot be categorized as a consolidated domain and thus many staffing organizations of various sizes are active in the domain, these organizations can operate in niche segments of the domain (e.g. a staffing organization for Polish employees) as well as staffing organizations that serve the total domain within and outside the Netherlands (e.g. Randstad). Furthermore there is no general consensus amongst the staffing organizations that a general standard is required / desirable, for a standard potentially removes flexibility from the organization and organizations might be less able to differentiate it from competitors. The domain has high competition dynamics which prevents staffing organizations to demand that their chain partners have to convert to a particular standard. Furthermore the staffing organizations collectively (by means of the ABU) do not compel its members to convert to the standards.

Trading partners

The SETU standards are not that long in existence however it already processes approximately ten percent of the time sheets and the usage of the standards are becoming ever more popular however it cannot be said that critical mass has been reached. Organizations that are internationally orientated will implement the HR-XML standard and also the SETU standard, this has as a result that the organization is able to conduct its services globally and also in the Netherlands. There are multiple staffing industry heavy weights that have adopted the standard (e.g. Randstad Timing etc.) however they cannot exert too much pressure to chain partners due to the dynamics of the domain. Furthermore on the other side of the (vertical) business the government can also be regarded as a heavy weight organization that has (partially) adopted the standard and that is actively endorsing the standard, the expectation of these heavy weight organizations is that they will attract other organizations. The risk that other standards (like c-XML) will become dominant in the domain is relatively small due to the relatively large installed base of industry big fish (the Dutch government, Randstad, Adecco etc.).

Macro Environment

Governmental agencies which are potential adopters can be affected through the comply-or-explain regime this endorsement of the Dutch government can potentially have great influence on the adoption of the standard. Furthermore the standard is based on an international accepted and open standard, which is also beneficial for organizations that operate on a global level.

D Aspect search field cases

		<i>Vektis</i>	<i>Setu</i>
IT Resources	Network effects	The network effects of the standards can mainly be attributed to the fact that the standards are relatively open (only the insurance organizations pay contributions), the standards are made very specific for groups of organizations (e.g. physiotherapist). The fact that the standards are built using ASCII and that it is not compatible with other standards have no influence on the adoption.	Because the standards are relatively open, the standards are based upon HR-XML SIDES which ensures that linkages can be made to international organizations, and the standards cover the entire employee lending process the adoption of the standards is increased.
	Switching costs	The standards are free for health provider organizations which are an important reason that the adoption is so high at this point.	Although the standards are open the standards are not as widely used that software vendors have solutions ready "on the shelf" which are SETU compliant, this stresses the switching costs and portability. However many organizations / software solutions are already compliant to HR-XML which ensures that lower switching costs and portability is mediated.
	Maintainability	The fact that the functionalities of the standard is very complete (by means of relatively a lot of standards) the maintainability of a software program is made more difficult and potentially hampers the adoption of the standard	The standards are open and based on the HR-XML SIDES standards which increase the maintainability when compared to other standards.
	Portability	The standards need to be easily comprehend otherwise the acceptance of the standard will drop. The standards are very specific which results in high recognition. Furthermore the testing of software is considered important for it gives a sense of confidence (testing the standards is actively encouraged by Vektis)	Although the standards are open the standards are not as widely used that software vendors have solutions ready "on the shelf" which are SETU compliant, this stresses the switching costs and portability. However many organizations / software solutions are already compliant to HR-XML which ensures that lower switching costs and portability is mediated.
	Volume	The high number of implementations of the standards can be attributed to the fact that the standards are open, very specific and easy to use.	-
	Diversity	Because the standards are built for specific occupational groups (complete set of functionalities), the adoption of the standard has increased amongst those groups. Furthermore organizations have several modules to choose from and are not obligated to implemented all	The standards are built out of four complementary standards (based on the lending process). Organizations can choose to implement one or multiple
	Breath	-	-
Organizational resources	Network effects	The fact that Vektis and Vecozo is funded by insurance organizations but is placed in the market in an independent manner (as a commanditaire vennootschap) does not affect the adoption of the standards. However the presence of the KEI within Vektis encourages good will and reduces misinterpretations and thus has positive effects on adoption. Furthermore all organizations within the healthcare domain can make significant cost savings through the usage of the standards (economies of scale do apply)	The SETU standards can induce cost savings amongst those organizations that have adopted it, furthermore the development of the standards is conducted in such a manner that organizations can participate in the development. This creates good will and reduces misinterpretations amongst industry players. Furthermore organizations within the staffing domain can make significant cost savings through the usage of the standards (economies of scale do apply).
	Switching costs	-	-
	Maintainability	-	-
	Portability	-	-
	Volume	The broad adoption of the standards can be attributed to the cost savings amongst all parties involved in the chain. And the manner in placing the standard in the market.	Broad adoption of the standards can mainly be attributed to cost savings, whereas the larger organizations will be prompted first to convert,
	Diversity	-	-
	Breath	-	-

Business process (performance)	Network effects	The standard ensures that the declaration process is conducted on an unambiguous manner which makes the adoption of the standard more attractive because it can be used to enhance business processes. Furthermore insurance organizations also offer to collect the money that is not covered by the insurance, which creates good will and makes the declaration process simpler.	The standards ensure that no paper documents (e.g. hour specifications) will have to be sent towards other organizations that have converted to the standards. This will yield burden reliefs through increased processes which can attract organizations to adopt the standards.
	Switching costs	-	-
	Maintainability	-	-
	Portability	-	-
	Volume	-	-
	Diversity	On paper organizations can improve their business processes through the adoption of one or multiple standards that has been developed for his occupational group. However in practice the organization does not have a choice by means of contractual agreements.	The SETU standard that affect business processes most are the "standard for reporting time and expenses" and thus this standard will be adopted most frequently when organizations do not adopt the standards as a whole.
Breath	-	-	
Industry characteristics	Network effects	Health insurance organizations do not compete by means of an effective communication process between chain partners, they do compete through lower insurance fees and by having superior customer contacts etc. This means that the health insurance organizations can collectively endorse / develop the standards.	The adoption of the SETU standards can make sure that organizations are less dependant on other (chain) partners. This can be conducive to further adoption of the standards.
	Switching costs	-	-
	Maintainability	-	-
	Portability	-	-
	Volume	Because the healthcare declaration processes are highly regulated within the market there are lots of adopters	The staffing industry is one where there is lots of competition (i.e. the market is not consolidated), organizations can choose not to convert because the organizations will be less flexible to market changes.
	Diversity	-	-
Breath	The standard are specifically built for the transmission of data between health provider type and insurance organizations, There is no need for more types of transactions and thus is not of influence on the adoption.	When adopting the SETU standards staffing customer organizations have the possibility of reaching more staffing companies, and thus giving them more flexibility. This can have positive effects on the adoption of the standards.	
Trading partners	Network effects	The standards have become widely used because health insurance organizations have made the use of the standards obligatory by means of contractual agreements, i.e. the health insurance organizations have such influence on the market (Big Fish) that they are in the situation that they can make such demands on the entire market.	There are several important organizations (e.g. Randstad, Adecco) within the market that are actively working for higher adoption of the standards, however they cannot make the standard use compulsory towards their partners.
	Switching costs	The standards have been widely adopted within the healthcare market, this ensures that the programs (that are compliant to the standards) are relatively cheap and thus lowers the switching costs (there is even a free program "prometeec" which is provided by the insurance organizations).	The standards cannot be considered as common and thus implementation organizations do not have solutions ready by default, this means that customization to software programs will have to be conducted (this is mediated because the standards are based on HR-XML SIDES
	Maintainability	-	-
	Portability	Insurance organizations collectively have such powers that they can obligate the usage of the standards, and thus health providers will have to implement the standards.	-
	Volume	The insurance organizations have such powers that they can force the standards on the health providers, which ensures high adoption volume.	At this point in time the installed base of the standard is not conducive to further adoption by other organizations.
	Diversity	-	Trading partners do not have specific powers within the staffing industry, hence they cannot force the entire/ sub standards onto other firms
	Breath	-	-

Macro environment	Network effects	The standards have not been obligatory and thus cannot be attributed to the success of the standards (however one interviewee states that if it was the standards could have been "mature" sooner)	The SETU standards have been added to the comply-or-explain regime of the Dutch government which pressures governmental organizations to convert to the SETU standards.
	Switching costs	-	-
	Maintainability	-	-
	Portability	-	-
	Volume	The standards are not obligated by law, however the healthcare domain is which encourages the usage of the standards. Furthermore when the government did obligate the standards one respondent states that the adoption would have gone quicker.	The number of implementations of the standard is rising, due to the comply-or-explain regime this can rise significantly
	Diversity	-	The SETU standards consist out of four sub-standards, when following the comply-or-explain regime only those standards will need to be adopted that are necessary for the specific organization.
	Breath	-	The comply-or-explain regime will attract mainly organizations with relations with the government. Organizations without that bond do not have to convert.

E Vektis questionnaire

Allereerst algemene vragen:

Kunt u aangeven wat uw relatie is met de Vektis standaarden?

- Eind gebruiker – Werkzaam bij softwareleverancier / ICT afdeling – Lid van standaardisatie organisatie
- Waar wijdt u het succes van de Vektis standaarden aan toe?
- Welke voordelen heeft uw organisatie om gebruik te maken van de Vektis standaarden?
- Wat is naar uw mening de reden voor andere organisaties om de standaarden te adopteren? Verschillen deze redenen per type organisatie (zorgaanbieders, servicebureau's en verzekering maatschappijen)?

Vragen betreffend de Vektis standaarden:

- Wilt u aangeven hoe de implementeerbaarheid van de Vektis standaarden invloed heeft op de adoptie van die standaarden?
- In welke mate heeft de onderhoudbaarheid van de Vektis standaarden invloed op de adoptie van die standaarden?
- In welke mate heeft de compatibiliteit van de Vektis standaarden met andere bedrijf transactie standaarden (zoals HL7) invloed op de adoptie van de standaard?
- De Vektis standaarden zijn opgebouwd in het ASCII formaat (met uitzondering van de Controle Op Verzekeringsrecht standaard) waarbij in het EI handboek standaardisatie 2009 de wens wordt getoond om naar een XML formaat om te schakelen. In hoeverre heeft het formaat waarmee de standaard is opgebouwd invloed op de adoptie van de standaarden?
- Vektis ontwikkelt en onderhoud relatief veel standaarden die gericht zijn op specifieke beroepsgroepen binnen de zorg (bv. declaratie vervoer, declaratie mondzorg, declaratie paramedische hulp etc.). Hoe heeft deze opzet effect op de adoptie van de standaarden?
- Tijdens het maken/ onderhouden van de standaarden worden functionaliteiten getoetst door het KEI, waarbij het KEI een afspiegeling is van de uiteindelijke

gebruikers (zorgaanbieders, zorgkantoren en zorgverzekeraars). Wat voor een invloed heeft deze opzet op de adoptie van de standaarden?

- De standaarden van Vektis kunnen gecategoriseerd worden als relatief open standaarden, (de standaard is publiekelijk beschikbaar tegen nominale kosten en de totstandkoming van de standaard is toegankelijk) In welke mate heeft dit effect op de adoptie van de standaard?
- Heeft het beheren van het AGB register door Vektis ook invloed op een hogere adoptie van de standaarden, zo ja hoe?

Vragen betreffende uw organisatie:

- Vektis ontwikkelt en onderhoud veel standaarden die onderverdeeld kunnen worden in drie categorieën (Controle Op Verzekeringsrecht standaard, het declaratie bericht en retour informatie van het declaratie bericht) waarbij geen verplichtingen zijn opgelegd om al deze standaarden te gebruiken. Op welke wijze heeft deze vrijblijvendheid effect op de adoptie van één of meerdere Vektis standaarden?
- Vektis wordt hoofdzakelijk gefinancierd door zorgverzekeraars en vraagt geen contributie aan gebruikers van de standaarden. Kunt u voor en nadelen met betrekking tot de adoptie van de standaarden noemen van deze constructie?
- Het declaratie proces gaat hoofdzakelijk via een portal dat wordt aangeboden door VECOZO (die net zoals Vektis gefinancierd wordt door Zorgverzekeraars Nederland), waarbij VECOZO en Vektis beiden relatief onafhankelijke organisaties zijn. Wat voor effect heeft deze manier van plaatsing in de markt op de adoptie van de standaard?
- Zijn veranderingen in (bedrijf) processen door invoering van de Vektis standaarden van invloed op de adoptie van de standaard, zo ja welke veranderingen zijn voor uw organisatie belangrijk?

Vragen betreffende de relaties tussen uw organisatie andere organisaties in de zorg declaratie keten:

- Tijdens de uitgevoerde literatuurstudie kwam verschillende keren naar voren dat wanneer bedrijf transactie standaarden geïmplementeerd worden organisaties minder snel kunnen reageren op de markt en dus aantastend kan zijn op de concurrentie positie van de organisatie. Erkent u dit verschijnsel, en op welke wijze is dit voor uw organisatie van belang bij de adoptie van de Vektis standaarden?
- Wordt het gebruik van de standaarden door bepaalde partijen binnen de keten actief gestimuleerd (bijvoorbeeld door beloning systemen of door het hanteren van sancties)? Zo ja hoe?
- Op dit moment zijn er veel organisaties die al zijn overgestapt naar de Vektis standaarden, In welke mate heeft dit een aanzuigende werking voor andere (potentiële) gebruikers?

Vragen betreffende de macro omgeving:

- In hoeverre en hoe wordt het gebruik van de standaarden aangemoedigd door de overheid?
- Is het zo dat regelgeving in Nederland zorgt voor een hoge adoptie van de standaard?