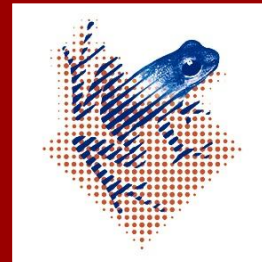


Stakeholder identification method within the project Electronic Health Record

Going beyond the identification method developed by Achterkamp & Vos (2007)

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Trefw issues, stakeholders, stakeholder identification regulative cycle, issue management, stakeholder theory, quality criteria, process criteria, content criteria

PREFACE

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ABSTRACT

This paper presents an improved identification method for identifying, analyzing, and mapping issue-stakeholder combinations in case of an Electronic Health Record (EHR) implementation. The enhanced method is based on the identification method developed by Achterkamp & Vos (2007). For this purpose, the Regulative Cycle of Van Strien (1997) has been applied. The regulative cycle consist of four basic phases, which are: problem definition, analysis/diagnosis, design solution and validation.

The objective of this research is to design an identification method to identify, analyse, and map issue-stakeholder combinations in a quick and effective manner in the early phase of an EHR implementation. The central research question is: How can issue-stakeholder combinations be mapped in case of an Electronic Health Record?

To answer the research question, the identification method of Achterkamp & Vos (2007) is taken as starting point, and this method is adjusted and improved. In phase 1 (problem definition), the quality, process, and content criteria concerning the identification method were presented to come through a well-developed improved identification method. These criteria were obtained through addressing the questions, points of interest, and requirements encountered by the management of EHR program organization. In phase 2 (analysis/diagnosis), a concept design for the identification method was developed, tested, and evaluated. This concept design was developed by means of addressing, and incorporating the criteria presented in phase one. In phase 3 (design solution), a design for an enhanced identification method is presented, for the identification, analysis, and mapping of issue-related stakeholders within the healthcare organization LTHN. The design was developed based on the results of phases one and two. In phase 4 (validation), the design for an enhanced identification method was validated. The result of this phase is a validated method, which meet the quality, process and content criteria.

The conclusion of this paper is: issue-stakeholder combinations should be carefully taken into account when dealing with an EHR implementation. An identification method is a good approach to identify issue-related stakeholders and to map these issue-related stakeholders.

1 INTRODUCTION

This paper presents an adjusted method for the identification and analysis of issue-stakeholder combinations in case of an Electronic Health Record (EHR) implementation. Furthermore, the method can be used to map these issue-related stakeholders. The enhanced identification method is based on the identification method developed by Achterkamp & Vos (2007). In this paper, the Regulative Cycle of Van Strien (1997) is applied, which consist of five basis phases, and are: problem definition, analysis/diagnosis, design solution, implementation, and validation.

1.1 ELECTRONIC HEALTH RECORD

The Electronic Health Record (EHR) is currently a popular topic of discussion. Almost every hospital in the Netherlands is working on the implementation of an EHR (Boonstra & Govers, 2009). An EHR is a software application where all medical and administrative data of the patient is recorded and coupled digitally. The purpose of an EHR is the reduction of medical errors (Vest, 2008; Miller & Sim, 2004), and the reduction of the mortality rates (Al-Sarira et al., 2007; Langer, 2007; Stitzenberg, Sigurdson, Egleston, Starkey, & Meropol, 2009; van Heek et al., 2005). However, the EHR and other healthcare exchange systems developed so far have been criticized heavily. The subject EHR has been discussed in Dutch media very much. In 2012 almost four hundred Dutch newspapers included articles about the EHR or other healthcare exchange systems. The EHR has been discussed, because of the approach that is taken to develop such a system. Until now, the current EHRs have been developed from a purely a technical perspective. These EHR systems may be technologically good designed systems, but taking a business perspective, these systems have failed (Van Twist et al., 2012). In the healthcare sector a large number of Information System (IS) implementations have failed (Stoop et al. 2007; Aarts & Berg, 2006; Jensen & Aanestad, 2007). However, other researchers argue that many IS implementations fail due to the issues that may emerge during the implementation phase of an EHR, and the related stakeholders that perceive these issues (Balsters 2012; Legris & Colletette, 2006). The

development of an IS, such as an EHR, is quite a complex and uncertain process. Many factors can be the cause of this complexity and uncertainty. One of the factors is the stakeholders involved in the EHR implementation. Stakeholders are a primary source of uncertainty, because the implementation of an EHR affects many stakeholders with different perspectives, interests, perceived issues, and with different degrees of autonomy and expertise (Boonstra & Govers, 2009; Stoop et al. 2007, Aarts & Berg, 2006, Van Linge, 2006; Ploem & Gevers, 2011). This source of uncertainty and complexity can be understood by identifying the relevant stakeholders and the issues that these stakeholders are interested in, in such an EHR project (Ward & Chapman, 2008). This will be the focus of this research; designing a method which can be used to deal with the stakeholders involved in the implementation of an EHR. In more detail, the method developed is able to identify and analyse issue-stakeholder combinations, and how to map these issue-related stakeholders. As the identification method indicates, the terms issue and stakeholder are main concepts. The terms will be explained, to get a better understanding of these terms.

In this paper, the definition of Freeman (1984: p.46) is used to define stakeholders: 'any group or individual who can affect or is affected by the achievement of the organization's objectives'. In the case of implementing an IS in a healthcare setting, many stakeholders can be identified. These stakeholders can be the healthcare professionals, such as doctors, nurses, governmental agencies and patient representatives (Achterkamp, Boonstra & Vos, 2013). Identifying these stakeholders is essential, because it shows both who is affected by the project and who can affect the project. This latter type of stakeholders can be crucial to a project's success, because it suggests that stakeholders could either actively support the project, or hinder the project (Vasiliki, Themistocleous & Irani, 2007). As Crable & Vibbert (1985: p.5) argue "issues are not simply questions that exist; an issue is created when a stakeholder attaches significance to a situation or perceived concern". Issues and the stakeholder that perceive these issues are inseparable, and therefore it is relevant that these stakeholders should

carefully be identified and involved by the management. According to Mitchell, Agle and Wood (1997) managers can perceive numerous stakeholder groups differently and prioritize competing claims from these groups. The prioritization of stakeholders, and managing them accordingly, is becoming more and more important as the complexity of projects rises due to an increase in the number of relevant stakeholders. Managing the stakeholders, will enable implementers of the innovation project to better understand their viewpoints, interests in issues, and roles, and enable more informed decisions regarding the implementation of an innovative system (Vasiliki et al., 2007). According to Harris & Weistroffer (2009), the involvement of stakeholders is not only important, but essential to the success of an IS implementation. The identification of these issues and the related stakeholders that perceive these issues will help implementers to better deal with this complexity and uncertainty (Ward & Chapman, 2008).

Issues are the subjects under discussion between an implementer of an IS, such as an EHR, and a stakeholder. These issues can “result from different organizational activities, occur in different points in time, and can thus have various forms” (Achterkamp et al., 2013). Issues can range from small requirements involving only a few stakeholders, to a large project that affects several of groups of stakeholders. The issues might affect stakeholders, which in turn can motivate them to undertake action. Issues could have a significant effect on the functioning or performance of an organization (Lientz & Larssen, 2006). There is the risk that delays, conflicts, or even failure of the implementation of an EHR can arise, if issues remain unresolved (Regester & Larkin, 2002). Thus, it is for an organization of relevance to identify and analyse these issues. This may result in harmony between the stakeholders and the implementers of an EHR. The process of identifying and analysing issues, which may result in harmony between stakeholders and implementers, can be defined as issue management (Heath, 2002). Using issue management during the implementation phase of an EHR project is therefore of high importance.

EHRs have gained considerable importance in academic research. Although, much research has been performed with the focus on the identification of stakeholders during the implementation process of an IS, not much attention has been given to issues in relation with stakeholder identi-

fication (Umble et al., 2003; Finney & Corbett, 2007). Little is known about the issue-stakeholder combinations, and how these issue-related stakeholders can be analysed and mapped, in case of an EHR implementation, in a healthcare setting (Boonstra & Govers, 2009). This research contributes to the existing base of theory to identify the issues and stakeholders that emerge during the implementation of an EHR in a healthcare setting, and also to analyse and map these stakeholders. Furthermore, it tries to clarify the interconnection of the issue and stakeholder combinations within an EHR implementation in a healthcare setting. Practically, this research gives organizations in a healthcare setting more insight in the issue-related stakeholders of an EHR. Gaining more insight in the relevant issue-related stakeholders of an EHR, will help the healthcare organization to reduce the complexity and uncertainty during an EHR implementation phase, and therefore be able to implement the EHR in a successful way.

1.2 OBJECTIVE & CONTEXT

The objective of this research is to design an identification method to identify issue-stakeholder combinations, and to analyse and map these issue-related stakeholders in a quick and effective manner in the early phase of an EHR implantation. As the term EHR indicates, the research is performed in the healthcare area. This research will provide more insight in issues and the issue-related stakeholders of the healthcare organization, and therefore contribute to deal with the complexity and uncertainty of the issue-stakeholder combinations during the implementation phase of an EHR. To come through a well-developed design for the identification method, the identification method of Achterkamp & Vos (2007) will be used as a starting point, and this method will be improved. The output is an improved identification method, which serves as guidance of how to identify the issue-related stakeholders, and how these stakeholders can be analysed and mapped. This research is conducted at a Large Teaching Hospital in the Netherlands (LTHN), at the EHR program organization department. LTHN introduces a new EHR, and is currently in the pre-implementation phase. For this department it is relevant to reduce the complexity and uncertainty of the EHR implementation process, by gaining more insight in

the relevant issues and stakeholders of the EHR, and to be more able to implement the EHR in a successful way. They are interested in the identification of issue-related stakeholders of the EHR, and how they can deal with these issue-stakeholder combinations. From the research objective the central research question can be formulated and will therefore be:

How can issue-stakeholder combinations be mapped in case of an Electronic Health Record?

To answer the research question, an identification method will be developed by using the regulative cycle of Van Strien (1997), as shown in figure 1 below. The regulative cycle will be explained in detail in section methodology of this paper.

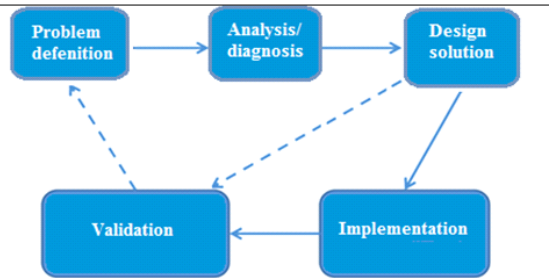


Figure 1 Regulative Cycle (Van Strien, 1997, p.685)

2 THEORETICAL BACKGROUND

Achterkamp & Vos (2007) have presented an identification method that can be used to identify and classify issue-stakeholder combinations.

2.1 IDENTIFICATION METHOD

According to Achterkamp & Vos (2006), stakeholders involved in an EHR project, could be identified and classified. Achterkamp & Vos (2006) argue that "for classification models to be useful for stakeholder identification, they should fit the issue the stakeholders are interested in, or are affected by". Achterkamp & Vos (2007) claim that issues and stakeholders are interconnected, but it is unknown how they are interconnected. Therefore, it is valuable to identify stakeholders based on issues. This results in gaining insight in what role stakeholders play in relation to a specific issue, and who to involve when dealing with an issue. The identification method of Achterkamp & Vos (2007), which is the starting point of this research, focuses on the identification of stakeholders in the particular context of an innovation project, like an IS project. When dealing with an IS implementation, a stakeholder identification enables implementers to have a better understanding of stakeholders involved in the project, and thus enables more informed decisions regarding the adoption of an IS (Mantzana et al., 2007). In case of an IS project, it is essential to focus on the roles stakeholders play, and what influence these stakeholder roles can have within the project (Kolltveit & Gronhaug, 2004). The stakeholder roles can be used to identify stakeholders. Achterkamp & Vos (2007) make a distinction in two roles of involvement of stakeholders in the implementation process of an EHR project, namely actively involved and passively involved stakeholders. The actively involved stakeholders are any group or individual who can affect the achievement of the project's objectives. The passively involved stakeholders are those who are affected by the achievement of these objectives without being able to have an impact on these objectives. They distinguish that the actively involved stakeholders can fulfil several roles: clients, decision makers, and designers/experts. A client is the stakeholder whose purpose is

being served. A decision maker is the stakeholder that sets requirements and evaluates whether these requirements are met. A designer/expert contributes expertise, and is responsible for the deliverables. There is another role that can be fulfilled, which is that of a representative. This is a person who acts on behalf of the passively involved (Vos & Achterkamp, 2006; 2007). Identifying stakeholders in an EHR project, and classifying these stakeholders based on their roles in the project might enable implementers to have a better understanding of stakeholders in the light of a specific issue (Vos & Achterkamp, 2006).

The identification method consists of three steps. The first step consisted of the identification of issues regarding the EHR. In the second step, internal and external stakeholders related to the chosen issue are identified. In the third step, the identified stakeholders are categorized on several characteristics. Below a detailed description of the method is given.

Step one, Issue Identification: In this step, the participants identify several issues. To identify EHR related issues, support questions were used, as shown in table 1.

Support questions for issue identification

What is an actual and crucial EHR-issue?

Whereby are many stakeholders involved?

What are the different views?

About what is knowledge from different stakeholder needed?

Table 1 Support questions for issue identification

Step two, Stakeholder identification based on the issue chosen: In the second step, internal and external stakeholders related to the chosen issue are identified. For the identification of the issue-related stakeholders, the role concepts

(see table 2) presented by Achterkamp & Vos (2007) are under consideration.

Roles of stakeholders
Client
Decision maker
Designer/expert
Passively involved/representative EHR

Table 2 Role concept (Achterkamp & Vos, 2007)

Step three, Stakeholder analysis: In the third step, the identified stakeholders are categorized on several characteristics. To capture these characteristics, several questions are used. Participants are asked to indicate on a five-point scale ranging from totally disagree to totally agree to what extent they agree with the questions. Besides, also open questions are asked.

The identification method is taken as a starting point for this research. This method will be improved to be able not only identify and classify issue-stakeholder combinations, but also analyse and map these issue-related stakeholders. As a result, the identification method will address the complexity and uncertainty of the implementation phase of an EHR in a healthcare setting. With this enhanced identification method, the implementers of an EHR could manage the identified stakeholders.

The identification method include many terms and concepts which have to be explained and clarified to have a better understanding of these terms and concepts. Table 3 presents the terms and concepts concerning the content of the identification method developed in this research which have to be explained and elaborated.

The above mentioned terms concerning the content of the identification method will be discussed in more detail below.

As the identification method developed by Vos & Achterkamp (2006) claims, "the identification method is useful if it fit the issue that stakeholders are interested in, or

are affected by". According to Vos & Achterkamp (2006), the cooperation of stakeholders starts with an issue being under discussion. This is complemented by other researchers by stating that "whenever a problem or challenge relates to several stakeholders, it is likely to have a complexity that cannot to be handled by one actor" (Roloff, 2008, p.246). Therefore, it is of relevance to clarify what issues are and what impact issues can have on innovation projects.

Terms/concept
Stakeholders
Issues
Issue management
Stakeholder theory

Table 3 Terms and concepts

2.2 ISSUES

Issues are the matters under discussion between a implementer of an IS and a stakeholder, and can "result from different organizational activities, occur in different points in time, and can as a result have various forms" (Achterkamp & Vos, 2007). Issues can influence stakeholders, which in turn can motivate them to undertake action. However, the actions stakeholders take essentially exist independently of their involvement with the implementation process of the project. Some stakeholders may be well informed and engaged in the implementation process before others become aware, and therefore may perceive issues differently or perceive different issues that others who are less aware (Bigelow, Fahey & Mahon, 1993). The individuals in an organization have different understanding of the same event, as they are operating in different locations in the organization, and are familiar with and interested in different aspects in the organization (Weick, 1995). Implementers should be aware that the issue can lead to stakeholder concerns that need to be dealt with. In case of new technological challenges, such as an EHR implementation, various professional stakeholders within the healthcare organization are involved. The change of a new technology may be

perceived by some stakeholders as a challenge, joy, or an opportunity to benefit from, whereas other stakeholders may perceive the change as disadvantageous, or stressful (Bouckenhooghe, 2010). According to Lorenzi and Riley (1995), the implementation of an IS can be considered as a success, when a new technology meets more than 90% of the perceived needs of the potential users. Therefore it can be stated that the issues that stakeholders have are important to take into account in an early phase of the implementation process to be able to meet their needs.

2.2.1 IDENTIFICATION OF ISSUES

Identifying the issues that stakeholders perceive in the implementation phase of an EHR is seen as crucially important. Therefore it is relevant to understand the characteristics of these issues. In case of a large and complex project such as the EHR, several issues emerge simultaneously. Hence it is relevant to identify and classify these issues, than only focus a specific issue or on a specific aspect of the implementation process (Grant, 2003; Robey et al., 2002; Tarafdar & Roy, 2003). During the implementation phase of an EHR, issues should be analysed in order to gain a detailed understanding of how stakeholders react on issues and why they react in such ways. Depending in the type of an issue, an issue have a different effect on the stakeholder' attitude that perceive these issues. Therefore, it is relevant to identify and classify the type of issues. These issues should be effectively classified for effective use in contexts of change (Dutton & Jackson, 1987). Identifying and classifying issues generates the opportunity to understand the various understandings of stakeholders, which implementers in turn can use to manage stakeholders.

2.2.2 TYPE & IMPACT OF ISSUES

Issues regarding an IS in a healthcare context can be of different types and can have quite an impact in different ways. To determine the foundation of the issues, Star and Ruhleder (1996) developed an issue order model that identifies three levels of issues that appear during a large IS implementation, such as an EHR. These levers are the first order, second order, and third order. Issues that belong to the first order are the ones that are most obvious to stakeholders. These issues can be easily solved by re-allocation, increase of resources, or by the provision of information.

These issues are regularly easily to observe and solutions are practical (Star and Ruhleder, 1996). In the article of Forsell et al. (2010), the issue order model is used to evaluate the failure of an EHR in a surgical clinic. In their article, they claim that issues of the first order are related to everyday situations; for example how the system should be used. Second order issues, are issues that can be caused by a collision or combination of two or more first order issues (Forsell et al., 2010). Examples of second order issues are: technical choices made or differences in cultures of practice. These issues are unexpected and occur often as secondary effects after the implementation (Forsell et al., 2010). Third order issues are issues that are political or social in nature, and therefore hard to solve. Examples of such issues are privacy requirement, and power redistribution within the organization (Forsell et al., 2010). As third order issues are hard to solve, these issues can have effect on the implementation phase of an IS, like the EHR. Hence, it is important to be aware of the impact issues can have on a project.

As can be summarized, issues may have different kind of impact on the implementation process. Taking an issues management approach, implementers of an EHR could deal with the impact of issues (Heath, 2002).

2.3 ISSUES MANAGEMENT

Issue management began as a distinct discipline in the late 1970s; it did not gain real momentum until the mid-1980s; since then issue management is still been in development. From its earliest days issue management had a strong focus on management models. Different alternative models concerning issue management are developed by several scholars. According to Coates et al. (1986, p.9), issue management is defined as 'the organized activity of identifying emerging trends, concerns or issues likely to affect an organization in the next few years and developing a wider and more positive range of organizational responses toward the future'. Another definition is that of Heath (2002); issue management is the process of seeking harmony between the stakeholders and the implementers of an IS project.

The objective of issues management, as stated by Heath (2002) is 'to make a smart, proactive and more respected organization'. An organization like this is one that understands its stakeholders and responds to them. Issue management is about building, maintaining, and repairing relationships with stakeholders and stake seekers (Heath, 2002). Building, maintaining and repairing relationships with stakeholders and stake seekers in a successful way requires taking a stakeholder perspective concerning issue management (Heath, 2002; Jaques, 2006; Gaunt & Ollenburger, 1995). Taking a stakeholder perspective, stakeholders are identified based on issues and the related stakeholders that perceive these issues are addressed. This way of addressing issue management might result in better understanding between implementers and stakeholders, and could have a potential influence on the result of an IS implementation (Jaques, 2005). It could make an IS successful and achieve improvement, when implementers are able to successfully cope with and address a wide variety of issues (Gaunt & Ollenburger, 1995).

In case of a large and complex IS project implementation, like an EHR implementation, the importance to gain understanding in issues management by taking a stakeholder perspective is high in an early phase of the project. This is because many issues are involved with different related stakeholders (Ward & Chapman, 2008). The potential influence of stakeholders through a project is high in the early phase of the project (Kolltveit & Gronhaug, 2004). If gathering essential information from the related stakeholders in an early phase of the project fails, it could result in significant delays in the subsequent phases (Lahiri & Seidmann, 2012). In this report, the implementation phase is meant by the early phase of the project. This phase consists of activities as planning, deciding roles, and managing the introduction (Herold et al., 1995). The implementation phase is seen as a critical phase, because not taking into account the issues and related stakeholders could have significant consequences on the total success of an IS project (Markus & Tanis, 2000). As stated before, the related stakeholders have also to be addressed in issue management (Markus and Tanis, 2000; Heath, 2002; Jaques, 2006; Gaunt & Ollenburger, 1995). Taking an issues management approach on stakeholders, brings discipline to the work of gathering knowledge about issues and the interests of

stakeholders, and could be a source for success of a project. According to Boutilier (2011: p4) issue management is useless without relating them to stakeholders: 'trying to manage issues without building relations with stakeholders is like trying to direct a movie and change the script without ever talking to the actors or crew'. Hence, the stakeholder theory has to be taken into consideration to make issue management useful.

2.4 STAKEHOLDER THEORY

The concept of stakeholder can be defined in different ways. There are more than twenty different definitions of this concept available in academic literature. A classic definition which is applied widely, and will be applied in this report is the definition of Freeman (1984: p.46). His definition of a stakeholder is as follows: 'A stakeholder is any group or individual who can affect or is affected by the achievement of the organization's objectives'. This means that any interested stakeholder is a group or individual that affects or is affected by the achieved goals set by the organization. Hence, organizations should address stakeholders, who consist of the whole range of individuals that have an interest in the organization; the interests of the stakeholders should be taken into account (Stoop et al. 2007). By addressing the interests of stakeholders during the IS implementation, the organization could better manage these stakeholders. Stakeholders can be internal stakeholders, such as senior management, and can be external, such as the government. Besides stakeholders on the organizational level, organizations have also various stakeholders in projects which all have different understandings and views. Because stakeholders operate in different locations of the organization, they have different understandings of the same event, and may perceive issues differently (Weick, 1995). These stakeholders have besides different views and views of the IS implementation, also a different perception of the success of an IS implementation (Scott et al., 2005). If implementers of an IS project want to manage stakeholders in a successful way, they have to understand the issues, roles, and behaviour of these stakeholders, and attempt to manage these (Laplume et al., 2008). Stakeholders, can help underline the desirable changes, and can offer their knowledge and skills which are necessary to execute the

change. Thus, it is important to pay attention to the identification of stakeholders, understanding their issues, roles and behaviour, involving them into the project, and manage them in case of IS implementation (Schwalbe, 2009; Harris & Weistroffer 2009).

2.4.1 IDENTIFICATION AND CLASSIFICATION OF ISSUE-RELATED STAKEHOLDERS

In the stakeholder literature, a lot of theories have been established over the years about stakeholders and their influence on organizational behaviour. Stakeholder identification is seen as a classification problem. Many classification models are available in academic literature, although the salience model of Mitchell et al. (1997) is considered to be the leading classification model (Scholl, 2004). The work of Mitchell et al. (1997) has added value to the stakeholder theories by identifying the stakeholders and defining the principle of 'who and what really counts'. Mitchell et al. (1997) propose a first step in managing stakeholders by assessing stakeholders on their level of salience. This is called the salience model. Stakeholder salience can be defined as "the degree to which managers give priority to competing stakeholder claims" (Mitchell et al., 1997: 854).

The stakeholder salience theory divides the stakeholders in eight different classes. It is proposed that classes of stakeholders can be identified by their possession or attributed possession of the following attributes: power, legitimacy, and urgency (Mitchell et al., 1997). Mitchell et al. (1997) define the concept of power as the extent to which a group can exert its coercive, utilitarian or normative means to force it's will in a relationship. It is the stakeholders' power to influence the organization. Legitimacy is defined by Mitchell et al. (1997) as 'the general perception that the actions of an entity are desirable, proper or appropriate within some socially constructed system of norms, values, beliefs and definitions', it also refers to claims that have a legal foundation. Urgency is focused on the time factor. Urgency refers to the extent to which a stakeholder claim calls for immediate attention; delay in attending to the claim is unacceptable to the stakeholder (Mitchell et al., 1997).

This theory produces a comprehensive typology of stakeholders based on the normative assumption that these variables define the field of stakeholders; those entities to which managers should pay attention. The proposition made in this research is that when managers perceive all three attributes at a stakeholder, stakeholder salience will be high. When two attributes are perceived, the salience will be moderate and when only one attribute is perceived, the salience will be low. Using the salience model, stakeholder types can be identified in degrees of influence according to their salience as seen from management perspective, as is in this case the implementers of an EHR.

The salience model can be used in stakeholder identification in an EHR implementation to estimate the influence possibilities of the parties involved regarding a specific issue. Salience describes the extent to which stakeholders are noticed. Stakeholders with a high degree of salience, have a stronger influence in the organization and are often earlier addressed; in most cases, the claims of powerful stakeholders who affect the organization are addressed. Managers often do not pay attention to the vulnerable stakeholders who only are affected by the organization (Roloff, 2008). However, in case of EHR implementation, implementers should not overstate the demand of powerful stakeholders and should include vulnerable stakeholder groups.

From this theoretical background, the relevant concepts used for the identification method are clarified. The objective of this paper is to develop an adjusted identification method, which completing the process of identifying issues, identifying stakeholders and classifying, analysing and mapping these stakeholders. Achieving this process, it is essential to understand the content of the identification method. This theoretical background helps to understand the role of stakeholders, and the issues they perceive during the implementation phase in a better way.

3 METHODOLOGY

The methodology section is divided in two sub-sections, which can also be divided into smaller parts. In the first sub-section, the empirical context is presented. In this empirical context, a general introduction of LTHN is given first. Subsequently, the EHR program organization, and its core activities are described. The current progresses of activities in this department are illustrated, and the desired situation for the EHR implementation is explained. In the second sub-section, the regulative cycle of Van Strien (1997), which is applied in this paper will be discussed in detail.

3.1 EMPIRICAL CONTEXT

LTHN traditionally store all information about their patients in paper files. The use of computer systems is to support procedures, but these computer systems often cannot automatically exchange patient' information. LTHN has currently started implementing an organization wide Electronic Health Record (EHR). This EHR is a stand-alone initiative of the healthcare institution and should not be confused with a national EHR. With the new EHR, a new IS is implemented. This new IS would replace the current IS application of LTHN by one organization wide information system, where many functions are geared to one another. The main objective of the EHR is to increase the quality of patient' data that is collected in the system, and to use it for multiple purposes. With the EHR, one digital file of each patient is created, which health professionals in the healthcare institution can use in their daily work.

To ensure that the EHR implementation can be achieved, a special department is established, namely the EHR program organization. Below, a detailed description of the department is given, together with the core activities.
EHR program organization

The EHR program organization concerns the introduction of a new EHR for the entire LTHN. The introduction of a new EHR is a large program, especially because of the size of the project. The new EHR program brings some major changes for almost all staff of LTHN, not only technical

changes, but also organizational changes. This department is responsible for managing the organizational changes. Furthermore, this department has the task to communicate information concerning the EHR project to the rest of the employees. The EHR organization program is engaged in targeting of the upcoming changes. The objective of the EHR organization program is to support the program team and all the sub-projects that are working toward the completion of a functioning EHR, in order that the employees know what to do to work properly. Furthermore, the EHR program organization ensures the identification, assessment, and control of both barriers and facilitating factors. Moreover, this department supplies and performs specific, practical change strategies and activities to the rest of LTHN.

Due to the complexity and size of the EHR project, the EHR deals with many issues and stakeholders. Currently the new EHR of LTHN is in its pre-implementation phase, where many decisions are made by the management of the EHR program organization. To ensure that the right decisions are made, and the right stakeholders are addressed for specific issues, these issues and stakeholders are needed to be identified and included. There are over than 43 departments and working groups, with each their own issues, that result in a complex position. Due to the issues that different departments and working groups have, uncertainty emerges regarding the EHR. The management of the EHR program organization has to deal with these issues and the numerous stakeholders that are related to these issues. They concerned with the complexity and uncertainty as is the result of the issues and stakeholders that are involved. This research is trying to address the issues that the management is currently dealing with. With the questions and a set of requirements obtained from the management, an enhanced method is developed for identifying issue-stakeholder combinations in an quick manner, and analysing and mapping these issue-related stakeholders within the EHR implementation. With these maps, the management of the EHR program organization can involve the issue-related stakeholders in an early phase of the implementation process.

3.2 REGULATIVE CYCLE

As mentioned before, the regulative cycle has five basic process phases; problem definition, analysis/diagnosis, design solution, validation and implementation, as shown in figure 2 below (Van Strien, 1997, p.685).

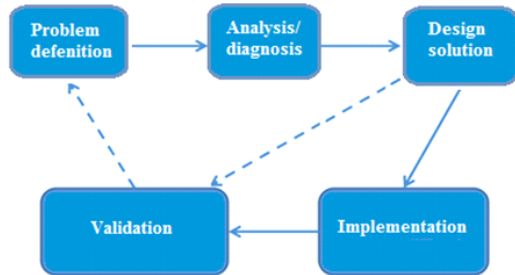


Figure 2 Regulative Cycle (Van Strien, 1997, p.685)

The phases problem definition, analysis/diagnosis, design solution, and validation, will be passed through to come through a well-developed enhanced identification method. The Implementation phase is excluded in this research, because the EHR project at LTHN is still in the pre-implementation phase, and the method developed in this research is an identification method which can be used during the implementation phase. Therefore, the implementation phase is excluded.

The output of each phase, will serve as input for the phase following. The purpose of phase 1 (problem definition), is to obtain a set of criteria for the identification method that is developed in this paper. The output of phase 1 are criteria for the identification method. In phase 2 (analysis/diagnosis), these criteria are addressed and incorporated, and a concept design for the identification method is developed, tested, and evaluated. In phase 3 (design solution), the design for the improved identification method is presented. This design is the result of the output of phases one and two. In the last phase, phase 4 (validation), the design for the identification method is validated. Due to the outcome dependencies of the different phases, the project as a whole will be performed in a collaborative and incremental fashion.

3.2.1 PHASE 1: PROBLEM DEFINITION

To obtain the quality, process, and content criteria for the adjusted identification method, different sources were used to collect the data. First, several interview sessions were attended with the management of the EHR program organization. During these interview sessions the interests and problems of the management were discussed, and a set of requirements were obtained (for the interview questions, see appendix 1). Furthermore, other previously performed studies at LTHN served as input. The previously performed studies at LTHN that were used for this research are: Issues and stakeholders in EHR implementation (van den Bos, 2013), and Rapportage stakeholder-identificatie_LTHN_17-10-2012 (Achterkamp, Boonstra & Vos, 2012). In these studies the identification method of Achterkamp & Vos (2007) was performed. The results of these studies (identification method) were reviewed during several brainstorm sessions with the management of the EHR program organization. These studies contribute the following: whether the identification method meets the requirements of the management.

From all the interviews and brainstorm sessions with the management, the requirements were established and the identification method was reviewed, criteria were set up for the identification method. The identification method of Achterkamp & Vos (2007), is evaluated based on these criteria.

3.2.2 PHASE 2: ANALYSIS/DIAGNOSIS

In this phase of the regulative cycle, a concept design of an improved stakeholder identification method is developed, tested and evaluated. Specifically, the process, and content criteria are addressed and incorporated in the concept design. In other words, the output of phase one serves as input for this phase. The result of this phase is a first evaluation of the identification method.

DEVELOPING THE CONCEPT DESIGN

To develop the concept design for the identification method, brainstorm meetings were attended with the management of the EHR program organization. During these brainstorm meetings, a list of the process and content criteria obtained in phase 1 was discussed; how to incorporate

these criteria in the concept design. Furthermore, the concept design developed was discussed and reviewed. The issue- and stakeholder identification session were held with seven members of the EHR program organization. These participants were selected for their knowledge regarding the EHR, on their different backgrounds, tasks in the project, and functions in the healthcare institution. This way they could provide insight into issue-related stakeholders during EHR implementation.

TESTING THE CONCEPT DESIGN

In the issue identification session, the relevant issues were listed. The participants discussed together which issues they perceive. The issues were classified according to their level (first, second, third order) as explained in the issue order model developed by Star and Ruhleder (1996). Furthermore, the participants choose the most crucial issue.

In the stakeholder identification session, the relevant stakeholders were listed based on the roles. Regarding the identification method, particularly the role concepts of Achterkamp & Vos (2007) were under consideration. Participants were asked to come up with all parties who can, will or ought to fulfil the roles of client, decision maker, designer, and/or (representative of) passively involved, in the EHR project. Stakeholders were listed based on the role they play. Furthermore, the stakeholders which had two or more roles were also listed.

In the third step of the identification session, the identified stakeholders were analysed according to several characteristics. These characteristics were salience, reputation, their desired and actual commitment regarding the EHR, their desired and actual commitment in issue-specific context, their estimation of issue-impact on the stakeholder by the project, and their EHR-impact on the stakeholder by the project. During the analysis phase of the brainstorming session, the present participants were asked to give an estimation of the above mentioned characteristics of the identified stakeholders. Participants were asked to indicate on a five-point scales ranging from totally disagree to totally agree to what extent they agree with the twelve questions presented in Appendix 3. For the identified stakeholders, scatterplots were designed based on the characteristics the stakeholders were analysed and evaluated on. Which characteristics each scatterplot contains, depend on the inter-

ests of the management of the EHR program organization. Before designing the scatterplots, the significant correlations between these characteristics were tested.

EVALUATING THE CONCEPT DESIGN

After holding the identification sessions and analysing the data, the concept design was evaluated. Therefore, the data collected from the issue identification session and the stakeholder identification session were verified (i.e. are the results in conformity with the requirements of LTHN?) and validated (i.e. are the results justifiable?). The participants involved in this research, were taking a role in this evaluation process. The results of the concept design were linked back to the participants, so that the participants can give feedback. They have greater knowledge about the environment, and can make a better judgment on whether their requirements were fulfilled.

The feedback was collected through interviews with the management of the EHR project and the participants. During the interviews with the management the output of the concept design were presented. The management was asked if the results fit their requirements. Furthermore, the process criteria and content criteria of the identification method presented in phase 1 of this paper were discussed, and whether these criteria were achieved. The participant and the management were asked to give feedback through interviews on the process of the issue identification session and the stakeholder identification session, and the results of the identification method (appendix 4 presents an overview of the interview questions).

3.2.3 PHASE 3: DESIGN SOLUTION

In this phase, the results are presented for the research question 'How can issue-stakeholder combinations be mapped in case of an Electronic Patient Record?'. To come through a well-developed design for an enhanced identification method, the outputs of phase 1 (problem definition), the process and content criteria, and the outputs of phase 2 (analysis/diagnosis), the evaluated concept design, served as input. The design is validated twice, first in the analysis/diagnosis phase and second in the validation phase, which is presented in the phase following.

The evaluated concept design of phase 2 was reviewed during an evaluation session with the management of the EHR program organization. In this evaluation session the process and content criteria which the concept design was evaluated on whether the criteria were achieved were taken into account. The process criteria and content criteria, which were not satisfied, were incorporating in the design for the improved identification method.

3.2.4 PHASE 4: VALIDATION

In this phase, the design for the improved identification method presented in phase 3, was validated. The objective of this phase was to present a validated identification method that meets the criteria composed in phase 1. Therefore, it should be evaluated, because when the output do not fit the requirements (i.e. for this specific study the criteria) composed in a research, or are inadequate, it will have consequences for the project (Robertson & Robertson, 2006). The enhanced identification method should be verified (i.e. are the results in conformity with the requirements?) and validated (i.e. are the results justifiable?). The design for the enhanced identification method is validated based on the process and content criteria. Each criterion is taken into account and reviewed whether it meets the criteria.

4 RESULTS

4.1 RESULTS PHASE 1 (PROBLEM DEFINITION)

During the several interviews attended with the management of the EHR program organization of LTHN, in which the questions and the problems the management was dealing with were discussed. The management currently has some concerns during the implementation phase of the EHR. A crucial subject that LTHN is dealing with is the acceptance of the new EHR. The reason for having difficulty with the acceptance of the new EHR is, because with the introduction of the new EHR, the proceeding and routines of the healthcare professionals will change dramatically. Examples of changing proceeding and routines are: the healthcare professionals have to work together in one patient' file, they have to work with new standards and codes, some tasks has to be transferred and/or changes from care management to doctors. Furthermore, there are problems that the management encounter. These problems concern the new features and expectations of the EHR technology. Management: "Currently we are dealing with various issues, we would like to map the most crucial issues, and to identify the relevant involved stakeholders or to whom stakeholders these issues are important". Different departments and different working groups at LTHN have varying viewpoints and thought about the EHR. Each department or working group deals with own issues regarding the EHR. A large number of departments and working groups are experiencing "change of the rules surrounding head clinician shelf" as an issue. Another issue which much departments and working groups are dealing with is "insight in functionality of EHR". Management: "These departments and working groups have certain expectations regarding the EHR, but they do not know whether the EHR can meet these expectations". Some other issues, the departments and working groups are dealing with are "disappearance of visualization" and "multidisciplinary collaboration". Besides these issues, there are some issues that only a specific department or working group is dealing with. An example is the nursery department; with the new EHR their work will be digitalized.

From the questions, problem, and points of interest the management was dealing with, some requirements were established. The management of the EHR program organization is interested in addressing the complexity of the many stakeholders and issues involved in the EHR project that cause in uncertainty of the EHR. This department is interested in identifying relevant issues and related stakeholders that emerge during the implementation phase of an EHR in a quick an effective manner. Also, they were interested in analysing and mapping these stakeholders in a structural, quick, and effective manner. Furthermore, they were interested in developing a set of interventions related to the stakeholders.

Furthermore, other previously performed studies were reviewed with the management during several brainstorm meetings (For the details of these brainstorm sessions, see appendix 2). The management indicated that the previously performed stakeholder identification session developed by Achterkamp & Vos (2007) was a good approach, but took too long time, as it took almost four hours successively. This was caused by the analysis step of the identification method; the open questions took too long time from the participants. The management would like to perform the same stakeholder identification session in a shorter time, preferably no longer than three hours. Furthermore, the management desired a get more insight in the interpretation of the stakeholder session (i.e. the interventions to develop). Management: "We would like to make a translation to what does that mean for us?". The identification method of Achterkamp & Vos (2007) does not go beyond the identification of issues, and classification of stakeholders based on a specific issue. The management would like to have an improved identification method, in order to get a better understanding of the relations between the identified stakeholders and the characteristics these stakeholders are analysed and evaluated on. The management would like to map the identified stakeholders.

As mentioned before, the implementation of the EHR is a complex and uncertain process, with much related stake-

holders (Stoop et al. 2007, Aarts & Berg, 2006). To address the issues of stakeholders, it is crucial to identify and analyse these stakeholders in a quick and effective manner in the early phase of the implementation. The implementers of the EHR have to have an understanding of the issues that these stakeholders perceive during the implementation process (Stoop et al. 2007, Aarts & Berg, 2006). From the literature addressed and from the interests of the management, the problems they are dealing with during the implementation phase of the EHR, and the requirements they set for the identification method developed in this research, this improved identification method has meet some criteria. In the following section, these criteria are presented and discussed.

4.1.2 CRITERIA FOR THE IDENTIFICATION METHOD

This research develops an enhanced method that helps identifying and analysing issue-stakeholder combinations. Furthermore, this enhanced method will provide a landscape map of issue-related stakeholders within an EHR project. The desired outcome of this research is to create value rather than determine a reality. Therefore, this research is a business problem-solving project; there is a gap between the way the management of LTHN at this moment perceive the world, and the way they would like to perceive the world. Van Aken, Berends and van der Bij (2007) developed a research methodology for business problem-solving projects. Problem-solving projects of Van Aken Et al. (2007), has to meet some quality criteria. This research at LTHN fits the quality criteria of a problem-solving project of Van Aken et al. (2007).

Quality criteria

- 1 Performance focused: the research is initiated to develop an enhanced method for identifying and analysing issue-related stakeholders, and from this to be able to reduce the complexity and uncertainty of the implementation phase of an EHR
- 2 Design-oriented: the activities during this research are controlled through a research methodology.
- 3 Theory-based: knowledge from scientific literature is used for analysis and design activities.
- 4 Client-centred: the users, problem owners and other stakeholders are respected.

Besides the quality criteria of a problem-solving project, the developed method has to meet other criteria. These criteria are process criteria, which explicate the progress of the process of the identification method, and the content criteria, which explicate the content of the method. The process and content criteria are explained in more detail below.

Process criteria

- 1 The time needed for using the identification method should be limited and take no longer than three hours successively
- 2 The identification method should be effective, in order to help the management to address the relevant stakeholders
- 3 The progress of the identification method should be logical, in order to help the management to perform the identification method easily

The process criteria can be measured through testing the identification method, followed with evaluating the method with the management and the participants.

Content criteria

- 1 The identification method should not include open questions
- 2 The identification method should identify the relevant stakeholders
- 3 The identification method gives an overview of the identified stakeholders
- 4 The identification method should identify the relevant issues that stakeholders perceive during the implementation process
- 5 The identification method should give insight to the management in the issues that stakeholders perceive during the implementation process
- 6 The identification method gives insight in the relation between the stakeholders and the issues
- 7 The identification method should provide starting points for developing interventions related to the stakeholders identified
- 8 The relevance of the identification method should be clear to the management and the participants

The identification method of Achterkamp & Vos is evaluated based on the above mentioned criteria. Table 4 presents the process and content criteria followed whether the iden-

tification method of Achterkamp & Vos (2007) meets each criteria.

Criteria (process or content)	Criteria met?
The time needed for using the identification method should be limited and take no longer than three hours successively	No, the issue- and stakeholder identification method of the concept design were still too long
The identification method should be effective, in order to help the management to address the relevant stakeholders	Yes, the results were in conformity with the requirements of the management
The progress of the identification method should be logical, in order to help the management to perform the identification method easily	Partially, the progress of the identification method is logical, but it is desirable to separate the issue – and stakeholder identification sessions
The identification method should not include open questions	No, the identification method presents closed as well as open questions
The identification method should identify the relevant stakeholders	Yes, the stakeholders identified are all relevant stakeholders involved in the EHR project
The identification method should identify the relevant issues that stakeholders perceive during the implementation process	Yes, the identified issues were relevant to the participants and the management
The identification method gives an overview of the identified stakeholders	Yes, the concept design gives an overview of the identified stakeholders
The identification method should give insight to the management in the issues that stakeholders perceive during the implementation process	Yes, the concept design gives insight to the management in the issues that stakeholders perceive during the implementation process
The relevance of the identification method should be clear to the management and the participants	Yes, the relevance of the identification method was clear to the management and the participants
The identification method should provide starting points for developing interventions related to the stakeholders identified	No, the identification method does not provide starting points for developing interventions related to the stakeholders identified

Table 4 Process criteria of the identification method followed whether the criteria is met

The identification method of Achterkamp & Vos (2007) is improved, in order that it meets all the process and content criteria.

4.2 RESULTS PHASE 2 (ANALYSIS/DIAGNOSIS)

In this section the results of developing, testing, and evaluating the concept design for the identification method are presented.

4.2.1 DEVELOPED CONCEPT DESIGN

The concept design was split into two sessions. The first session was called the issue identification session. The objective of this session is the identification of the most relevant issues, and a selection of two most crucial issues perceived by the participants. After this session the identification of the stakeholders related to the identified issues can be conducted. The objective of this session is to identify the related stakeholders based on the chosen issue and analysing these stakeholders.

4.2.2 TESTED CONCEPT DESIGN

Step one, Issue Identification: During the issue identification session, the participant identified several issues. An

overview of these issues can be found in table 5 on the next page. After the identification of the issues, these issues were classified according to the issues classification. Looking at the issues and their classification, it can be stated that all issues were third order issues. The participants which all are part of the project group, mainly focus on issues regarding on third order issues. All participants believed that the issue 'system design requirements book' and 'capacity utilization' were the fundamental issues regarding EHR implementation and therefore worthy of further investigation.

Identification of issues

System design requirements book (third order)	Digitalization of nursery (third order)
Contribution of EHR to the safety of patients/quality of care (third order)	Cooperation between different roles (third order)
Ownership of patient' data and patient' file (third order)	Dealing with management information (third order)
Transparency of the EHR (third order)	Involvement of users (third order)
Evaluation of previous group-wide projects (third order)	Multidisciplinary collaboration (third order)
Dealing with the expectations of the EHR (third order)	Training of all users in short term (third order)
Acceptance of EHR at department level (third order)	Insight in functionality of EHR (third order)
Provision of information through LTHN (third order)	Cooperation of one patient' file (third order)
Pressure on users in the preparation phase (third order)	Disappearance of visualization (third order)
Working with new standards and codes (third order)	Standardization vs. professional freedom (third order)
Acceptance of new displays and routines (third order)	Changing target, behaviour and processes (third order)

Process adjustments at different departments (third order)	Tasks transfer from administration to doctors (third order)
Leadership of the EHR (third order)	Acceptance of the rules surrounding head clinician shelf (third order)
Changing management situation (third order)	
Capacity utilization (second order)	

Table 5 Identified issues during the issue identification session

Another issue identification session was held after a week, and the most crucial issue was chosen. The participants choose to perform the identification session based on the issue 'system design requirements books'. System design requirements book is a collection of department-specific information from all departments that are important for the design of the EHR, and which serves as input for the software provider. An important premise of the system design requirements book is that the deviations of generic processes and descriptions of department-specific processes are included in the new software. Therefore, this issue is

perceived as crucially important, because it can further the implementation process.

Step two, Stakeholder identification based on 'system design requirements book': In the second step, internal and external stakeholders related to the chosen issue were identified. In using the method, a total of 35 stakeholders were identified regarding the issue 'system design requirements book'. These stakeholders were classified on roles, which is based on activities within the project. These roles are: client, decision maker, designer, and/or (representative of) passively involved, of the project. Table 6 provide the identified stakeholders based on their roles.

Clients	Designer/Expert
Steering Committee	Steering Committee
EHR program director	EHR program director
EHR coordinators	ICT Company
46 working groups	Management Team
Division Revalidation	EHR program manager
Internal medicine	Project leader system design requirement books
Division Psychology	Staff of system design requirements books
Chef de Cliniques	Review system design requirements books
care program HHO	Advisor project/process design
Chairman Steering Committee	Core Team
Doctors	Expertise Team
Nursing staff	EHR coordinators

Care administration
 Paramedical/medical experiments
 Staff of the EHR program organization
 ICT support

Advisor project dossier formation
 Strategy Group
 46 Working groups

Decision maker

(Representative of) passively involved

Steering Committee
 EHR program director
 Company Siemens
 Management Team
 EHR program manager
 Project leader communication /change management
 Project leader system design requirement books
 Heads of department + Head per department
 Company Siemens

Department staff out of the working groups
 Current and future staff
 Board of directors
 Sector directors
 Main business offices
 Work council

Table 6 Identified stakeholders based on their roles

Step three, Stakeholder analysis: In the third step, the identified stakeholders were analysed and classified according to their salience, reputation, their desired and actual commitment regarding the EHR and in issue-specific context. Also, their estimation of issue-impact and EHR-impact on the stakeholder by the project were identified and analysed.

Furthermore, scatterplots were designed based on the characteristics the stakeholders were analysed and evaluated on. The management was interested in the relationship between: the salience of stakeholders and the desired commitment regarding the issue, the salience of stakeholders and the actual commitment regarding the issue, the salience of stakeholders and the desired commitment regarding the EHR, the salience of stakeholders and the actual commitment regarding the EHR, the desired commitment regarding the issue and the actual commitment

regarding the issue, and the desired commitment regarding the EHR and the actual commitment regarding the EHR. Before designing the scatterplots, the significant correlations between these characteristics were tested. Pearson's correlations were tested, and as shown in table 7, there is strong evidence to infer that the variables are related.

Scatterplots are designed for the following variable combinations:

- 1 salience and desired commitment regarding issue (figure 3)
- 2 salience and actual commitment regarding issue (figure 4)
- 3 salience and desired commitment regarding EHR (figure 5)
- 4 salience and actual commitment regarding EHR (figure 6)

- 5 desired commitment regarding issue and actual commitment regarding issue (figure 7)
- 6 desired commitment regarding EHR and actual commitment regarding EHR (figure 8)

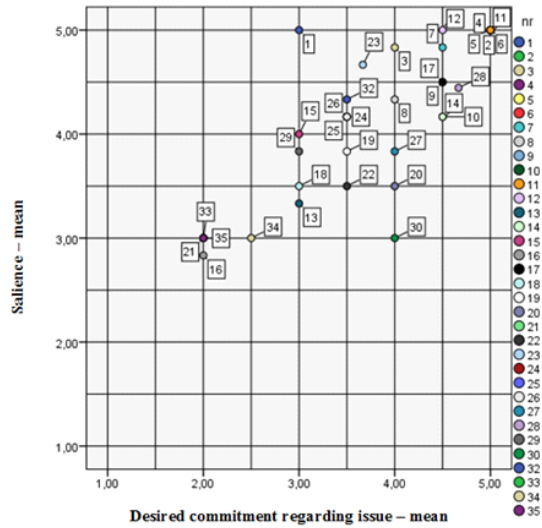


Figure 3 Scatterplot Saliency – desired commitment regarding issue

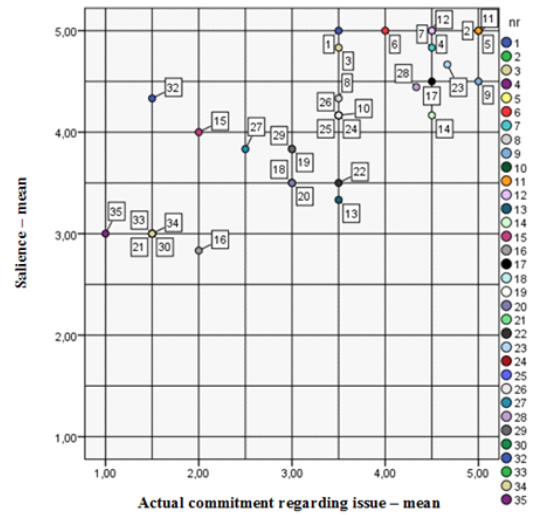


Figure 4 Scatterplot Saliency – actual commitment regarding issue

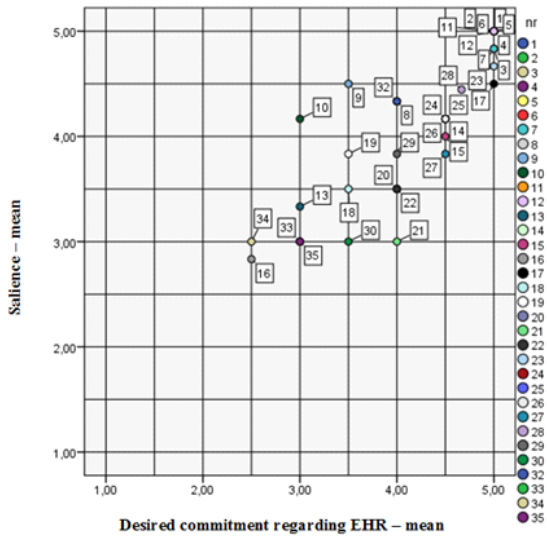


Figure 5 Scatterplot Salience – desired commitment regarding EHR

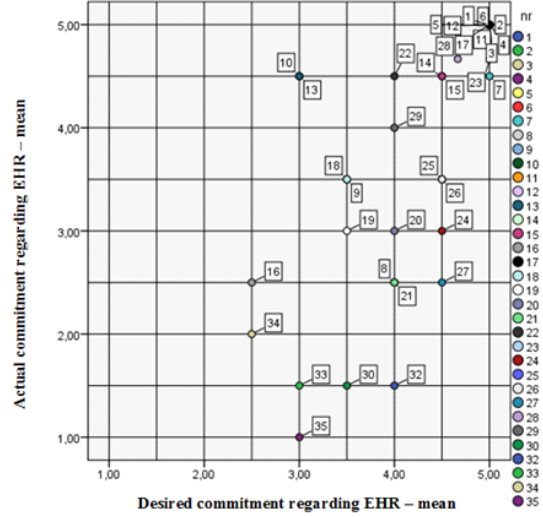


Figure 7 Scatterplot Desired commitment regarding HER – Actual commitment regarding EHR

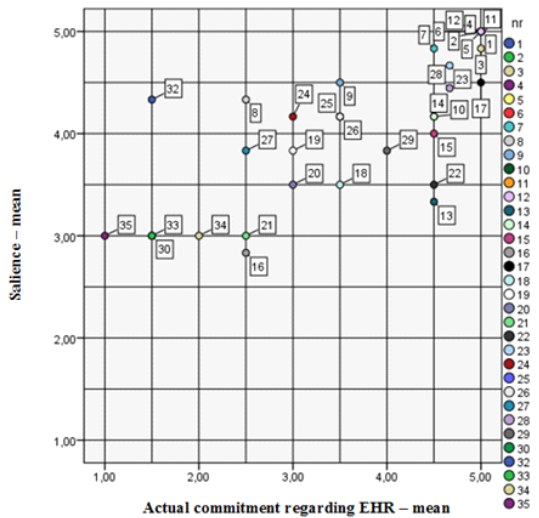


Figure 6 Scatterplot Salience – actual commitment regarding EHR

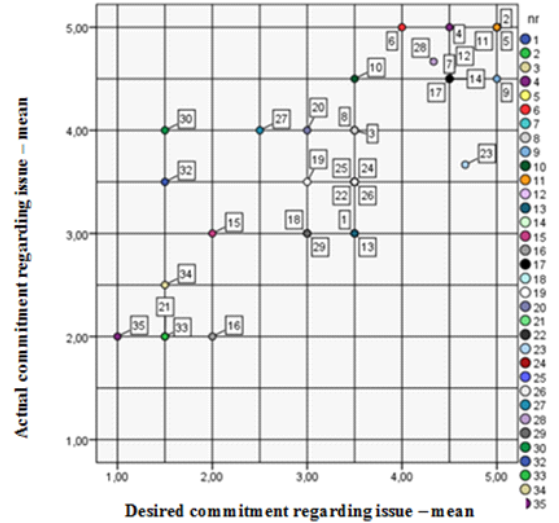


Figure 8 Scatterplot Desired commitment regarding issue – Actual commitment regarding issue

4.2.3 EVALUATED CONCEPT DESIGN

The participants responded quickly on the questions asked for the evaluation. Generally, they perceived the stakeholder identification session as being clear and useful. The content of the session was properly understood. Participant: 'found the session very useful, and it is good to realize that there are many stakeholders involved. Also this way someone realize the size and complexity of the EHR project'. On the other hand, the participants had still some comments on the process of the issue identification session. The issue identification was too extensive. Participant: 'Choosing an issue could also be done in the same session. The second session was not necessary'. Furthermore, they perceived the stakeholder identification session as too long (it took about three hours); being too long in the same discussion about stakeholders. Participant: 'I would shorten the brain-

storm session and together already come up with interventions'.

During the evaluation session with the management, scatterplots were showed and feedback was requested. The management was satisfied with the results and the outcomes (stakeholder landscapes) of the sessions. Management: 'The scatterplots provide an orderly landscape of the identified stakeholders. This way, we can see how the stakeholders are related to each other and how the stakeholders are related to the variables'.

Additionally, the process and content criteria were reviewed with the management based on the results of the evaluation.

Table 8 shows the criteria, and whether the criteria is met.

Criteria (process or content)	Criteria met?
The time needed for using the identification method should be limited and take no longer than three hours successively	No, the issue- and stakeholder identification method of the concept design were still too long
The identification method should be effective, in order to help the management to address the relevant stakeholders	Yes, the results were in conformity with the requirements of the management
The progress of the identification method should be logical, in order to help the management to perform the identification method easily	Yes, the management understood the concept design
The identification method should not include open questions	Yes, the concept design did not include open questions
The identification method should identify the relevant stakeholders	Yes, the stakeholders identified are all relevant stakeholders involved in the EHR project
The identification method should identify the relevant issues that stakeholders perceive during the implementation process	Yes, the identified issues were relevant to the participants and the management

The identification method gives an overview of the identified stakeholders	Yes, the concept design gives an overview of the identified stakeholders
The identification method should give insight to the management in the issues that stakeholders perceive during the implementation process	Yes, the concept design gives insight to the management in the issues that stakeholders perceive during the implementation process
The relevance of the identification method should be clear to the management and the participants	Yes, the relevance of the identification method was clear to the management and the participants
The identification method should provide starting points for developing interventions related to the stakeholders identified	Yes, the concept design does provide starting points for developing interventions related to the stakeholders identified

Table 8 Process criteria of the identification method followed whether the criteria is met

As can be seen from the table, one of the ten criteria was not met, namely the process criteria The time needed for using the identification method should be limited and take no longer than three hours successively. The process criterion is addressed and is improved in the design of the identification method in this paper. The identification method is shortened as the management of the EHR program organization desire.

4.3 RESULTS PHASE 3 (DESIGN SOLUTION)

The enhanced identification method, identifies, analyses, and maps issue-stakeholder combinations. This method helps to illustrate an orderly landscape of the stakeholders in a quick and effective manner. The improved identification method can be performed with participant chosen by the management of the EHR project. These participants has to be selected on their knowledge regarding the EHR, on their different backgrounds, tasks in the project, and functions in the healthcare institution. This way they could provide different views on the issues identified. An average of ten participants is sufficient. These participants should be contacted and informed about the process and the content of the identification method. Additionally, a date should be

scheduled where all participants can be present to hold the identification sessions. Furthermore, presentations should be prepared, which include the content of the issue identification session and the stakeholder identification session. The improved identification method consists of four steps, which are presented and explained below.

4.3.1 STEP ONE, ISSUE IDENTIFICATION

In this step an issue identification session can be performed to identify relevant issues related to the EHR project. To identify EHR related issues, support questions can be used, as shown in table 9 on the next page. This issue identification session should be limited and take no more than one and a half hours. First, the different participants have to identify several issues. After a short break, the most crucial issue has to be chosen, and with the chosen issue the stakeholder identification method can be continued. Again here, a date should be scheduled for the stakeholder identification method, where all participants can be present.

Support questions for issue identification

What is an actual and crucial EHR-issue?
Whereby are many stakeholders involved?
What are the different views?
About what is knowledge from different stakeholders needed?

Table 9 Support questions for issue identification**4.3.2 STEP TWO, STAKEHOLDER IDENTIFICATION BASED ON THE ISSUE CHOSEN**

In the second step, the stakeholder identification session can be held. This session has to be limited and take no longer than one hour. This stakeholder identification session can be held with the same participants as in the issue identification session. In this session, internal and external stakeholders related to the chosen issue can be identified. For the identification of the issue-related stakeholders, the role concepts (see table 10) presented by Achterkamp & Vos (2007) can be taken under consideration. The stakeholders can be identified through brainstorming and discussing together about the relevant stakeholders that can have one of the four stakeholder roles.

Roles of stakeholders

Client
Decision maker
Designer/expert
Passively involved/representative EHR

Table 10 Role concept (Achterkamp & Vos, 2007)**4.3.3 STEP THREE, STAKEHOLDER ANALYSIS**

This third step has to be in direct succession with the second step. In the third step, the identified stakeholders can be analysed and evaluated on several characteristics. This

step has to be limited and take no longer than one hour. These characteristics can be based on the salience level of Mitchell et al. (1997), the commitment of the stakeholders regarding the EHR and regarding the issue in question. The commitment can be divided in the desired and the actual commitment of the stakeholders. Furthermore, the reputation of the stakeholders can be analysed and evaluated. In consultation with the organization and the EHR project management these variables can be chosen. To capture these characteristics, several closed questions can be used (i.e. not including open questions related to the length of the session). Participants can be asked to indicate on a five-point scale ranging from totally disagree to totally agree to what extent they agree with the questions.

4.3.4 STEP FOUR, RESULTS ANALYSIS

In the fourth step, the results of the identification session can be analysed. An overview of the identified stakeholders together with their roles can be presented. Also, a table can be presented which shows the stakeholders with two or more roles (if there are stakeholders that fulfil more than one role). This gives the management of the EHR project an overview which roles each identified stakeholder has. The data gathered during the issue- and stakeholder identification can be analysed in SPSS. The analysis in SPSS can be performed based on the interests of the management. Designing scatterplots, gives an orderly overview of the identified stakeholders in a quick and effective manner. Furthermore, these scatterplots are starting points for developing interventions related to the identified stakeholders. First, the significant correlation between the characteristics has to be tested. This can be achieved by performing the Pearson's correlation test.

4.4 RESULTS PHASE 4 (VALIDATION)

The improved identification method is only theoretically validated. Assuming that the identification method is implemented in the way described in the design solution (phase 3).

Table 11 presents the process and content criteria, and whether these criteria are met, when implemented the identification method in way described.

Criteria (process or content)	Criteria met?
The time needed for using the identification method should be limited and take no longer than three hours successively	Yes, the issue- and stakeholder identification sessions are limited and take no longer than three hours successively
The identification method should be effective, in order to help the management to address the relevant stakeholders	Yes, the results are in conformity with the requirements of the management
The progress of the identification method should be logical, in order to help the management to perform the identification method easily	Yes, the identification method proceeds in a logical order. First the issues are identified followed with the related stakeholders
The identification method should not include open questions	Yes, the identification method does not include open questions
The identification method should identify the relevant stakeholders	Yes, performing the identification method correctly, will ensure identification of relevant stakeholders
The identification method should identify the relevant issues that stakeholders perceive during the implementation process	Yes, performing the identification method correctly, will ensure identification of relevant issues
The identification method gives an overview of the identified stakeholders	Yes, performing the identification method correctly, will result in an overview of the identified stakeholders
The identification method should give insight to the management in the issues that stakeholders perceive during the implementation process	Yes, performing the identification method correctly, will result in insight in the issues that stakeholders perceive during the implementation process
The relevance of the identification method should be clear to the management and the participants	Yes, addressing the identification method correctly, will result in understanding the relevance of the identification method

The identification method should provide starting points for developing interventions related to the stakeholders identified	Yes, the identification method does provide starting points for developing interventions related to the stakeholders identified
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Table 11 Process criteria of the identification method followed whether the criteria is met

4.5 CONTRIBUTIONS TO THE IDENTIFICATION METHOD OF ACHTERKAMP & Vos (2007)

This section presents the results for the improved identification method. Comparing the improved identification method with the initial identification method of Achterkamp & Vos (2007) several adjustments and improvements can be presented. First of all, the process of the identification method is improved. The identification method developed in this paper is limited and take no longer than three hours successively. Also, in the improved identification method open questions are excluded. Furthermore, the progress of the activities are adjusted. The identification method of Achterkamp & Vos (2007) performed the issue – and stakeholder identification and the stakeholder analysis successively in one session. The improved identification method split the issue – and stakeholder identification in two sessions. Additionally, the improved identification method goes beyond the identification and classification of issue-related stakeholders. This identification method, analyses the issue-related stakeholders, and this analysis provides starting points for developing interventions.

5 DISCUSSION

The objective of this paper was to design a method for the identification of issue-stakeholder combinations in an EHR implementation. Previously performed research has indicated that issues and stakeholders are valuable aspects to research when dealing with a change project, such as an EHR project. This research used the identification method developed by Achterkamp & Vos (2007) as a starting point, and improved their identification method. To improve the identification method, and to answer the proposed research question: How can issue-stakeholder combinations be mapped in case of an Electronic Health Record?, the research took into account the process and content criteria concerning the identification method, and incorporated these criteria. Specifically, an issue identification session based on a specific issue, and a stakeholder identification session based on stakeholders were examined and evaluated. From the results, an enhanced identification method is developed.

The purpose of this study was to improve the identification method developed by Achterkamp & Vos (2007). The identification method of Achterkamp & Vos (2007) only identifies stakeholders based on a specific issue, and classifies these stakeholders based on four roles. The enhanced identification method in this research examined how stakeholders could also be analysed and mapped. The regulative cycle has been applied to develop the method, which ensured two rounds of validation. The problem definition phase resulted in quality, process, and content criteria, which the method should meet. In the analysis/diagnosis phase the first validation was maintained. The second validation was maintained in the validation phase, which evaluated the design of the improved identification method. The improved identification method met all the process and content criteria. This method identifies and analyse issue-stakeholder combinations. It gives insight in the issue-related stakeholders, and how these stakeholders relate to each other and to several characteristics. It also gives starting points for developing interventions. By repeating the identification session, the session can be deployed as a process of learning.

5.1 THEORETICAL IMPLICATIONS

Research on EHR implementation and the issue-stakeholder combinations that emerge during the implementation can be a valuable step toward increasing chances of implementation success. The issue-stakeholder identification and analysis is an appropriate approach when dealing with stakeholders in a complex EHR project. Bringing issues and stakeholders together has added to the awareness on factors underlying the potential success of the implementation of complex EHR projects. This research supports and improves earlier research findings, which state that the identification method of Achterkamp & Vos (2007) is a worthwhile tool for stakeholder identification. The method brings stakeholders and issues together by identifying stakeholders based on a specific issue. This research expands the tool for stakeholder identification, and provides more insight in the relation between issues and stakeholders within an EHR project. Moreover, it provides starting points for developing interventions, which can be used to address factors underlying the potential success of the EHR implementation process. Design-oriented interventions can be used in an early phase of the implementation process. The implementers are able to address the factors underlying the potential success of the EHR implementation, and result therefore in a successful implementation of an EHR.

5.2 PRACTICAL IMPLICATIONS

This research has produced significant insights that will benefit healthcare institutions. This paper shows individual healthcare institutions that using an identification tool that identified issue-stakeholder combinations helps the management and implementers to understand which issues are perceived by the stakeholders, and why these issue-related stakeholders are important aspects for implementers to address in complex EHR projects. It also shows that the issue-stakeholder combinations are complex, as a specific issue has different stakeholders, and these stakeholders perceive different issues. A main contribution of this paper for the management of EHR is that it suggests an approach

for stakeholder identification and classification that acknowledges the roles that stakeholders have as well as the degree of several characteristics of stakeholders regarding a single issue. With this identification method, not only powerful stakeholders who affect the project are identified, but also the vulnerable stakeholders. Stakeholders are considered as a primary source of uncertainty in the implementation phase of a project. This source of uncertainty can be addressed using an identification method to identify and analyse issue-related stakeholders. By doing this from the implementation stage on, implementers have more time to deal with issues perceived by stakeholder, which results in less risk for the creation of conflicts, delays, or even failure of the EHR implementation. Furthermore, by repeating the identification session, the session can be deployed as a process of learning. The identification session can be used as a learning tool to help managers and implementers how to deal with issue-related stakeholders.

5.3 RESEARCH LIMITATIONS AND FURTHER RESEARCH

Although this study yields some interesting results, a number of limitations should be mentioned about this research. Generally, this research was limited to the regulative cycle of Van Strien (1997). This paper was restricted to the phases of the cycle. The limitations for phase one are related to the sample of the management. Due to the small number of participants interviewed to give an overview of the points of interest, problems and requirements, it is plausible that this is a limited view of the actual points of interests, problems and requirements. Furthermore, phase two and three had also some limitations. First of all, the scope of this research. Due to the very busy period at LTHN, the researcher was not able to conduct more than one identification session. This caused in limited data, because the data was based on one identification session. This results in not being able to implement the improved identification method, followed by not being able to validate the improved identification method. Second, the sample of this research. Due to the small number of participants in the issue- and stakeholder identification sessions, it is plausible that this is a limited view of the actual stakeholder identification based on a single issue. Third, the data collected during the identification session were analysed solely by one researcher,

which means that the interpretations of the data come from a single person. Moreover, the data were collected only at the pre-implementation phase, however, the improved identification method is intended to use in the implementation phase. Additionally, it is interesting to identify stakeholders based on other issues than the one used in this research. The type of issue which is interesting for stakeholder identification depends on the phase the project is in. When dealing with the early phases of the implementation process, stakeholders may be identified based on issues that concern the implementation process, like involvement. Another limitation is that the data was gathered in only one healthcare institution in the Netherlands during one change project. Organizations in a healthcare related environment operate autonomously and it is therefore possible that the sample was not heterogeneous. This might limit the generalizability of this research. As the improved identification method was not implemented and validated in this research, further research could be done on implementing the identification method, which in turn will result in validation of the identification method. Furthermore, research could be done on expanding the improved identification method, by adding design-oriented interventions to the identification method. Additionally, research could be done on the data completeness, and reliability. This could be achieved by expanding the number of identification methods performed in a research. Another suggestion for further research is, focusing on more healthcare institutions which are dealing with an EHR implementation. This results in data that can be compared to each other, that can improve the identification method. Another investigation can be done during different stages of an EHR project, since various stakeholders may react in different ways in different stages of the implementation process. Therefore, other issues may arise in different stages of the implementation process. Having an early awareness of issues and pursuing issues management reduces the changes of implementation failure.

5.4 CONCLUSIONS

To conclude, based on the findings in this research from the issue identification session, and a stakeholder identification session, it can be concluded that issue-stakeholder combinations are complex when dealing with the implementation phase of an EHR. This paper tried to reduce this complexity to propose that a stakeholder identification tool identifies the stakeholders and clarifies the issues they perceive. A stakeholder identification method based on a specific issue is a proper method when dealing with many stakeholders in a complex EHR project. It enables implementers to have a better understanding of stakeholders and the issues these stakeholders perceive. Furthermore, the identification method offers a more complete view of the issue-related stakeholders, and how these issue-related stakeholders are related to each other. Moreover, the improved identification method provides starting points for developing design-oriented interventions, that addresses factors underlying the potential success of the implementation process. All this has consequences for the implementation process of an EHR in a healthcare institution. Considering issues and stakeholders may help to focus on fundamental problems. Developing interventions may help to address these fundamental problems. Issue-stakeholder combinations should therefore be carefully taken into account when dealing with an EHR implementation.

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