



FAKULTÄT FÜR INFORMATIK
DER TECHNISCHEN UNIVERSITÄT MÜNCHEN

Master's Thesis in Wirtschaftsinformatik

**Designing a Stakeholder-Specific Enterprise
Architecture Management based on Patterns**

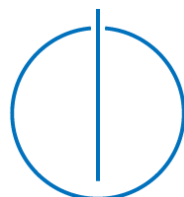
**Entwicklung eines Stakeholder-spezifischen
Enterprise-Architecture Managements
basierend auf Patterns**

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Abstract

Today's enterprises are faced with an increasing rate of change in the economic environment. Underlying factors are the increased customization of products and services coupled with globalization and a more competitive market situation. Enterprises have to continuously adapt to these environmental changes by aligning their business, processes, applications, and technologies to the new requirements. One commonly accepted means to guide such adaptations is enterprise architecture (EA) management, which is a holistic and model-based approach to enterprise engineering aiming at aligning business and IT.

Major tasks of the EA management function are the documentation of the current state of the EA, the design of desired future states, and the development of transformation plans guiding the evolution of the enterprise from the current to the desired future states. In order to guide the managed evolution of the EA, the EA management function has to interact with other enterprise-level management processes and units within the organization and perhaps outside the organization. Thereby, it has to ensure that planned changes to the EA originating from other processes conform to the planned evolution of the EA. The EA management function therefore has to deal with various actors with diverse and possibly conflicting goals and backgrounds. Stakeholder theory describes stakeholder management processes that provide a systematic approach to this challenge. The aforementioned collaboration challenge between the various stakeholders of the EA can be mastered by an EA management function, which addresses the concerns of the different stakeholders during architecture development. The Enterprise Architecture Management Pattern Catalog (EAMPC) provides a collection of EA methods to address typical concerns. Thereby, it supports the EA management function in dealing with a multitude of stakeholders and their concerns. Nevertheless, the concept of stakeholders is missing in the EAMPC.

The objective of this thesis is to close the aforementioned gap. Therefore, a stakeholder management approach is developed based on an analysis of the state-of-the-art of stakeholder management in literature and a series of expert interviews. The literature analysis provides stakeholder management concepts, as well as stakeholder roles and their concerns. Furthermore, stakeholder roles and their concerns are derived from the expert interviews. Then, an exemplary role set is built from the expert interviews and complemented with the role information discovered in the literature analysis. These stakeholder roles are then related to the concerns of the EAMPC. The stakeholder management concepts discovered in the literature analysis and the stakeholder roles are included in the stakeholder management approach. The resulting approach allows an EA management function to manage its relations with stakeholders using the patterns contained in the EAMPC.

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1 Introduction

In this chapter the general motivation of this thesis is described and the objective of this thesis is established. Then, three research questions are posed, which need to be answered in order to reach this objective. Finally, the outline of this thesis is described.

1.1 Motivation and Objective

Today's enterprises are subject to an ever increasing number of changes driven by increased competition, a growing complexity in business transactions, new regulations, and the promises offered by new technologies [Fi07]. In order to cope with changes, enterprises have to continuously adapt the way they do business and how the business is supported and enabled by information technology (IT). An accepted method for addressing this challenge by aligning business and IT through a holistic perspective is enterprise architecture (EA) management. In order to facilitate the design of an organization-specific EA management, the sebis chair of the TU München developed a pattern-based approach, the EA management pattern catalog (EAMPC). When designing an EA management using the EAMPC, a set of concerns guides the selection of patterns. However, there is currently no connection between these concerns and the people involved in EA management, the so called EA stakeholders.

The importance of EA stakeholders is widely accepted by authors in the EA management field (cf. [Ai08b, Ra08, St04]). However, the current research into stakeholder management in the EA management field is limited [Ra08], presenting an opportunity for further research. The reasons for stakeholder management in the EA management field are

- the proper integration of the EA management function into the organizational and governance environment [Ra08],
- the gaining of support from relevant EA stakeholders [Ga09], and
- the defense of the objectives of the EA management function against potentially threatening EA stakeholders [Sc08a].

The integration aspect is important because it ensures that formal and informal processes for communication and collaboration between the EA management function and EA stakeholders exist. This in turn avoids the ivory tower syndrome, i.e. the EA management function delivering methods and tools that are too complex to be used by EA stakeholders. Furthermore, by addressing the concerns of EA stakeholders, the EA management function can help them achieve their goals, which in turn increases their support for the EA management function. [Ra08, Ga09] Finally, EA stakeholders might be negatively affected by the EA management function pursuing its objectives or object to EA management for other reasons. Again, by actively providing value to these EA stakeholders by addressing their concerns, the EA management function can minimize the threat from these EA stakeholders and turn them into supporters [Sc08a].

Therefore, the objective of this thesis is to combine a proven EA management design method, the EAMPC, with state-of-the-art stakeholder management into an approach for stakeholder-

specific design of an EA management based on patterns. Thereby, the above advantages of stakeholder management in the EA management context will be addressed by the approach.

1.2 Outline of the Thesis

In order to design the approach for stakeholder-specific EA management, three questions will have to be answered during the thesis:

1. What is the current state-of-the-art in stakeholder management in the EA management field?
2. What is a suitable definition and model for EA stakeholders?
3. Which EA stakeholders are related to which EAMPC concerns?

In order to answer these three questions, the thesis is structured into four basic and interrelated chapters. The general outline of the thesis and the relationships of its chapters are displayed in Figure 1.

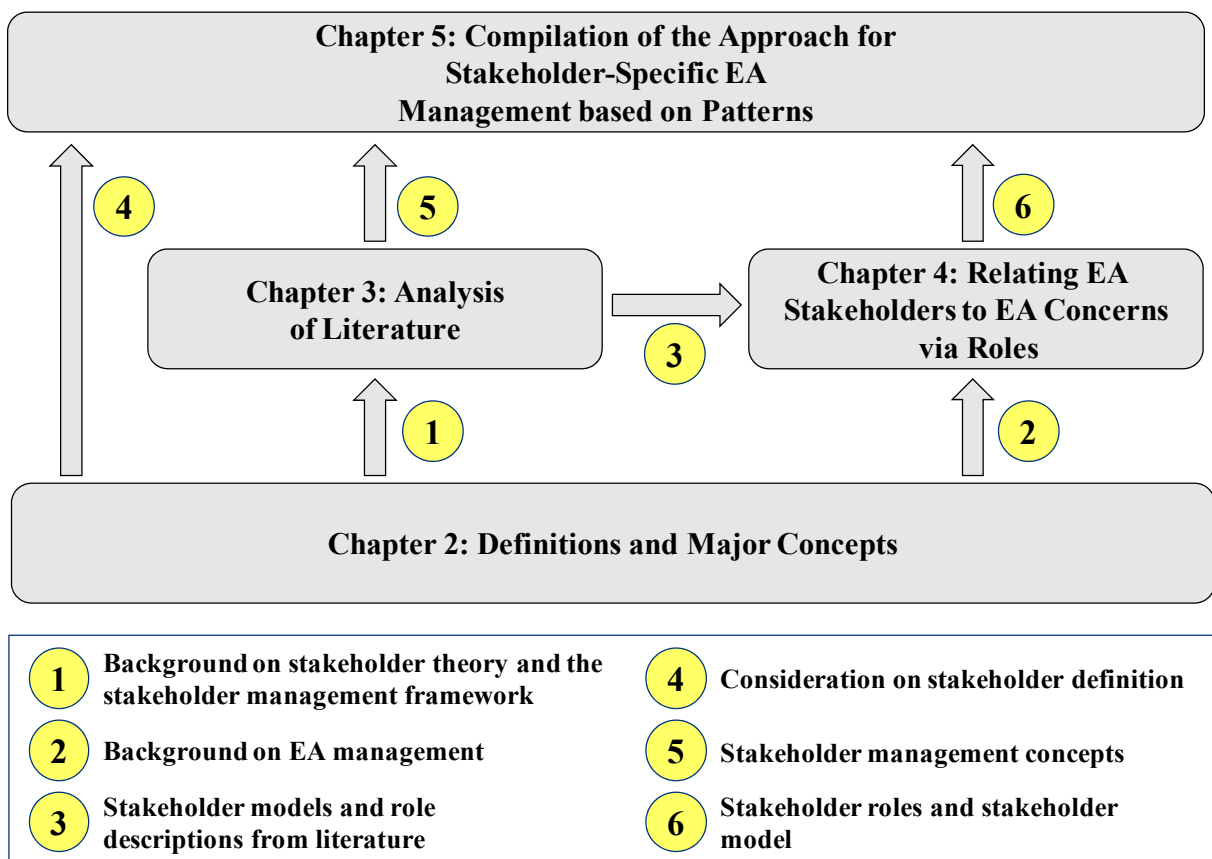


Figure 1: Outline of the thesis and relations of its chapters

In Chapter 2, the theoretical background on stakeholder theory and EA management is described and analyzed. Thereby, the adoption of stakeholder theory, a theory with focus on an organization's external stakeholders, to the more internally focused field of EA management is discussed. Furthermore, a stakeholder management framework is described in this chapter.

This framework is used in Chapter 3 to analyze the current state-of-the-art in stakeholder management in the field of EA management and related fields. The outcomes of this chapter are the current stakeholder management concepts and descriptions of stakeholder roles, as well as their concerns. The latter are used in Chapter 4 for relating stakeholders to EA concerns via roles. In this chapter, the conduction and evaluation of expert interviews is described. The stakeholders described in the interviews serve as the basis for the development of a stakeholder model. Furthermore, stakeholder roles are developed from the described stakeholders. These stakeholder roles and the concerns mentioned in the interviews are combined with the descriptions of concerns discovered during the analysis of literature. Then, the stakeholder roles are related to EAMPC concerns in order to provide a reusable connection between stakeholders and the EAMPC. Finally, the results of the individual chapters, namely the working definition established in Chapter 2, the stakeholder management concepts discovered in Chapter 3, and the stakeholder model and the stakeholder roles built in Chapter 4 are used in the design of the approach for stakeholder-specific EA management in Chapter 5. This approach is then discussed in Chapter 6. Finally, the summary of this thesis and an outlook on further research are provided in Chapter 7.

2 Definitions and Major Concepts

This chapter serves as an introduction to the relevant aspects of theories on stakeholders, EA management, and organization. Thereby it provides the foundation of the thesis. First the stakeholder theory is described, including core concepts and its evolution. The chapter on stakeholder management provides a framework to analyze approaches found in literature. Then, the relevant definitions in the area of EA management are established and explained. Furthermore, the activities of the EA management function and its relations with other enterprise functions are described. Since this thesis is based on the EAMPC an introduction to this best-practice approach is provided. Finally, the concepts of the stakeholder theory are adapted for usage in the context of EA management.

2.1 Stakeholder Theory

Stakeholder theory became famous as a strategic management concept and was developed further in the area of business ethics. Nowadays, concepts originating from stakeholder theory can be found in more operational fields like project management. The following chapters provide an introduction to the theory and its evolution, as well as to the term stakeholder. Then, stakeholder management is discussed with respect to the basic types of approaches. Finally, a framework to analyze stakeholder management approaches with respect to their content is presented.

2.1.1 Fundamental Proposition and Origins

Throughout its evolution, stakeholder theory has been attacked for its vagueness and ambiguity, because the concepts surrounding the theory “are referred to in confusing ways” [Fa09]. Even today, the term stakeholder is still often used without reference to fundamental work in the field as if the term alone would imply all that needs to be known about the subject [La08, AcVo08]. Therefore, this chapter provides the foundations on which the stakeholder theory is built and the early influences.

The fundamental proposition around which the stakeholder theory revolves is that a company should be in business for more than just the sole benefits of its financiers, the shareholders. It thereby rejects the primacy of the shareholder value concept and enters into the shareholder vs. stakeholder debate [Ag08]. Stakeholder theory proclaims that companies have to accept that they have obligations towards other parties as well [Jo02]. These obligations are, in theory, not coupled with the ability of the parties to further the economic interest of the company. Everybody who “can affect or is affected by” [Fr84] a company “merits consideration for its own sake” [DoPr95]. Apart from this perspective, which might be based on ethics or strategic thinking, the effects that adoption of the stakeholder theory has on a company, e.g. with respect to financial performance, are also researched [Ag08]. In an argument geared towards convincing the proponents of shareholder theory, some stakeholder theorists claim that a company is only able to fulfill the shareholder goal of benefiting those who finance an organization by managing the interests of all stakeholders. They argue that a company can only yield profits to shareholders in a sustainable way, as long as it serves all stakeholders. This is the case, because if a stakeholder is not adequately considered, he or she will turn against the

company and thereby harm profits. Examples of the latter behavior are union strikes and consumer boycotts [Fr07, Je01].

Jones, Wicks et al. trace the roots of stakeholder theory back to ancient Greece, where business was “expected to be of service for the larger community” [Jo02]. An early example of inclusion of non-shareholders in modern scientific literature is given by Dodd [Do32] in 1932. He recognizes two other groups apart from shareholders: *Employees* and *customers and the general public* as parties that are to benefit from a corporation lead by “a better type of businessman” [Do32]. In 1958, Dill [Di58] analyzed the relations of an organization with external factors by describing the environmental influences that limit the management’s autonomy. He was credited by Donaldson and Preston [DoPr95] with providing a foundation for modern stakeholder analysis with this inclusion of non-shareholding outsiders. Modern stakeholder theory was decisively influenced by Freeman in 1984 [Fr84, Jo95]. His definition of a stakeholder as “any group or individual who can affect or is affected by the achievements of the organization's objectives” [Fr84] is perhaps the most cited one and serves as a starting point for the majority of publications in the field [AcVo08].

2.1.2 Definition of the Term Stakeholder

According to the Merriam Webster Dictionary¹, the term ‘stake’ originally referred to a pole that was put in the ground and used as marker. To stake something is the activity of marking limits by the use of stakes. Finally, to claim a stake means to assert a right to something as if by placing stakes. From this literal perspective, the stakeholder of an enterprise can describe a person who asserts a certain right over some (staked) part of the enterprise. In line with this thought, Mitchell et al. [Mi97] define the *stake* as an “area of argument”.

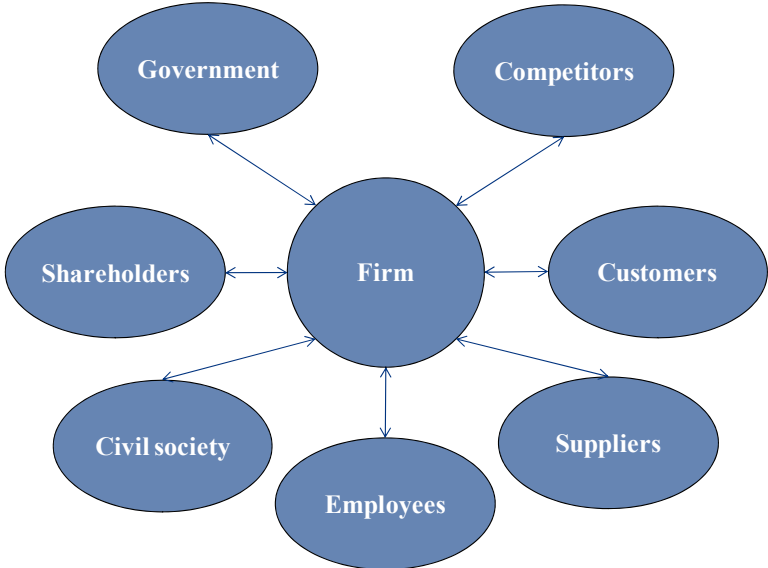


Figure 2: Visual representation of Freeman's stakeholder definition [Fr84]

¹ See <http://www.merriam-webster.com>.

However, according to Freeman the stakeholder is not defined by his interest in a fixed part of the enterprise, but the relationship in which the enterprise interacts with the stakeholder in order to achieve its objectives. His definition of a stakeholder as “any group or individual who can affect or is affected by the achievements of the organization's objectives” [Fr84] is visualized in Figure 2. The figure shows examples of stakeholder categories. Freeman’s definition is certainly one of the broadest in the field [Mi97]. The set of groups or individuals, who affect (support or hamper) the organization in the pursuit of its objectives or are affected (positively or negatively) by the organization can be stretched to include almost everybody [La08]. The only excluded parties are those that can not affect, because they are lacking the power, or are not affected, because they have no claim with respect to the organization [Mi97].

The relationship between the firm and its stakeholders can be directional and bi-directional. This is the case, because a stakeholder can affect the firm or can be affected by the firm, as well as affect the firm and be affected by it at the same time [Mi97]. As opposed to such broad definitions, some publications constrict the term stakeholder to a narrow range based on e.g. participation in “wealth-creating capacity and activities” [Po02] or their capacity to “influence the firm” [FrMu05]. In general, narrow definitions try to limit the resources, time, and attention required by managers for dealing with stakeholders. While broad definitions take into consideration, that companies can affect and be affected by almost anybody [Mi97].

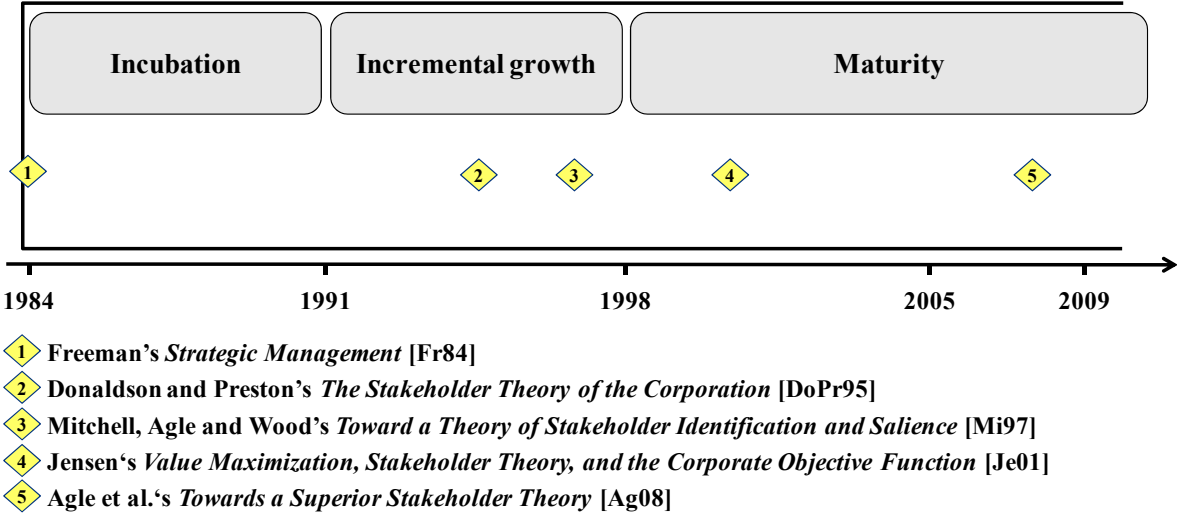
Overall, it can be said that the definition of the term stakeholder is heavily influenced by the world view and the objective of the respective author. Freeman’s emphasis in his original publication was on strategic management, so he concludes that an effective strategist has to deal with the groups that can affect him or her. Although in order to be responsive and effective in the long run, he adds, one has to deal with the groups that are affected [Fr84]. In contrast to this strategic approach, Kaler [Ka02] is looking for moral imperatives towards claimants (beneficiaries or people being harmed) and is adjusting his view accordingly, by restricting it to the second part of Freeman’s definition. He is therefore only interested in the people *affected by* an organization.

In an operational setting, one can start with a Freeman-style definition and then detail the categories of affect and can be affected by [AcVo08]. As a working definition a *stakeholder* is defined as any individual or group that can support or hinder an organization in reaching its objectives as well as any person or group who is positively or negatively affected by an organization. This working definition is detailed further in Section 2.2.1 in the context of EA management.

2.1.3 Recent Evolution of the Field

In 2008, Laplume et al. [La08] researched the effect of Freeman’s publication on the evolution of stakeholder theory. They describe its path as starting in the field of strategic management and then expanding into organization theory and business ethics and from there to special subjects like social issues in management and the sustainable development debate. Furthermore, they distinguish three development periods of stakeholder theory. The first period ranging from Freeman’s book in 1984 to 1991 is called *incubation*. In this period, the theory is confined to book chapters, conference proceedings and dissertations. The second period, ranging from 1991 to 1998, is called *incremental growth* and is marked by the first

publications in leading management journals. The third period, which continues until today, is called *maturity* and is characterized by widespread adoption of the theory and its concepts [La08]. The publications displayed in Figure 3 are noteworthy both in their contribution to stakeholder theory as in their value for this thesis. The publications are categorized according to the above periods.



In the period of incremental growth, Donaldson and Preston [DoPr95] categorized stakeholder theory by differentiating three categories that they called normative, descriptive and instrumental. These categories are described in Table 1.

Category	Description
Normative	The stakeholder theory is used to introduce moral or philosophic guidelines into a company’s operation and management.
Descriptive	The stakeholder theory is used to describe how companies behave or attempts to explain why companies behave in a certain way.
Instrumental	The stakeholder theory is used to explore the effects of the theory on company objectives (e.g. revenue growth, customer retention). Instrumental findings may rely on descriptive data.

Table 1: Categories of stakeholder theory according to Donaldson and Preston [DoPr95]

Their aim with regard to stakeholder theory was to “clarify and justify its essential content and significance” [DoPr95] in order to streamline the discussion of the theory. The major statement in the article was that while the categories are interrelated and supporting each other, the normative category serves as the common base. This statement emphasizes the importance of the normative aspects of the stakeholder theory to large part of the research

community (cf. [Jo95, Po02, Ag08]). In this thesis the categories normative and instrumental will be considered to analyze different approaches to stakeholder management in Section 2.1.4.1.

In 1997, Mitchell et al. [Mi97] devised a measure of the importance of a stakeholder, called *stakeholder salience*. It is defined by the following attributes:

- “1. The stakeholder's power to influence the firm
2. The legitimacy of the stakeholder's relationship with the firm
3. The urgency of the stakeholder's claim on the firm” [Mi97]

The stakeholder salience is intended to support managers in the selection of those stakeholders that are to be included in their decision making process. The salience of a stakeholder depends in their view on the accumulation of the above attributes, namely power, legitimacy, and urgency, while the most important stakeholders possess all three. It is acknowledged, that the possession of these attributes is observed subjectively by the management and that possession is dynamic, i.e. may change over time. In order to include all stakeholders before ranking them, Freeman's definition is proposed as a starting point. Based on the attributes, Mitchell et al. [Mi97] distinguish three categories and eight classes of stakeholders:

- **Latent stakeholders:** Three classes of stakeholder who possess one attribute (either power or legitimacy or urgency) and have low salience in the eyes of managers
- **Expectant stakeholder:** Three classes of stakeholders who possess two attributes and are perceived to have moderate salience
- **Highly salient stakeholders:** One class of stakeholders possessing all attributes

Stakeholders who do not possess any salience attribute are not considered by their approach. The three categories are visualized in Figure 4.

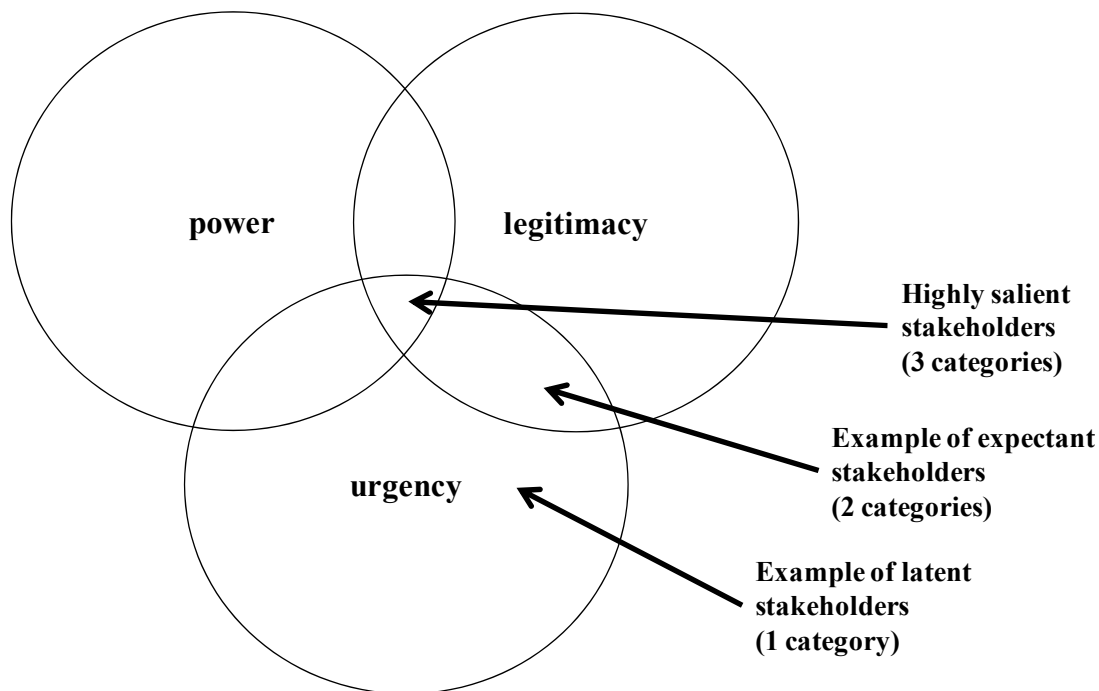


Figure 4: Stakeholder salience according to Mitchell et al. [Mi97]

In their work, all eight classes are given mnemonic names and examples are provided for each, e.g. a stakeholder that possesses only urgency is called a *demanding stakeholder* and the corresponding example is a protester without public support. An interesting trait of this stakeholder model is its dynamic nature. A stakeholder can increase his or her salience by collecting salience attributes, e.g. forming coalitions or gaining legitimacy by lobbying. The relevance of the salience concept for this thesis lies in its operational nature. While many theorists in the stakeholder field are interested in the normative value of an approach Mitchell et al. do not hesitate to include instrumental influences like power and urgency. The idea of using attributes to measure stakeholder importance is picked up in the expert interviews by establishing which attributes the interviewees use when they assess stakeholder importance.

During the development of stakeholder theory a number of important challenges have been proposed by critics of the concept. Apart from general criticism revering to the lack of guidance and the ambiguity of the theory itself [Fa09] some critics provided more detailed reasons for their rejection of the theory. Jensen [Je01] is a prominent example of defending the traditional stockholder concept against the stakeholder theory, which he perceives to be inadequate for corporate decision making. Instead, he relies on the single measurement of value maximization. He argues that in traditional economics the decision on *what to do* can be broken down to the question of whether an additional dollar of investment yields more than a dollar in the long term. His challenge to stakeholder theory is that the tradeoffs between stakeholders cannot be measured in the same way. On the one hand, the occurrence of conflicting stakeholder goals and their reconciliation is on a theoretical level accounted for, if not central to stakeholder theory. On the other hand, Jensen is right in pointing out that an objective function that replaces the concept of shareholder value is missing in stakeholder theory. He continues his argument, that with a clear cut goal missing, company funds can be diverted by executives on a subjective or even fraudulent basis. For example, executives could divert money to causes

of their choice under the pretence of stakeholder service [Je01]. He concludes his by argument, by stating that any trade-off between stakeholder interests might be decided on under the influence of subjective bias questioning the relevance of the overall theory. A possible solution to this choice problem might be a more monetary view of stakeholder interaction. Figge and Schaltegger [FiSc00] provide such a measure by defining *stakeholder value* as the sum of the value of the stakeholders to a company and the value a company to its stakeholder. The underlying idea is one of free selection of the two groups, firm and stakeholder, which holds to a degree for the stakeholder group of employees in a free market society. On the downside, the approach is based on readily available data like taxes and salaries, which offer little assistance in the resolving non-monetary relationships e.g. with activist groups or local communities. However, Jensen later reconciled with stakeholder theorists on the target value measurement of long term total firm value. He is siding with earlier concepts of the strategic dimension of the stakeholder approach by stating that “long run value maximization cannot be realized by ignoring or mistreating any corporate stakeholder, be it customer, employee, suppliers, or community” [Ag08]. Nevertheless, with the immediate reconciliation of conflicting stakeholder interests open to subjective influences, the “organization’s objective” [Fr84] seems to be the only guidance for stakeholder management.

In their *current and future state* article on stakeholder theory, Agle et al. [Ag08] identify three streams along which stakeholder theory is currently progressing:

- “1. Works concerning the basic debate (stakeholder vs. stockholder)
2. Works that focus on the instrumental development of stakeholder approaches
3. Works that generate new questions in stakeholder theory research” [Ag08]

This thesis is strongly positioned in the second line of work since it is aimed at designing an instrumental stakeholder management approach in the field of EA management. However, the focus of this thesis is more operative and narrow in nature than the overall stakeholder theory. This aspect is further discussed in Section 2.3.

2.1.4 Stakeholder Management

On the subject of stakeholder management, Freeman noted that the stakeholder concept is “deceptively simple” because it is easy to identify stakeholders but “the task of managing relationships with them is enormous” [Fr84]. This chapter aims to structure the management of stakeholders into two dimensions. First, it is explored *which* approaches to stakeholder management companies can choose. Then, it is explored *what* companies can do to manage stakeholders. For the latter, a framework is provided that allows for the assessment and comparison of different stakeholder management approaches found in literature.

2.1.4.1 Approaches to Stakeholder Management

In the literature two basic approaches to stakeholder management are mentioned. In the first approach an organization is using stakeholder management in order to reach its strategic objectives. This is referred to as instrumental stakeholder management and includes a ranking of the stakeholders by how they affect the organization in reaching its objectives. In the second

approach a company is embracing ethics as part of its business strategy. Thereby, not only those stakeholders that affect the organization in reaching its objectives are considered, but more importantly those that are affected by the organization. This is referred to as the normative approach. Furthermore, a company can decide not to conduct stakeholder management.

Stakeholder management approach / Characteristics	Considered groups	Definition	Ranking
None	Only shareholders	Provides financial resources	By resource provision
Instrumental	Shareholders and others who can affect	Can affect or is affected (with stress on the former)	By effect on the reaching of strategic objectives
Normative	All stakeholders with a moral claim	Can affect or is affected (with stress on the latter)	None, all stakeholders are equally important

Figure 5: Approaches to stakeholder management

Therefore, the managers of an organization have three basic options when it comes to managing stakeholders. They can opt not to consider stakeholders apart from shareholders. They can opt to consider stakeholders with respect to their strategic value or they can equally consider all stakeholders that hold a moral claim. These three options are displayed in Figure 5.

Berman et al. [Be99] researched the financial effects of the adoption of normative and instrumental stakeholder management approaches. Their results indicate that only the instrumental approach has a positive impact on corporate financial performance, while the normative approach shows no effect. Nonetheless, they refer to Jone’s argument [Jo95] who claimed that in the long run, a company is not able to just pretend stakeholder orientation by instrumentally promoting mutual trust, without a moral approach. His argument continues that, if stakeholder orientation is sacrificed at one point for other strategic goals, the firm will lose the trust of stakeholders and therefore stakeholder management will lose its strategic value to the firm. Therefore, in his view, it is not possible to manage stakeholders merely instrumental because no long term trusted relationship with stakeholders can be established. Furthermore, proponents of normative stakeholder theory argue that while normative stakeholder management does not necessarily make firms perform better, it makes the firms *better* in a moral sense without negatively impacting financial results [Ag08]. On a larger empirical basis, however, the results concerning the relationship of stakeholder management and financial performance

are inconclusive [Ce07]. Therefore the decision of an organization on whether or not to use stakeholder management and if so, which approach is chosen has to be decided by a company's management. In case of an instrumental stakeholder management approach the management aims at using stakeholder management in order to achieve its strategic objectives. In case of a normative stakeholder management approach the management aims at using stakeholder management to achieve its strategic objectives and to pursue these objectives in an *ethical* way.

2.1.4.2 Analysis Framework for Stakeholder Management Approaches

Concerning the question of *what* can be done in order to manage stakeholders, Schuppisser [Sc02] and Freeman [Fr07] identified three levels of the stakeholder management. Furthermore, Schuppisser [Sc02] named focus areas for each of these levels. The combined framework consisting of layers and focus areas is displayed in Figure 6.

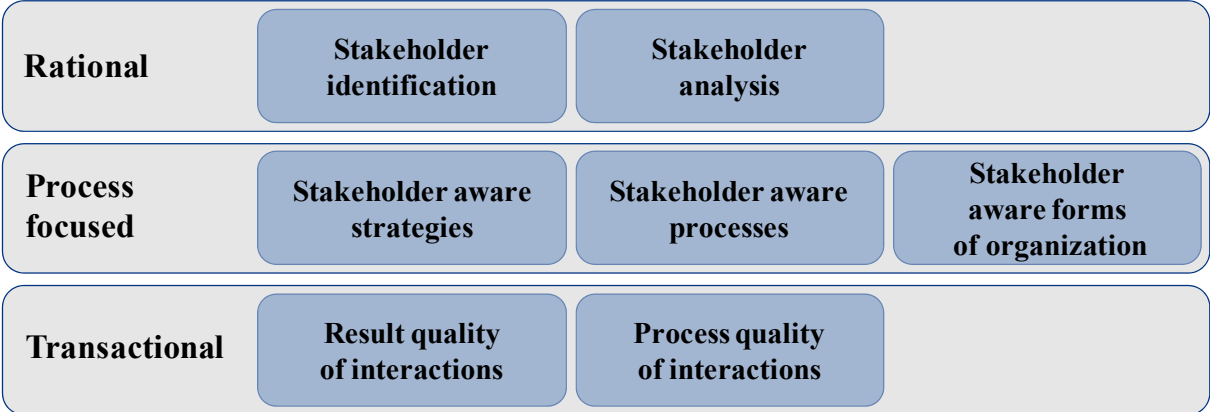


Figure 6: Analysis framework for stakeholder management approaches [Sc02]

This framework will be used throughout chapter 3 in order to analyze publications in the area of stakeholder management. It serves as an overview of the scope of a given contribution by highlighting the covered focus areas. However, this can only roughly categorize the content of a contribution. Therefore, it does not attempt to measure the level of detail of the discussion of topics that belong to a given focus area. The remainder of this section describes the different levels and focus areas. Examples for the contents of the focus areas are given where applicable.

The *rational level* is concerned with identifying stakeholders and their stakes. It contains the two focus areas *stakeholder identification* and *stakeholder analysis*. In the area of identification, the stakeholder definition that is chosen by an approach plays a major role. Furthermore, methods for identifying stakeholders fall into this category. The analysis of stakeholders deals with the generation of information about the identified stakeholders. This information includes e.g. the possibilities of the stakeholder to affect the company, how the stakeholder is affected by the company and the strategies developed to deal with the stakeholder. Another important set of methods in this area are rankings of stakeholders e.g. by influence, power, urgency.

The *process focus level* is concerned with including stakeholders into the organizations operation. The focus area *stakeholder aware strategies* deals with the inclusion of stakeholders into strategic planning and the formulation of strategies that refer to stakeholders. *Stakeholder aware processes* is the area under which the design and operation of processes which include stakeholders is discussed. If stakeholders are considered in the design of organizational structures these approaches are categorized under *stakeholder aware forms of organization*. Governance approaches might result in both new organizational units and processes. They are therefore assigned to the focus areas *stakeholder aware processes* and *stakeholder aware forms of organization* depending on their content.

The *transactional level* is concerned with the daily interactions between the firm’s representatives and its stakeholders. It contains two focus areas. One is concerned with the *result quality of interactions*, the other is concerned with the *process quality of interactions*. As an example for the former Schuppisser uses a scale developed by Clarkson [Cl95] to rate an organizations responsiveness towards stakeholder issues. This so called reactive-defensive-accommodative-proactive (RDAP) scale can be used to create a portfolio showing an organization’s relationships with its stakeholders scored by RDAP rated issues. The RDAP scale is displayed in Table 2. Therefore this focus area is concerned with measuring the response of an organization to stakeholder concerns.

Rating	Posture or strategy	Performance
Reactive	Deny responsibility	Doing less than required
Defensive	Admit responsibility but fight it	Doing the least that is required
Accommodative	Accept responsibility	Doing all that is required
Proactive	Anticipate responsibility	Doing more than is required

Table 2: RDAP scale by Clarkson [Cl95]

The measurement of the *process quality of interactions* is concerned with how the relationships between the company and stakeholders are created. On this level, the development of trust and the establishment of the communication between the organization and its stakeholders are discussed [Sc02].

2.2 EA Management

“Every system has an architecture” [Re00] regardless of whether this architecture is explicitly described or not. In case of organizations (e.g. companies, government agencies, etc.), this architecture is referred to as EA [Ai08a], which is defined as “the fundamental organization of a system [the organization] embodied in its components their relationships to each other, and to the environment, and the principles guiding its design and evolution” [IS07]. In order to actively manage the evolution of an EA, a management function is required. EA management

aims at improving the business/IT alignment. Therefore, an ideal future EA is developed, which serves as a guiding principle for the evolution of the current EA. Based on the ideal future EA and the current state a roadmap for the organizations' transformation can be derived. The following sections provide an overview on EA management. At first, the reasons for conducting EA management are explored and the relevant terms are discussed. Second, the activities of the EA management function are described. Third, the relationships between the EA management function and other enterprise functions are analyzed. Finally, the EAMPC as a promising approach to establish an enterprise-specific EA management function is discussed.

2.2.1 Overview and Definitions

Today's organizations need to adapt continuously to changes in their environment. Possible sources of these changes are [Fi07]:

- An increased complexity of business transactions in the development, creation and distribution of services due to increased customization and globalization
- An increased global competition that requires companies to adapt their business models in order to remain competitive
- New government regulations with implications for companies, such as the need to prove the reliability of core processes and the compliance with regulations e.g. the Sarbanes Oxley Act in the United States.
- A growing rate of change in IT offering the potential for differentiation from the competition

In order to achieve its current and future goals an organization has to adapt its strategy, its business processes, and its IT while continuing operations. The changes on the business side often require a subsequent change of the organization's IT, while the changes on the IT side enable new business scenarios, which need to be supported by the respective business processes. This alignment of business and IT has been one of the key areas of information systems research for many years. However, while attempts to solve the alignment problem from the viewpoint of IT did not yield the desired results, the consideration and management of both business and IT via an integrated perspective, show promising results [Ro09].

This approach is commonly referred to with the term EA management. Buckl et al. [Bu09a] define EA management as a continuous process to align business and IT based on a holistic perspective of the enterprise. Therefore, information is received from other enterprise level management processes, which in turn are informed and controlled by EA management. Examples for other enterprise level management processes are project portfolio management, security management, and compliance management [Ai08a]. In order to successfully inform and control these processes, information on the relevant elements of the EA has to be gathered. The structure in which this information is gathered is called an information model. Since, however, there is no consensus on the actual scope of EA management, apart from business/IT alignment, no consensus exists on which information is required at which level of

detail in order to perform EA management. Furthermore, due to the differences between organizations the gathering of this information requires an organization-specific information model. Matthes et al. [Ma08] propose the basic structure of such an information model for EA management as displayed in Figure 7. The model is structured in horizontal layers and orthogonal cross-functions. Thereby, the layers show the general structure of an organization’s EA ranging from infrastructure to business. Two service layers, the infrastructure service layer and the business service layer, provide an abstraction from infrastructure and application functions respectively. The cross-functions contain concepts, which influence the elements organized in the layers. The cross-function *measures & metrics* is an exception to this rule, because it is used for quantifying aspects of EA elements and concepts in both the layers and other cross-functions. While it is commonly accepted that all layers and cross-functions are important for EA management, the actual selection of elements and concepts on the layers and cross-functions is organization-specific [Ma08].

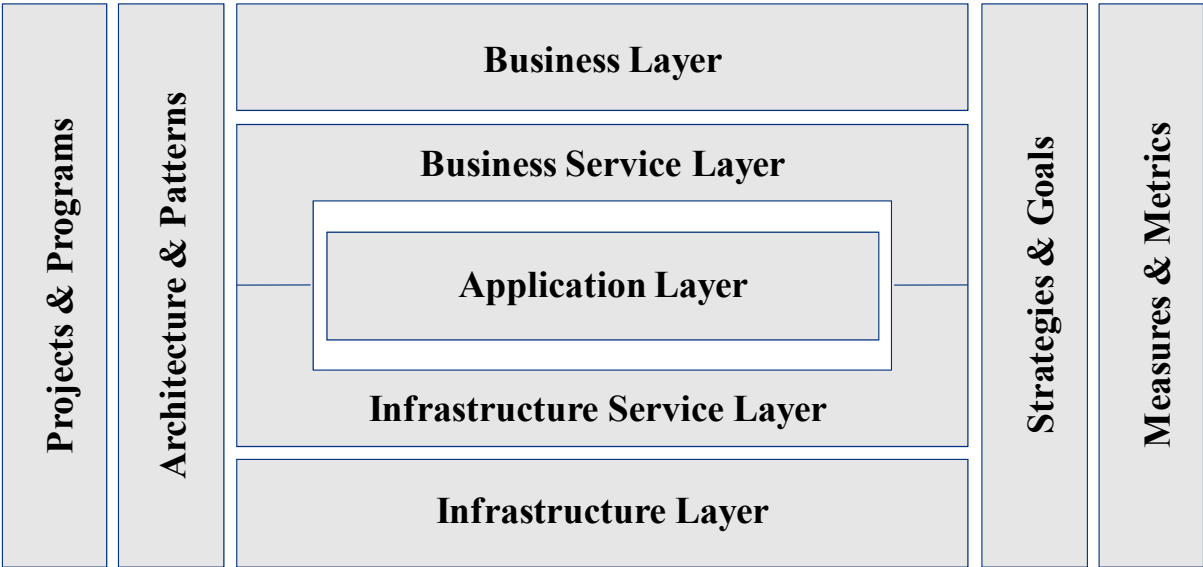


Figure 7: Layers and cross functions of EA management [Ma08]

A promising approach for scoping an organization-specific EA management including the underlying information model, the EAMPC, is described in section 2.2.3. The following section provides an overview on the enterprise function performing EA management.

2.2.2 The EA Management Function

Driven by the rate of changes, enhancing the alignment between business and IT is to be seen as a continuous process rather than a one-time project. Although the actual changes to the EA are performed in projects, the setting up of a distinct management function performing EA management has several advantages. One is concerning the documentation of the EA that can be kept up to date without having to be rechecked or rebuilt for every new EA project. Furthermore, since standards and guidelines are a part of the EA documentation, they have to be evaluated and reviewed from time to time. Otherwise, they could be outdated by technological changes or new objectives and thus no longer fit their purpose. Since the business/IT alignment process is continuous, the support of this process should be provided by a conti-

nuous EA management function [Bu09b]. Such a function is defined by van der Raadt et al. as “the organizational functions, roles and bodies involved with [...] Enterprise Architecture decision-making” [RaBa08]. According to the EA management method library (EAMML), the main activities of the EA management function are documenting the current EA, envisioning the target EA, analyzing different EA states, planning transformation EAs and road mapping, deciding on EA future states, and enforcing transformation EAs on route towards the target EA [Bu09b]. The main activities of the EA management function are displayed in Figure 8.

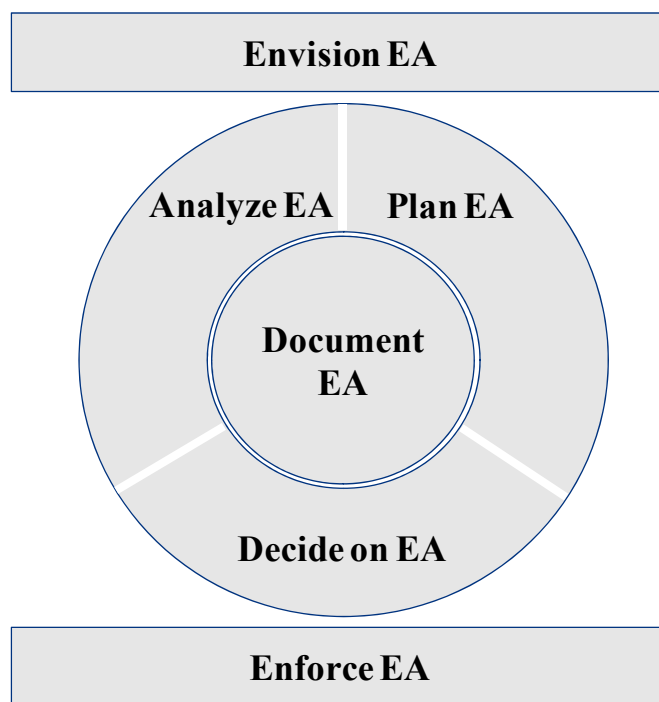


Figure 8: The main activities of the EA management function according to the EAMML [Bu09b]

The activity *Envision EA* seeks to develop the target EA in respect to the business and IT strategy of the enterprise. Thereby, different parts of the EA are envisioned in their future state and EA principles are derived from the strategy and the objectives of the enterprise. These principles aim at guiding the evolution towards the target EA, e.g. by specifying that support processes are always to be examined concerning their outsourcing potential. The activity *Document EA* is concerned with the current state of the EA. It therefore records data on all architecture layers, as well as the aforementioned principles. The activity *Plan EA* is concerned with the transformation EAs that occur in the transformation from the current EA towards the envisioned target EA. Thereby, the EA management function is dealing with the requirements towards the EA that are brought forward by other enterprise functions. These demands provide the basis for project proposals. Concerning these project proposals, the planning activity is responsible for balancing the short term operational value of individual projects with the long term strategic value with respect to the envisioned target EA. By selecting sets of projects, different EA scenarios can be designed. These scenarios represent different routes towards the desired target EA. In the activity *Analyze EA* the different scenarios are analyzed with respect to their functional and non-functional properties. This analysis serves as

the basis for the activity *Decide on EA*. As the result of the *Decide on EA* activity one scenario is selected and becomes the next transformation EA. Furthermore, the projects that are part of the scenario are approved based by the EA management function. The transformation EA in turn is the input for the activity *Enforce EA*. This activity is interacting with other enterprise management processes in order to ensure the realization of the planned EAs and the compliance of e.g. projects with the guidelines [Bu09b].

In order to successfully support the evolution towards the target EA, the EA management function has to interact with various other enterprise functions. Since the EA management function is often realized by a staff department [RaBa08], it has by design little organizational authority over other enterprise functions. In order to still be able to successfully manage the EA, its decision rights, its involvement in processes, as well as relevant organizational structures are designed through EA management governance [NA04]. An enterprise establishing an EA management function therefore has a wide range of design options ranging from a purely advisory EA management function to a powerful one that has the final decision in any EA related matter. Furthermore, the EA management function might also have to cooperate with individuals that are external to the organization, e.g. external IT suppliers. In summary, the EA management function has to be integrated into the existing organizational and governance structures. The goal of the integration effort is to foster collaboration between the members of the EA management function and other stakeholders on EA topics. An effective EA management governance design is important for the success of an EA management function [RaBa08, Ga09].

With respect to the aforementioned activities, some general areas of interaction can be identified. In the activity *Envision EA* the EA management function requires input from enterprise executives concerning the business and IT strategy, therefore the access to the executives or documented strategies is critical. In the activity *Document EA*, the EA management function relies on the information from different enterprise sources concerning EA elements to be documented, e.g. application owners for information regarding the properties of applications. In the activities *Plan EA*, *Analyze EA*, and *Decide on EA*, the EA management function needs to have access to the requirements from other enterprise functions. The activity *Enforce EA*, for example, depends heavily on the chosen EA management governance design. Again, its influence can range from giving advice to other enterprise functions, to having the right to interfere, e.g. by stopping projects that are not conforming to EA principles. According to its influence, the artifacts that are created in this activity can range from informational materials, to binding standards, process descriptions, and portfolios [Bu09b].

With respect to the working definition of a stakeholder established in Section 2.1.2, the roles and functions that can support or potentially hinder the EA management function in pursuing its objectives are considered to be EA stakeholders. The willingness of these stakeholders to cooperate with the EA management function depends on whether this cooperation increases their chances of reaching their objectives [Ra08]. These objectives and the tasks related to reach these objectives are the root of the concerns that EA stakeholders have regarding EA management [Ai08b]. Therefore, with respect to the scope of the EA model that is created in the activities *Envision EA* and *Document EA*, in these activities it has to be ensured that the stored information is suitable for addressing the concerns of the relevant EA stakeholders.

This in turn can be accomplished by using the EAMPC for designing an organization-specific EA management as described in the following section.

2.2.3 The EA Management Pattern Catalog

The EAMPC is a best-practice, pattern-based approach to EA management. The development of the EAMPC is part of the research project of Software Cartography² at the chair for Software Engineering for Business Information Systems (sebis)³ at TU München. It is the result of the cooperation between the research facility and EA management practitioners. The version 1.0 was released as a technical report in 2008 [Bu08]. Currently the EAMPC is updated and maintained on a wiki platform⁴. In order to allow for traceability, this wiki saves the change history of all items. Unless noted differently, this thesis uses the content of the wiki as of the 01.04.09.

The EAMPC contains three interconnected types of patterns that guide the user towards establishing an organization-specific EA management. Companies who start EA management initiatives might be faced with an overwhelming set of requirements by EA stakeholders. Without guidance like provided by the EAMPC, architecture information is collected unsystematically in order to deal with the various requirements. In the end only a small part of the collected information is actually used leading to an overall inefficient process and an overinflated information model. The EAMPC is addressing this challenge by providing a set of best practices patterns that specify which information is needed to answer which stakeholder concerns, as well as how the data can be collected and visualized [Bu08].

The EAMPC contains three different types of patterns and a set of concerns:

- **Concerns:** These typical pain points of enterprises serve as a starting point for the usage of the EAMPC. EA Stakeholders select the concerns relevant for their specific enterprise, which are related to Methodology Patterns (M-Patterns).
- **Methodology Patterns:** The concerns addressed by an M-Pattern are listed. Then, procedures and steps are outlined of how the concerns can be addressed. The relationships to Viewpoint Patterns (V-Patterns) describe the visualization used during the solution of the concerns.
- **Viewpoint Patterns:** This type of patterns describes how information collected according to one or more information model patterns (I-Patterns) can be visualized to facilitate the solution of the concern. They are meant to provide a template for the continued distribution of visual EA information as opposed to ad hoc designed reports that might vary in design rules and used elements.

² See <http://www.softwarekartographie.info>.

³ See <http://www.matthes.in.tum.de>.

⁴ See <http://eampc-wiki.systemcartography.info>.

- Information Model Patterns: This type of patterns details on the data to be collected in order to address the concern. Therefore, it defines the respective elements and their relationships. A definition is given for each element and each relationship, as well as an UML diagram showing the elements and their relations graphically.

The structural organization of the EAMPC is provided in Figure 9.

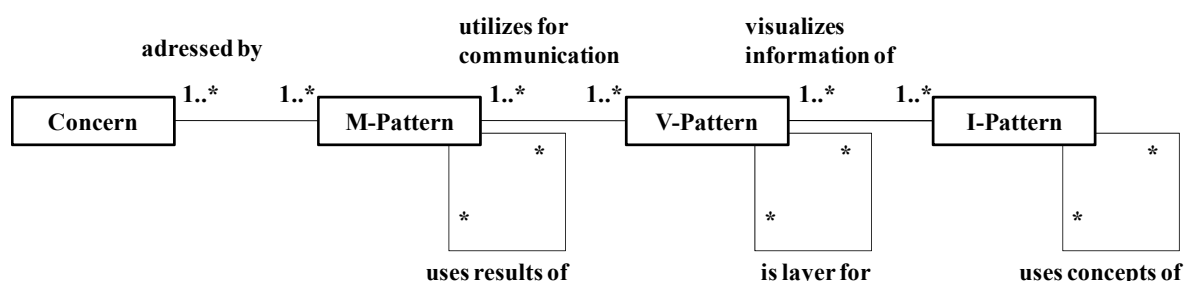


Figure 9: Structure of the EAMPC [Bu08]

The EAMPC describes three possible usage scenarios:

- Establishment of an organization specific EA management – via the selection and integration of patterns
- Analysis of an existing EA management – via the identification of patterns, which might provide further value
- Act as a basis for academic research – by further enhancement of the EAMPC with new patterns

For this thesis the establishment use-case is the most relevant one. Therefore, the relevant concerns are selected by EA stakeholders, leading to the required M-Patterns, which provide the methodologies to address the concerns identified before. The M-Patterns in turn are connected to the V-Patterns that define how the information that is required in the M-Pattern can be visualized. Finally, the V-Patterns link to the I-Patterns, which contain the required information model fragment. Then, the identified I-Patterns are integrated into a organization-specific information model. The last step is the implementation of the patterns, which might include the introduction of an EA management tool. In the EA field the use of specialized tools is quite common [Ai08a]. Exemplary tools can be found in the Enterprise Architecture Management Tool Survey [Ma08]. An overview of the process for the usage scenario developing an organization-specific EA management is given in Figure 10.

This thesis is trying to leverage the EA management knowledge captured in the EAMPC for stakeholder-specific design. Therefore, the concept of the EA stakeholder has to be related to the EAMPC. Figure 11 displays two relationships of a stakeholder to the enterprise and its architecture derived from the ISO 42010 standard [IS07]. The relationship between the enterprise and the stakeholder is best described by the overall stakeholder theory discussed in Section 2.1. The relationship that is established in this thesis is the one between stakeholders and

concerns. Therefore, Figure 11 illustrates the current scope of the EAMPC as well as the planned extension, which will be established in this thesis.

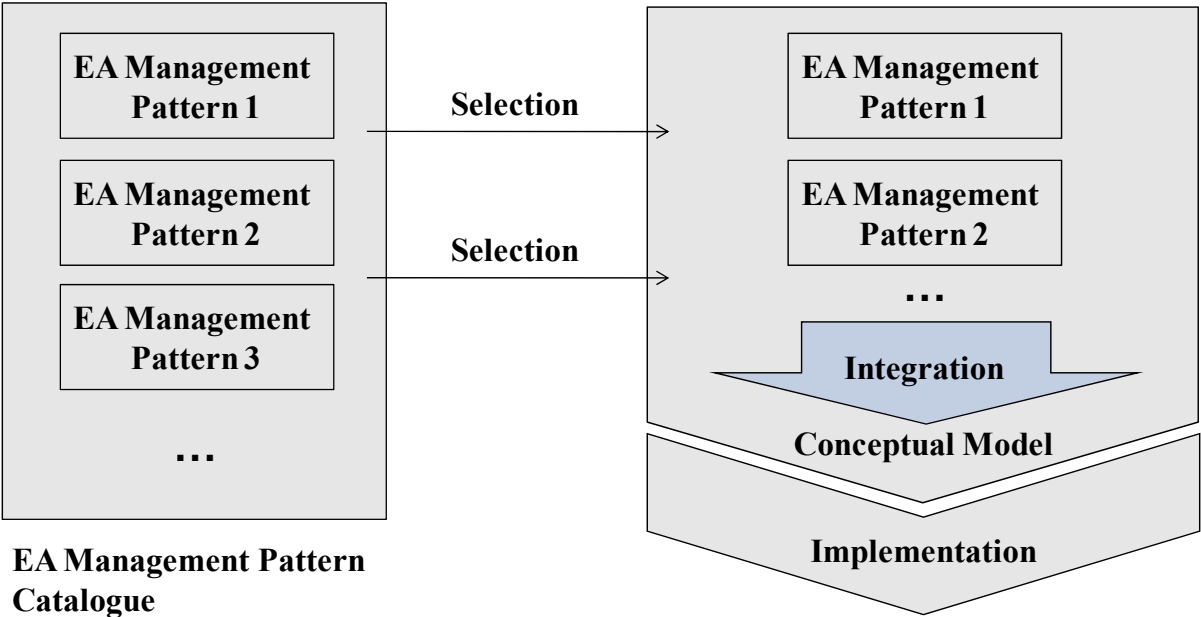


Figure 10: Implementing an EA management based on EA management patterns [Bu08]

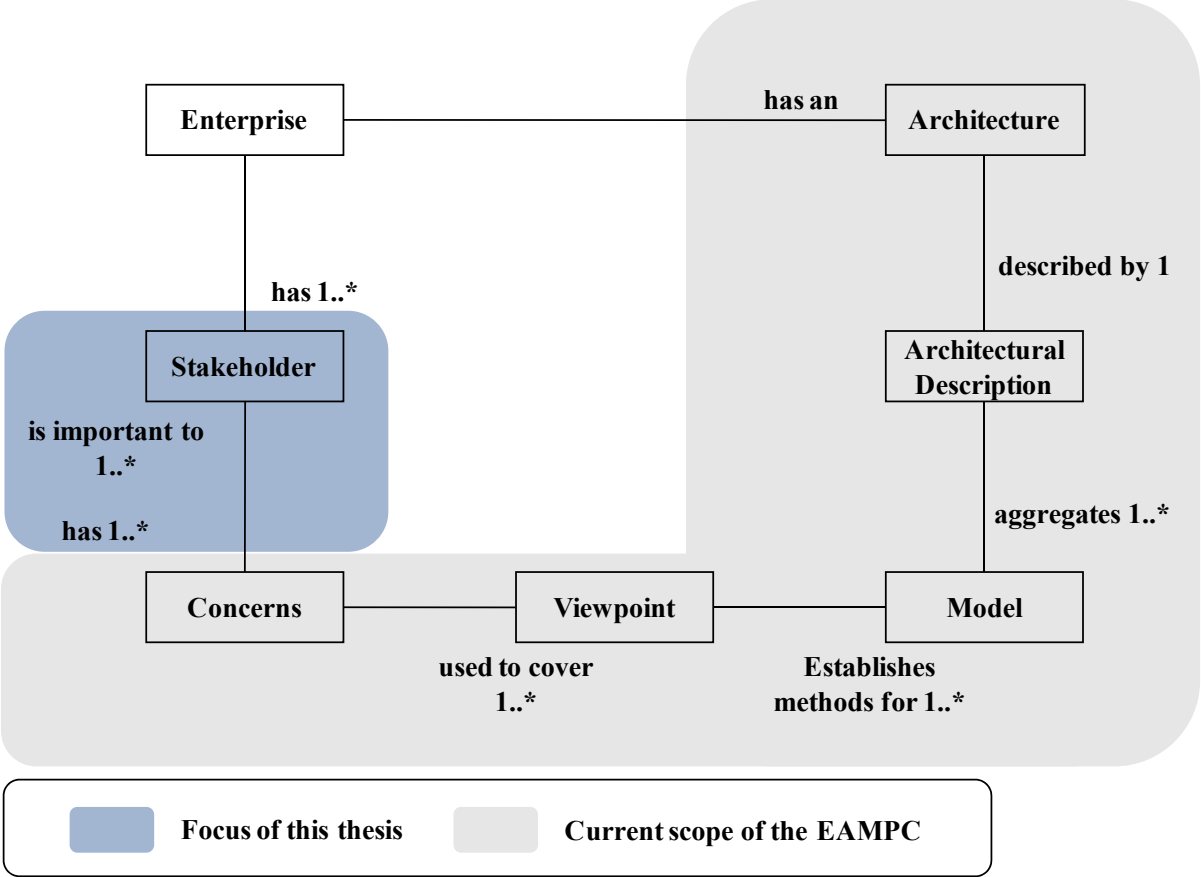


Figure 11: Relationship between ISO 42021, EAMPC and this thesis [IS07, Bu08]

2.3 Stakeholder Management in the EA Management Context

Stakeholder theory is the theory about the stakeholders of an organization, a fact that also influenced the associated stakeholder management approaches. Therefore, some differences have to be observed, when these approaches are transferred to the EA management context. One major difference is the focus on external stakeholders in stakeholder theory and on internal stakeholders in the EA management context. This requires an investigation of a suitable concept for stakeholder identification for internal stakeholders, which is performed in the following section. Furthermore, in the stakeholder theory the organization, represented by its management, is affecting and is affected by its stakeholders in reaching its objectives. This concept is transferred to the EA management context in Section 2.3.2.

2.3.1 Concept for Stakeholder Identification

Stakeholder theory has a long tradition in describing groups of external stakeholders like *customers and the general public* [Do32] or *government and competitors* [Fr84]. While these groups might be interested in EA in a broader sense, they are usually not directly involved in the design and daily operation of the EA management function. Since the objective of this thesis is to develop an EA management approach based on patterns where EA stakeholders and concerns are related, the organization-internal stakeholders are of major importance. In the following, the separation of tasks is discussed with respect to its potential to yield a concept for stakeholder identification.

The identification of tasks and their assignment to members of the organization is a fundamental problem of any organization [La05]. A general procedure to solve this problem is a top down approach starting with the organizations purposes. Based on the purposes as input, the overall task of the organization is defined. During task analysis, the complex overall task is divided into a set of elementary tasks. The elementary tasks are then combined to form job positions during task synthesis. These job positions are later combined in departments. Finally, the departments are related in respect to their decision-making power over each other in an organizational structure. The two major steps task analysis and task synthesis aim at supporting the achievement of the overall task through the division of labor [WöDö08].

Therefore, if a stakeholder is a member of an organization, then he/she assumes a position that includes both a description of his/her tasks and his/her integration into the organizational hierarchy. A position is the smallest, independently acting organizational unit [BeGö06]. It is defined independently of an individual. This allows the organization to continue its operation in case a member leaves. The position is then assumed by another individual, while the organizational structure remains valid and operational [Br06]. Exemplary job descriptions for positions that resulted from the creation of an organizational structure are displayed in Table 3.

Location in the hierarchy	Objectives and Tasks	Requirements
<ul style="list-style-type: none"> • Job title • Department • Superior position(s) • Inferior position(s) 	<ul style="list-style-type: none"> • Tasks and individual assignments • Information and communication partners • Competencies 	<ul style="list-style-type: none"> • Technical skills and expertise • (Inter)personal skills

Table 3: Exemplary job description [BeGö06]

With all this information documented by an organization, the position might be used as a stable and informative concept for identifying stakeholders. Its stability stems from the independence from a given individual. Its major value in terms of information stems from the list of objectives and competencies. However a major drawback to using this concept for stakeholder identification and for relating stakeholders to the EAMPC exists: Since each organization is free to choose job titles as it wishes the requirement of reusability is endangered. The same position in terms of tasks and rank in an organizational structure might have differing job titles in any other organization. Furthermore, the same job title might refer to different organizational ranks and tasks in two organizations.

In order to still achieve the desired relation between organization members and the EAMPC, a form of generalized job positions must be developed. In organizational literature, especially in the field of work design, the term *role* is used to describe such a concept. Originally, the term role referred to a set of expectations by other members of an organization towards an individual [St99]. Its origins therefore lie in the field of sociology and emphasizes on the growing importance of behavioral science in the field of organizational theory [Sc08b]. Nowadays, however, the term role is used to describe a variety of concepts. It is used to refer to job positions, e.g. a “Service Manager” [OG07]. Then, role can refer to the member of an organization, who is the responsible for a process and therefore assumes “the role of process owner” [Ai07]. On an even more detailed level, the participation of the member of an organization in a process can be described as a role [Ro00]. These examples show that while a role can describe a position, it can also refer to more specific part of the work of an individual. However, in this thesis the term role is used to refer to “the part an individual plays in an organization” [Th09] on the level of granularity of a position and with a general functional title as a role name. The consideration of stakeholders as roles allows for an abstraction from complex individual concerns and therefore enables the analysis of generic role-specific concerns [FrMc01].

In summary, the members of organizations assume specific roles that define their tasks and their place in the organizational hierarchy. The job titles found in job descriptions however, are specific to an organization. In literature, generalizations of positions are encountered in roles. Therefore, the mapping from stakeholders to the EAMPC will describe such roles in order to allow for the usage of the approach by a wide variety of organizations.

2.3.2 Adaptations to Stakeholder Theory

The stakeholder theory is a theory of the organization and its stakeholders. More precisely, Freeman describes stakeholders as “any group or individual who can affect or is affected by the achievements of the organization's objectives” [Fr84]. Thereby, Freeman is placing the emphasis on what the organization is doing to reach its objectives. If this idea is applied to the field of EA management, then the term *EA stakeholder* can be defined as any group or individual who can affect or is affected by the achievement of the EA management function's objectives. By detailing the terms *affect* and *affected by*, the definition of EA stakeholders used in this thesis is gained. An EA stakeholder is any individual or group that can support or hinder the EA management function in reaching its objectives as well as any person or group who is positively or negatively affected by activities of the EA management function. In stakeholder theory, the *managers* of the organization are managing the relationships with stakeholders. Therefore, in the context of EA management this task is to be performed by whoever is in charge of the EA management function. In stakeholder theory, the alternative to not considering stakeholders is to focus the organization on providing value to shareholders. Consequently, if an EA management function is deciding not to use stakeholder management, it can still focus its attention on providing value to whoever funds the department. However, as stakeholder theorists [Fr07] claim for the organization and EA management publications [Ra08, Th09] claim for the EA management function, it might not be possible for either to achieve its objectives without stakeholder management. Therefore, the following chapter is analyzing the publications in the field of EA management and related fields concerning their possible contribution to a stakeholder management approach for the EA management function.

3 Analysis of Literature

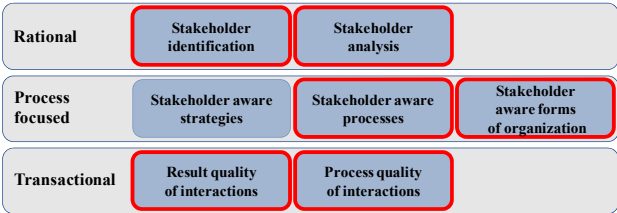
This chapter provides the current state-of-the-art in stakeholder management in EA management and related fields by examining the stakeholder notion of a variety of publications. The term *stakeholder notion* was chosen to reflect the plurality of existing approaches. While some publications present stakeholder management approaches others focus on specific aspects like stakeholder analysis. The publications analyzed are divided into EA management publications and publications in related fields. During the analysis, each publication is evaluated concerning its contribution to the three levels of the stakeholder management framework developed in Section 2.1.4.

3.1 Stakeholder Notion in EA Management Literature

The following section discusses publications in the research area of EA management with respect to their stakeholder notion. The publications are not discussed in their entirety. Instead the objective of this thesis on a stakeholder-specific design of an EA management based on patterns is used to focus the analysis. Thus, stakeholder roles, which are described in EA publications are analyzed, too. At first, TOGAF as a prominent EA management framework is analyzed. The latest version contains a stakeholder management approach. Then, the NASCIO EA Toolkit is analyzed. This approach from the US government sector includes an approach to stakeholder roles in EA management. The approach by van der Raadt et al. in turn contains a stakeholder model and introduces a method to analyze stakeholder expectations concerning the EA management function. Finally, the approach by Steen et al., which provides a method to categorize EA concerns and viewpoints, is discussed.

3.1.1 Stakeholder Notion in TOGAF

TOGAF [Th09] is an architecture framework that is developed by EA practitioners organized in the non-profit organization The Open Group. It is currently available in version 9.0. It is one of the most prominent frameworks in the EA management field [Bu09a]. TOGAF claims to contain “methods and tools for assisting in the acceptance, production, use, and maintenance of an enterprise architecture.” [Th09]. It is structured around an iterative process model, the *architecture development method* (ADM). Additionally it provides best-practice approaches, techniques, and methods.



With respect to the *rational level* and the focus area of *stakeholder identification* TOGAF contains a formal stakeholder definition. The term stakeholder is defined in TOGAF the following way: “An individual, team, or organization (or classes thereof) with interests in, or concerns relative-to, the outcome of the architecture.” [Th09]. This definition is a broad definition aimed at identifying a large number of stakeholders as input to further stakeholder management measures. It could serve as the basis for an instrumental or normative stakeholder management approach, since it contains both stakeholders, who are *affected* and *affected by*

the architecture results. The analysis results of TOGAF regarding its stakeholder notion are shown in the above figure and detailed subsequently.

3.1.1.1 Stakeholder Management Process

TOGAF provides a reference process for stakeholder management consisting of four steps. This process is mapped to the *rational level* of the stakeholder management framework. Since it is both identifying (step 1) and analyzing (steps 2-4) stakeholders it is mapped in detail to the focus areas *stakeholder identification* and the focus area *stakeholder analysis*. The TOGAF stakeholder management process and its result, the stakeholder map, are displayed in Figure 12. The yellow figures show how the information produced in the steps of the stakeholder management process is gathered in an exemplary stakeholder map. For example, the step *classify stakeholder positions* is analyzing the stakeholders, which results in the description of their involvement in the stakeholder map. The following sections briefly describe the single steps.

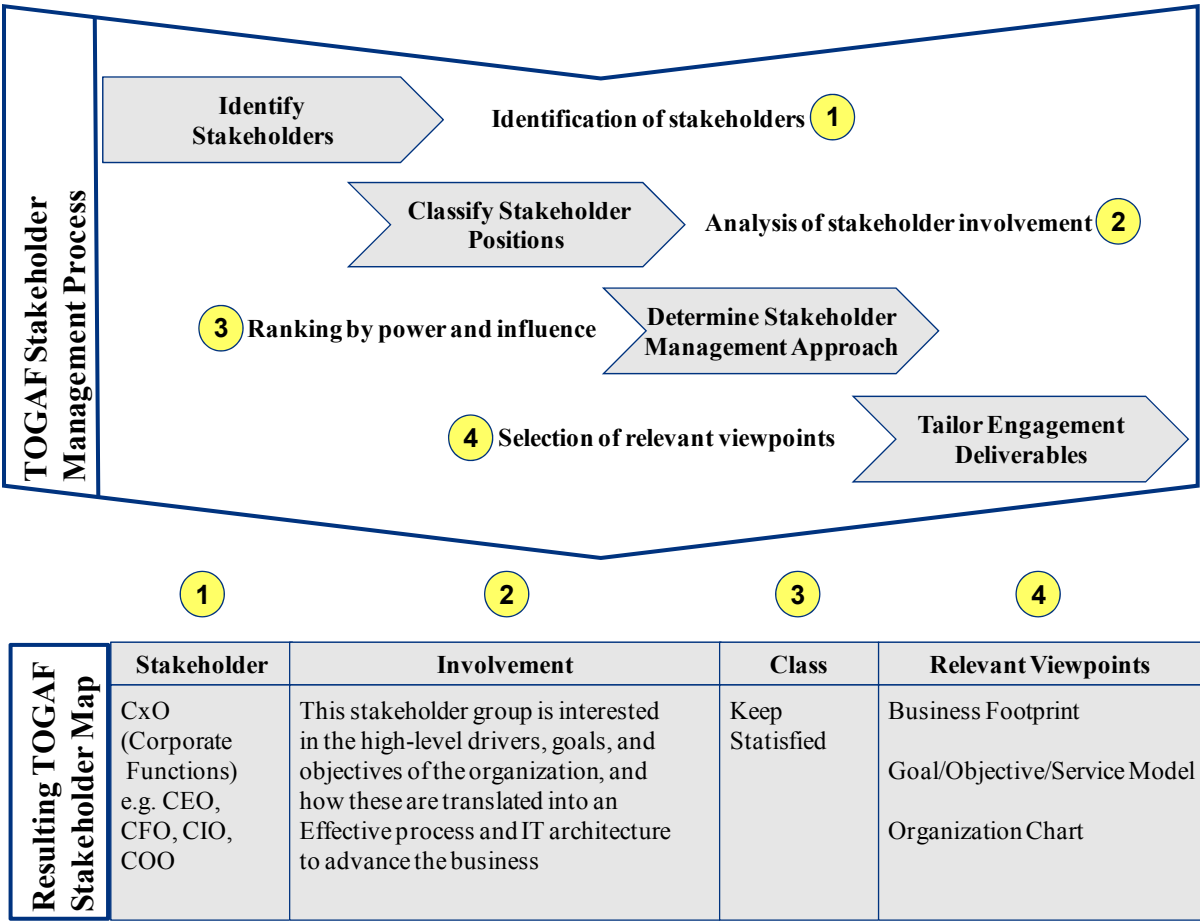


Figure 12: TOGAF stakeholder management process and the resulting stakeholder map [Th09]

3.1.1.1.1 Identify Stakeholders

The *identify stakeholders* step aims at establishing a list of key stakeholders for the EA. TOGAF recommends a brainstorming process to identify the main stakeholders according to

the above definitions. Examples for stakeholders are provided using position such as senior executives and system developers. The participants, however, should also think of informal stakeholders as opposed to formal ones. TOGAF provides a list of questions aiming at identifying stakeholders. The list shows a first bias towards an instrumental stakeholder management approach by extensively probing for stakeholders that *affect* the project. Table 4 provides an overview about the questions proposed by TOGAF and classifies them according to the categories *affected by* and *affects*.

Category	Stakeholder questions
Affected by	Who gains and who loses from this change?
Affect	Who controls change management of processes?
	Who designs new systems?
	Who will make the decisions?
	Who procures IT systems and who decides what to buy?
	Who controls resources?
	Who has specialist skills the project needs?
	Who has influence?

Table 4: TOGAF questions to identify stakeholders [Th09]

The question *Who has influence?* is included to yield powerful stakeholders who can decisively influence the course of the project. This in turn is a clear characteristic of an instrumental approach, because it leads to a distinction between less and more powerful stakeholders. Concerning the granularity of the identification, TOGAF strongly recommends identifying individual stakeholders, not just roles or groups. This is seen to be important because in the end the EA project team needs to communicate with real people [Th09]. Furthermore, TOGAF identifies five broad categories of stakeholders, namely corporate functions, end-user organization, project organization, system operations, and external. Figure 13 shows exemplary stakeholders for each category. The categories, however, are not described any further. Therefore, it can only be assumed, that the category *Project Organization* describes the project team performing the TOGAF ADM. Furthermore, it is not clear how this model is adapted, e.g. in case multiple *End-User Organizations* exist.

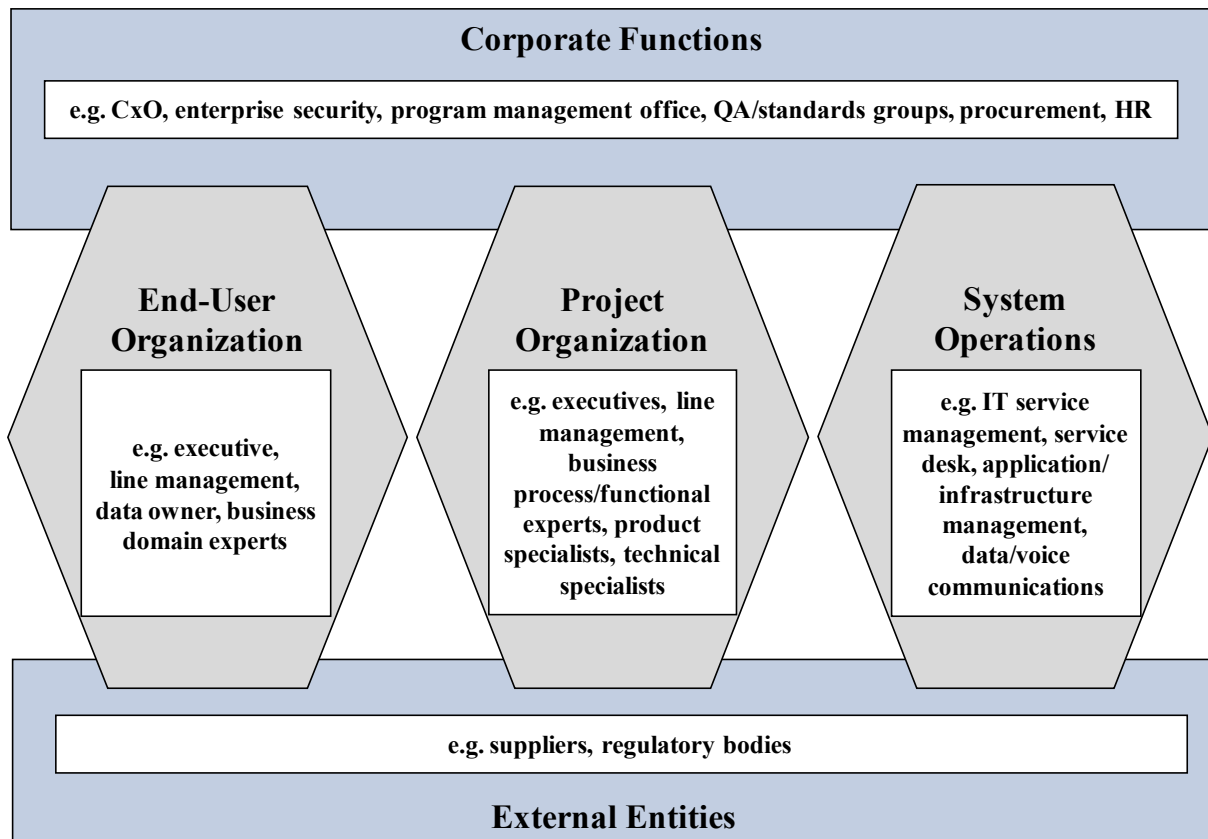


Figure 13: TOGAF stakeholder categories and stakeholder examples [Th09]

3.1.1.1.2 Classify Stakeholder Positions

In order to develop a good understanding of each stakeholder, TOGAF recommends creating a list with an entry for each stakeholder, detailing on the characteristics of the stakeholder. As an example the following attributes are provided:

- Stakeholder role (e.g. CIO, CFO)
- Stakeholder name
- Ability to disrupt change (high, medium, low)
- Current understanding (high, medium, low)
- Required understanding (high, medium, low)
- Current commitment (high, medium, low)
- Required support (high, medium, low)

These and further attributes are to be evaluated via a set of questions. One exemplary question is concerned with the readiness of a stakeholder to move in the direction of the transformation

EA⁵. Another question assesses the capability of the stakeholder to be an advocate of the EA management initiative. Judging by the above attributes, stakeholders whose commitment needs to be ensured for successful progress of the initiative’s work are rated by their current commitment and their desired future commitment. This juxtaposition of current and required level immediately allows identifying gaps. These gaps are then to be targeted e.g. by promoting the EA management initiative to foster the commitment of stakeholders.

3.1.1.1.3 Determine Stakeholder Management Approach

In order to determine the level of engagement of each individual stakeholder, TOGAF suggests a ranking according to the attributes interest and power. The stakeholder management approach of TOGAF is of clearly instrumental nature, because a ranking is performed. By differentiating both attributes with the measures high and low, the 2x2 matrix displayed in Figure 14 is gained. TOGAF does not provide any measurement of either attribute and therefore leaves the task of determining the levels to the team performing the stakeholder management process.

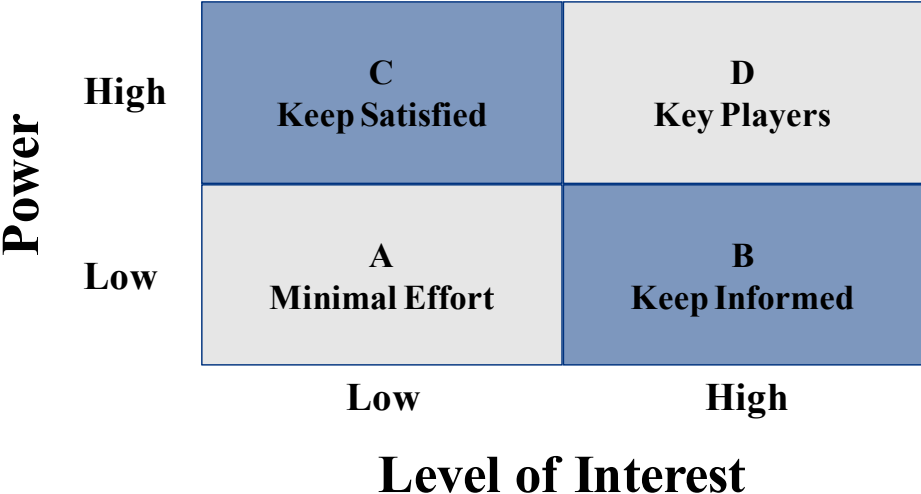


Figure 14: TOAGF Stakeholder Power Grid [Th09]

The four mentioned categories, namely key player, keep informed, minimal effort, and keep satisfied, are not discussed further in the documentation.

3.1.1.1.4 Tailor Engagement Deliverables

Finally, the required viewpoints for each stakeholder role have to be defined. This process step is supposed to yield viewpoints that allow “the architecture to be communicated, and understood by all stakeholders” [Th09]. Furthermore, stakeholders should see that their concerns are addressed. With respect to the construction of viewpoints, TOGAF provides infor-

⁵ In TOGAF’s terminology, the ADM realizes a target EA via a series of transition architectures from the current EA. However, in the broader context described in Section 2.2.2 this *target EA* of the TOGAF ADM is a transformation EA on route towards the target EA of the organization. In order to be consistent with the aforementioned definitions of the current EA, the transformation EA, and the target EA, the terminology in the following sections has been adjusted accordingly.

mation on architecture artifacts in a separate chapter. Therein, different viewpoints are described, but a method is missing to relate those viewpoints to stakeholder concerns.

The TOGAF stakeholder management process results in a stakeholder map that summarizes the key information gained from stakeholder analysis. The example given by TOGAF includes the role, a short description of the involvement, the category according to the power-interest grid, and the viewpoints to be supplied to the stakeholder. The layout of the example stakeholder map provided by TOGAF is displayed in the bottom part of Figure 12.

3.1.1.2 Involvement of Stakeholders in the ADM

The focus area of *stakeholder aware processes* is located on the *process focus* level of the stakeholder management framework. It is concerned with the direct integration of stakeholders into processes. TOGAF's integration of stakeholders into the ADM is therefore mapped to this focus area. During the conduction of the ADM, the requirements management is responsible for updating requirements and their priority in cooperation with stakeholders. Thereby, the EA management project team is always aware of how the requirements of different stakeholders are treated and of possible conflicts between requirements. This aspect is mapped to the focus area of *result quality of interactions* on the *transactional level*.

The ADM is the central process model provided by TOGAF. It is iterative, but allows for recursions on any number of phases if necessary. The ADM can be used as delivered by TOGAF or be adapted by organizations according to their specific needs. The method consists of 8 phases (A-H), plus a preliminary phase, and a central requirements management. The complete ADM is displayed in Figure 15. In the following sections each phase of the ADM is described shortly and the involvement of stakeholders into each phase is discussed.

3.1.1.2.1 Preliminary Phase

The *Preliminary* phase in TOGAF is concerned with the groundwork for the development of a new EA, or a specific part of it. From the standpoint of the enterprise, this phase is about “where, who, and how we do architecture” [Th09]. In the Preliminary phase, the organizational context of the architecture effort (*where*), the team carrying out the effort (*who*), and the frameworks and tools for EA management (*how*) are selected and with respect to the latter also tailored to enterprise-specific needs. The organizational context includes e.g. existing EA management approaches, the EA stakeholders, the culture of an organization, and processes currently used in the change and operation of IT.

The stakeholders of this phase are the individuals and groups affected by the “business directive to create and enterprise architecture” [Th09]. A special emphasis is placed on stakeholders, which might serve as a sponsor for the endeavor. Their job is, according to TOGAF, to identify the key decision-makers and other stakeholders that are affected by the requirements for the architecture work at hand. These stakeholders are invited to workshops on how to measure the maturity of the EA. Furthermore, they are consulted concerning the EA management governance and the usage of other EA management frameworks. Finally, the EA project team is created including the definition of role and responsibility for each team member.



Figure 15: TOGAF's Architecture Development Method [Th09]

3.1.1.2.2 Phase A: Architecture Vision

This phase is concerned with clarifying the business principles, business goals, and strategic business drivers of the organization that are relevant for the current EA management effort [Th09]. The key business requirements stemming from those environmental factors are defined. Furthermore, a value proposition and a comprehensive project plan are created.

In this phase, the stakeholder management process described in Section 3.1.1.1 is performed. The stakeholder map, which is generated, is used to support the creation of the following outputs of the architecture vision phase:

- In order to develop the transformation EA as a part of the architecture vision the business requirements of the EA stakeholders have to be clarified. TOGAF recommends the use of business scenarios. The derived requirements together with the described concerns are used to achieve a high level view of the transformation EA.

- The development of a communication plan (cf. Section 3.1.1.3) uses the list of EA stakeholders, their concerns, and their involvement to plan the communication with the respective EA stakeholders.
- The statement of architecture work is the working contract between the architecture organization and sponsor of the EA project [Th09]. It contains the key roles and responsibilities of the participants of the architecture work derived from the stakeholder map.

3.1.1.2.3 Phases B, C, D: Business/Information System/Technology Architecture

The phases B, C, and D develop the business, information system, and technology architecture. The information system architecture is made up of the data architecture and the application architecture. The phases B, C, and D can be analyzed together because they follow a common pattern as far as stakeholder involvement is concerned.

Each of the phases starts with the step *Select Reference Models, Viewpoints, and Tools*. During this step, the viewpoints for the stakeholders with a concern or a requirement towards the architecture layer are selected. The selection is guided to select viewpoints “that will enable the architect to demonstrate how the stakeholder concerns are being addressed” [Th09]. Furthermore, TOGAF recommends to check, whether all stakeholder concerns are covered by existing viewpoints. If gaps between the relevant stakeholder requirements and available viewpoints are detected, new viewpoints are to be created. Each of the phases ends with a formal stakeholder review. In this review, the developed architecture model of the respective layer is checked against the original motivation for architecture work and the statement of architecture work. The stakeholders are asked whether the developed model of the architecture layer is fit for the described purpose and for the subsequent architecture work. In case of rejection by the stakeholders, the architecture model is refined. The output of each phase is a draft architecture definition document that contains the current and future architecture model, as well as a collection of the relevant stakeholder viewpoints.

3.1.1.2.4 Phase E: Opportunities & Solutions

This phase is concerned with drafting the mechanisms, e.g. projects, programs, and portfolios, for transforming the current EA into the transformation EA realized in the ADM. Therefore, work packages are created and logically grouped. The integration of architecture work into existing portfolios is specified, which requires discussion with stakeholders from both business and IT to determine if the business is ready for transformation.

TOGAF does not perceive the architecture effort to be isolated, but rather seeks to incorporate its realization in other enterprise initiatives. To succeed in the transformation of the EA, TOGAF advises the participation of stakeholders from *corporate strategic planning*. Thus, the EA management effort is coordinated with existing portfolios, projects, and initiatives. A further aspect that is referred to in this phase is the assessment of the culture of the IT organization. The organizational structure, centralized or decentralized, is described to have an influence on how shared services are delivered. The training of participating stakeholders is also discussed. An assessment is recommended that identifies the necessary professional development in terms of the capability to implement, operate, and sustain the proposed transformation

EA. As far as implementation activities are concerned, stakeholders are informed on how the transformation is planned to progress. A further aspect with stakeholder involvement is the decomposition of the transformation into capability increments, if the implementation of the transformation EA requires several steps. Furthermore, stakeholders and the enterprise architect plan how the business goals of the architecture effort are realized in an incremental fashion.

3.1.1.2.5 Phase F: Migration Planning

This phase is concerned with finalizing a detailed implementation and migration plan according to the draft specified in phase E. The key stakeholder involvement is the agreement on the planned projects realizing the steps towards the current transformation EA. In order to come to an agreement, a business value has to be assigned to the individual projects. Furthermore, in the view of TOGAF, the stakeholder with the role CIO has to ensure, that the contribution from the IT side is adequately measured and recognized. These contributions are included into return on investment evaluations. These evaluations however have to be prepared with recognition of stakeholder concerns. TOGAF provides the following example: "...if employee retention is a top priority, then the transferability of the skill set being made redundant by a new system has to be taken into consideration and a retraining effort factored into the cost/benefit arrangement" [Th09]. The individual projects then have to be prioritized by the stakeholders. This might result in some projects being postponed or cancelled due to limited funds for architecture work. Thereby, individual projects might have to be redesigned in case a high priority funded project has dependencies on a cancelled or postponed project. Finally, the stakeholders have to agree on the risk assessment of the funded projects to ensure that everybody is aware of the residual risk.

3.1.1.2.6 Phase G: Implementation Governance

In this phase the implementation progress of the funded projects is monitored on a high level. Thereby, the consistency of the implemented solution with the transformation EA and the architectural contract is checked. From a stakeholder point of view, the main task in this phase is the education and training of implementation workers. They are informed on the expected EA deliverables and the developments to be performed in their projects. Thereby, EA priorities can be given to each development team.

3.1.1.2.7 Phase H: Architecture Change Management

This phase takes place after the implementation of the transformation EA has taken place. Its main objective is "to ensure that the architecture achieves its original business value" [Th09]. This is supported by only allowing changes to the existing EA that preserve its coherence or by the decision to start a new ADM cycle creating the next transformation EA. Examples for changes are "governance requests, new developments in technology, and changes in the business environment" [Th09]. TOGAF provides a rule of thumb for the management of changes based on stakeholders. It states that if two or more stakeholders are impacted by the change, then a new ADM cycle is likely to be set up. If only one stakeholder is impacted, then change management activities are likely to be sufficient. This is a strange twist however from the instrumental approach promoted by TOGAF stakeholder management. It is however not mentioned, if this rule applies only to influential stakeholders that were established via the ranking, or if all stakeholders are included into this consideration.

3.1.1.2.8 ADM Architecture Requirements Management

The architecture requirements management deals with the handling of stakeholder requirements. It is therefore mapped to the focus area of *result quality of interactions* on the *transactional level*. The management of architecture requirements is performed throughout the ADM. This is visualized by its central position in Figure 15 and its connection to all other phases represented by bidirectional arrows. The meaning of those arrows is that requirements are updated throughout the ADM by the different phases and that the requirement management serves as a vault for supplying requirements to the individual phases. TOGAF distinguishes the terms *requirement* and *concern* by defining a concern as an area of interest, which sits at the root of identifying individual requirements. Furthermore, one concern may be represented by many requirements, which should be specific, measurable, attainable, realistic, and time bound (SMART). For example, the concern of a stakeholder could be that the developed architecture is secure. A requirement in this context could be that 512-bit RSA encryption is implemented for all communications between software components of different systems before the testing phase.

The requirement management process is intertwined with the other steps of the ADM phases. Noteworthy with respect to stakeholder interaction is that the assignment of priorities to new requirements requires a confirmation from the relevant stakeholders. This confirmation is also required, if a phase changes requirements or the priorities of existing requirements. Furthermore, the requirements management is responsible for identifying conflicting requirements. These conflicts have then to be resolved during the phases of the ADM. Although, both the confirmation from relevant stakeholders and the identification of issues imply a connection between stakeholders and requirements, a description of how this connection is established is missing in TOGAF.

3.1.1.3 Communications Plan

With focus on the *process quality of interactions* on the *transaction* level of the proposed stakeholder management framework, communication is an important factor. The TOGAF chapter on establishing a communication plan is therefore mapped to this focus area. The communications plan is an architecture deliverable that is created in the ADM phase A and used as input to the phases B, C, D, E, and F. TOGAF perceives the communications plan to be a critical success factor for effective communication, which means providing the right information to the right stakeholders at the right time [Th09]. The communications plan contains stakeholders grouped by communication requirements. The communication requirements are derived from the stakeholder map. Furthermore, it is analyzed which key message has to be communicated to a stakeholder in respect to the architecture vision. In order to interact with the stakeholders, different channels can be used, e.g. meetings, newsletters, or personal communication. Since stakeholders have different requirements and different priorities, the appropriate channel has to be chosen for each stakeholder separately. Finally, a timetable can be used to display which communication is to take place at what point in time via which communication channel.

3.1.1.4 Establishing an EA Management Function

TOGAF's recommendations on how to establish an EA management function⁶ within an organization are mapped to the focus area *stakeholder aware forms of organization* on the *process focused* level of the developed stakeholder management framework. With respect to stakeholder management TOGAF describes EA management governance and an architecture board.

3.1.1.4.1 EA Management Governance

TOGAF defines governance in the EA management context as “the practice and orientation by which enterprise architecture and other architectures are managed at an enterprise wide level” [Th09]. Two governance areas are distinguished, namely *design governance*, which is concerned with change processes and *operational governance*, which is concerned with the design and enforcement of operational performance levels. Furthermore, TOGAF describes an organizational structure, which is deemed necessary to perform the described governance activities.

The following rather generic activities are proposed by TOGAF to establish governance in the EA management context in an organization:

- Introduction of a system of control for architectural components and activities
- Introduction of a system of control that ensures compliance with internal, external, and regulatory standards and obligations
- Introduction of processes that support the effective management of the above systems
- Development of practices for ensuring accountability to all stakeholder, both internal and external to the organization

In order to ensure the successful installation of the above systems, processes, and practices, a suitable organizational structure has to be installed. TOGAF identifies three key areas of architecture management. These areas are *develop*, which includes the tasks of the ADM up to phase G, *implement*, which is encompassing activities of phase G, and *deploy*, which covers the systems operation and monitoring. All three areas and the assigned roles are displayed in Figure 16. Apart from the establishment of an organizational structure for the EA management function, TOGAF recommends further elements relevant for a successful introduction of EA management. Therefore, the establishment of an architecture board is discussed in the following section.

⁶ TOGAF uses the terms *architecture capability* and *architecture practice*.

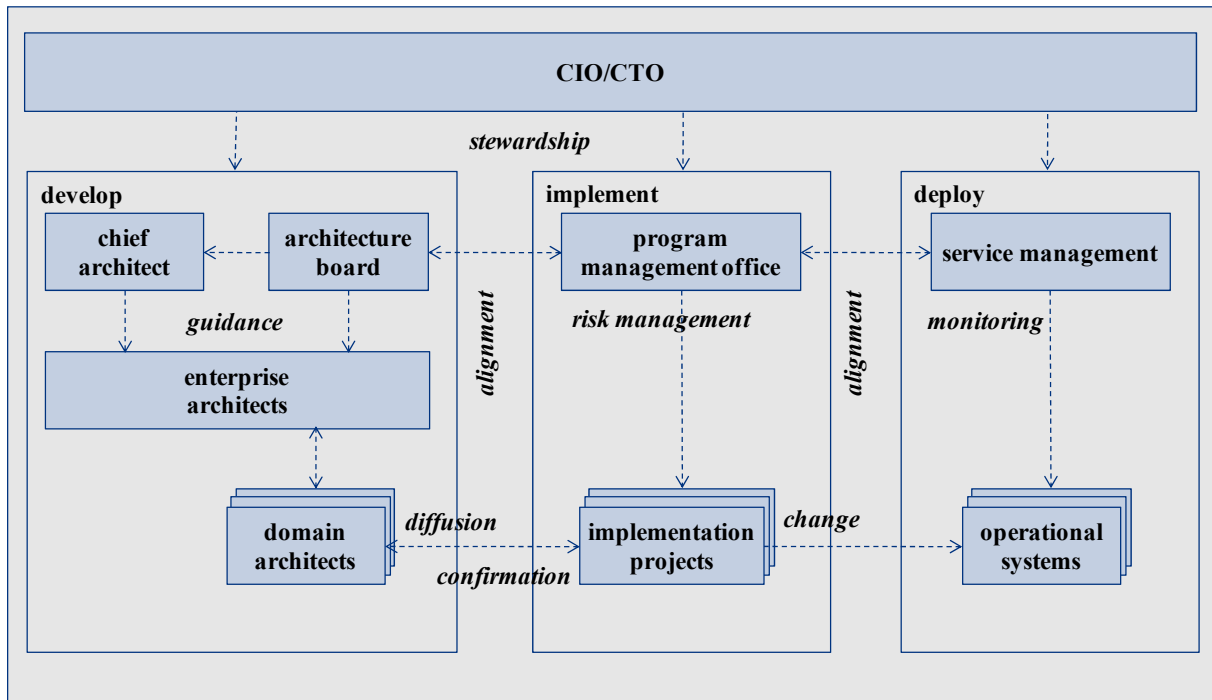


Figure 16: TOGAF Architecture Governance Framework – Organizational Structure [Th09]

3.1.1.4.2 Architecture Board

The architecture board is described by TOGAF as a key component in the successful implementation of a governance strategy. It is a cross-functional committee that is staffed with representatives of all key stakeholders [Th09]. In larger organizations however, several architecture boards e.g. with global, regional, and business line scope may exist. The responsibilities of an architecture board are described by TOGAF as “the review and the maintenance of the overall architecture” [Th09]. As far as the involvement of the stakeholders is concerned, the architecture board should consist of four or five permanent members. If more stakeholders need to directly participate, membership is rotated between the stakeholders. In order to ensure a basic level of consistency and continuity, membership terms expire at different times when rotation is necessary. In order to support the operation of the architecture board, an exemplary agenda for architecture board meetings is supplied in TOGAF [Th09].

3.1.1.5 Summary

The different approaches to integrate stakeholders into EA management in TOGAF version 9.0 can be mapped to all three levels of the stakeholder management framework developed in Section 2.1.4.2. The stakeholder management process of TOGAF is mapped to the focus areas *stakeholder identification* and *stakeholder analysis* on the *rational* level. The integration of stakeholders into the ADM is mapped to the focus area of *stakeholder aware processes* on the *process focus* level. The requirement management during the conduction of the ADM is mapped to the focus area of *result quality of interactions* on the *transactional* level. Furthermore, the chapter on the establishment of an EA management function is mapped to the focus area of *stakeholder aware organizations* on the same level. The chapter on the communications plan is a short, but noteworthy contribution and is mapped to the focus area of *process*

quality of interactions on the *transactional* level. Overall, the stakeholder management approach provided by TOGAF is an instrumental approach because of its ranking that relies on the power of stakeholders.

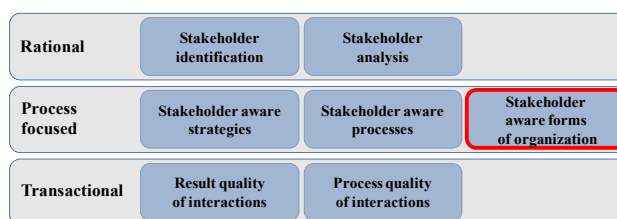
However, due to the fact, that TOGAF is developed by separate working groups, some inconsistency can be noticed. In the chapter on stakeholder management, stakeholder roles are only provided as part of examples. In the ADM however, some references to specific stakeholder roles are made e.g. the reference to *corporate strategic planning* in phase E. Furthermore, roles that are part of the enterprise architecture team, e.g. enterprise architect, are not included in the examples, although the definition does include them.

The use of the term *key stakeholder* can also be seen critically. With respect to the usage of the term, a clear distinction to the term *stakeholder* is missing. During the stakeholder management process, “stakeholder analysis should be used [...] to identify the key players in the engagement” [Th09]. Thus, key stakeholders are identified via the Stakeholder Power Grid displayed in Figure 14. The dimensions power and interest are differentiated by the values low and high. However, TOGAF does not supply methods or examples on how this evaluation is to be carried out. Therefore the identification of key stakeholders is dependent on the subjective impression of the person or group carrying out the stakeholder management.

Finally, TOGAF is not adhering to basic scientific guidelines. Ideas and concepts that are taken from past works of other authors are not cited, e.g. the Stakeholder Power Grid. Moreover, there is no explanation of how the presented models, processes, and approaches were developed. Therefore, TOGAF can on the one hand be used as a starting point for the development of an approach, but on the other hand is always to be reviewed critically with respect to its contents validity.

3.1.2 Stakeholder Notion in the NASCIO EA Development Tool-Kit

The National Association of State Chief Information Officers (NASCIO) is an organization of senior state official from U.S. states and territories. The members are IT executives from all branches of U.S. state governments. The goal of NASCIO’s Enterprise Architecture Development Tool-Kit (EADT) is to “guide agencies at all levels of government in the definition, development, utilization, maintenance, and institutionalization of an enterprise architecture program” [NA04]. Although, the term stakeholder is not explicitly defined in the EADT, the EA management governance described therein can be mapped to the focus area of *stakeholder aware forms of organizations* on the *process focused* level. The motivation for this governance approach is to support implementation and management of an EA [NA04]. It is focused on the necessary roles and responsibilities in an EA management function. In contrast to the examples given in the TOGAF stakeholder management where exemplary organizational roles were provided, the EADT approach relies on architecture roles. An architecture role consists of a name and set of describing attributes. The attributes described in Table 5 are provided for each architecture role.



Attribute	Content
Description	Description of the architecture role and its relations with other architecture roles
Implementation recommendations	Recommendations concerning the assignment to a single person or a group
Checks and balances	Possible combinations of architecture roles in one person or group and combinations to be avoided
Full-time / part-time	Effort required of the architecture role
Contribution significance	Importance of the architecture role in categories <i>critical</i> , <i>necessary</i> and <i>helpful</i>
Missing contribution risk	If the architecture role is <i>critical</i> or <i>necessary</i> in contribution significance a description of the risks involved is given, that emerge if this architecture roles is not assumed

Table 5: EADT information on roles and responsibilities [NA04]

Two basic sets of architecture roles are identified in the EADT. *Primary architecture roles* are assigned to people, involved consistently in the EA management processes. *Supporting contributors* contribute to the EA deliverables on demand and constitute a more supportive capacity. The architecture role set is meant to be used to analyze an existing EA management governance approach as well as to develop one from scratch. In contrast to other stakeholder approaches, which are starting from a definition and then identify stakeholders, the identification in the EADT is performed by finding a person or a group, who accepts the architecture role. While no process is described on how to perform this task, organizational roles are described in connection with some architecture roles. In Table 6 three examples for architecture roles supplied in the EADT are shown with their main objectives and associated organizational roles, if they are mentioned in [NA04]. The complete table can be found in Appendix E.

NASCIO architecture role	Category/significance	Main objectives	Organizational role
Documenter/author	Primary/critical	Maintain EA information	Senior/junior level IT staff, or business staff, best implemented by domain committees for specific architectures

Champion	Primary/ critical	Promote benefits, ensure that goals are met	Executive at CIO or equivalent level
Manager	Primary/ critical	Coordination of the EA management effort	Chief architect (enterprise level), local architects (division level)

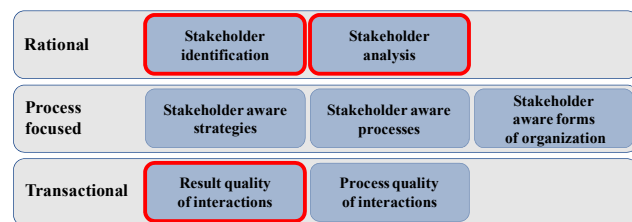
Table 6: EADT roles and related functions [NA04]

To illustrate the approach, the EADT contains a selection of EA management governance designs from state and local governments. These diagrams show the exemplary assignment of architecture roles to organizational roles within a specific organization.

In summary, the EADT provides an interesting approach to stakeholder management in the EA management field. Instead of relying on a definition and an analysis process, architecture roles are described. In order to utilize these roles an organization has to assign existing stakeholders to them. Furthermore, the governance rules described in the EADT have to be put in place to establish an EA management function. Another interesting aspect of the EADT approach is the separation into primary and supporting roles as well as different levels of significance. The category of *primary architecture roles* allows insight into the internal roles of the EA management function and their direct stakeholders, the audience. The *supporting roles* describe the relations that integrate the EA management function with other enterprise-level management processes. The overall contribution of this publication is, in absence of further formal methods and definitions, mapped only to the focus area *stakeholder aware forms of organization* on the *process focused* level.

3.1.3 Stakeholder Notion by van der Raadt et al.

In their research paper *Stakeholder Perception of Enterprise Architecture* van der Raadt et al. [Ra08] examine how different groups of EA stakeholders perceive the EA management function. The motivation for their research was the experienced



lack of research on EA stakeholders on the one hand. On the other hand, they identified that many EA management functions suffer from the “ivory tower syndrome”, which refers to an EA management function, delivering EA models that are too abstract and too complex to be used in practice [Ra08]. In their view, this is caused by the missing collaboration between EA stakeholders and the stakeholders of the EA management function.

With respect to analyzing the contributions of van der Raadt according to the analysis framework developed, two distinct parts can be identified: In the first part, a general stakeholder model is developed and discussed. This contribution is mapped to the focus areas *stakeholder identification* and *stakeholder analysis* of the rational level. It is mapped to the focus area of *stakeholder identification* because a definition and a model are provided. The mapping to the focus area *stakeholder analysis* is established, because roles are described in terms of their

concerns. The second part describes how interviews were conducted to clarify the expectations of four different stakeholder roles towards the EA management function. This part is therefore mapped to the focus area of *result quality of interactions* on the transactional level.

	Business	Information	Information Systems	Technical Infrastructure
Enterprise	CEO, CFO, COO	CIO	CIO	CTO
Domain	Head of BD/BU, business change manager	DIO, IT change manager	DIO, IT change manager	Platform manager, platform subject matter expert
Project	Business project manager, business process designer	Information analyst	Software development project manager, designer/architect	Infrastructure project manager, infrastructure engineer
Operational	Operational business manager, business process engineer	Data administrator	Application manager, application administrator	Data center manager, infrastructure administrator

Figure 17: Key EA Stakeholders, their aspect areas and organizational levels [Ra08]

In the first part, van der Raadt et al. define EA stakeholders as “individual or grouped representatives of the organization who are affected by EA products, either by providing input to EA decision making or having to conform to EA products” [Ra08]. EA products in turn are described to be architectural descriptions or EA policies. To conform to EA products, EA stakeholders have to perform their development activities according to the current transformation architecture as well as to follow the rules defined in EA policies. This definition is not in-line with other definitions in the field, as stakeholders who provide input are usually categorized in the *affect* and not the *affected by* category. The concentration on specific stakeholders based on their relationship with EA products, e.g. *having to conform to EA products*, makes it a narrow definition. This simplifies the identification of stakeholders by limiting the scope of the definition. Nevertheless, potential stakeholders are omitted e.g. individuals who are interested in EA descriptions without having to conform to EA products. The objectives of EA stakeholders are described to depend on three attributes, their specific role, their organizational level, and the architectural layers they focus on. In their stakeholder model they use four architectural layers, namely business, information, information systems, and technical infrastructure. Furthermore, four organizational levels are used, namely enterprise, domain, project, and operational. Both categories, aspect areas and organizational levels, result in a 4x4 matrix displaying exemplary stakeholders. This matrix is displayed in Figure 17. An overview of the assignment of roles to architectural layers and responsibilities is given in Table 7. The roles of architects are omitted intentionally as the publication focuses on the EA stakeholders. Therefore van der Raadt et al. make a clear distinction between the EA management function, to which the architects belong, and EA stakeholders.

Role(s)	Architectural layer	Responsibility
CEO, CFO, COO	Business	Developing the general business strategy
CIO	Information, information systems	Alignment of business and IT
CTO	Technical infrastructure	Maintaining technology components and platforms
Head of the business division	Business	Ensuring operational performance of the business division
Program/portfolio managers	Information, information systems	Managing or coordinating domain-specific change programs
Division information officer (DIO)	Information, information systems	Alignment of business and IT in business unit
Platform subject matter expert	Technical infrastructure	Supervising changes to the platform
Business project manager	Business	Finishing projects that meet business requirements
Business process designer	Business	Designing required business processes
Information analyst	Information	Creating of database designs according to information requirements
Software development project manager	Information systems	Delivering software solution according to functional and non-functional requirements
Infrastructure engineer, infrastructure project manager	Technical infrastructure	Supplying infrastructure configurations according to the requirements of information systems

Table 7: Roles, relationship to architectural layers, and responsibilities according to van der Raadt et al. [Ra08]

In the second part of the publication, van der Raadt et al. performed an exploratory study in an organization concerning stakeholder perception of the EA management function. The goal of the study was to gain an insight into the expectations of EA stakeholders with respect to

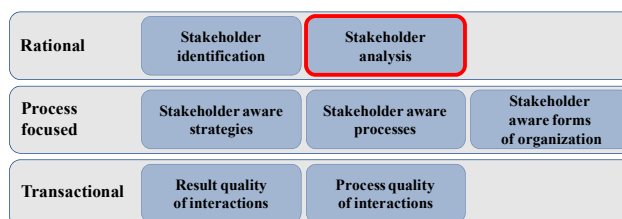
how the EA management function can help them achieve their objectives. The interviews were conducted using a soft-laddering technique in order to determine why observable attributes contributed to the goal achievement of individual stakeholders. Furthermore, this technique allowed for the creation of means-end chains. Thereby, observable attributes are related to consequences, which in turn lead to high level values. So for example, the observable attribute *governance processes* of the EA management function results in the consequence *EA conformance*, which in turn is important to achieve the high level value *realization of strategy*, i.e. achieving the transformation EA. The interviewed stakeholder groups consisted of the roles change manager, project manager, project leader, and application manager. Due to the limited number of participants – a total of 16 respondents – van der Raadt et al. stress the exploratory nature of the study. Nonetheless, it represents an interesting case of how to measure the result quality of interactions between an EA management function and its stakeholders. The four most important high level values found in the study were:

- Realization of strategy – realizing the target architecture and the company’s strategy
- Horizontal alignment – changes are introduced consistently across the different organizational units
- Monitoring of changes – gaining an overview of the projects and programs in the organization and their relationship to the target architecture
- Operational continuity – ensuring the stability and continuity of business and IT operations

In summary, two main contributions for the approach developed in this thesis can be derived from the contribution discussed in this section. First, a stakeholder model that categorizes EA stakeholders by organizational level and aspect area. Second, the view that the area of interest of a stakeholder, i.e. his or her general concern, depends on his or her role in the organization and on the level of this role. Although this idea is not farfetched, no other publications were found that discuss similar ideas. The other important concept presented is the usage of means-end chains to determine the stakeholder benefit. This seems to be a promising approach to establish common, high-level goals of stakeholders in a complex environment. The knowledge about the expectations of stakeholders could serve as a starting point for an EA management function to define *stakeholder aware strategies*. However, such a proposal is missing in the publication.

3.1.4 Stakeholder Notion by Steen et al.

In their research paper *Supporting Viewpoint-Oriented Enterprise Architecture* Steen et al. [St04] designed an approach to classify viewpoints from a stakeholder perspective. Although the paper focuses on the design of a tool environment for view-



point-oriented EA management, their classification approach is a valuable part with respect to this thesis as the analysis of which stakeholders have which concerns, and therefore use which viewpoints, is important.

A view according to Seen et al. is defined to be “a representation of a whole system from the perspective of a related set of concerns” [St04]. A viewpoint in turn is a template to develop individual views. In order to classify viewpoints, Steen et al. propose to use two attributes, the purpose of the viewpoint and its content. They identify three different purposes, namely designing, deciding, and informing [St04]:

- Designing – These viewpoints are used in the design process by architects and designers. While they often focus on one domain, e.g. application architecture or business process model, they may be used to show interdependencies between domains.
- Deciding – These viewpoints are used in decision making processes by managers. They offer insight into cross-domain relations and might include analytical techniques.
- Informing – These viewpoints are used to inform stakeholders about the EA to achieve understanding, obtain commitment, and convince adversaries.

Concerning the content, three levels of abstraction are defined:

- Details – Viewpoints that consider one architectural layer in detail. This level is especially relevant to stakeholders concerned with design and operation like software engineers and process owners.
- Coherence – Viewpoints that span multiple layers or multiple aspects displaying architectural relationships. A typical stakeholder would be an operations manager responsible for both a business process and the required IT services.
- Overview – Viewpoints that span multiple layers and multiple aspects. A typical stakeholder for such an overview would be an enterprise architect.

The complete classification model is displayed in Figure 18. In summary, this approach is mapped to the focus area *stakeholder analysis* of the *rational* level, since it explores the interests of stakeholders concerning viewpoints. With respect to stakeholders, the main attribute is the purpose followed by the content. For the three content categories some exemplary roles are mentioned as displayed in Figure 18. However, they are not discussed in any further way.

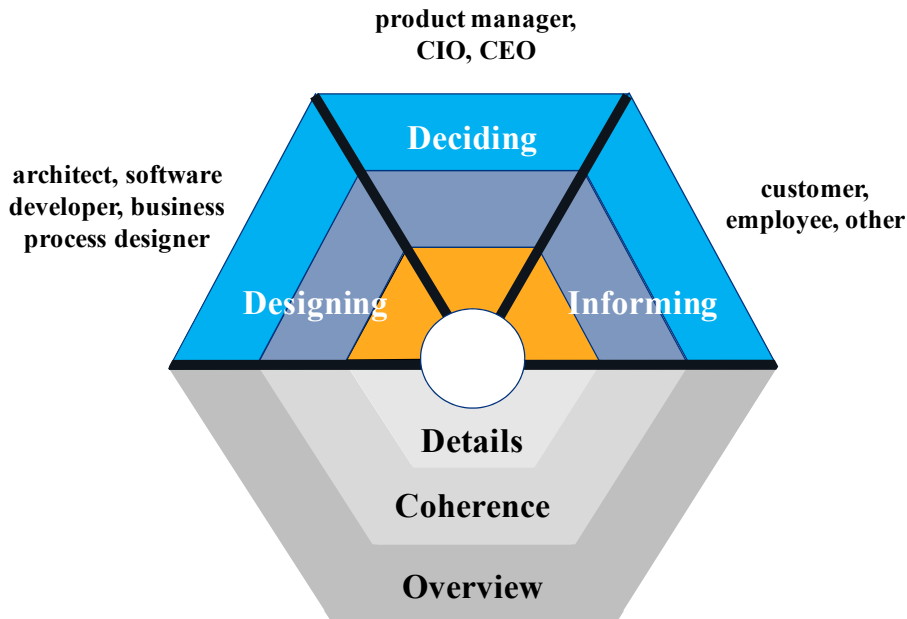


Figure 18: Classification framework for EA concerns and viewpoints [St04]

3.1.5 Summary

The analysis of current publications in the EA management field that include a stakeholder notion has shown a variety of approaches. Parts of the publications could be mapped to all focus areas of the stakeholder management framework except for one focus area. None of the publications made references concerning *stakeholder aware strategies*.

The most wide reaching approach was found in TOGAF. It consists of a stakeholder management process, the integration of stakeholders into the ADM, the establishment of a communication plan, and the introduction of an EA management function. The ADM assumes a central role in TOGAF as well as in TOGAF's stakeholder management approach. In the phase architecture vision, the stakeholder management process is triggered. The resulting stakeholder matrix is updated during subsequent phases. The communication plan is established in the same phase and used for the communication with stakeholders throughout the early phases of the ADM. Furthermore, the requirements of stakeholders are managed during the ADM. To establish an EA management function TOGAF suggest to use the ADM. Overall, the stakeholder management in TOGAF was ascertained to be instrumental in nature.

The NASCIO approach is focusing on architecture governance with specific emphasis on how to establish an EA management function. Instead of providing organizational roles, architecture roles are provided that can then be mapped to the respective organization. A distinction is made between stakeholders that work directly with architecture elements and those that only contribute to this work.

The approach developed by van der Raadt et al. identifies the concerns of different stakeholders. The developed stakeholder model has two dimensions, namely architectural layer and organization level. The central idea is that the concern of a stakeholder is influenced by both his or her role and his or her position in the organization hierarchy. Furthermore, typical con-

cerns are described. The stakeholder expectation analysis performed by van der Raadt et al. describes a way to measure the result quality of interactions through stakeholder interviews.

The approach developed by Steen et al. is describing a framework to categorize concerns and viewpoints. The central idea is that a concern or viewpoint supports a given purpose of designing, deciding, or informing and that different stakeholder roles are interested only in specific purposes.

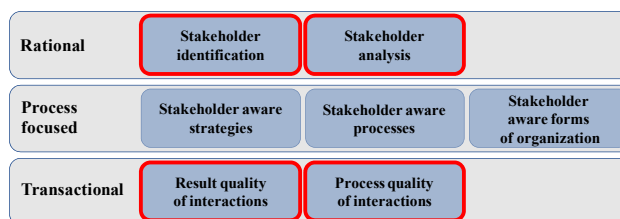
In summary the analyzed publications provide a mix of contributions to stakeholder management. A common lack is the clear definition of stakeholder roles. All approaches include references to organizational stakeholder roles but none defines these roles in a coherent way. Finally, the relation of mentioned stakeholder roles to concerns or viewpoints is not performed systematically. Therefore the development of a set of reusable roles needs to be performed in order to achieve the objective of this thesis. This is the case, because a stakeholder-specific approach based on patterns requires the selection of concerns by stakeholders. With a reusable role set, the concerns can then be pre-selected in order to ease the pattern-based EA management design process.

3.2 Stakeholder Notion in Related Fields

The development of stakeholder notion approaches is not confined to the field of EA management. Especially in project management the stakeholder notion is discussed in a number of publications [AcVo08]. Furthermore, the responsibilities of different stakeholders in the IT field are extensively discussed in the COBIT Framework, which is focused on IT governance. In order to include these approaches in the design of the stakeholder-specific approach, this section discusses the PMBOK as a major project management publication and the COBIT framework.

3.2.1 Stakeholder Notion in the PMBOK

The Project Management Body of Knowledge (PMBOK) currently available in its fourth edition is a standard for project management published by the Project Management Institute (PMI) [Pr08]. It is recognized by the American National



Standards Institute (ANSI) as national standard ANSI/PMI 99-001-2008. In summary, the PMBOK is providing guidelines for managing individual projects, is defining project management and related concepts, and is describing the project management lifecycle and related processes [Pr08]. With respect to stakeholder management, the central information included in the PMBOK is located in the chapter on *project communications management*. With respect to the stakeholder management framework, the approach described in the PMBOK is mapped to the *rational* and the *transactional* level.

The management of project communications is concerned with the generation, collection, and distribution of project information. The chapter contains processes that support this task and describes five processes of which three are relevant for this thesis, namely *identify stakehold-*

ers, plan communications, and manage stakeholder expectations. Furthermore, the chapter on project life cycle and organization provides some basic information on the stakeholder concept. The following sections summarize and analyze the stakeholder management information included in the PMBOK.

3.2.1.1 Basic Information and Definition

The PMBOK includes a definition of stakeholders and a stakeholder model, which are mapped to the focus area *stakeholder identification* of the *rational* level. Stakeholder are defined in the PMBOK as “persons or organizations (e.g. customers, sponsors, the performing organization, or the public), who are actively involved in the project or whose interest may be positively or negatively affected by the performance or completion of the project” [Pr08]. Furthermore, it is noted that “stakeholders may also exert influence over the project, its deliverables, and the project team members” [Pr08]. This definition is a broad definition and slightly reminiscent of the Freeman definition through the *affected by* clause.

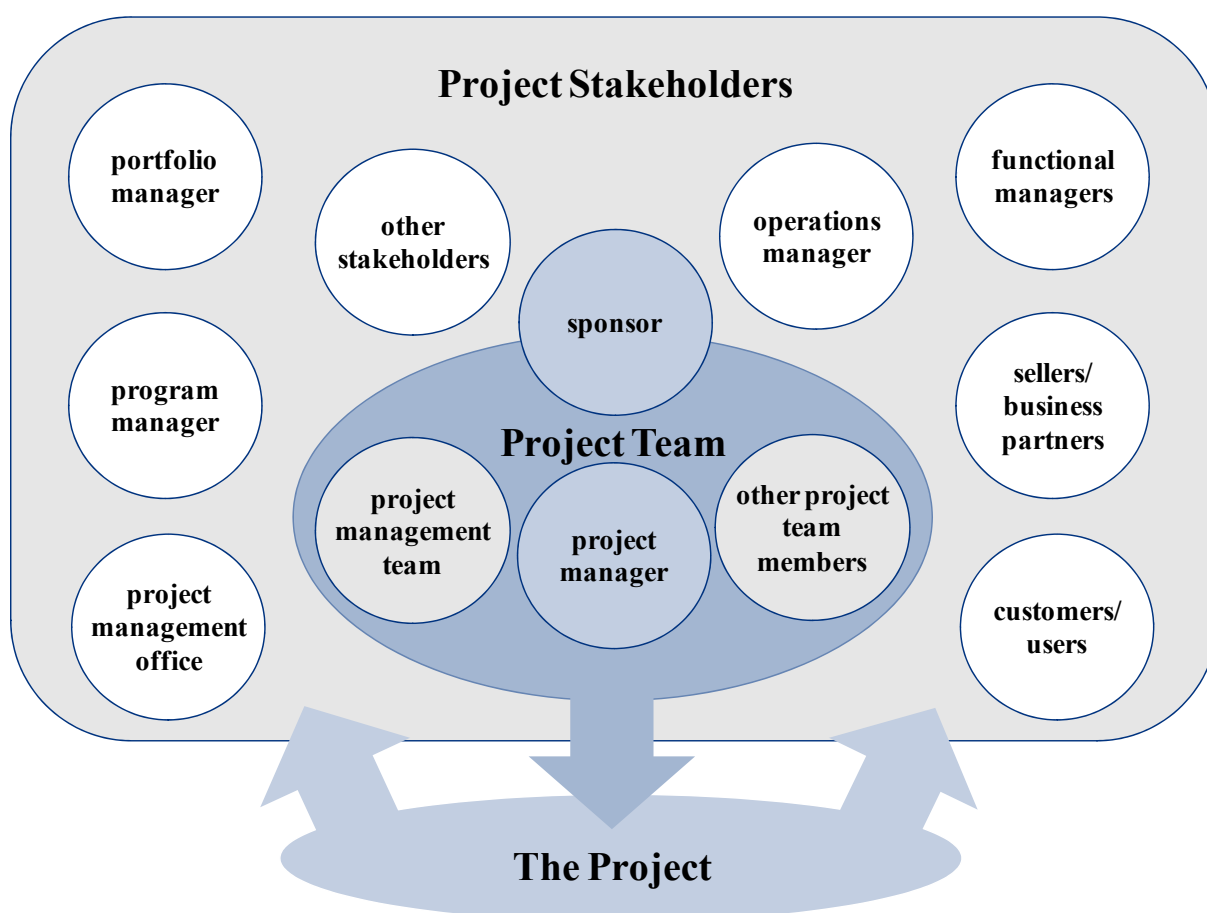


Figure 19: Relationship between stakeholders and the project [Pr08]

The PMBOK recognizes the dynamics of stakeholder management and its continuous character by stating that stakeholders have different levels of responsibility and authority and that these levels may change over the course of the project. Furthermore, stakeholders may perceive a project as positive or negative in terms of its results. In order to cope with these poten-

tially conflicting interests, the PMBOK advises to manage the stakeholder expectations in order to balance the interests of the different stakeholders.

In order to visualize the relationship between project stakeholder roles both inside and outside the project team, a stakeholder model is provided which is visualized in Figure 19. The roles presented therein are further described in terms of their activities and responsibilities in the project. Since the roles are not relevant in the EA management context, the descriptions are not presented and discussed here.

3.2.1.2 Identify Stakeholders

The PMBOK includes a process to identify and analyze stakeholders, which is mapped to the focus areas *stakeholder identification* and *stakeholder analysis* of the *rational* level. Based on the analysis, strategies for individual stakeholder are defined. Since these strategies are strategies of individual stakeholders and not the strategies of the project, this aspect is also mapped to the focus area of *stakeholder analysis*.

The process *identify stakeholders* is concerned with the identification and analysis of project stakeholders. The identification of stakeholders described in the PMBOK is carried out in a larger project context. Therefore, it is advised to consider the stakeholders that are mentioned in or can be derived of the project charter. Furthermore, the procurement documents have to be analyzed. According to PMBOK key project stakeholders can be identified, if the project itself is the result of a procurement activity or established based on a contract. In either case, key stakeholders are the parties of the underlying contracts. Another source of stakeholders could be the stakeholder registers of past projects with similar character.

The actual stakeholder identification and analysis is carried out in three steps. In the first step, all potential stakeholders are identified and relevant information is gathered. This information includes the stakeholder's role and department, their interest and knowledge level, as well as their expectations and influence level. The PMBOK notes that key stakeholders are usually easy to identify. A key stakeholder is said to be "anyone in decision-making or management role who is impacted by the project outcome, such as the sponsor, the project manager, and the primary customer" [Pr08]. Therefore, this stakeholder approach can be considered to be of instrumental nature, since it ranks stakeholders by their decision power into key stakeholders and other stakeholders. In order to identify the other stakeholders, previously identified stakeholders are interviewed concerning other stakeholders they can think of. These interviews continue, until no new stakeholders are identified anymore. In the second step, stakeholders are classified according to the established information. The logic behind the classification is that in large stakeholder communities, the communication effort should be focused on key stakeholders and their expectations. As models for stakeholder classification, stakeholder grids with the dimensions power & interest, power & influence, as well as influence & interest are suggested. Such a grid is displayed in Figure 14. Furthermore, a salience model is proposed that is identical to the stakeholder salience model proposed by Mitchell et al. [Mi97]. This model is displayed in Figure 4. As a third step, the PMBOK recommends to predict how key stakeholders will react or respond in different situations that will occur during the project [Pr08]. Then measures can be planned that enhance the stakeholder's support for the project in these situations. However, no method is supplied to perform this analysis. After

performing the identification and analysis, experts are to be consulted in order to validate the results. These meetings, either face-to-face or in panel format, should include inter alia senior management, identified key stakeholders, and project managers of past projects in the same area.

The output of the stakeholder identification is a stakeholder register that contains the relevant information gathered in the process. It contains information about the identity of the stakeholders, e.g. name, organizational role, project role, location, and contact information. Furthermore, the information gathered in the analysis is recorded such as the major requirements and expectations, the potential influence, and the interest in specific project phases. If a classification has been performed this information is documented as well. Examples for classes are internal and external or the categories derived from the power & interest grid.

For the key stakeholders a further document is compiled, that has a more strategic focus and is called stakeholder analysis matrix. To construct this matrix, information from the stakeholder register is supplemented with strategies to gain the support of stakeholders or to reduce obstacles [Pr08]. As a note of caution, the PMBOK states that some information of the stakeholder analysis matrix should not be publically available. Therefore, it is decided by the project manager which parts are made public in which detail.

3.2.1.3 Plan Communications

The PMBOK includes the process *plan communications* to prepare communications with stakeholders, which is mapped to the focus area *process quality of interactions* on the *transactional* level. In this process, the information needs of project stakeholders are determined and the suitable communication methods are selected for each stakeholder. The ultimate goal is to design the communication with stakeholders both effective and efficient. In this context, *effective* means that “the information is provided in the right format, at the right time and with the right impact” [Pr08]. Efficiency in terms of communication refers to only providing required information. While the communications plan is established early in the project, it should be reviewed continually during the project. According to the PMBOK, a missing communication plan can result in delays in message delivery, the disclosure of confidential information, and stakeholders being excluded from the information flow.

Key tasks in this process are the analysis of communication requirements, as well as the selection of the communication technologies and methods. In analyzing the communication requirements, the key criterion is the value of the information versus the cost of communication. Project resources related to the communication effort are only be expended for two reasons. First, when the communication with the stakeholder increases the chances of successfully concluding the project. Second, when the successful conclusion of the project is endangered by not communicating with the stakeholder. As input to determine the communication requirements the stakeholder register and organizational information, e.g. organizational charts and department responsibilities, are used. When selecting the communication technology, several factors influence the choice. First, the existing technology limits the possibilities available for the project team. Second, Similar considerations hold for the skills of the project team members to use available technologies. Third, the set up of the project team, e.g. as a virtual team, influences the selection. In general, the information can be presented in a variety

of ways ranging from simple written statements to complex reports and from face-to-face meetings to large audiences. Concerning the choice of a communication method, the PMBOK distinguishes three types of methods:

- Interactive communication – the direct, multidirectional communication between the project team and stakeholders
- Push communication – a directed communication, where information is simply sent out to recipients
- Pull communication – the offering of communication materials, e.g. intranet sites, to stakeholders

These three decisions on requirements, technology, and methods of communication are documented in a detailed communications management plan. This plan contains further information concerning e.g. the confidentiality of information, a glossary of terminology, and person responsible for communicating the information. Furthermore, guidelines and templates, as well as the use of software can be documented there.

3.2.1.4 Manage Stakeholder Expectations

The PMBOK includes the process *manage stakeholder expectations* to execute the communications plan and to proactively deal with stakeholder concerns. This process is therefore mapped to the focus areas *process quality of interactions* and *result quality of interactions* of the *transactional* level. When the communications plan is executed, the expectations of stakeholders are considered at all times. This involves the active communication of achievements, the clarification of identified issues, and the anticipation of future conflicts in the areas of interest of the respective stakeholders. The central tools to this process from a stakeholder perspective are the issue log and the change log. In the former, action items are compiled, that are not significant enough to merit a formal project activity. By documenting issues in this way a clear and common understanding of the topic by all participants is fostered. The list can be sorted by urgency and importance. Furthermore, an owner is assigned to each item and a closure date is set. In the change log all changes that occur within a project are documented. These changes can then be communicated to the appropriate stakeholders. The success of this process relies largely on the interpersonal skills of the project manager. The focus lies on the establishment of trust between the project team and stakeholders. This allows the project team to overcome resistance to change on the stakeholder side.

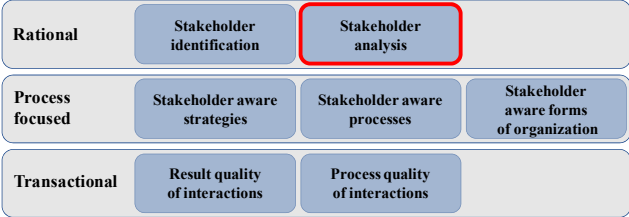
3.2.1.5 Summary

The PMBOK supplies a comprehensive approach to stakeholder management on the rational and on the transactional level that is relevant to this thesis. The relevance stems on the one hand from the fact that EA management initiatives sometimes start out in the form of projects. On the other hand, the processes described in the PMBOK are largely transferable to any stakeholder management approach since they rely only in parts on the project context. Furthermore, in the context of EA management, projects are used to drive the organizational change and to change the EA in order to reach next transformation architecture. Examples of such projects are described Chapter 4 in connection with the conduction of expert interviews.

However, some remarks have to be made with respect to the presented content. First of all, the concept of key stakeholder is not precisely defined. It is stated, that key stakeholders can be identified by looking at the parties of underlying contracts. Furthermore, the classification of stakeholders should yield more key stakeholders. With the latter, the problem exists that the measures used, such as power and interest, contain two ranges high and low. Since there is no definition concerning the meaning of high and low, or the cut-off point between the two the process of selecting key stakeholders is subjectively biased. The same problem was found in TOGAF’s stakeholder management. Both approaches share a power & interest grid, which is referred to as Stakeholder Power Grid in TOGAF (cf. Section 3.1.1.1.3).

3.2.2 Stakeholder Notion in COBIT

The Control Objectives for Information and related Technology (COBIT) [IT07] framework is an approach to IT governance developed by the IT Governance Institute (ITGI).⁷ It is a consensus of parts that aims to provide an authoritative



and internationally accepted IT governance framework. With respect to the objective of this thesis, COBIT includes a comprehensive set of role descriptions. Therefore, it is mapped to the focus area of *stakeholder analysis* on the *rational* level.

COBIT is organized in four domains that represent the IT management tasks of plan, built, run, and monitor. These domains are referred to as *Plan and Organize (PO)*, *Acquire and Implement (AI)*, *Deliver and Support (DS)*, and *Monitor and Evaluate (ME)*. Within these domains a total number of 34 processes are described. For each of these processes COBIT provides a RACI-chart. This chart contains roles⁸, activities, and the assignment of roles to activities with the attributes responsible, accountable, consulted, or informed (RACI). The person responsible for an activity has to ensure its successful completion. The person accountable for an activity has the authority to approve its execution. The assignment in the RACI-chart therefore shows which role in the framework is concerned with which activities and how strong the concern is. An exemplary RACI chart is displayed in Figure 20.

⁷ See <http://www.itgi.org>.

⁸ COBIT uses the term *function*. This is considered to be equivalent to the concept of *role*. In order to keep the terminology consistent across this thesis, the term *role* is used the following.

RACI chart	Roles					
	CEO	CFO	Business executive	CIO	Chief architect	..
Activities						
Create and maintain corporate/enterprise information model		C	I	A	R	
Maintain the program portfolio	A	R	R	R		
Assess IT operational benefits of proposed solutions		I	R	A/R	I	

Figure 20: Exemplary COBIT RACI chart [IT07]

Overall, 18 roles are included in the COBIT framework and some are briefly described in the glossary. However the focus of COBIT is on the collaboration of different roles in the context of IT governance, whereas the focus of this thesis is on roles and their concerns in the context of EA management. Therefore, the COBIT roles were analyzed in respect to the activities they are *responsible* for. The resulting activities were then evaluated concerning their EA management relevance. The roles, which could not be related to any relevant activities, are not further discussed in this thesis. An example of the resulting mapping of 13 roles is shown in Table 8, while the full table is located in Appendix F. In order to allow for traceability of the activities, the domain and the process are supplied for each activity. In some cases the activities can only be understood in their context. In these cases, the required contextual information is supplied in square brackets.

Role	Activities	Domain	Process
CEO	Establish executive and board oversight and facilitation over IT activities	ME	4
	Review, endorse, align and communicate IT performance, IT strategy, resource and risk management with business strategy	ME	4
	Obtain periodic independent assessment of performance and compliance with policies, standards and procedures	ME	4

CFO	Maintain the program portfolio	PO	5
	Determine risk management alignment (e.g. assess risk)	PO	9
	Establish the monitoring approach [for IT performance]	ME	1
Business executive	Identify critical dependencies [between business and IT] and current performance [of IT]	PO	1
	Maintain the program portfolio	PO	5
	Assess IT operational benefits of proposed solutions	AI	1
	Report performance [of IT]	ME	1

Table 8: Example COBIT roles and activities in the EA management context [IT07]

In summary, COBIT provides a mapping from roles to activities for a wide range of IT subjects. When evaluating these activities, only a few could be related to the context of EA management. Nonetheless, the mapped activities provide valuable insights into the concerns of stakeholder roles from both business and IT.

3.2.3 Summary

The analysis of publications in related fields included one publication from project management literature and one from IT governance. The project management publication, the PMBOK, provided a comprehensive stakeholder management approach focusing on the *rational* level and on the *transactional* level. The *process focused* level was not discussed in the publication. The reason for this lies in the focus of the PMBOK on project management. Overall, the PMBOK provides a stakeholder model and a process to identify stakeholders. The later includes methods for stakeholder analysis and recommends the creation of stakeholder strategies for key stakeholders. The communication plan is used to manage the communication with the stakeholders. In the chapter on managing stakeholder expectations logs are described to ensure stakeholder concerns are addressed and that stakeholder conflicts are identified before they occur. The contribution of the IT governance publication, the COBIT framework, was mapped to the focus area of *stakeholder analysis* on the *rational* level. While other analyzed publications are containing approaches to identify stakeholders, COBIT provides an exemplary set of roles and activities. The activities that are relevant to the EA management context and their relationships to roles were extracted from the framework. Thereby, they can be utilized in order to relate roles to EAMPC concerns in Section 4.2.

3.3 Findings

In summary, the publications analyzed contain aspects of all focus areas of the stakeholder management framework except the focus area *stakeholder aware strategies* on the *process focused* level. A possible reason for this is that the stakeholder management framework was developed for organizations where the development and publication of strategies is more

common than for internal functions like the EA management function. Nonetheless, it might be worthwhile to contemplate a stakeholder aware strategy for the EA management function. As a starting point to defining such a strategy, the approach used by van der Raadt et al. could be used to establish the expectations of relevant stakeholders (cf. Section 3.1.3). The combined findings of the analysis are displayed in Figure 21. Subsequently, the contributions to the individual focus areas are described. The roles discovered in the publications are not further discussed here, as a set of roles is constructed in Section 4.2.2.

3.3.1 Stakeholder Identification

Concerning the focus area *stakeholder identification*, the analyzed publications contain three different types of contributions. These types are methods to identify stakeholders, stakeholder models, and stakeholder definitions. Concerning the first type, three different methods were discovered. The first method is described in TOGAF and involves a brainstorming session guided by a list of questions. The second method is described in the PMBOK. It starts with an analysis of the documentation of past project and other related documents, e.g. the project charter or organizational charts. The third method is also described in the PMBOK and requires that some stakeholders have already been identified. This can be achieved by the re-searching documents or by identifying sponsors and other influential stakeholders. These stakeholders are then asked to name further stakeholders during stakeholder interviews. The interviews are then conducted with named stakeholder. These steps are repeated until no more stakeholders are discovered. In a last step, the resulting list of stakeholders is validated by experts. Concerning the second type of contributions, the stakeholder models, three models are contained in the publications. The TOGAF stakeholder model consists of five categories with four internal categories and one external category. The model provided by van der Raadt et al. in turn was purely internal. It categorizes stakeholders by their organizational level and by their interest in architecture layers. Both of these models exclude members of the EA management function from their consideration. In contrast, the stakeholder model described in the PMBOK includes the roles in the project team. Concerning the third type of contributions, the stakeholder definitions, three definitions were discovered. The definitions provided in the PMBOK and in TOGAF are broad definitions, while van der Raadt et al. use a narrow definition.

3.3.2 Stakeholder Analysis

Concerning the focus area of *stakeholder analysis* the analyzed publications contain three different types of contributions. These types are methods to analyze stakeholders, description of stakeholder roles, and a method to analyze concerns. Two different methods were discovered for the first type: Both the approach in TOGAF and in the PMBOK include a ranking in order to differentiate more important *key stakeholders* from other stakeholders. Both approaches provide lists with questions to analyze the stakeholders and recommend storing the result in stakeholder documents. The PMBOK further recommends defining strategies for winning the support of key stakeholders. While in TOGAF the definition of viewpoints for stakeholders is mentioned. Concerning the second type, two different role sets were found. Van der Raadt et al. provide a brief description for each role and its relation to architecture layers. In the COBIT framework roles are described concerning their exemplary activities in

the IT governance context. The activities that are relevant to EA management and their mapping to roles can therefore be used in this thesis. Finally, Steen et al. provide a categorization for EA concerns and viewpoints based on the purpose. Furthermore, exemplary stakeholder roles are assigned to the different purposes.

3.3.3 Stakeholder Aware Processes

Concerning the focus area of *stakeholder aware processes* in the analyzed publications only TOGAF contains a contribution. In TOGAF's ADM, stakeholders are systematically integrated into all phases of the process. In the early phases of the project, the sponsors, the project team, and the stakeholders of the project are identified. Furthermore, the communication with stakeholders is planned. In the phases that design the different architecture layers the concerns of the stakeholders are addressed and adequate viewpoints for all stakeholders are created. In the implementation phases, the prioritization of projects is performed together with stakeholders. Furthermore, their training requirements are considered. Finally, when changes are requested, the decision to start a new ADM cycle is based on the number of affected stakeholders.

3.3.4 Stakeholder Aware Forms of Organization

Concerning the focus area of *stakeholder aware forms of organization* the analyzed publications contain two descriptions of EA management governance. In the TOGAF approach an organizational structure is proposed and a number of general activities for the introduction of an EA management function are mentioned. Furthermore, the composition of the architecture board as a representative body for stakeholders is described. The NASCIO EADT presents a set of architecture roles and their interaction in EA management. In contrast to approaches that rely on upfront stakeholder identification, the EADT focuses on finding members of the organization, who take on the architecture roles.

3.3.5 Result Quality of Interactions

Concerning the focus area of *stakeholder analysis* the analyzed publications contain two different types of contributions. These types are approaches for handling stakeholder concerns and an approach to determine stakeholder expectations regarding the EA management function. With respect to the first type, the requirements management in TOGAF serves as a central register throughout the ADM. The contained requirements and their priorities are only updated in cooperation with stakeholders. Furthermore the connection of requirements to stakeholders is maintained. Therefore, the EA project team always knows who is affected by changes and where possible conflicts of interest could arise. In the PMBOK the same functionality is provided by the issue log and the change log. Again, the communication of changes to stakeholders is ensured. With respect to the second type, van der Raadt et al. researched the expectations of stakeholders towards the EA management function. They used a series of interviews in order to establish the benefits that stakeholders expected from such a function. Thereby, common values are established for four different stakeholder roles.

3.3.6 Process Quality of Interactions

Concerning the focus area of *process quality of interactions* the analyzed publications contain approaches to establish and execute communication plans. In TOGAF, the communication plan is only described briefly. It is developed in the first phase of the ADM and then used to communicate with stakeholders in subsequent phases. In the PMBOK, the development of the communication plan is described in detail with respect to communication requirements, methods, and technology. In both TOGAF and the PMBOK, the results of the stakeholder analysis serve as input for the development of the communication plan.

The combined findings are displayed and ordered by the focus area in Table 9.

Focus area	Identified contributions
Stakeholder identification	<ul style="list-style-type: none"> • Stakeholder definition • Methods to identify stakeholders • Stakeholder models
Stakeholder analysis	<ul style="list-style-type: none"> • Methods to analyze stakeholders • Description of stakeholder roles • Method to analyze concerns
Stakeholder aware processes	<ul style="list-style-type: none"> • Inclusion of stakeholders into the ADM
Stakeholder aware forms of organization	<ul style="list-style-type: none"> • Descriptions of EA management governance
Result quality of interactions	<ul style="list-style-type: none"> • Approaches to handle stakeholder concerns • Approach to determine stakeholder expectations regarding the EA management function
Process quality of interactions	<ul style="list-style-type: none"> • Methods to design a communication plan • Methods to execute a communication plan

Table 9: Findings by focus area of the stakeholder management framework

	Rational level		Process focused level			Transactional level	
TOGAF	Stakeholder identification	Stakeholder analysis	Stakeholder aware strategies	Stakeholders aware processes	Stakeholder aware forms of organization	Result quality of interactions	Process quality of interactions
NASCIO	Stakeholder management		Stakeholder integration into the ADM	Establishing an EA management function	EA management governance	Requirements management	Communication plan
vander Raadt et al.	Stakeholder model	Description of concerns				Stakeholder benefit analysis	
Steen et al.		Description of concerns					
PMBOK	Identify stakeholders						Communication plan
COBIT	Stakeholder model					Manage stakeholder expectations	
		Roles and activities					

Figure 21: Complete findings from the analysis of stakeholder notion publications

4 Relating EA Stakeholders to EA Concerns via Roles

In order to leverage the EA management knowledge contained in the EAMPC, a connection between the pattern-based approach and the respective EA stakeholders has to be established. As argued in Section 2.3.1 organizational roles provide a stable and reusable concept for this purpose. In Chapter 3 stakeholder roles found in literature are described. In order to gain additional insight into the management of stakeholders and stakeholder roles in a real-world setting, expert interviews were conducted with consultants of an international consultancy. Subsequently, the conduction and evaluation of these interviews is described. According to the mentioned stakeholder categories, a stakeholder model is designed. Furthermore, the personal opinion of the interviewees concerning stakeholder management is evaluated. Then, the stakeholder roles and their concerns as mentioned by the interviewees are combined with stakeholder roles from literature and related to EAMPC concerns. Finally, the chosen approach is summarized and discussed at the end of the chapter.

4.1 Conduction and Evaluation of Expert Interviews

The majority of the interviewed consultants belongs to the department of an international consultancy specialized in EA management. The objective of the interviews was to understand the project situation and to investigate which stakeholders have which concerns with respect to EA management. Furthermore, the consultants were questioned concerning their personal opinion on stakeholder management. The interviews resulted in twenty distinct case studies regarding EA projects in ten different organizations. This section describes the design of the field manual, the conduction of the interviews with the consultants and the findings derived from the expert interviews, apart from the description of concerns of the stakeholder roles. These descriptions are directly included into the construction of roles in Section 4.2.

4.1.1 Design of the Field Manual

The conduction of the interviews at a consultancy allowed the research of a large number of cases at different organizations. Since consultants are often involved in different projects at different companies, each interviewed consultant was questioned regarding his or her past three EA project involvements. The number of projects was limited to three in order not to prolong the interview time excessively, since all consultants participated on a voluntary basis. An average interview took approximately 60 minutes. In cases where the consultant was only able to supply a fewer number of EA projects, the interview time was shortened accordingly.

The expert interviews at the consultancy had three major objectives:

- To understand the purpose of the EA project in which the stakeholders were involved
- To understand the concerns stakeholders had with respect to the EA in this project
- To understand how the consultant himself perceives stakeholder management

In order to achieve these objectives, a field manual was designed to guide the interview. The field manual consisted of four general parts:

1. Introduction
2. Questions concerning each project
3. Questions concerning the stakeholders of each project
4. Questions concerning the interviewee's perception of stakeholder management

In the following paragraphs each part of the field manual is described briefly in the form of an example. The complete field manual is included in the appendix.

At the beginning of the interview, the interviewee was informed on the general outline of the interview, its objectives, and the privacy of the data recorded. Since the interview could involve sensitive information on client companies, the interviewee was assured that all data would be made anonymous before publication. The interviewee further was asked to agree to the interview being recorded. The introduction was completed by asking interviewees if any questions remained open on their side. Then, the interviewee was asked to name his or her past three EA projects, in order to guide the interview towards the next part.

In order to understand the specific project setting, the interviewee was then asked to supply basic information on each project. This included the name of the project, the name of the organization, and the duration of the project. Furthermore, the interviewee was asked to outline the phases of the project and its objectives. Finally, the interviewee was asked to describe his or her involvement in the project with respect to the phases of the project.

Then, the interviewee was asked to name the stakeholders of the project. For all stakeholders the interviewee was asked to supply information on their overall objectives, concerns, and EA elements they were interested in. The interviewer then tried to gather as much information as possible on each named stakeholder. This part of the interview ended when no more information concerning the stakeholders could be produced by the interviewee.

After the basic project data and the stakeholder information for all projects had been gathered, the last part of the interview was conducted. Therein, the interviewee was asked concerning his or her opinion on stakeholder management. This included a personal definition of the term *stakeholder* and his or her understanding of stakeholder importance. Finally, the interviewee was asked whether he or she has experienced any restrictions on the usage of stakeholder management in practice.

4.1.2 Conduction of the Interviews

The expert interviews were conducted between the 20th of July and the 21st of August 2009. An overall number of nine interviews were accomplished. Eight interviews were conducted with one interviewee, while one interview involved two interviewees at the same time. The reason for this was that they both participated in one project and time constraints allowed for no other solution. Eight of the interviews were conducted face-to-face and one interview was conducted via phone. All interviews were recorded using a laptop and recording software. Additional notes were taken during the interview on a form derived from the field manual. This ensured the adherence to and completion of the field manual.

The interviewees were all consultants of the international consultancy. Of the ten interviewees, seven belonged to the department that is specialized in EA management, including the head of this department. The remaining three consultants belonged to neighboring departments, which are involved in EA projects when their specialist knowledge is required. They contributed their expertise with respect to the consulted industry (e.g. telecommunications) or with respect to a specific subject (e.g. information management).

4.1.3 Findings

The following sections describe the analysis of the expert interviews conducted at the international consultancy. At first, the statistical questions concerning the experience and the number of projects are evaluated. Then, the projects are distinguished into four different types. These types are analyzed concerning the mentioned stakeholders. Then, a stakeholder model is build based on the stakeholder categories mentioned by the interviewees. The stakeholder roles and their mapping to the categories of the stakeholder models are briefly described. Finally, the personal perception of the interviewees concerning stakeholder management is analyzed.

4.1.3.1 Basic Facts and Figures

The interviewees were questioned with respect to their last three EA projects. Because of time constraints interviewee 9 supplied only two projects and interviewee 10 supplied only one project. Interviewee 4 was only willing to supply details on one project, because the interviewee felt unable to supply significant details on other projects. A total of four projects were described by two different interviewees. This resulted in a set of 21 distinct projects. One project was eliminated from the set because it had a research and development focus that was seen to be irrelevant to the given research. Therefore, a total of 20 projects form the basis of the further work. The twenty projects were conducted in ten different companies. In Figure 22 the consulted organizations, consisting of companies and government agencies, are assigned to sectors. In Figure 23 the number of projects is displayed by sector. Thereby, the importance of the telecommunications sector to the consultancy is shown. This sector alone accounts for half of the projects.

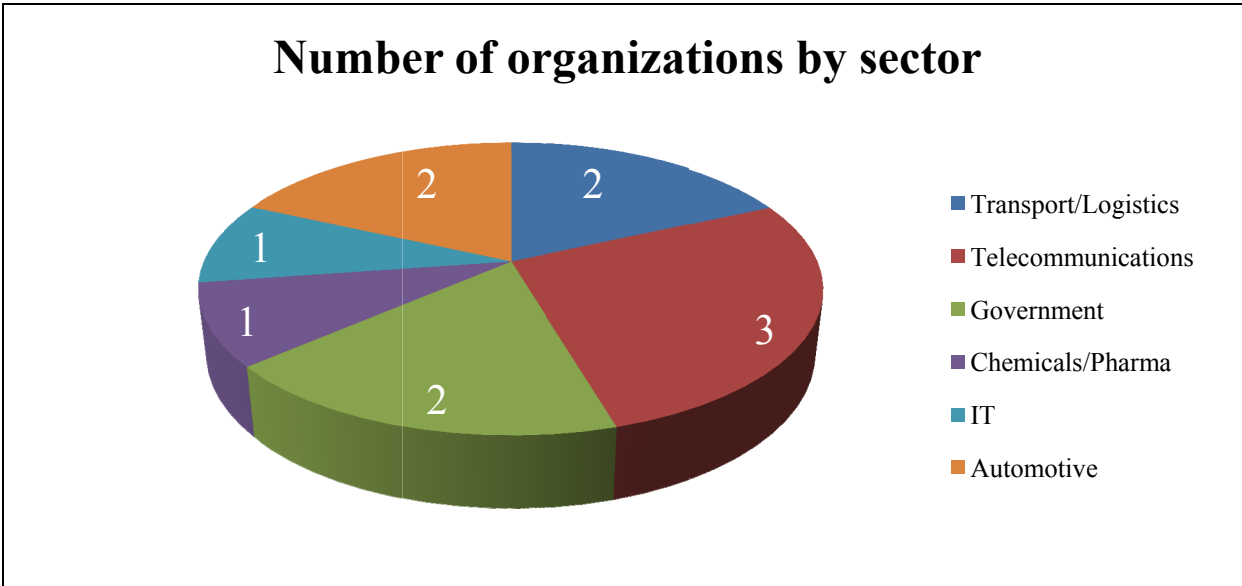


Figure 22: Number of organizations by sector

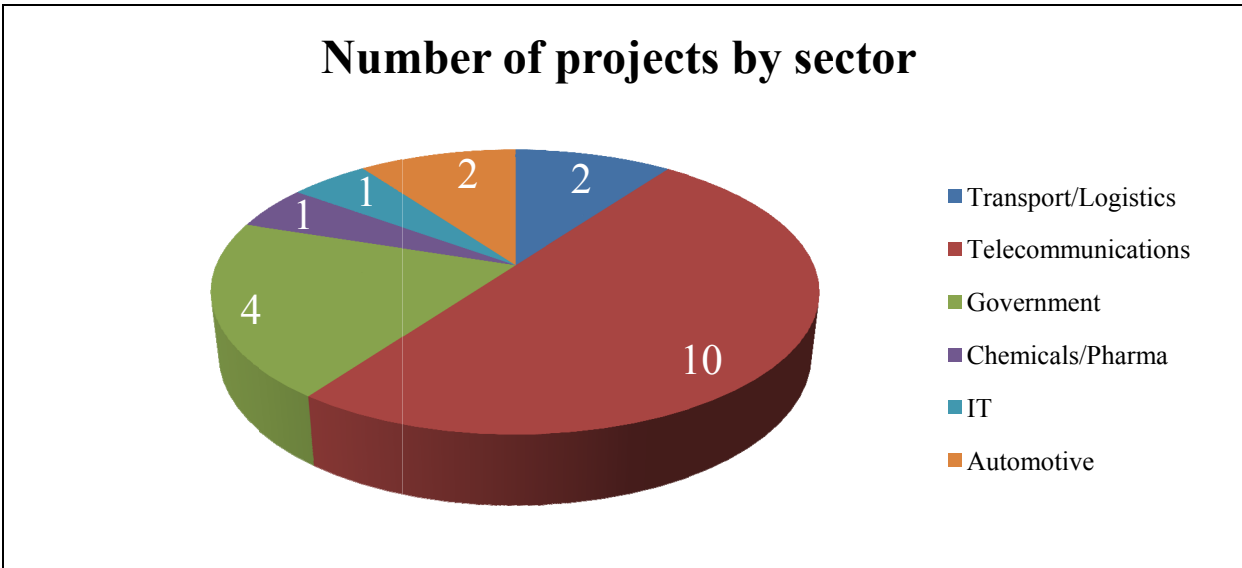


Figure 23: Number of projects by sector

4.1.3.2 Differentiation of Project Types

When the interviewees were questioned about their past three EA projects, a wide range of different projects were described. The following project types could be observed:

- Method development and communication:** Projects that were developing EA management methods, e.g. by adapting TOGAF to company specific requirements, or that focused on the communication of developed EA management methods.
- Data collection:** Projects that focused on the aggregation of data in order to obtain a clear picture of the current EA, e.g. by gathering information on all business applications.

- **Governance:** Projects that introduced new organizational structures or processes aimed at improving or introducing EA management, e.g. the creation of an architecture board.
- **Landscape optimization:** Projects that changed significant parts of the application landscape of an organization, e.g. by introducing common support business processes across divisions.

The difference between the types *method development and communication* and *governance* lies in the binding character of the latter. The projects of type *method development and communication* developed deliverables that had to be communicated to the organization and were not mandatory. In the case of projects of type *governance* however, the delivered processes or organizational structures had binding character. In Figure 24 the distribution of the projects by project types is displayed.

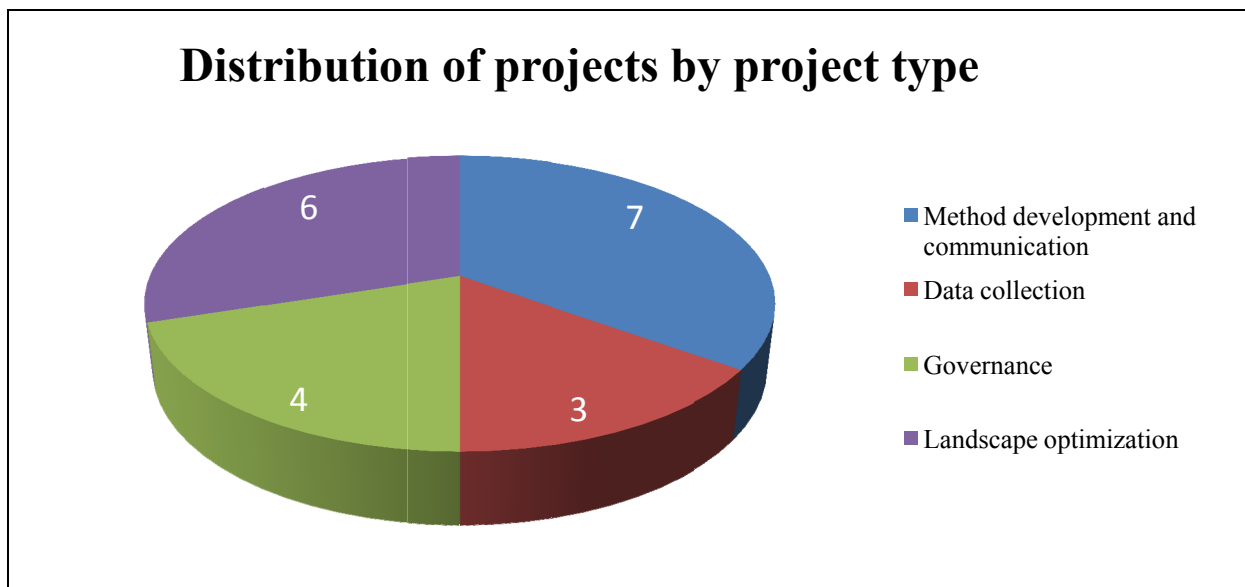


Figure 24: Distribution of projects by project type

When investigating the projects based on project types, different reasons for conducting the projects were given by interviewees. The reasons by project type are displayed in Table 10.

Project type	Reasons for conducting the project
Method development and communication	<ul style="list-style-type: none"> • Development of a company specific EA management approach • Support during introduction of an EA management function in the organization

Data collection	<ul style="list-style-type: none"> • Inventory of assets after company merger • Inventory of business systems for compliancy reasons • Inventory of business systems for identifying potential synergies
Governance	<ul style="list-style-type: none"> • Reorganization resulting in unclear responsibilities and the need for a new governance design • Increase of the adherence to standards • Design of binding standards
Landscape optimization	<ul style="list-style-type: none"> • Leveraging synergies through common business processes • Restructuring of organizational units • Need for integrated data across different divisions • Legacy IT landscape unable to support the business • Legacy IT landscape with growing operating costs

Table 10: Reasons for projects by project type

With respect to the main activities of the EA management function described in Section 2.2.2 a mapping of these activities to the project types can be established. The project type *data collection* is mapped to the *document EA* activity, since both deal with establishing a model of the current EA. The project types *method development and communication* and *governance* are both mapped to the *enforce EA* activity. This is the case, because both project types deal with the interaction of EA management with other enterprise management functions. The difference between the two project types is that the former communicated developed methods, while the latter was introducing mandatory processes and organizational structures. This reiterates that the organizational power of the EA management function with respect to its ability to enforce EA management can vary. Finally, the project type landscape optimization is mapped to all of the EA management function's activities. The reason for this is that the projects of this type, as described by the interviewees, included all of the activities from the envisioning of the target EA, via the documentation of the current EA to the transformation of the EA through planning, analysis, decision, and enforcement.

4.1.3.3 Observed Stakeholder Categories and Appropriate Stakeholder Model

In order to analyze the participation of stakeholders in the described projects a suitable stakeholder model had to be developed. As a starting point the TOGAF model⁹ was used, due to its simplistic design. It consists of only five categories, namely *corporate functions*, *end-user organization*, *project organization*, *system operations* and *external entities*. However, with respect to two aspects, the TOGAF model has to be adapted. First, it does not include a category for architecture roles, e.g. *enterprise architect*, *process architect*. Such a category is required, since these roles were often mentioned as stakeholders by the interviewees. With respect to the inclusion of architecture roles, the PMBOK¹⁰ introduces a stakeholder model that has two kinds of stakeholders – the project team and the project stakeholders. In the field of EA management this concept is also used by the NASCIO EADT¹¹, which distinguishes primary and supporting stakeholders. Second, the interviewees often described project situations where the cooperation between central corporate entities and federal business divisions was essential. With respect to the cooperation of central and federal units the TOGAF model could not be used to display this cooperation especially regarding local and corporate IT units. These two concepts, the existence of federal business divisions and the differentiation between the EA management function and EA stakeholders, were included into the TOGAF model. Therefore in the stakeholder model used in this thesis, the EA management function is at the center of the model, like the project team in the model provided by the PMBOK. This replaces the TOGAF category *project organization* which was used in TOGAF to categorize the stakeholders involved in the ADM project. The category *end-user organization* is remodeled to represent the divisions of an organization. Therefore, this category further includes the divisions' IT units and the division's EA management functions. The category *system operations* is renamed to *central IT* to stress the differences to the IT units of the divisions. Finally, the category *projects* is introduced for stakeholders of cross-category projects. The categories *corporate functions* and *external entities* remain unaltered. The resulting stakeholder model is displayed in Figure 25. Since a description of the categories is missing in TOGAF, all categories are described in Table 11.

Category	Description
EA management function	This category contains all stakeholder roles that are directly involved in the organization-wide EA management effort. This includes but is not limited to the roles <i>chief</i> or <i>enterprise architect</i> and architects that focus on specific layers, such as a <i>process architect</i> .

⁹ See Section 3.1.1.1.

¹⁰ See Section 3.2.1.1.

¹¹ See Section 3.1.2.

Corporate functions	This category contains all stakeholder roles that have an enterprise wide influence and therefore are not part of the categories <i>divisions</i> or <i>central IT</i> . This includes but is not limited to the roles <i>chief executive officer (CEO)</i> , <i>chief financial officer (CFO)</i> , and <i>chief information officer (CIO)</i> .
Central IT	This category contains all stakeholder roles that are involved in IT related work which is not specific to a single division. This includes but is not limited to the roles <i>application owner</i> and <i>IT demand manager</i> as far as their tasks are geared to supporting the entire organization.
External entities	This category contains all stakeholder roles that are external to the considered organization. This includes but is not limited to the role of an external <i>IT supplier</i> .
Projects	This category contains all stakeholder roles that are involved in projects that are relevant for EA management. This includes but is not limited to the role <i>project manager</i> .
Divisions	This category contains all business stakeholder roles that are occurring in the divisions of the organization. This includes but is not limited to the roles of <i>head of business division</i> , the <i>division information officer (DIO)</i> , and the <i>division financial officer (DFO)</i> .
Divisions' IT units	This category contains all stakeholder roles that are involved in the IT related work within a division. This includes but is not limited to the roles <i>application owner</i> and <i>IT demand manager</i> as far as their tasks are geared to supporting the division.
Divisions' EA management functions	This category contains all stakeholder roles that are directly involved in division-wide EA management efforts. This includes but is not limited to the roles <i>enterprise architect</i> and architects that focus on specific layers, such as an <i>infrastructure architect</i> .

Table 11: Categories of the developed stakeholder model

By introducing the category *divisions* according to the stakeholder descriptions provided in the interviews, the resulting model assumes that the organization has a divisional organizational structure. While the divisional organizational structure is the dominating structure for large enterprises [Pi08], the model should also support other organizational structures. Therefore, if the model is used in an organization without a divisional organizational structure, the categories *divisions*, *divisions' IT units*, and *divisions' EA management functions* can be replaced by the original TOGAF category of *end-user organization*. This category then describes all business stakeholder roles that are not part of the upper management of the *corporate functions* category.

With respect to the building of categories and the assignment of roles, some simplifications had to be performed. All architecture roles are assigned to the categories *EA management function* and *divisions' EA management functions* depending on the context they were mentioned in. This does not imply that such a function exists in each organization described by the interviewees. This was performed since it was often unclear where an architecture role was precisely located in the organization, e.g. in category *corporate functions* or *central IT*, or even both. Furthermore, the stakeholder model aims at establishing a differentiation between the EA management function and EA stakeholders which is addressed by assigning architecture roles to the EA management function category. The C-level executives of business divisions, namely *CIO*, *CFO*, and *CEO*, were grouped under the roles *division information officer (DIO)*, *division financial officer (DFO)*, and *head of business division* respectively. This was performed in order to differentiate these roles from the roles in the category *corporate functions*. This is consistent with the naming of roles in van der Raadt et al.'s approach.¹² The roles mentioned in the government projects differed from those mentioned in the industry projects. In order to keep the set of roles small the chairmen in government projects were classified as *CEO* and *head of business division* roles depending on their seniority. With respect to the category *projects* no assumption is made regarding the organizational scope of the project, i.e. whether the project affected all business divisions or only the central IT. In the stakeholder model all stakeholders from projects are summarized in this category.

When the stakeholder roles mentioned in the interviews are mapped to the stakeholder model categories according to these rules, some differences can be observed between the project types. While business roles were heavily involved in *landscape optimization* projects almost no stakeholder roles from business, i.e. the roles *CEO*, *head of business division*, *CFO*, *DFO*, or *business executive*, were mentioned in the other project types. While one business role, *business executive*, was mentioned in *method development and communications* projects, none were mentioned for the other two types. Either the role *CIO* or the role *enterprise architect* or *chief architect*, on both corporate and division level, were mentioned in interviews of all project types. Also external entities, in the form of *IT suppliers*, were mentioned for each project type. The stakeholder model with the described stakeholder roles from landscape optimization projects is displayed in Figure 26. The models for the other projects can be found in Appendix G.

¹² See Section 3.1.3.

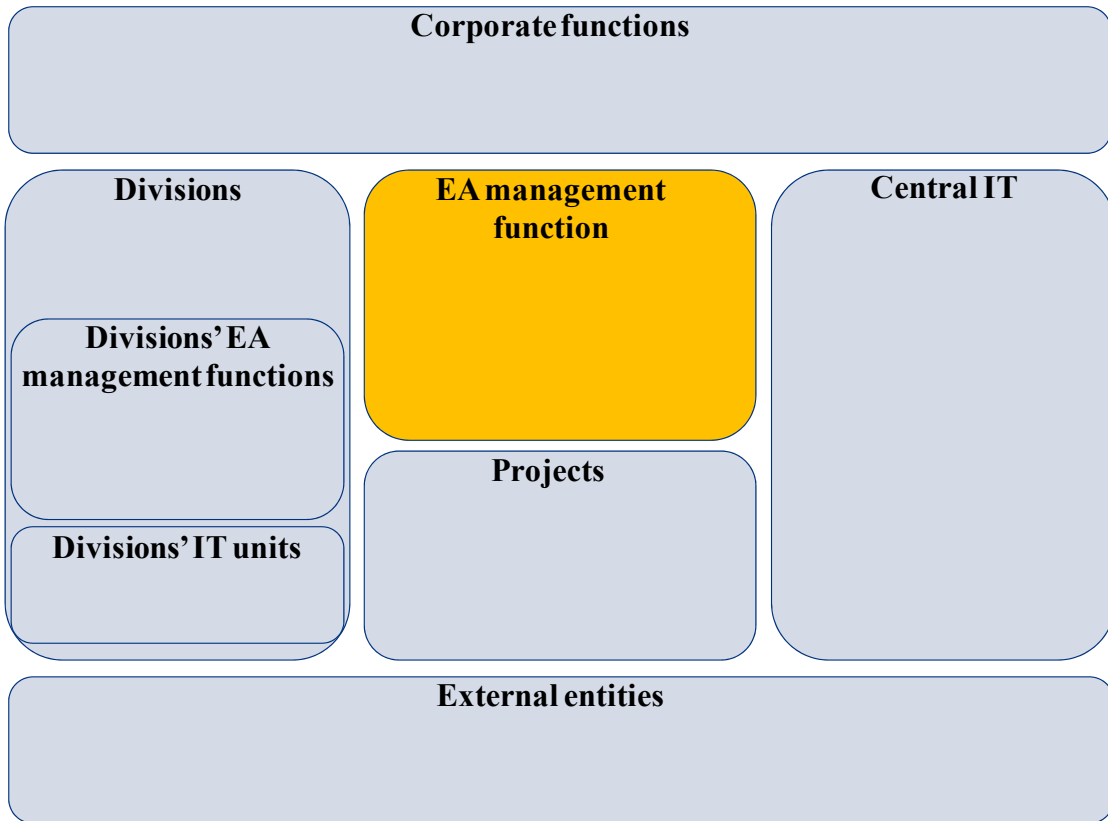


Figure 25: Stakeholder categories derived from expert interviews

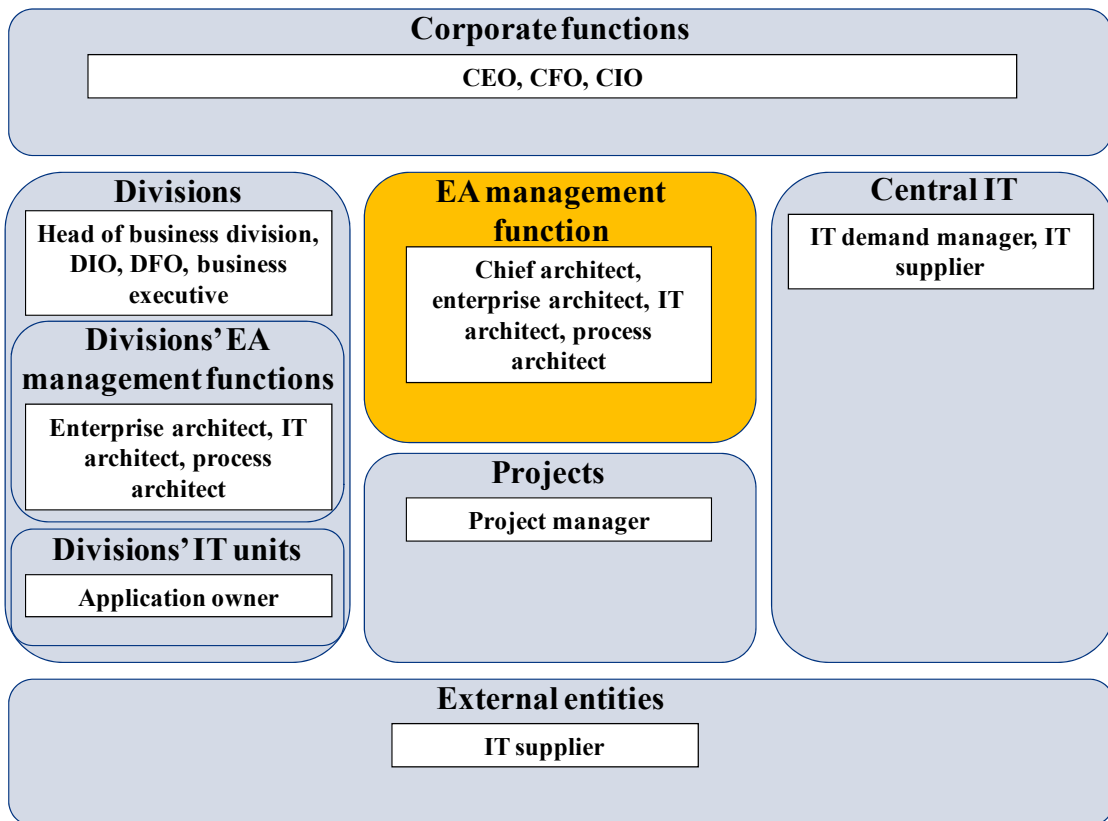


Figure 26: Stakeholder roles in landscape optimization projects mapped to stakeholder categories

4.1.3.4 Stakeholder Roles Mentioned in Interviews

The interviewees mentioned a number of roles when describing their projects. Although the limited number of projects does not allow for a valid quantitative assessment, an overview of the roles mentioned during the interviews is given in Table 12. In order to arrive at a general set of roles this table contains only roles that were mentioned at least twice. Furthermore, the categories the role was assigned to, as well as the number of times each role was assigned to each category are displayed. For example, the role *IT architect* was assigned two times to the category *EA management function* and four times to the category *Divisions' EA management functions*. Therefore, the role was mentioned six times overall.

Role	Corporate functions	Central IT	EA management function	Divisions	Divisions' IT units	Divisions' EA management functions	Projects	External entities	Number of times the role was mentioned
Chief/enterprise architect			10			5			15
CIO/DIO	7			4					11
Business executive	2			7					9
IT supplier		1						6	7
Project manager							6		6
IT architect			2			4			6
IT manager		3			1				4
Process architect			2			1			3
IT demand manager		3							3
Application owner		1			2				3
CFO/DFO	1			1					2
CEO/head of business division	1			1					2
Infrastructure architect			2						2

Table 12: Roles mentioned by the interviewees

In Table 12 the importance of the CIO/DIO role in the interviewee's projects is stressed. Furthermore, architecture roles, e.g. chief/enterprise architect, and IT architect, were often identified as stakeholders by the interviewees. Concerning the mentioned stakeholder roles, the interviewees were questioned with respect to the concerns of the roles and the EA elements the roles were interested in. Furthermore, interviewees were asked to describe the information that was supplied to the stakeholder roles or produced by them. However, the responses were quite diverse, ranging from detailed descriptions of project responsibilities of a role to rather

vague and generic descriptions. Moreover, not all roles were described in a fashion that supports the objectives of this thesis. For the roles emphasized in Table 12 a basic level of information on concerns could be gathered. Therefore, the descriptions of these roles as supplied by the interviewees are compared and integrated with the role descriptions from literature in Section 4.2.

4.1.3.5 Interviewee’s Perception of Stakeholder Management

At the end of the interview, the interviewees were asked six questions concerning their perception of stakeholder management. This part was answered by nine of the interviewees. In detail, the interviewees were asked:

1. How important is stakeholder management for your work? (ranging from very important to very unimportant)
2. What is your definition of the term *stakeholder*?
3. What makes one stakeholder more important than another stakeholder?
4. Which methods and tools have you already used to conduct stakeholder management?
5. How do you solve conflicts between stakeholders concerning a common goal?
6. Do you see limitations in using stakeholder management in your work?

With respect to the first question, eight interviewees answered that stakeholder management was *very important*, while one considered it as being *important* in the context of EA projects. The answers of the interviewees are visualized in Figure 27.

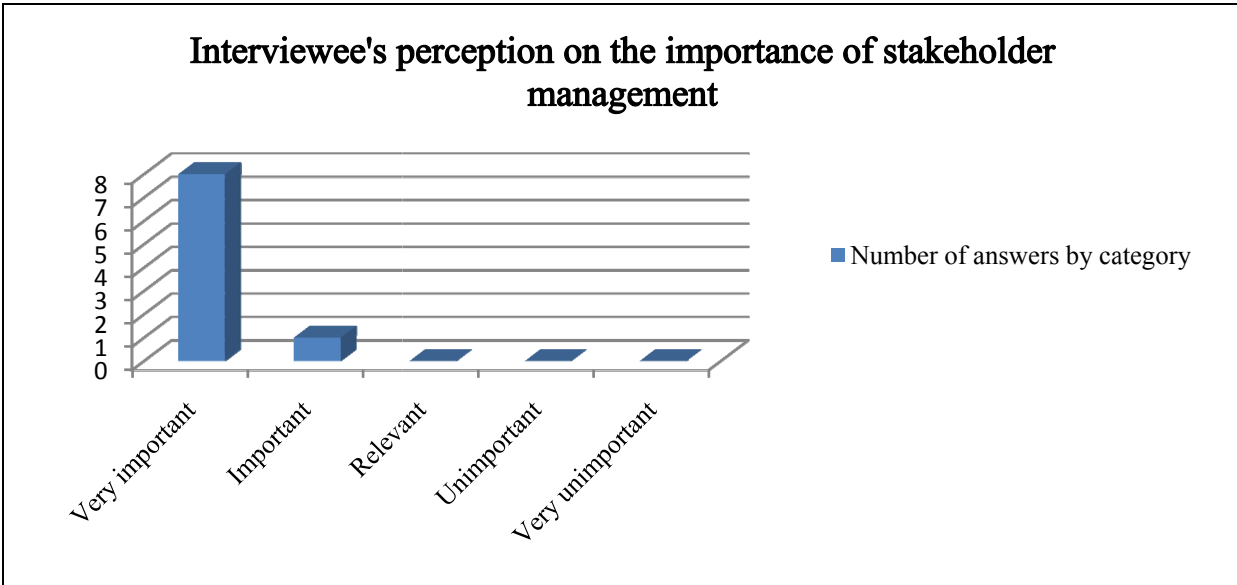


Figure 27: Interviewee's perception on the importance of stakeholder management

The second question resulted in different answers, where no two identical definitions were given. However, three general classes of definitions could be observed as displayed and explicated via an example in Table 13.

Class	Example	Number of definitions
Interested in	“Anybody with an interest in architecture work”	5
Affected by	“All individuals or groups, who are affected by the EA management approach”	3
General	“Anybody who has something to do with what you are doing”	1

Table 13: Classes of stakeholder definitions

With respect to the stakeholder definitions discussed in Section 2.1.2 the classes *interested in* and *general* are broad definitions, while *affected by* definitions are a form of claimant definitions. This is interesting because such a normative approach to stakeholder management was not expected in the EA management context as the approaches in literature were pointed to a purely instrumental understanding.

However, the next question showed that the normative approach was really only used by one interviewee. The third question concerned the importance of stakeholders. Nine interviewees mentioned attributes that they used for ranking stakeholders. Therefore, they were following an instrumental approach to stakeholder management. The attributes they used to rank stakeholders are summarized in Table 14. However, one interviewee stated that he would consider all stakeholders as being important, even those that have no power and are forced by their superiors to collaborate with the EA management function. This in turn is a characteristic of a normative approach to stakeholder management.

Attribute	Number of times mentioned
Decision power	4
Importance of input	2
Cost/benefit ratio of addressing the stakeholder’s concerns	2
Potential to threaten the project’s success	1

Table 14: Attributes of stakeholder importance

The attributes of stakeholder importance mentioned by the interviewees can be divided into the two general categories of *required support* and *potential threat*. The *required support* is evident in the attribute *importance of input* and the *cost/benefit ratio* as the latter implies that more benefit is gained from the stakeholder than the cost necessary to address his or her concerns. Therefore, if the support of the stakeholder is not required nothing can be gained from addressing the stakeholder's concerns. The *potential threat* category is evident in the *potential to threaten the project's success* attribute. Finally, the *decision power* attribute can be mapped to both categories as positive decisions (e.g. on a project's approval or budget) can provide *required support*, while negative decisions (e.g. the cancelation of project) pose a *potential threat* to the project.

When the interviewees were asked the fourth question, as to which methods and tools they had already used to conduct stakeholder management, TOGAF was named most often with a total of five interviewees mentioning it. Furthermore, one interviewee had used COBIT to clarify the roles and responsibilities of stakeholders in one project. Another interviewee used stakeholder interviews in order to identify more stakeholders. This method is also described in the PMBOK stakeholder approach analyzed in Section 3.2.1.2. In the project described by the interviewee, however, the importance of stakeholders was derived from the number of times they were mentioned by other stakeholders.

In question five, the interviewees were asked how they resolved conflicts between stakeholders. Several interviewees described that they would try to first talk to the parties involved in the conflict individually trying to find areas of agreement. Then, the conflicting parties would be brought together in a workshop environment in order to achieve a solution acceptable to all parties. Furthermore, interviewees described the advantage of making the concerns of stakeholders gained in stakeholder management transparent to all parties, thereby fostering common agreement. One interviewee directly referred to the ranking of stakeholders, claiming that in situations where joint decisions had to be made it was possible that a less important stakeholder would be overruled by more powerful stakeholders.

Finally, in question six the stakeholders were asked which limitations they saw for using stakeholder management in their work. Several interviewees mentioned the high effort involved with identifying, ranking, and analyzing stakeholders. One interviewee described it as challenging to keep up with changing stakeholder concerns after the initial analysis. Another interviewee said that the availability of the most powerful stakeholders was a major problem. These stakeholders would often have a busy schedule and therefore no time for lengthy interviews. Another interviewee mentioned that not all parts of the stakeholder analysis could be made publicly available. In the view of this interviewee, it was not acceptable for members of an organization to be ranked as *low power* stakeholder. Therefore, only selected parts of the analysis should be made public. Another consultant described a project, where the *power* attribute in stakeholder analysis was exchanged for the softer term *influence* in order to avoid this problem. The following limitations were mentioned by the interviewees:

- Effort to perform stakeholder identification and ranking
- Effort in accumulating information on stakeholder concerns

- Effort in keeping up-to-date with dynamic stakeholder concerns
- Access to high level stakeholders
- Issue of privacy of stakeholder analysis results

On the one hand, one interviewee concluded the interview by stating that stakeholder identification was easier in organizations with many organizational hierarchies, presumably for greater functional differentiation, while accessibility in such organizations for stakeholder analysis was limited. On the other hand, the interviewee continued, in organizations with flat hierarchies identification of stakeholders was difficult, while accessibility was relatively easier. However, this insight is probably influenced by the consultancy perspective of interviewee. This perspective and other limitations are discussed Section 4.3.

4.2 Designing the Relations of EA Stakeholder Roles to EAMPC Concerns

In order to utilize the EA management knowledge contained in the EAMPC in stakeholder management, the concerns of the EAMPC have to be related to EA stakeholder roles. Information on the concerns of the EA stakeholder roles was gathered in the expert interviews and during the literature analysis. In order to relate these concerns to EAMPC concerns, a suitable method is devised. Then, the information on concerns from the expert interviews and the literature analysis is described and integrated for each role. Finally, the role concerns are mapped to EAMPC concerns.

4.2.1 Method for Relating Role Concerns to EAMPC Concerns

The relation of role concerns from interviews and literature to EAMPC concerns is a difficult problem due to the different granularity of concerns on both sides. A concern is understood in this thesis as an “area of interest” [Th09], which is related to an organizational role through the tasks assigned to this role [Ai08b]. However, this definition places no restriction on the size of an *area of interest*. This was also experienced during the interviews as the size of concerns mentioned in relation to roles ranged from very general concerns, e.g. *the CIO was concerned with the alignment of business and IT*, to specific concerns, e.g. *the application owner was interested in the cost of business applications*. On the side, however, the size of concerns is not discussed in the EAMPC. The concerns of the EAMPC are represented in the form of a specific questions, e.g. “*How does the application landscape look like at a specific date?*” [Bu08]. With respect to the concerns described in the interviews and in literature, three different types of concerns were encountered in relation to stakeholders:

Not applicable: These concerns cannot be mapped to EAMPC concerns, because they describe general expectations towards the EA management function or its operation.

Specific: These concerns describe an area of interest similar in size to the area of interest described by EAMPC concerns. These concerns can therefore be related directly to EAMPC concerns.

General: These concerns describe an area of interest greater than typically described by an EAMPC concern. In order to address these concerns, several EAMPC concerns need to be combined.

In order to systematically relate role concerns to EAMPC concerns, a method has to be devised for *general* and *specific* concerns. *Not applicable* concerns are ignored because, although they are interesting in the context of stakeholder management, they are not supported by the EAMPC.

The first step for specific and general concerns is to attempt a mapping of the concern to the layers and cross functions of the EA management framework displayed Figure 7. This mapping provides a first overview of the scope of the described area of interest. Then, for *specific* concerns, a direct matching with an EAMPC concern is attempted. If no suitable EAMPC concern can be found, this is recorded. For *general* concerns, the EAMPC concerns that can be mapped to the same layers and cross-functions are analyzed. Finally, it is evaluated whether the gathered EAMPC concerns can be related to the *general* concern at hand.

The methods for *general* and *specific* concerns therefore result in a relationship between role concerns and EAMPC concerns wherever such a relationship is plausible. In case this relationship cannot be established, at least the layers and cross-functions referred to by the role concern are shown.

4.2.2 EA Stakeholder Roles and their Relationships to EAMPC Concerns

In the following sections the stakeholder role descriptions provided by interviewees are compared and integrated with the roles found during the review of the literature. Therefore, the descriptions by interviewees are provided first, followed by information supplied in literature. Finally, the concerns of the role are related to EAMPC concerns with the method of relating both concern sets depending on the role concern being specific or general.

4.2.2.1 Chief/Enterprise Architect

In the interviews, the most frequently mentioned role was enterprise architect or chief architect. In this analysis no distinction is made between these two roles because no significant difference appeared in the description of these roles by the interviewees. This role was often in charge of the EA projects described by the interviewees acting as the sponsor, i.e. overseeing the project's budget. This was the case, when for example the EA project concerned a specific part of the overall EA management function. In general, the concern of this role was to support the introduction of EA management and to increase the use of its methods and tools. Therefore, the chief/enterprise architect tried to convince other members of the organization of the benefits of EA management, examples included:

- The promotion of a common, TOGAF-based method for conducting architecture projects with the goal of establishing a comparable and systematic approach.
- The establishment of an organization-wide functional domain model in order to improve the communication between business and IT.

- The increase of the reporting capabilities concerning the standard conformity of the application landscape.

As further general concerns, interviewees mentioned the identification of synergies in the application landscape and its alignment to changes in corporate strategy. The latter was also mentioned as a concern of an architecture board, made up of chief architects from different divisions. Furthermore, the enterprise architect was described to monitor the projects changing the application landscape for conformance with EA guidelines.

In summary, the following concerns for the role chief/enterprise architect were derived from the interviews:

- How can EA management methods and tools be promoted and used effectively?
- How can a functional domain model¹³ be developed and introduced?
- How can the standard conformity of the application landscape be increased?
- How can synergies in the application landscape be identified?
- How can functions provided by individual software be transferred to standard software solutions?
- Are the projects changing the application landscape conforming to EA guidelines?
- How can the fit of projects regarding the current IT strategy be evaluated?

With respect to the reviewed literature, COBIT mentions the role chief architect. First of all, COBIT states that this role is responsible for creating and maintaining the EA model. With respect to one particular architecture layer, COBIT describes this role as being responsible for the technological infrastructure. In detail, the role is described to be responsible for the creation and maintenance of an infrastructure plan, as well as for the strategy and maintenance of the infrastructure itself. Furthermore, in COBIT the role is responsible for the identification of data owners. With respect to the usage of technology, the role monitors the evolution of technology and defines its future use. Furthermore, COBIT defines the publishing of standards and the monitoring of standard compliance as responsibilities of this role. In the EADT, the organizational role chief architect assumes the architecture role *manager* and is therein responsible for the coordination of the EA management effort. In summary, the following concerns were derived from the literature analysis:

¹³ The term functional domain model as used in this section describes a multi-level model of the different functions required by an organization. On the top-most level the functions are divided into domains which are then further detailed. An example for such a domain would be *supply chain management*, which is then further refined into, e.g. *material management*. However, these domains do not reflect the current IT functionality, but the functionality required by the business.

- How can models of the EA be created and maintained?
- How can the infrastructure architecture be planned and maintained?
- How can data owners be identified?
- How can technology evolution be monitored in order to define the future use of technology?
- How can technology standards be published and how can their compliance be evaluated?
- How can the EA management efforts be coordinated?

In order to combine the concerns from both the interview and the analysis of literature, some common topics can be identified. Both concern sets refer to the involvement of the role in the EA management effort. Furthermore, both concern sets mention concerns related to the monitoring of standard conformity. Therefore, both concern sets are integrated in Table 15.

Common topics	Concerns	Concern type	Architecture layers and cross functions
EA management function	How can the EA management efforts be coordinated?	Not applicable	
	How can models of the EA be created and maintained?	Not applicable	
	How can EA management methods and tools be promoted and used effectively?	Not applicable	
	How can the infrastructure architecture be planned and maintained?	Not applicable	
Standard conformity	How can technology standards be published and how can their compliance be evaluated?	General	Business service layer, application layer, infrastructure service layer, infrastructure layer, architecture & patterns
	How can the standard conformity of the application landscape be increased?	Specific	Application layer, architecture & patterns, projects & programs

Landscape optimization	How can synergies in the application landscape be identified?	Specific	Application layer
	How can functions provided by individual software be transferred to standard software solutions?	Specific	Application layer, projects & programs
	Are the projects changing the application landscape conforming to EA guidelines?	Specific	Application layer, projects & programs, architecture & patterns
Others	How can a functional domain model be developed and introduced?	Specific	Business layer
	How can data owners be identified?	Specific	Infrastructure layer
	How can technology evolution be monitored in order to define the future use of technology?	General	Business service layer, application layer, infrastructure service layer, infrastructure layer
	How can the fit of projects regarding the current IT strategy be evaluated?	Specific	Projects & programs, strategies & goals

Table 15: Chief/enterprise architect – combined concerns ordered by topic

At first, a mapping for the *specific* concerns is attempted. Thereby, three specific concerns could be mapped directly to EAMPC concerns as displayed in Table 16.

Role Concern	EAMPC Concern	EAMPC Concern ID
How can the standard conformity of the application landscape be increased?	Which activities or projects have to be started, in order to increase conformance to standards? What has to be done in order to modify the current business applications to increase their conformance to standards and reduce heterogeneity?	C-5

How can synergies in the application landscape be identified?	How can the operating expenses and maintenance costs be reduced, e.g. by identification of business applications providing the same functionality (redundancy)?	C-44
How can functions provided by individual software be transferred to standard software solutions?	The goal is to reduce the usage of individual software, by replacing such systems with standard software. The concern is aimed at outlining project proposals for replacing individual software, which can then be evaluated in respect to their feasibility and benefit.	C-8
How can the fit of projects regarding the current IT strategy be evaluated?	The activities modifying the application landscape should be aligned to the needs, which have been specified by the defined strategies. Thereby, financial aspects and necessities dictated by the environment of the organization, e.g. via laws, regulations, etc. should be considered.	C-91

Table 16: Chief/enterprise architect – relationship of specific concerns to EAMPC concerns

With respect to the concern *“How can data owners be identified?”* no suitable EAMPC concern could be found. With respect to the concern *“How can a functional domain model be developed and introduced?”* it was determined that the concept of a functional domain model is not contained in the EAMPC. Therefore, this concern could also not be related to an EAMPC concern. Finally, no EAMPC concern could be found for the role concern *“Are the projects changing the application landscape conforming to EA guidelines?”*.

Furthermore, four general concerns need to be analyzed. Using the information on the scope of each *general* concern in respect to the EA management framework, the EAMPC was analyzed concerning matching EAMPC concerns. Starting with the role concern *“How can technology standards be published and how can their compliance be evaluated?”* the EAMPC concerns displayed in Table 17 were related to this role concern, based on the analysis of the EAMPC.

EAMPC Concern	Concern ID	Remark
Where are architectural blueprints or architectural standards used, and are there areas where those standards are breached?	C-2	Concerning the compliance to standards

Do currently used business applications correspond to architectural blueprints and solutions (architectural standards)? Are deviation-reasons documented, e.g. strategic decisions?	C-19	Concerning the compliance to standards of business applications
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Table 17: EAMPC concerns for role concern “How can technology standards be published and how can their compliance be evaluated?”

The EAMPC concerns related the role concern “How can technology evolution be monitored in order to define the future use of technology?” based on the analysis of EAMPC concerns are displayed in Table 18.

EAMPC Concern	Concern ID	Remark
Which technologies, e.g. programming languages, middleware, operating systems, database management systems, used in the application landscape should be replaced, which ones should be kept?	C-4	Decision concerning the further use of technologies
Possibilities to reorganize the application landscape in respect to the used technologies should be outlined. Thereby, possible goals are: Reducing licensing costs, reducing maintenance costs, taking into account the support periods of the technology products, etc.	C-9	Possibilities concerning the future use of technology

Table 18: EAMPC concerns for role concern “How can technology evolution be monitored in order to define the future use of technology?”

With respect to the overall interest of the role chief/enterprise architect, concerns related to all architecture layers and to the cross functions *strategies & goals, projects & programs*, and *architecture & patterns*, could be derived from the concerns mentioned in interviews and in the literature analysis.

4.2.2.2 CIO/DIO

The role of chief information officer (CIO) or division information officer (DIO) was amongst the most frequently mentioned roles in the interviews. Again both roles are combined, as no general difference could be identified in the description of the roles by interviewees. The CIO/DIO played a critical role in projects because of two power sources – being the manager of the chief/enterprise architect and/or controlling the budget of the project. As a general concern the alignment between, as well as the cooperation of, business and IT were mentioned. This included the ability of the CIO/DIO to introduce innovations. Therefore, this role was described as being involved in the planning of the application landscape. Within the

application landscape, interviewees described that the identification of synergies was of interest to this role. With respect to the individual business applications of the application landscape, the interviewees described further concerns. One aspect was the health of the business applications, defined as the business application meeting the requirements of the respective stakeholders. Another area of interest was the compliance of business applications to the relevant laws and company directives. Further, the management of vendors and the outsourcing potential of business applications were mentioned. In one project, the CIO established an EA management function in order to gain a better insight in the IT departments work. In a project of type *landscape optimization*, the CIO was particularly involved in processes and their support through business applications. The information that was supplied to this role was described as milestones and road maps as well as analysis concerning functional gaps in planned implementations. With respect to EA elements, interviewees described the CIO/DIO role as being interested in all elements of the EA on a coarse granular level. In summary, the following concerns were mentioned in the interviews:

- How can the alignment of and cooperation between business and IT be improved?
- How can changes to the application landscape be planned?
- How can synergies in the application landscape be identified?
- How can the health of business applications be evaluated?
- How can the compliance of business applications be evaluated?
- How can vendor management be performed?
- How can the outsourcing potential of business applications be evaluated?
- How can EA management be used to gain insights into the IT department?
- How can the support of processes provided by business applications be evaluated?
- How can functional gaps in proposed solutions be identified?

With respect to the reviewed literature, van der Raadt et al. also mentioned the alignment of business and IT as the prime responsibility of the CIO. In COBIT, this view is reiterated by further making the CIO responsible for linking business goals to IT goals and for building the strategic IT plan. This role is furthermore responsible for managing the program portfolio. In the cooperation with business functions, the CIO is responsible for assessing the benefits of proposed IT solutions. Finally, the role is described in COBIT as being responsible for monitoring supplier service delivery. According to the EADT, the architecture role *champion* is assumed by the organizational role CIO and in turn responsible for promoting the benefits of the EA management function and ensuring that its goals are met.

- How can business goals be linked to IT goals?
- How can the program portfolio be managed?

- How can the business benefits of proposed IT solutions be assessed?
- How can the service delivery by suppliers be monitored?
- How can EA management benefits be promoted?
- How can it be ensured that EA goals are met?

In order to combine the concerns from both the interview and the analysis of literature, some common topics can be identified. Both concern sets refer to the involvement of the role in the alignment of business and IT. Furthermore, both concern sets mention tasks related to sourcing activities. Finally, both concern sets include concerns related to the EA management function. Therefore, both concern sets are integrated in Table 19.

Common topics	Concerns	Concern type	Architecture layers and cross functions
Alignment of business and IT	How can the alignment of and cooperation between business and IT be improved?	General	Business layer, business services layer, application layer, strategies & goals
	How can business goals be linked to IT goals?	Specific	Strategies & Goals
	How can the support of processes provided by business applications be evaluated?	Specific	Business layer, application layer
	How can the business benefits of proposed IT solutions be assessed?	General	Business layer, Business service layer, measures & metrics
EA management function	How can EA management be used to gain an insight into the IT department?	Not applicable	
	How can EA management benefits be promoted?	Not applicable	
	How can it be ensured that EA goals are met?	Not applicable	

Sourcing	How can the service delivery by suppliers be monitored?	General	Business service layer, infrastructure service layer,
	How can vendor management be performed?	General	Business service layer, application layer, infrastructure service layer, infrastructure layer
	How can the outsourcing potential of business applications be evaluated?	Specific	Application layer
Application landscape & business applications	How can changes to the application landscape be planned?	General	Application layer
	How can synergies in the application landscape be identified?	Specific	Application layer, measures & metrics
	How can the health of business applications be evaluated?	Specific	Application layer, measures & metrics
	How can the compliance of business applications be evaluated?	Specific	Application layer, architecture & patterns
Others	How can the program portfolio be managed?	General	Projects & programs
	How can functional gaps in proposed solutions be identified?	General	Business layer, business service layer, business application layer

Table 19: CIO/DIO – combined concerns ordered by topic

At first, a mapping for the *specific* concerns is attempted. Thereby, three specific concerns could be mapped directly to EAMPC concerns as displayed in Table 20.

Role concern	EAMPC concern	EAMPC concern ID
How can the support of processes by business applications be evaluated?	To which extent are the business processes supported by business applications? Which business processes are supported manually? Can the automated support be extended?	C-78
How can synergies in the application landscape be identified?	How can the operating expenses and maintenance costs be reduced, e.g. by identification of business applications providing the same functionality (redundancy)?	C-44
How can the compliance of business applications be evaluated?	Do currently used business applications correspond to architectural blueprints and solutions (architectural standards)? Are deviation reasons documented, e.g. strategic decisions?	C-19

Table 20: CIO/DIO – relationship of specific concerns to EAMPC concerns

However, with respect to the last role concern in Table 20 it is unclear whether mapped EAMPC concern C-19 suffices as it does not refer to compliance with laws and other legal obligations. Furthermore, no EAMPC concerns could be found for the *specific* concerns “*How can the health of business applications be evaluated?*”, “*How can the outsourcing potential of business applications be evaluated?*”, and “*How can business goals be linked to IT goals?*”. Furthermore, six general concerns remain to be analyzed. Using the information on the scope of each *general* concern in respect to the EA management framework, the EAMPC was analyzed concerning matching EAMPC concerns. Starting with the role concern “*How can the alignment of and cooperation between business and IT be improved?*” the EAMPC concerns displayed in Table 21 were identified to relate to this role concern.

EAMPC concern	EAMPC concern ID	Remark
Which business applications are used by which organizational units?	C-33	Relationship between business applications and organizational units
Which business processes are supported by which services?	C-66	Support of business processes by services

To which extent are the business processes supported by business applications? Which business processes are supported manually? Can the automated support be extended?	C-78	Level of support of business processes
To which extent does the IT support the flexibility of the business processes? Where is the flexibility put at risk?	C-80	Flexibility of the support of business processes
Which business processes are supported by which business applications?	C-87	Relationship between business processes and business applications
How can a more continuous IT support concerning business processes be realized?	C-95	Improving the IT support of business processes

Table 21: EAMPC concerns for role concern “How can the alignment of and cooperation between business and IT be improved?”

The EAMPC concerns related the role concern “How can changes to the application landscape be planned?” are displayed in Table 22.

EAMPC concern	EAMPC concern ID	Remark
Possibilities to reorganize the application landscape in respect to the used technologies should be outlined. Thereby, possible goals are: Reducing licensing costs, reducing maintenance costs, taking into account the support periods of the technology products, etc.	C-9	Starting points for planning of the application landscape
How does the long-term vision, the target of the application landscape, look like?	C-34	Vision of the application landscape
How does the application landscape look like at a specific date?	C-35	Planned steps in the evolution of the application landscape
How will the application landscape evolve over time in order to support the strategies defined? What are the differences to the current landscape?	C-88	Alignment of application landscape planning to defined strategies

Table 22: EAMPC concerns for role concern “How can changes to the application landscape be planned?”

The EAMPC concerns related the role concern “*How can the program portfolio be managed?*” are displayed in Table 23. However, the EAMPC does not include any concerns related to program management. Nonetheless, two concerns from the project portfolio management area were selected, because programs, which are not introduced and discussed in the EAMPC, typically represent logical groupings of individual projects.

EAMPC concern	EAMPC concern ID	Remark
At the beginning of a planning period the available IT budget has to be assigned to project proposals. Project proposals that will be approved have to be selected, others have to be rejected or delayed.	C-29	Selection of projects into portfolio
Increase the probability of success of challenging projects by selecting them for special project monitoring/consulting by the enterprise architecture management. Identify the projects, which can be expected to profit from such a monitoring.	C-92	Monitoring of specific projects

Table 23: EAMPC concerns for role concern “*How can the program portfolio be managed?*”

With respect to the *general* concern “*How can functional gaps in proposed solutions be identified?*” the EAMPC contains a concern to analyze the extent of the IT support for a business process. This concern is related to this role concern in Table 24.

EAMPC concern	EAMPC concern ID	Remark
To which extent are the business processes supported by business applications? Which business processes are supported manually? Can the automated support be extended?	C-78	With respect to the proposed IT solution

Table 24: EAMPC concern for the role concern “*How can functional gaps in proposed solutions be identified?*”

However, no EAMPC concerns could be identified for the general role concerns “*How can the business benefits of proposed IT solutions be assessed?*”, “*How can the service delivery by suppliers be monitored?*”, “*How can vendor management be performed?*”.

With respect to the overall interest in EA management of the role CIO/DIO, concerns related to all architecture layers and cross functions could be derived from the interviews and the literature analysis.

4.2.2.3 IT Architect

With respect to the role of IT architect two rather different descriptions were given by the interviewees. In a project of type *data collection* the IT Architect was interested in the architecture of business applications. Furthermore, the communication between business applications was described to be of interest. While in projects of type *landscape optimization* the IT architect was responsible for ensuring the support of business processes by business applications and that the new application landscape provided the required functionality. With respect to the latter, the IT architect was concerned with identifying the business functionality supported by application systems and the business functionality required by the business divisions involved in the project. In summary, the following concerns for the role IT architect were derived from the interviews:

- How can the architecture of business applications be analyzed?
- How can the communication between business applications be analyzed?
- How can the support of business functionality by business applications be analyzed?
- How can the support of business processes by IT be improved?
- Which business functionality is required by more than one division?

For this role, no further concerns were contributed by the analysis of literature. The identified common topics, concern types, and relations to architecture layers and cross functions are displayed in Table 25.

Common topics	Concerns	Concern type	Architecture layers and cross functions
Alignment of Business and IT	How can the support of business functionality by business applications be analyzed?	Specific	Business layer, application layer,
	How can the support of business processes by IT be improved?	Specific	Business layer, business service layer, application layer
	Which business functionality is required by more than one division?	Specific	Business layer

Others	How can the architecture of business applications be analyzed?	Specific	Application layer
	How can the communication between business applications be analyzed?	Specific	Application layer

Table 25: IT architect – concerns categorized by common topics, concern type, and architecture layer

The mapping of these role concerns was not straightforward. With respect to the concern “*How can the architecture of business applications be analyzed?*” EA management is more concerned with providing an overview of the application landscape than with the architecture of individual systems. Therefore, only a concern regarding such an overview could be related to this role concern. The relationships between role concerns and EAMPC concerns are displayed in Table 26.

Role concern	EAMPC concern	EAMPC concern ID
How can the architecture of business applications be analyzed?	Where are architectural blueprints or architectural standards used, and are there areas where those standards are breached?	C-2
How can the communication between business applications be analyzed?	Which interfaces are offered/used by which business application?	C-67
How can the support of business processes by IT be improved?	To which extent are the business processes supported by business applications? Which business processes are supported manually? Can the automated support be extended?	C-78

Table 26: IT architect – relationship of specific concerns to EAMPC concerns

Since the EAMPC does not contain a functional domain model, the role concerns “*How can the support of business functionality by business applications be analyzed?*” and “*Which business functionality is required by more than one division?*” could not be related to an EAMPC concern. With respect to the overall interest in EA management of the role IT architect, concerns related to the *application layer*, to the *business service layer*, and to the *business layer* could be derived from the interviews.

4.2.2.4 Business Executive

The role business executive is used to refer to functional executives mentioned by the interviewees. In two projects, marketing executives were involved. In one project of type *methods and communications* the marketing executive was expecting a better communication between the marketing department and IT. In detail, the stakeholder expected the timelines of marketing campaigns and software development to be synchronized. In another project of type *landscape optimization* the concern of the marketing executive was to be able to access customer data across the boundaries of divisions. In the same project, an executive from the service department was interested in the availability and scalability of the companies call centers operating on the new landscape. In summary, mostly functional concerns were described. When questioned about the information that was interesting for those stakeholder roles, the interviewees mentioned business scenarios. Therein, the expected customer interaction with the company was described, highlighting new or changed functionality. In summary, the following concerns of the role business executive were derived from the interviews:

- How can the communication between business and IT be improved through EA management?
- How can the supported functionality of proposed solutions be analyzed?
- Which business scenarios are supported by proposed solutions?
- How can the quality of the IT support for business activities be improved?
- How can cross-division initiatives be supported by EA management?

In COBIT, the role business executive is responsible for identifying critical dependencies between business and IT. This includes the assessment and reporting of the current performance of IT. Furthermore, the role is responsible for managing the program portfolio. With respect to proposed solutions, the role is responsible for assessing the operational IT benefits of these solutions. In the EADT, the organizational role business executive is mentioned in relation to the architecture roles *advisor*, *approver*, and *audience*. In the role of *advisor*, the business executive advises the chief architect on strategic and economic aspects of EA management decisions. In the architecture role *approver*, the business executive is supporting EA management decision making by providing leadership and guidance. In the architectural role *audience*, the business executive complies with EA management decision making. In summary, the following concerns of the role business executive were derived from literature:

- How can the critical dependencies between business and IT be assessed?
- How can the current performance of IT be assessed and reported?
- How can the program portfolio be managed?
- How can the business benefits of proposed IT solutions be assessed?

- How can EA management decision making be supported best, e.g. by advice, leadership, or guidance?
- What is required to comply with EA management decision making?

In order to combine the concerns from both the interview and the analysis of literature, some common topics can be identified. Both concern sets refer to the involvement of the role in the alignment of business and IT. Furthermore, both concern sets include concerns related to the EA management function. Therefore, both concern sets are integrated in Table 27.

Common topics	Concerns	Concern type	Architecture layers and cross functions
Alignment of business and IT	How can the critical dependencies between business and IT be assessed?	General	Business layer, business service layer
	How can the current performance of IT be assessed and reported?	General	Business layer, business service layer, measures & metrics
	How can the supported functionality of proposed solutions be analyzed?	General	Business layer, business service layer
	Which business scenarios are supported by proposed solutions?	Specific	Business layer, business service layer
	How can the business benefits of proposed IT solutions be assessed?	General	Business layer, business service layer, measures & metrics
	How can the quality of the IT support for business activities be improved?	General	Business layer, business service layer
EA management function	How can the communication between business and IT be improved through EA management?	Not applicable	
	How can cross-division initiatives be supported by EA management?	Not applicable	

	How can EA management decision making be supported best, e.g. by advise, leadership, or guidance?	Not applicable	
	What is required to comply with EA management decision making?	Not applicable	
Others	How can the program portfolio be managed?	General	Projects & programs

Table 27: Business executive – combined concerns ordered by topic

With regard to the *specific* concern “Which business scenarios are supported by proposed solutions?” no suitable EAMPC concern was discovered, since the concept of business scenario does not exist in the EAMPC. The analysis of the *general* concerns starts with the role concern “How can the critical dependencies between business and IT be assessed?”. The relationships of this role concern to EAMPC concerns are displayed in Table 28.

EAMPC concern	EAMPC concern ID	Remark
Which business applications are used by which organizational units?	C-33	Used business applications
What business processes contain core competencies of the organization?	C-56	Identification of core business processes
Which business processes are supported by which services?	C-66	Support of business processes by services, in this case geared towards core processes
Which business processes are supported by which business applications?	C-87	Support of business processes by business applications, in this case geared towards core processes

Table 28: EAMPC concerns for role concern “How can the critical dependencies between business and IT be assessed?”

With respect to the *general concern* “How can the supported functionality of proposed solutions be analyzed?” the EAMPC contains a concern to analyze the extent of the IT support for a business process. This concern is related to this role concern in Table 29.

EAMPC concern	EAMPC concern ID	Remark
To which extent are the business processes supported by business applications? Which business processes are supported manually? Can the automated support be extended?	C-78	With respect to the proposed IT solution

Table 29: EAMPC concern for the role concern “How can the supported functionality of proposed solutions be analyzed?”

The EAMPC concern mapped in Table 29 is also related to the general concerns “How can the quality of the IT support for business activities be improved”. Furthermore, it could serve as a starting point for the general concern “How can the current performance of IT be assessed and reported?”, although it lacks metrics on how well processes are supported. With respect to the *general concern* “How can the program portfolio be managed?” the related EAMPC concerns are displayed in Table 23, as this role concern is also relevant for the role CIO/DIO. No relationships to EAMPC concerns could be established for the *general concern* “How can the business benefits of proposed IT solutions be assessed?”. With respect to the layers and cross functions of the EA management framework, concerns relating to the *business layer* and the *business service layer*, as well as the cross functions *measures & metrics* and *projects & programs* were derived from the interviews and the literature analysis.

4.2.2.5 Project Manager

The role project manager refers to an EA stakeholder who is the head of a project. In one EA project of type *data collection* the interviewee participated in the exercise to identify *Project Managers* of projects with high architecture impact via a series of stakeholder interviews. The identified stakeholders were then coached by the architecture team, concerning the architecture guidelines and standards. In another EA project, a detailed functional domain model of the organization was developed. This model could then be used by project managers to detect overlaps with other projects and therefore avoid unnecessary effort by jointly developing deliveries. Furthermore, the project manager was interested in the costs of different EA scenarios in on interview. In summary, the following concerns of the role project manager were derived from the interviews:

- Which architecture guidelines and standards are relevant for a given project?
- How can functional domain models be used to identify project overlaps?
- What are the costs of different EA scenarios?

In the analyzed literature, the EADT mentions the architecture role *project team* which has the responsibility to comply with EA management decisions and guidelines, as well as to perform changes to the EA. In summary, the following concerns of the role project manager were derived from the literature analysis:

- How can compliance of a project with EA management decisions and guidelines be ensured?
- Which changes are to be performed to the EA by a project?

Both concern sets include concerns related to the EA management function. Therefore, both concern sets are integrated in Table 30.

Common topics	Concerns	Concern type	Architecture layers and cross functions
EA management function	How can compliance of a project with EA management decisions and guidelines be ensured?	Not applicable	
	Which changes are to be performed to the EA by a project?	Not applicable	
Others	How can functional domain maps be used to identify project overlaps?	Specific	Business layer, projects & programs
	Which architecture guidelines and standards are relevant for a given project?	General	Business service layer, application layer, infrastructure service layer, infrastructure layer, architecture & patterns
	What are the costs of different EA scenarios?	Specific	Measures & metrics

Table 30: Project manager – combined concerns ordered by topic

Since the concept of a functional domain model is not contained in the EAMPC, the concern “*How can functional domain maps be used to identify project overlaps?*” could not be related to EAMPC concerns. Furthermore, no suitable EAMPC concern could be found for the role concern “*What are the costs of different EA scenarios?*”. For the *general* concern “*Which architecture guidelines and standards are relevant for a given project?*” the EAMPC only provides concerns that show the usage of standards in the application landscape. In lack of a

list of applicable standards, these EAMPC concerns are assigned to this role concern in Table 31.

EAMPC concern	EAMPC concern ID	Remark
Where are architectural blueprints or architectural standards used, and are there areas where those standards are breached?	C-2	Usage of standards in the application landscape
Do currently used business applications correspond to architectural blueprints and solutions (architectural standards)? Are deviation reasons documented, e.g. strategic decisions?	C-19	Usage of standards in business applications

Table 31: EAMPC concerns for role concern “Which architecture guidelines and standards are relevant for a given project?”

With respect to the layers and cross functions of the EA management framework, concerns related to all layers and the cross function *architecture & patterns, measures & metrics* and *projects & programs* were derived from the interview and the literature analysis.

4.2.2.6 IT Supplier

The role IT supplier was only described very superficially. One interviewee described that the supplier was interested in the requirements of the organization related to a functional domain model. Using this domain model, the IT supplier was able to identify synergies when servicing different divisions. While another interviewee described this role to be more technology oriented. In the latter project, the IT supplier cross-checked new technology standards developed in the EA project for feasibility. In summary, the following concerns of the role IT supplier were derived from the interviews:

- How can organization’s functional domain model be used to identify synergies in requirements from different divisions?
- Which technology standards need to be observed when servicing the organization?

For this role, no further concerns were contributed by the analysis of literature. The identified concern types, and relations to architecture layers and cross functions are displayed in Table 32.

Concerns	Concern type	Architecture layers and cross functions
How can organization's functional domain model be used to identify synergies in requirements from different divisions?	Specific	Business layer
Which technology standards need to be observed when servicing the organization?	General	Business service layer, application layer, infrastructure service layer, infrastructure layer, architecture & patterns

Table 32: IT supplier – concerns categorized by concern type and architecture layer

Since the concept of a functional domain model is not contained in the EAMPC, no EAMPC concern could be related to the concern “*How can organization's functional domain model be used to identify synergies in requirements from different divisions?*”. For the *general* concern “*Which technology standards need to be observed when servicing the organization?*” the EAMPC only provides concerns that show the usage of standards in the application landscape. In lack of a list of applicable standards, these EAMPC concerns are assigned to the role concern in Table 33.

EAMPC concern	EAMPC concern ID	Remark
Where are architectural blueprints or architectural standards used, and are there areas where those standards are breached?	C-2	Usage of standards in the application landscape
Do currently used business applications correspond to architectural blueprints and solutions (architectural standards)? Are deviation reasons documented, e.g. strategic decisions?	C-19	Usage of standards in business applications

Table 33: EAMPC concerns for role concern “*Which technology standards need to be observed when servicing the organization?*”

With respect to the layers and cross functions of the EA management framework, concerns related to all layers and to the cross function *architecture & patterns* were derived from the interviews.

4.2.2.7 Application Owner

The role of application owner is used to describe the stakeholder responsible for a business application. This role was mentioned in two distinct projects. In one project of the type data collection, the application owners were vital in providing information about their business application to the enterprise architect. In this project, they had a number of concerns regarding the application landscape around their business application. In another project of type *landscape optimization*, the situation was quite different. Again the application owners possessed the required information, but they were reluctant to share the information with the project team, because of fear that their application would be shut down during the optimization. The following concerns were stated by application owners in the first project:

- What happens in case the business application is shut down?
- Which other applications are connected to the business application?
- What are the costs associated with the business application?
- On which physical hardware does the business application run?
- Which services are supported by the business application?
- How many users are using the business application?
- Which locations are using the business application?
- Which network is the business application connected to?

For this role, no further concerns were contributed by the analysis of literature. The concerns, the identified concern types, and the relations to architecture layers and cross functions are displayed in Table 34.

Concerns	Concern type	Architecture layers and cross functions
What happens in case the business application is shut down?	Specific	Application layer
Which other applications are connected to the business application?	Specific	Application layer
What are the costs associated with the business application?	Specific	Application layer, measures & metrics
On which physical hardware does the business application run?	Specific	Application layer, infrastructure layer

Which services are supported by the business application?	Specific	Business service layer, application layer
How many users are using the business application?	Specific	Business layer, application layer
Which locations are using the business application?	Specific	Business layer, application layer
Which network is the business application connected to?	Specific	Application layer, infrastructure layer

Table 34: Application owner – concerns categorized by concern type and architecture layer

With respect to the mapping of the role concerns of the role Application Owner no suitable EAMPC concerns were found for three role concerns. These concerns were “*What are the costs associated with the business application?*”, “*On which physical hardware does the business application run?*”, and “*How many users are using the business application?*”. For the role concern “*Which locations are using the business application?*” only an EAMPC concern for the connection between organizational units and business applications was discovered. This relation and the relations of the other specific concerns to EAMPC concerns are displayed in Table 35.

Role concern	EAMPC concern	EAMPC concern ID
What happens in case the business application is shut down?	Analyzing failure propagation in the application landscape	C-110
Which other applications are connected to the business application?	Which interfaces are offered/used by which business application?	C-67
Which services are supported by the business application?	Which services are offered by which business application?	C-65
Which locations are using the business application?	Which business applications are used by which organizational units?	C-33

Table 35: Application owner – relationship of specific concerns to EAMPC concerns

With respect to the layers and cross functions of the EA management framework, concerns related to all layers and the cross function *measures & metrics* were derived from the interviews.

4.2.2.8 CFO/DFO

This role is referring to the stakeholder in charge of the overall budget on corporate or division level. In projects in the government sector, employees of the finance ministry assumed this role. The CFO/DFO was concerned with the overall costs of different EA scenarios. Furthermore the role was described as being interested in possible synergies in terms of costs regarding an optimized landscape. In summary, the following concerns of the role CFO/DFO were derived from the interviews:

- What are the costs of different EA scenarios?
- What are the possible synergies in different EA scenarios?

With respect to literature, COBIT includes the role CFO. This role is responsible for assessing the risks in IT and determining the risk management. Furthermore, this role is responsible for establishing the monitoring approach for IT performance. Finally, the CFO is responsible for maintaining the program portfolio. In summary, the following concerns of the role CFO/DFO were derived from the literature analysis:

- How can IT risks be assessed?
- How can the current performance of IT be assessed and reported?
- How can the program portfolio be managed?

In order to combine the concerns from both the interview and the analysis of literature, some common topics can be identified. Therefore, both concern sets are integrated in Table 36.

Common topics	Concerns	Concern type	Architecture layers and cross functions
Financials	What are the costs of different EA scenarios?	Specific	Measures & metrics
	What are the possible synergies in different EA scenarios?	Specific	Measures & metrics
Alignment of business and IT	How can the current performance of IT be assessed and reported?	General	Business layer, Business service layer, measures & metrics
Others	How can IT risks be assessed?	General	
	How can the program portfolio be managed?	General	Projects & programs

Table 36: CFO/DFO – combined concerns ordered by topic

With respect to the *specific* concerns, no EAMPC concern was found for the role concern “*What are the costs of different EA scenarios?*”. The other specific concern is mapped to an EAMPC concern in Table 37.

Role concern	EAMPC concern	EAMPC concern ID
What are the possible synergies in different EA scenarios?	How can the operating expenses and maintenance costs be reduced, e.g. by identification of business applications providing the same functionality (redundancy)?	C-44

Table 37: CFO/DFO – relationship of specific concern to EAMPC concern

With respect to the *general* concerns, the relationship of “*How can the program portfolio be managed?*” is established in Table 23 since this concern is also relevant for the role *CIO/DIO*. For the concern “*How can the current performance of IT be assessed and reported?*” a starting point is provided for a similar concern in Table 29. For the concern “*How can IT risks be assessed?*” no relationship to EAMPC concerns could be established. With respect to the latter concern a mapping to the EA management framework was not conducted, since it is unclear which layer or cross function is concerned with risks. With respect to the layers and cross functions of the EA management framework, concerns related to the *business layer* and the *business service layer*, as well as to the cross functions *measures & metrics* and *projects & programs* were derived from the interviews and literature analysis.

4.2.2.9 Further Roles

The following roles were only briefly described by the interviewees and therefore do not merit a relation to EAMPC concerns. The role Infrastructure Architect was described to be concerned with the overall infrastructure, especially networks. The role IT Demand Manager was described to be interested in functional domain models in order to be able to communicate the demands precisely to the IT Supplier. Finally, the CEO acted as sponsor for projects of type *landscape optimization*.

4.3 Summary and Limitations

The analysis of the interviews with ten consultants from an international consultancy is presented in two parts. In the first part, some basic facts and figures about the interviewees’ projects and the organizations where the projects were conducted are presented. The projects are grouped by the organization’s sector and the number of projects performed in each sector is given. Subsequently, the interviewees’ projects are differentiated into four basic project types. Based on these projects, the stakeholders and stakeholder categories described by the interviewees are combined in a new stakeholder model. Using this stakeholder model, the stakeholder set of one project type is displayed exemplarily. Then, the roles mentioned by the interviewees and their mapping to stakeholder categories are discussed. Finally, the analysis results of the interviewees’ perception of stakeholder management are presented. In the

second part, the eight roles for which a basic level of information was obtained from the interviewees are further analyzed. For five of the roles, additional information on concerns is derived from the analysis of literature. Then, a relation of the role concerns to EAMPC concerns is provided for each role.

However, the following limitations concerning the chosen approach have to be discussed:

1. The influence of interviewing consultants on the outcome of the interviews.
2. The influence of choosing projects for the identification of stakeholder concerns.
3. The small number of interviewees.
4. The integration of concerns from different sources into stakeholder roles.
5. The limited information on role concerns from the interviews.

With respect to the first limitation, interviewing the consultants had the advantage of gaining insight into a great number of different EA projects and different organizations. An analysis of a similar number of organizations could not have been conducted otherwise in the given timeframe. On the other hand, the consultants are no true insiders to the organizations they are consulting. Therefore, their view of *who* the EA stakeholders are in a given situation might differ from that of the Enterprise Architect and other insiders of the organization. Thus, the findings from the interview are to be seen as a consultant's perspective on EA stakeholders in an organization. With respect to the second limitation, the setting in which the interviewees operated was an EA project and not an established EA management function. This, however, is not to be assessed as being critically, as an EA management initiative might start out as a project before it is turned into a management function. With respect to the third limitation, the small number of interview partners indeed limits the accuracy of the results. With ten different consultants and twenty analyzed projects, the results are purely exploratory and require further validation in subsequent research efforts. With respect to the fourth limitation, the assembly of roles from the different interviews and different sources is to be assessed critically. The building of roles relied on the role names given by the consultants. Therefore, on the one hand, it is not for certain, that different consultants were meaning the same role, even when they used identical role names, since it is not at all clear, what the scope of a role comprises. The same question arises with respect to supplementing the interview results with role descriptions from literature. This raises the general question whether the roles built during the analysis of the interviews are consistent and transferable to other organizations. On the other hand, roles are common in stakeholder management and the lack of a coherent role set as well as the need of a stable concept for relating stakeholders and EAMPC concerns make the building of roles a worthwhile approach. In order to validate the roles, however, further research is required. The validation of roles could build on the discriminate and factor analysis used by Fiedler and Kirchgeorg [FiKi07] who researched the role concept in stakeholder theory. With respect to the fifth limitation, only a limited amount of information on role concerns was obtained during the interviews due to the small number of interviewees. This represents a further weakness of the current relation of concerns to roles. In order to arrive at

a more valid relationship of roles and concerns more interviews would need to be conducted on this subject.

5 Compilation of the Approach for Stakeholder-Specific EA Management

In order to design a stakeholder-specific EA management based on patterns the combination of the EAMPC and a stakeholder management process is required. Therefore, an approach is built which combines the advantages of the stakeholder management approaches found in literature, the EA stakeholder roles developed from the expert interviews and literature analysis, and the EAMPC. At first, the assumptions underlying the development of the approach are described. Then, the approach, which is structured in three phases, namely the *stakeholder analysis phase*, the *planning phase*, and the *interaction phase*, is presented. The phases consist of individual steps, which are described for each phase. Finally, the summary describes the involvement of stakeholders according to the stakeholder management framework used in this thesis.

5.1 Assumptions of the Approach

The design of the stakeholder-specific approach to EA management based on patterns is built on four basic assumptions. These assumptions are:

1. The EA management function is implemented as a staff function within the organization.
2. The EA management function is assigned to the organizational role CIO.
3. The EA management function possesses very limited organizational power.
4. The objective of the EA management function is to address the concerns of the CIO and to address the concerns of other EA stakeholders as far as it helps to address the concerns of the CIO.

The first assumption is based on the observation by van der Raadt et al. [RaBa08] that the EA management function is typically implemented as a staff function. Furthermore, the motivations for introducing a staff function described by Schreyögg [Sc08b] fit the EA management function. He sees the main reason for the creation of staff functions in the recruitment of specialists who consult existing functions using new scientific knowledge, e.g. systematic methods for solving problems or methods to improve decision making. In the case of the EA management function, the specialists are the Enterprise Architects and the scientific knowledge is EA management.

The second assumption is derived from the fact that, as a staff function, the EA management function has to be assigned to an enterprise function or organizational role that it supports in decision making. Lindström et al. [Li06] argue that the organizational role CIO is the primary stakeholder of EA management. Furthermore, in TOGAF, the CIO is providing stewardship for the EA management function, indicating some kind of organizational power over the EA management function. In the expert interviews, the CIO was described as the manager of the Enterprise Architect. Therefore, the assumption is made, that the EA management function as

a staff function is assigned to the organizational role CIO. Under this assumption, the addressing of concerns of the CIO is the primary objective of the EA management function.

The third assumption is based on the first assumption. If the EA management function is a staff function, then it has very limited organizational power, i.e. little authority over other enterprise functions. The tasks of a staff function is to gather decision relevant information, to analyze the information and to suggest alternatives and measures [Sc08b]. The actual decisions are then taken by the function or role the staff function is assigned to. Based on the second assumption, the CIO is making the relevant decision. Therefore, the main source of organizational authority for the EA management function is the organizational power of the CIO. Apart from the authority of the CIO, the EA management function can only cooperate with other enterprise functions on a voluntary basis. Thus, if the EA management function requires support from enterprise functions outside the CIO's authority, it needs to provide value to these functions in return. One way for the EA management function to provide value to other enterprise functions is to address their concerns in the context of EA management.

The three assumptions result in the fourth assumption. The primary objective of the EA management function is to serve the concerns of the CIO. If this requires the cooperation with other enterprise functions, the EA management function can foster this cooperation by also addressing the concerns of other EA stakeholders.

5.2 Phases of the Approach

The approach to design a stakeholder-specific EA management based on patterns is structured into three phases. In the first phase, the EA stakeholders are identified and analyzed. In the second phase, the EA management is planned based on stakeholders concerns using the EAMPC. In the third phase, EA management is performed and the EA management function interacts with stakeholders guided by the communication plan. These phases are arranged to form a kind of waterfall model since each phase builds on the result of the previous phase, but a return to previous phases can occur, if required. The complete approach is displayed in Figure 28.

5.2.1 Stakeholder Analysis Phase

During the *stakeholder analysis phase*, the identification and analysis of stakeholders takes place. In order to identify stakeholders, the stakeholder definition¹⁴ and the stakeholder model¹⁵ created in previous sections are used. Concerning the analysis of stakeholders, the assignment of stakeholders to the developed stakeholder roles¹⁶ is discussed. Furthermore, a categorization model for stakeholder importance is proposed. The outcome of this phase is a stakeholder map that documents the stakeholders, their roles and their concerns, as well as their importance.

¹⁴ See Section 2.3.2.

¹⁵ See Section 4.1.3.3.

¹⁶ See Section 4.2.

5.2.1.1 Identification and Categorization

In this thesis, the term EA stakeholder is defined as any individual or group that can support or hinder the EA management function in reaching its objectives as well as any person or group that is positively or negatively affected by activities of the EA management function. Therefore, the stakeholder management is conducted by the members of the EA management function or the project team responsible for initiating the EA management function. Furthermore, the basis for the identification of stakeholders is their affiliation with the processes and activities that the EA management function conducts to reach its objectives. The main objective of the EA management function is to address the concerns of the CIO. Consequently, to identify stakeholders the activities that the EA management function pursues or is about to pursue in order to address the concerns of the CIO are analyzed.

With respect to these activities, the members of the EA management function conduct a brainstorming session, as recommended by TOGAF, trying to answer the following questions:

- Who is affected by the EA management function's current or planned activities?
- Who is supporting or hindering the successful conclusion of these activities?
- Who is providing resources to the EA management function?

The stakeholders mentioned by the participants are then assigned to the stakeholder model categories as described in Section 4.1.3.3. If the current or planned activities are in line with any of the project types discussed in Section 4.1.3.2, then the stakeholder model with assigned stakeholder roles of the project type can be taken as an example.¹⁷ The outcome of this brainstorming is a stakeholder model including the identified stakeholders. Depending on how well the members of the EA management function know the organization additional stakeholder identification interviews, as proposed by the PMBOK, can be performed. Finally, the stakeholder model with assigned stakeholders is handed to the CIO for additional management feedback. The information that is gathered for each of the identified stakeholders includes the name of the stakeholder, the organizational role, and the assigned stakeholder category.

5.2.1.2 Role Assignment and Further Analysis

In order to start the analysis of the stakeholders, a matching of the stakeholders' organizational roles to the stakeholder roles developed in Section 4.2 is performed. Since the stakeholder roles are based on generic organizational roles, it is assumed that suitable stakeholder roles can be established for some of the identified stakeholders. For these stakeholders, the roles provide a first insight into the possible concerns of the role and relevant EAMPC concerns. Depending on the number of identified stakeholder roles, possible common concerns between the stakeholders can also be identified upfront. These concerns are then compared with the current objectives of the EA management function and together serve as the foundation for the further analysis of stakeholders. The advantage of the matching of stakeholder roles to

¹⁷ See Section 4.1.3.3 for the stakeholder roles assigned to the stakeholder model for project type *landscape optimization* and Appendix G for the other project types.

stakeholders is that the members of the EA management function gain a first insight into EA stakeholders concerns and possible areas of agreement before conducting the further stakeholder analysis. As an example, the stakeholder roles CIO and CFO both share the concern of how to manage the program portfolio. If the role CFO is assigned to a stakeholder, the members of the EA management function know that by addressing this CIO concern, they can win the support of the CFO as well. Both TOGAF and the PMBOK suggest that the analysis of stakeholder concerns is determined by the team carrying out the stakeholder analysis. Therefore, the stakeholder roles provide a starting point for this analysis. For the EA stakeholders that cannot be assigned to a stakeholder role, the concerns are identified by the members of the EA management function based on their experience and previous interaction with these EA stakeholders.

In order to gain an understanding of how EA stakeholders affect the EA management function and are affected by it, these two dimensions are analyzed next. The underlying assumption of the approach developed in this thesis is that the CIO is the most important EA stakeholder. Therefore, this approach is an instrumental stakeholder management approach like the stakeholder approaches discussed in the literature analysis. This means, that EA stakeholders are ranked depending on different attributes in order to differentiate important from unimportant stakeholders. A common lack in the instrumental approaches discussed in the literature analysis is the missing description of the categories used for ranking the stakeholders. Therefore, the levels of the category for analyzing the instrumental dimension of how stakeholders *affect* the EA management function in reaching its objectives are described in this thesis. With respect to this dimension two general aspects can be derived from the expert interviews and are mentioned in the definition. The stakeholder can support or hinder, i.e. threat, the EA management function with respect to its objectives. For the categories *required support* and *potential threat* the possible levels are summarized in Table 38. With respect to the normative dimension of stakeholders *affected by* the activities of the EA management function the definition supplies the categories positive and negative. With respect to these categories, the effects are briefly described for both categories and for each stakeholder. Four general categories can be used to analyze the interaction with stakeholders – required support, potential threat, as well as positive and negative effects.

Category	Level low	Level medium	Level high
Required support	Little difference regarding the EA management function reaching its objectives, if support is provided by this stakeholder or not	Support would help the EA management function reach its objectives, but missing support from this stakeholder can be compensated for by other stakeholders	The EA management function cannot reach its objectives when support of this stakeholder is missing.

Potential threat	This stakeholder can pose no significant threat to the project	This stakeholder can delay the reaching of objectives or hinder activities of the EA management function	The stakeholder can prevent the EA management function from reaching some or all of its objectives
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Table 38: Categories and levels for analyzing stakeholders

With respect to differentiating important from unimportant stakeholders, only the categories of the dimension *affect* are relevant. Therefore, a key stakeholder is defined as any stakeholder, who is assigned the level *high* in either the *required support* category or the *potential threat* category, or both. The results of the assignment of roles and the further analysis of stakeholders are gathered in a stakeholder map. An exemplary stakeholder map is displayed in Table 39.

Stakeholder name	Organizational role	Stakeholder role	Stakeholder category	Identified concerns	Required support	Potential Threat	Positive effects	Negative effects
John Smith	Marketing manager	Business executive	Division	How can the supported functionality of proposed solutions be analyzed?	High	Medium	Gains insight into proposed solutions	-

Table 39: Exemplary stakeholder map displaying the results of the stakeholder analysis

Finally, the stakeholder map is sent out to key stakeholders and the CIO asking for feedback on the identified concerns and on identified positive and negative effects. The categories *required support* and *potential threat* are not included in the feedback as they represent an assessment of organizational power by the members of the EA management function. Such information is to be kept confidential within organizations according to a statement of a participant during the expert interviews. The result of the analysis phase is therefore a reviewed stakeholder map displaying the concerns of stakeholders and their potential impact, as well as the impact of EA management function's activities on them.

5.2.2 Planning Phase

During the planning phase the EAMPC is utilized to design a new or to redesign an existing EA management based on patterns. Therefore, the members of the EA management function

select the EAMPC concerns that are to be integrated in order to address the concerns of the CIO and those of other EA stakeholders supporting this objective. Furthermore, the members of the EA management function check whether additional viewpoints need to be developed in cases where no suitable EAMPC concern could be matched to a relevant EA stakeholder concern. Then, the patterns selected from the EAMPC and the additionally developed viewpoints are integrated into an organization-specific EA management. Based on this integration, the members of the EA management function design the required organizational forms and the processes for supporting the organization-specific EA management. Thereby, new stakeholders might be discovered, triggering a return to the *stakeholder analysis phase*. Finally, the roadmap for the future development of the EA management is developed and the communication plan is built based on the implemented viewpoints.

5.2.2.1 Selection and Integration of Patterns

To design a stakeholder-specific EA management based on patterns, the concerns that are to be addressed by EA management have to be selected. Therefore, the members of the EA management function prioritize and select the concerns of stakeholders based on the stakeholder map established during the *stakeholder analysis phase*. Thereby, the concerns of the CIO are given priority over the concerns of key stakeholders.

In order to leverage the EA management knowledge captured in the EAMPC, a relation between the identified stakeholders and their concerns on the one side and the EAMPC concerns on the other side has to be established. In cases where the stakeholder's organizational role was matched to a stakeholder role during the *stakeholder analysis phase* such a relation might already exist via the role. Otherwise, in order to connect both the stakeholder concern to EAMPC concerns the method developed in Section 4.2.1 can be utilized. In case a stakeholder concern is to be addressed by EA management, but no suitable EAMPC concern exists, a new EA management pattern consisting of the concern, the required methodology, the required viewpoint, and an information model has to be developed. In order to clarify the required viewpoint, the method developed by Steen et al.¹⁸ can be utilized. Finally, the selected and developed EA management patterns are integrated in an organization-specific EA management approach as displayed in Figure 10. If the members of the EA management function chose to delay the integration of some concerns, the future planning of the EA management is documented in the EA management roadmap.

5.2.2.2 Planning of Required Governance

In order to successfully gather the required information for EA management and to actually manage the EA, the members of the EA management function have to interact with other EA stakeholders. Therefore, suitable EA management governance has to be designed in order to guide and support these interactions. In the EAMPC, the methodology patterns describe how concerns are to be addressed. However, some of these patterns contain choices. Therefore, the members of the EA management function analyze the methodology patterns that address the selected concerns and choose the required methods were appropriate. Then, the organizational

¹⁸ See chapter 3.1.4

forms and processes required by the chosen methodologies are designed by the members of the EA management function. These designs are then passed to the CIO, who is taking care of their integration into the existing governance framework of the organization. When designing and integrating the EA management governance new stakeholders might be identified. Then, the *stakeholder analysis phase* is revisited in order to update the stakeholder map and assess the consequences.

If the EA management function itself needs to be set up in this phase, the EADT can be consulted. It provides a role-based approach to setting up an EA management function including the relationships with other enterprise functions. Furthermore, TOGAF provides an introduction to EA management governance, including the introduction of an architecture board consisting of stakeholders.

5.2.2.3 Creation of Communication Plan and Roadmap

In order to provide the stakeholders with the viewpoints to address their concerns, the members of the EA management function set up a detailed communication plan at the end of the *planning phase* in accordance with the PMBOK. This plan includes all stakeholders whose concerns are addressed by the current EA management. For these stakeholders, the communication requirements are covered by defined viewpoints. As far as the distribution of information is concerned, the question of whether or not the EA management function uses an EA management tool and allows access to EA stakeholders is of importance. In case it does, the communication method *pull communication* is the easiest to implement, since EA stakeholders can access information relevant to them freely. Otherwise, the communication method and technology is determined with respect to the importance of the stakeholder and the available technology. Furthermore, the communication interval is set based on the communication requirements of the stakeholder. An exemplary communication plan is displayed in Table 40.

Stakeholder	Viewpoints	Communication method	Communication technology	Communication interval
John Smith	Support of Business processes by services	Push communication	Email	Once per month

Table 40: Exemplary communication plan

In stakeholder management, the result quality of interactions is based on the knowledge of the organization and stakeholders of how concerns are handled.¹⁹ Therefore, in the EA management context the key stakeholders should know about whether and when their concerns are going to be addressed. The EA management roadmap contains all concerns that have not yet

¹⁹ See chapter 2.1.4.2.

been addressed, the stakeholders of these concerns, the current status of the concern and the planned implementation date, if one is set. The possible statuses of the concerns are:

- Planned – an implementation date has been assigned to the concern
- In Review – the concern is under discussion
- On hold – the concern is currently not scheduled for implementation

An example of an EA management roadmap is displayed in Table 41.

Concern	Stakeholders	Status	Planned implementation date
How can the supported functionality of proposed solutions be analyzed?	John Smith	Planned	31.04.2010

Table 41: Exemplary EA management roadmap

5.2.3 Interaction Phase

In the interaction phase the EA management is performed according to the design decisions made in the *planning phase*. The emphasis with respect to the developed approach lies on the interaction with stakeholders through the roadmap, the change log, and the communication plan. If a concern is scheduled for implementation at a certain date, a reiteration of the *planning phase* is triggered on that date in order to incorporate the new concern. In case new stakeholders emerge during the *interaction phase* a reiteration of the *stakeholder analysis phase* is triggered.

5.2.3.1 Update and Monitoring of the Roadmap

During the conduction of EA management changes in the EA management roadmap might occur. For example, the planned date of the implementation of a concern is postponed or cancelled. These updates of the roadmap are communicated to the relevant stakeholders. Furthermore, the planned date of a concern can be reached leading to a reiteration of the *planning phase*.

5.2.3.2 Execution of Communication Plan and Update of Change Log

During the *interaction phase* the communication plan established during the planning phase is carried out. In order to allow for feedback by the stakeholders, a change log is established. In this log, the members of the EA management function track requests by stakeholders concerning the provided viewpoints or the implemented EA management governance. The change log contains information on the requestor and a description of the change request. Furthermore, a status is assigned to each change request. The possible statuses of the change requests are:

- New – change request has been received
- In review – the concern is under discussion
- Planned – the change request is scheduled for implementation
- Closed – the change request has been implemented
- Canceled – the change request has been refused

Furthermore, a member of the EA management function is assigned to the change request and planned closure date is set according to the status. An exemplary change log is displayed in Table 42.

Requestor	Request	Status	Responsible architect	Planned closure date
John Smith	Viewpoint <i>Support of Business processes by services</i> should also display support by business applications	In review	Jane Doe	31.01.2010

Table 42: Exemplary change log

5.3 Summary

The presented approach is built on the literature analysis, the stakeholder roles developed from literature analysis, and expert interviews. The complete approach is displayed in Figure 28. This approach is built on four basic assumptions concerning the EA management function and its integration into an organization. The actual approach is structured into three distinct phases, namely the *stakeholder analysis phase*, the *planning phase*, and the *interaction phase*. Each of these phases produces artifacts that are used by other phases. The *stakeholder analysis phase* produces a stakeholder map that serves as the input for the *planning phase*. The *planning phase* produces the organization-specific EA management, the EA management roadmap, and the communication plan, which are used during the *interaction phase*. The *interaction phase* in turn maintains and monitors the EA management roadmap and the change log. Both in turn serve as input for the *planning phase*. Furthermore, in the *interaction phase* the communication plan is executed. These artifacts also serve as a starting point whenever the phase is restarted. Therefore, if a new stakeholder is identified in the *interaction phase* the *stakeholder analysis phase* does not have to start from scratch, but can analyze the newly identified stakeholder and add him or her to the stakeholder map. However, depending on the dynamics of the organizational environment, the stakeholder map should be updated from time to time in order to prevent it from being outdated.

With respect to the stakeholder management framework, all levels and focus areas discussed in the analyzed literature are represented in the approach. On the *rational level* the focus areas

stakeholder identification and *stakeholder analysis* are represented by the steps *identification and categorization* and *role assignment and further analysis* in the *stakeholder analysis phase*. With respect to the *process focused level* and the focus areas *stakeholder aware forms of organization* and *stakeholder aware processes*, the *planning phase* includes the design of the required EA management governance. The compilation of the communication plan in the *planning phase* and its execution in the *interaction phase* represent the focus area *process quality of interactions* on the *transactional level*. Finally, the focus area *result quality of interactions* on the *transactional level* is represented by the construction and monitoring of the EA management roadmap and the monitoring of the change log.

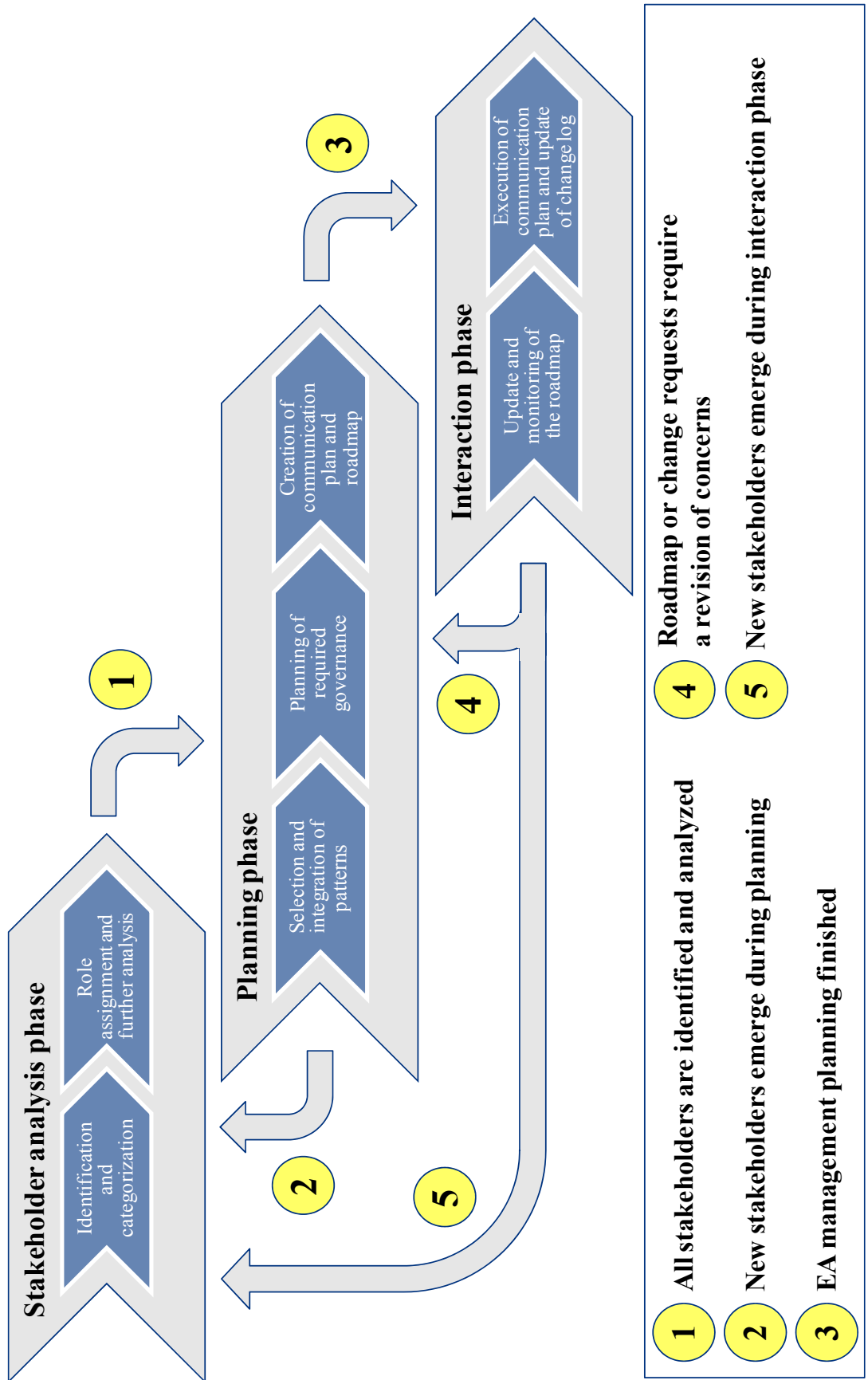


Figure 28: Approach for stakeholder-specific EA management based on patterns

6 Discussion of the Approach

In this discussion of the developed approach, the assumptions on which the approach is based are questioned first. Then, the three phases are discussed regarding the developed steps. Finally, the overall validity and applicability of the approach is critically assessed.

The development of the approach was guided by four basic assumptions:

1. The EA management function is implemented as a staff function within the organization.
2. The EA management function is assigned to the organizational role CIO.
3. The EA management function possesses very limited organizational power.
4. The objective of the EA management function is to address the concerns of the CIO and to address the concerns of other EA stakeholders as far as it helps to address the concerns of the CIO.

With respect to the first and the third assumption, two other organizational forms and related levels of organizational power are conceivable for the EA management function. On the one hand, EA management could be performed as part of a project and not as an enterprise function. On the other hand, the EA management function could be implemented as an enterprise function with a high-level of organizational power. In the former case, the EA management project would be in a situation similar to the situation of the EA management function implemented as a staff function. It would also have to rely on support gained by providing value to stakeholders through addressing their concerns, in order to foster their support, as its organizational power is limited as well. In the latter case, the EA management function implemented as an enterprise function would have a set of EA management related tasks and the required organizational power to perform these tasks. In this case, the value of stakeholder management is diminished by the ability of the EA management function to ensure stakeholder support and avoid threats by stakeholders via its organizational power. However, since EA management is a holistic approach that potentially affects all areas of an enterprise, EA stakeholders might still exist that are outside the organizational power of the enterprise function. If these stakeholders are relevant for the achievement of the EA management functions objectives, their involvement into EA management through the designed approach is merited.

With respect to the second assumption, the EA management function is assumed to be assigned to the CIO. This assumption was underpinned by literature and the results of the expert interviews. However, the results of the expert interviews could be biased by the large number of European companies in the cases described by the interviewees and not representative because of the small number of interviews. Therefore, the EA management function could be assigned to other roles as well. Winter and Schelp [WiSc08] describe a case study at a Swiss company where the team performing the EA management function was split into an IT architecture team and a business architecture team. While the former one was located close to the CIO, the latter one was reporting to the CEO. Whittle and Myrick [WhMy05] stress the im-

portance of the business architecture in EA management context. By identifying the CEO as its sponsor, they also imply an assignment of the EA management function to this role. In summary, the assumption that the EA management function is assigned to the CIO does not hold in all cases. However, in cases where the EA management function is not assigned to the CIO, the third assumption can be adapted to reflect the sponsoring organizational role, e.g. the CEO. The fourth assumption would then have to be adapted accordingly.

With respect to the fourth assumption, the EA management function's objective is to address the concerns of the CIO. A different approach to stakeholder-specific design is described by Aier et al. [Ai08b]. In their approach, EA stakeholders gather, prioritize, and select concerns that are to be addressed in a workshop. However, in this approach no guidance is given on who is to be invited to the workshop and therefore influences the EA management design.

With respect to the phases of the approach for stakeholder-specific design, the influences and the usability have to be discussed. The stakeholder analysis phase is heavily influenced by TOGAF as it uses the brainstorming technique proposed by TOGAF for the identification of stakeholders and a stakeholder model developed according to the interviews. Furthermore, it results in a stakeholder map detailing the analysis results. Concerning the chosen method of brainstorming over other methods discovered in literature, like stakeholder interviews, some drawbacks have to be noted. While the conduction of a brainstorming, guided by the provided list of questions, is a simple and straightforward method, it does not guarantee the identification of all stakeholders. This is the case, because stakeholders unknown to the participants of the brainstorming cannot be identified. A more complete identification can only be achieved by more time consuming methods like stakeholder interviews. However, since the approach allows for the return to the stakeholder analysis phase from the other phases in case new stakeholders are discovered an identification of all stakeholders in the first iteration is not necessary in order to continue the design of the EA management. As the PMBOK notes, the most important stakeholders are usually easy to identify. Therefore, the strong instrumental orientation of the approach does not merit a complete validation of non-key stakeholders, either. With respect to the mapping of the developed stakeholder roles to the identified stakeholders it is questionable, if this mapping is straightforward or possible in a real-world scenario. On the one hand, the stakeholder roles were developed from general organizational roles and therefore are expected to fit some of the identified stakeholders. On the other hand, the small number of roles could endanger a mapping in cases with a large and diverse stakeholder set. Even in cases where the organizational role of the identified stakeholder matches the stakeholder role, the actual concerns of the stakeholder might differ from the concerns of the stakeholder role. This might occur, since each organization is free to choose the tasks it assigns to organizational roles and because there is no unified understanding of which tasks a role is commonly assigned to. A concept that was designed in this thesis is the categories for identifying key stakeholders. This identification is performed by selecting the level of required support and possible threat regarding the objectives of the EA management function. The categories were introduced due to the missing description of stakeholder analysis categories in both TOGAF and the PMBOK. This was criticized as being open to subjective bias in the literature analysis. Therefore, the description of the levels in both categories offers more guidance to analyzing stakeholders than the mere naming of categories in the analyzed approaches. However, the levels still rely on the subjective perception of the members of the EA

management function. Therefore, the identification of key stakeholders by the described categories might be less prone to subjective bias, but can still not be judged as being objective.

With respect to the planning phase, the central guideline for the selection of the relevant EAMPC concerns is that CIO concerns are addressed with priority (fourth assumption). Then, the concerns of those stakeholders are addressed, that can support or endanger the ability of the EA management function to address the CIO concerns. This implies that the EA management function has gained a substantial level of insight into the concerns of the relevant EA stakeholders via the assignment of roles. However, no cost-benefit scale is supplied implying, that all concerns are addressed as long as it helps to address the concerns of the CIO. In practice, the addressing of stakeholder concerns via EA management will require resources on part of the EA management function. Therefore, the EA management function will have to select a set consisting of CIO concerns and the required concerns of other stakeholder that it can cope with from a resource point of view. This might require trade-offs between CIO concerns, a subject not covered by the current approach. With respect to the required governance, the approach is only referring to the approaches described in literature or the descriptions supplied with the EAMPC M-Patterns. This is a very basic and limited discussion of this important topic, keeping in mind that EA management governance was mapped to the stakeholder management subjects of stakeholder aware organizations and processes in the literature analysis. With respect to the possible forms of organizations and possible forms of organization-specific EA management designs, a standard solution for the inclusion of stakeholders seems not possible. The information on the desirable governance should therefore best be integrated into the EAMPC at the level of the M-Patterns, were some information about required processes is already described. With regard to the last step in the planning phase, the concept of establishing a communication plan is mentioned in both TOGAF and the PMBOK. The usage of a communication plan in the EA management context however depends on the usage of an EA management tool. If every relevant stakeholder has access to the relevant viewpoints via such a tool, the communication plan loses its value for managing the communication with stakeholders. Finally, the EA management roadmap allows the EA management function to postpone the implementation of concerns for tactical reasons, while still providing an incentive for cooperation to the relevant stakeholders. This could be relevant in cases where information needs to be provided by stakeholders in order to address their concerns later, when the data collection has finished.

With respect to the interaction phase, the change log, the execution of the communication plan, and the update of the roadmap have to be discussed. The change log is a combination of the issue log and the change log described in the PMBOK. On the one hand, it allows stakeholders to submit change requests and thereby to provide feedback to the EA management function. On the other hand, it allows other stakeholders to witness the active change request and thereby, in theory, improves the transparency of the interaction with stakeholders. The execution of the communication plan is a vital step in the approach since the underlying assumption is that the objectives of the EA management function can only be attained, if the concerns of key stakeholders are addressed. As discussed above, however, this step can be replaced by the usage of an appropriate EA management tool. Finally, the monitoring of the roadmap provides the trigger for the further development of the EA management in the planning phase. However, all three tools, the change log, the communication plan, and the road-

map are insufficient to address massive changes of stakeholder concerns. Therefore, if a fundamental shift in stakeholder concerns occurs, e.g. through a new organization-wide strategy or an organizational change like a merger, then an adaptation of the current EA management via these tools might be impossible due to relationships between the CIO's concerns and the concerns of other stakeholders. Therefore, in these cases, a full restart of the approach might be necessary.

In summary, the major drawback of the designed approach is the missing validation in a real-life scenario. A validation should be performed with respect to the following three areas:

- **Developed concepts:** In the design of the approach stakeholder concepts were adapted from literature or developed from scratch and need to be validated. This includes the ranking of stakeholders by their support or threat to the EA management function's objectives and the design of a suitable governance based on the selected patterns. Furthermore, the planning and execution of the interaction with stakeholders via the communication plan, the EA management roadmap, and the change log need to be conducted in a real-life scenario for validation purposes.
- **Mapping of stakeholder to roles:** This key concept in the designed approach needs to be validated in several real-life scenarios in order to establish its value to stakeholder management in the EA management field. In order to arrive at a more complete set of roles, the roles and concerns discovered in validation scenarios should be recorded and added to role set in order to enlarge both the EAMPC and the designed approach.
- **Scope and succession of the phases:** In the designed approach, the phases are structured according to the stakeholder management framework used in this thesis. Therefore, the appropriateness of the scope and the succession of the phases have to be validated in real-life scenarios. If, for example, in a scenario the planning phase is often identifying new stakeholders and therefore the stakeholder analysis phase is retriggered, a tighter integration of these phases possibly into one phase might streamline the approach.

Apart from these questions, the value of the approach with respect to the objectives of this thesis is summarized in the following chapter.

7 Summary and Outlook

The key message of this thesis is that stakeholder management can be utilized by the EA management function to design a stakeholder-specific EA management based on the EAMPC. The designed approach is geared towards realizing the objective of the EA management function. This objective is assumed to address the CIO's concerns. The concerns of other EA stakeholders are considered depending on the level of required support and possible threat with respect to addressing the CIO concerns. Thereby, the approach is addressing the three objectives of stakeholder management in the EA management field outlined in the introduction. The integration of the EA management function into the organization is achieved by designing the appropriate EA management governance according to the selected EAMPC concerns. The support of relevant stakeholders is ensured by addressing their concerns. Finally, stakeholders that pose a threat to the EA management function's objectives are integrated via the selection of their concerns during the pattern-based design of the EA management.

In order to build this approach, the definition of the term EA stakeholder used in this thesis was derived from Freeman's original definition and thereby linked to the objectives of the EA management function in Chapter 2. Furthermore, this chapter introduced the analysis framework for stakeholder management used throughout this thesis. In Chapter 3, this analysis framework is used to analyze the state-of-the-art of stakeholder management in area of EA management and related fields. Thereby, key stakeholder management concepts are identified and described. Furthermore, stakeholder role descriptions are gathered. These descriptions are then used in Chapter 4 to complement stakeholder roles derived from the expert interviews. In this chapter, the analysis procedure and the results of a series of expert interviews is described. Based on the stakeholders mentioned by the interviewees, a stakeholder model is built. Furthermore, the mentioned stakeholders are analyzed and, where appropriate, combined to stakeholder roles. These stakeholder roles and the concerns mentioned by the interviewees are then combined with the stakeholder roles found in literature. Then, a matching of these concerns to EAMPC concerns is performed resulting in a set of stakeholder roles with assigned EAMPC concerns. The results of the three chapters, namely the definition, the identified stakeholder management concepts, as well as the stakeholder models and stakeholder roles, are used in the design of the approach in Chapter 5. The approach designed in this thesis therefore combines state-of-the-art stakeholder management concepts with the results from expert interviews. It is structured in three phases that closely resemble the levels of the used stakeholder analysis framework. Finally, in Chapter 6, the assumptions underlying the approach and the approach in general are discussed.

With respect to the questions that guided the development of this thesis answers are provided to all three questions. The first question is concerned with the state-of-the-art of stakeholder management in EA management and related fields. This question is answered in Chapter 3 by analyzing six approaches in detail. However, the focus of this analysis was on depth and therefore is limited in scope. On the one hand, this was required in order to provide a solid foundation for the development of the approach. On the other hand, a more complete picture of the current state-of-the-art could have been attained by analyzing more publications especially from related fields. Since an in-depth and wide scope analysis was not possible due to

time constraints, only the former was performed. The second question is concerned with finding a suitable definition and model for EA stakeholders. This question is answered in Chapter 2 by deriving the working definition of this thesis from Freeman's original definition. Furthermore, a stakeholder model was built from the stakeholders described in the expert interviews. Both were then used in the development of the approach for stakeholder-specific design of an EA management based on patterns. Finally, the third question is concerned with relating stakeholders to EAMPC concerns. This question is dealt with throughout the Chapters 2, 3, and 4. In Chapter 2, the concept of a stakeholder role as a generic organizational role is introduced. This concept is then used in Chapter 3 to gather the concerns of stakeholder roles as described in literature. Finally, the stakeholders described by the interviewees are combined in stakeholder roles. Then, the concerns of stakeholder roles from literature and the interviews are combined. The role is then related to the EAMPC via the combined concerns. Therefore, the concept of the stakeholder role provides a reusable relation to EAMPC concerns, if the role is assigned to a stakeholder during the designed approach.

With respect to future research, both the designed approach and the included stakeholder roles still require a validation in a real-life scenario as discussed in Chapter 6. Furthermore, in the course of this thesis two questions related to stakeholder management in the EA management field were only briefly discussed or replaced by assumptions. These questions therefore also provide opportunities for further research. The first question is concerned with the implications of the organizational structure on stakeholder management. In the stakeholder model derived from the expert interviews a divisional form of organization is implied. Although this organizational form is common for big companies, other organizational forms exist. Furthermore, divisions or business units might have differing autonomy. This in turn might lead to situations where the CIO, and therefore the EA management function, has more or less power with respect to other units. An interesting question related to the organizational power is, whether stakeholder management is required at all, in cases where the EA management function has a high-level of organizational power. Furthermore, it needs to be assessed whether the instrumental, CIO-focused approach described in this thesis is merited if the CIO has only a low-level of organizational power or whether a more normative approach should be pursued, as described by one interviewee. Finally, the second question that is not answered in this thesis is whether the assumption holds that the EA management function is assigned to the CIO. This assumption was based on the description of projects by the interviewees. However, with the increasing significance of EA management and its holistic approach other high-level organizational roles such as the CEO would be possible. Therefore, future research should be devoted towards establishing the common integration of the EA management function into organizational structures. Finally, the advantages of performing stakeholder management in the EA management field are described by a number of authors (cf. [Ai08b, Ra08, Ga09]). In the stakeholder theory field, quantitative research has been conducted in order to establish the effects of stakeholder management on corporate financial results (cf. [Be99, Ce07]). Although, it is easy to argue that stakeholder management is of value to the EA management function, it would be interesting to see these arguments proven or rejected by empirical results.

Bibliography

- [AcVo08] Achterkamp, M. C.; Vosa, J. F. J.: *Investigating the use of the stakeholder notion in project management literature, a meta-analysis*. In (Paech, B.; Rolland, C., Ed.): REFSQ 2008, Springer-Verlag, Berlin. pages 749–757. 2008.
- [Ag08] Agle, B. R. et al.: *Dialogue: Towards a Superior Stakeholder Theory*. In Business Ethics Quarterly (18). pages 153–190. 2008.
- [Ai07] Aier, S.: *Integrationstechnologien als Basis einer nachhaltigen Unternehmensarchitektur: Abhängigkeiten zwischen Organisation und Informationstechnologie*. Gito-Verlag, Berlin. 2007.
- [Ai08a] Aier, S.; Riege, C.; Winter, R.: *Unternehmensarchitektur - Literaturüberblick und Stand der Praxis*. In Wirtschaftsinformatik (50). pages 292–304. 2008.
- [Ai08b] Aier, S. et al.: *Stakeholderorientierte Dokumentation und Analyse der Unternehmensarchitektur*. In (Hegering, H.-G.; Lehmann, A.; Ohlbach, H. J.; Scheideler, C., Ed.): GI Jahrestagung (2). pages 559–565. 2008.
- [Be99] Berman, S. L. et al.: *Does Stakeholder Orientation Matter? The Relationship between Stakeholder Management Models and Firm Financial Performance*. In Academy of Management Journal (42). pages 488–506. 1999.
- [BeGö06] Bea, F. X.; Göbel, E.: *Organisation – Theorie und Gestaltung*. Lucius & Lucius, Stuttgart. 2006.
- [Br06] Breisig, T.: *Betriebliche Organisation*. Verl. Neue Wirtschafts-Briefe, Herne. 2006.
- [Bu08] Buckl, S. et al.: *Enterprise Architecture Management Pattern Catalog, Version 1.0*. Technical Report TB 0801, TU München, Chair for Informatics 19 (sebis), Germany. 2008.
- [Bu09a] Buckl, S. et al.: *State of the Art in Enterprise Architecture Management - 2009*. TU München, Chair for Informatics 19 (sebis), Germany. 2009.
- [Bu09b] Buckl, S.; Matthes, F.; Schweda, C. M.: *Enterprise Architecture Management Method Library, Version 0.7*. TU München, Chair for Informatics 19 (sebis), Germany. 2009.
- [Ce07] Cennamo, C.; Berrone, P.; Gomez-Mejia, L.: *Does Stakeholder Management have a Dark Side?* In Journal of Business Ethics (74). pages 315–327. 2007.
- [Cl95] Clarkson, M. E.: *A stakeholder framework for analyzing and evaluating corporate social performance*. In Academy of Management Review (20). pages 92–117. 1995.
- [Di58] Dill, W. R.: *Environment as an Influence on Managerial Autonomy*. In Administrative Science Quarterly (4). pages 409–443. 1958.
- [Do32] Dodd, E. M.: *For Whom are Corporate Managers Trustees?* In Harvard Law Review (45). pages 1145–1163. 1932.
- [DoPr95] Donaldson, T.; Preston, L. E.: *The Stakeholder Theory of the Corporation: Concepts, Evidence, and Implications*. In Academy of Management Review (20). pages 65–91. 1995.
- [Fa09] Fassin, Y.: *The Stakeholder Model Refined*. In Journal of Business Ethics (84). pages 113–135. 2009.
- [Fi07] Fischer, R.; Aier, S.; Winter, R.: *A Federated Approach to Enterprise Architecture Model Maintenance*. In (Reichert, M.; Strecker, S., Ed.): EMISA 2007, Gesellschaft für Informatik, Bonn. 2007.
- [FiKi07] Fiedler, L.; Kirchgeorg, M.: *The Role Concept in Corporate Branding and Stakeholder Management Reconsidered: Are Stakeholder Groups Really Different?* In Corporate Reputation Review (10). pages 177–188. 2007.
- [FiSc00] Figge, F.; Schaltegger, S.: *Was ist "stakeholder value"? Vom Schlagwort zur Messung*. CSM, Lehrstuhl für BWL, Universität Lüneburg. 2000.
- [Fr07] Freeman, R. E.; Harrison, J. S.; Wicks, A. C.: *Managing for stakeholders. Survival, reputation, and success*. Yale University Press, New Haven. 2007.
- [Fr84] Freeman, R. E.: *Strategic management: A Stakeholder Approach*. Pitman, Boston. 1984.

- [FrMc01] Freeman, R. E.; McVea, J.: *A Stakeholder Approach to Strategic Management*. Darden Business School Working Paper No. 01-02. 2001.
- [FrMu05] Frooman, J.; Murrell, A. J.: *Stakeholder Influence Strategies: The Roles of Structural and Demographic Determinants*. In *Business & Society* (44): 3–31. 2005.
- [Ga09] Gartner Research: *Gartner Identifies Ten Enterprise Architecture Pitfalls*. <http://www.gartner.com/it/page.jsp?id=1159617> (cited 01.11.2009). 2009.
- [IS07] ISO/IEC: *42010:2007 Systems and software engineering – Recommended practice for architectural description of software-intensive systems*. 2007.
- [IT07] IT Governance Institute: *Cobit 4.1*. Rolling Meadows, IL. 2007.
- [Je01] Jensen, M. C.: *Value Maximization, Stakeholder Theory, and the Corporate Objective Function*. In *Journal of Applied Corporate Finance* (14). pages 8-21. 2001.
- [Jo02] Jones, T. M.; Wicks, A. C.; Freeman, E. R.: *Stakeholder Theory: The state of the art*. In Bowie, N. E. (editor): *The Blackwell guide to business ethics*. Blackwell, Malden, MA. pages 19–37. 2002.
- [Jo95] Jones, T. M.: *Instrumental Stakeholder Theory: A synthesis of business and economics*. In *Academy of Management Review* (20). pages 404–437. 1995.
- [Ka02] Kaler, J.: *Morality and Strategy in Stakeholder identification*. In *Journal of Business Ethics* (39). pages 91–99. 2002
- [La05] Laux, H.; Liermann, F.: *Grundlagen der Organisation. Die Steuerung von Entscheidungen als Grundproblem der Betriebswirtschaftslehre*. Springer, Berlin. 2005.
- [La08] Laplume, A. O.; Sonpar, K.; Litz, R. A.: *Stakeholder Theory: Reviewing a Theory That Moves Us*. In *Journal of Management* (34). pages 1152–1189. 2008.
- [Li06] Lindström, Å. et al.: *A survey on CIO concerns – do enterprise architecture frameworks support them?*. In *Information Systems Frontiers* (8). pages 81–90. 2006.
- [Ma08] Matthes, F. et al.: *Enterprise Architecture Management Tool Survey 2008*, TU München, Chair for Informatics 19 (sebis), Germany. 2008.
- [Mi97] Mitchell, R. K.; Agle, B. R.; Wood, D. J.: *Toward a Theory of Stakeholder Identification and Salience: Defining the Principle of Who and What Really Counts*. In *Academy of Management Review* (22). pages 853-886. 1997.
- [NA04] National Association of State Chief Information Officers: *Enterprise Architecture Development Tool-Kit v3.0*. <http://www.nascio.org/publications/> (cited 01.11.2009). 2004.
- [OG07] Office of Government Commerce: *ITIL Version 3 - Service Operations*. The Stationary Office, London. 2007.
- [Pi08] Picot, A.; Dietl, H.; Franck, E.: *Organisation. Eine ökonomische Perspektive*. Schäffer-Poeschel, Stuttgart. 2008.
- [Po02] Post, J. E.; Preston, L. E.; Sauter-Sachs, S.: *Redefining the corporation. Stakeholder management and organizational wealth*. Stanford Business Books, Cambridge. 2002.
- [Pr08] Project Management Institute: *A guide to the project management body of knowledge*. Newton Square, PA. 2008.
- [Ra08] van der Raadt, B.; Schouten, S.; Vliet, H.: *Stakeholder Perception of Enterprise Architecture*. In (Morrison, R.; Balasubramaniam, D.; Falkner, K., Ed.): *ECSA 2008*, Springer, Berlin. pages 19–34. 2008.
- [RaBa08] van der Raadt, B.; van Vliet, H.: *Designing the Enterprise Architecture Function*. In (Becker, S.; Plasil, F. Reussner, R., Ed.): *QoSA 2008*, Springer, Berlin. pages 103–118, 2008.
- [Re00] Rehtin, E.: *Systems architecting of organizations. Why eagles can't swim*. CRC Press, Boca Raton, FL. 2000.

- [Ro00] Roeckle, H.; Schimpf, G.; Weidinger, R.: *Process-oriented approach for role-finding to implement role-based security administration in a large industrial organization*. In (Rebensburg, K.; Youman, C.; Atluri, V., Ed.): RBAC 2000, ACM, New York, NY. pages 103-110. 2000.
- [Ro09] Ross, J. W.; Weill, P.; Robertson, D. C.: *Enterprise architecture as strategy – Creating a foundation for business execution*. Harvard Business School Press, Boston, MA. 2009.
- [Sc02] Schuppisser, S. W.: *Stakeholder Management. Beziehungen zwischen Unternehmungen und nicht-marktlichen Stakeholder-Organisationen – Entwicklung und Einflussfaktoren*. Schriftenreihe des Instituts für Betriebswirtschaftliche Forschung an der Universität Zürich, Haupt, Bern. 2002.
- [Sc08a] Scott, J.: *Create Greater Impact Through EA Stakeholder Management*. Forrester Research. 2008.
- [Sc08b] Schreyögg, G.: *Organisation. Grundlagen moderner Organisationsgestaltung*. Gabler, Wiesbaden. 2008.
- [St04] Steen, M. W. A. et al.: *Supporting viewpoint-oriented enterprise architecture*. EDOC'04. IEEE Computer Society, Los Alamitos, CA. pages 201–211. 2004.
- [St99] Staehle, W. H.; Conrad, P.; Sydow, J.: *Management. Eine verhaltenswissenschaftliche Perspektive*. Vahlen, München. 1999.
- [Th09] The Open Group: *The Open Group Architecture Framework (TOGAF) Version 9 "Enterprise Edition"*. 2009.
- [WhMy05] Whittle, R.; Myrick, C. B.: *Enterprise business architecture. The formal link between strategy and results*. Auerbach, Boca Raton, FL. 2005.
- [WiSc08] Winter, R.; Schelp, J.: *Enterprise architecture governance: the need for a business-to-IT approach*. In (Wainright, R.; Haddad, H., Ed.): SAC '08, ACM, New York, NY. pages 548-552. 2008.
- [WöDö08] Wöhe, G.; Döring, U.: *Einführung in die allgemeine Betriebswirtschaftslehre*. Vahlen, München. 2008.

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Appendix C Glossary

CEO	Chief Executive Officer
CFO	Chief Financial Officer
CIO	Chief Information Officer
CTO	Chief Technology Officer
DFO	Division Financial Officer
DIO	Chief Information Officer
COBIT	Control Objectives for Information and related Technology
EA	Enterprise Architecture
EAMML	EA management method library
EAMPC	Enterprise Architecture Management Pattern Catalog
IT	Information Technology
TOGAF	The Open Group Architecture Framework
PMBOK	Project Management Body of Knowledge

Appendix D Field Manual for the Expert Interviews

Start of the Interview

1. Introduction to and greeting of the interview partner
2. Introduction to the general goals of the interview, in detail to provide insight into
 - a) the purpose of the EA project in which the stakeholders were involved
 - b) the concerns stakeholders had with respect to the EA in this project
 - c) how the consultant himself perceives stakeholder management
3. Explanation of the course of the interview
 - a) Results will be made anonymous with respect to
 - i. The interview partner
 - ii. The projects the interview partner was involved
 - iii. The consulted companies
 - b) The transcript of the interview will be discussed with the interview partner prior to evaluation
 - c) The results will be authorized for publication by a Detecon employee
4. Short feedback from the interview partner whether he or she has additional questions

Personal Questions

1. Professional Experience
 - a. What is your organizational role in your current company?
 - b. How many years have you been involved in the field of EA management?
 - c. How many of those years in the consulting field?
2. Project Participation
 - a. In how many EA projects have you participated in?
 - b. What were the last three projects (identified by client company, project name, project phase) you were actively involved in? (further referred to as projects A, B, C)

Expertise Questions (repeated for identified projects A, B, C)

1. Concerning the setup of the project
 - a. What were the rough start and end points of the project? (example 03/08 – 09/08)
 - b. Which industry sector was the client company primarily active in? (Production, Service, Commerce, Finance, Information Industry, Public Utility, Transport and Logistics, Miscellaneous)

- c. What was the nature of the project? (Establishing an EAM, specific EA project,...)
 - d. What was the overall goal of the project?
 - e. In which phase was the project when you were involved (conceptualization, initiation, TOGAF ADM phase,...)?
 - f. Was the project successful? (follow-up project, client feedback,...)
2. Concerning the participants of the project
 - a. Which stakeholders were involved in the project? (In case the interview partner mentions groups ask for single participants e.g. Interview partner mentions Board XYZ, ask: "Who participated in the mentioned Board XY?")
 - b. What were the objectives of the mentioned stakeholders in this project?
 - c. In which elements of the Enterprise Architecture were the stakeholders interested in?
 - d. Who were the stakeholders of the mentioned functions? Who was affected by the outcome of the project?

Personal View on Stakeholder Management

1. How important is stakeholder management for your work? (ranging from very important to very unimportant)
2. What is your definition of the term *stakeholder*?
3. What makes one stakeholder more important than another stakeholder?
4. Which methods and tools have you already used to conduct stakeholder management?
5. How do you solve conflicts between stakeholders concerning a common goal?
6. Do you see limitations in using stakeholder management in your work?

Appendix E NASCIO Roles for EA Management

NASCIO architecture role	Category/significance	Main objectives	Organizational role
Overseer	Primary/helpful	Supervise business and IT plans, monitor budget	N.A. (a group or committee established by enterprise executives)
Champion	Primary/critical	Promote benefits, ensure that goals are met	Executive at CIO or equivalent level
Manager	Primary/critical	Coordination of the EA effort	Chief architect (enterprise level), local architects
Documenter/author	Primary/critical	Maintain EA information	Senior/junior level IT staff, or business staff, best implemented by domain committees for specific architectures
Communicator	Primary/critical	Supply EA information to enterprise community	Junior level IT staff
Advisor	Primary/necessary	Advise <i>manager</i> on strategic/economic aspects	Business executive or committee
Reviewer	Primary/critical	Review EA information	Executive/senior-level IT person or committee
Approver	Primary/necessary	Provide leadership and guidance in EA decisions	Mid-to-executive level member of the management team or committee

Audience	Primary/ necessary	Complies to EA decisions	Enterprise executives, departmental managers, and enterprise business leaders, internal and external IT staff, vendors, various enterprise architecture team members, executive IT staff members
Subject matter experts (SME)	Supporting/ necessary	Provide specialist knowledge for specific architectures	Members of support teams, project teams, architects, or a committee
Enterprise executive	Supporting/ critical	Strategic alignment of the enterprise	High level business executive
Project teams	Supporting/ necessary	Suggest/implement changes to EA, comply to EA decisions	N.A. (role has functional name)
Services teams	Supporting/ necessary	Support the existing business/IT portfolio for the enterprise	N.A. (role has functional name)
Procurement manager	Supporting/ critical	Assures that purchases are recorded in and comply to EA	N.A. (role has functional name)
Special interest groups	Supporting/ helpful	Identify special needs, considerations and benefits with respect to EA	N.A.
Project/services methodology communicator	Supporting/ necessary	Communicate current methodology, include EA checkpoints in methodology	N.A.

Table 43: NASCIO architecture roles and assigned organizational roles

Appendix F COBIT Roles and Activities in the EA Management Context

Role	Activities	Domain	Process
CEO	Establish executive and board oversight and facilitation over IT activities	ME	4
	Review, endorse, align and communicate IT performance, IT strategy, resource and risk management with business strategy	ME	4
	Obtain periodic independent assessment of performance and compliance with policies, standards and procedures	ME	4
CFO	Maintain the program portfolio	PO	5
	Determine risk management alignment (e.g. assess risk)	PO	9
	Establish the monitoring approach [for IT performance]	ME	1
Business Executive	Identify critical dependencies [between business and IT] and current performance [of IT]	PO	1
	Maintain the program portfolio	PO	5
	Assess IT operational benefits of proposed solutions	AI	1
	Report performance [of IT]	ME	1
CIO	Link business goals to IT goals	PO	1
	Maintain the program portfolio	PO	5
	Assess business benefits of proposed solutions	AI	1
	Monitor supplier service delivery	DS	2
	Review, endorse, align and communicate IT performance, IT strategy, resource and risk management with business strategy	ME	4

Chief Architect	Create and maintain corporate/enterprise information model	PO	2
	Create and maintain a technology infrastructure plan	PO	3
	Create and maintain technology standards	PO	3
	Publish technology standards	PO	3
	Monitor technology evolution	PO	3
	Define (future/strategic) use of new technology	PO	3
	Identify data owners	PO	4
	Define strategy and plan maintenance for infrastructure	AI	3
	Evaluate compliance of IT activities with IT policies, standards and procedures	ME	3

Table 44: COBIT roles and activities in the EA management context

Appendix G Stakeholder Roles by Project Type

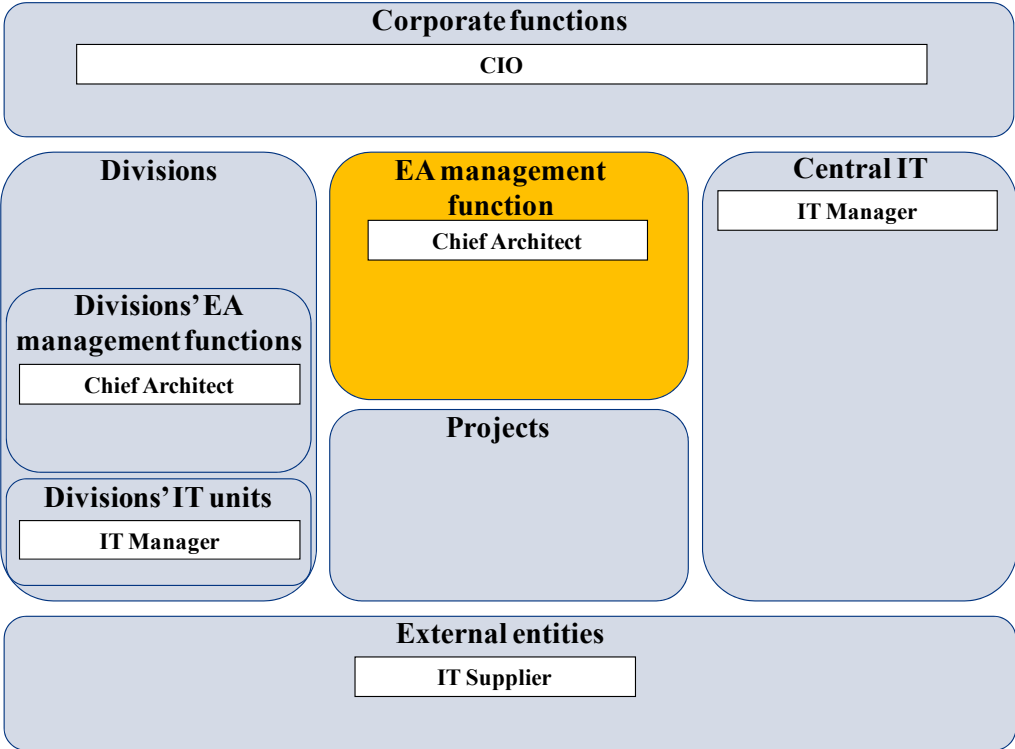


Figure 29: Stakeholder roles mapped to stakeholder model for project type governance

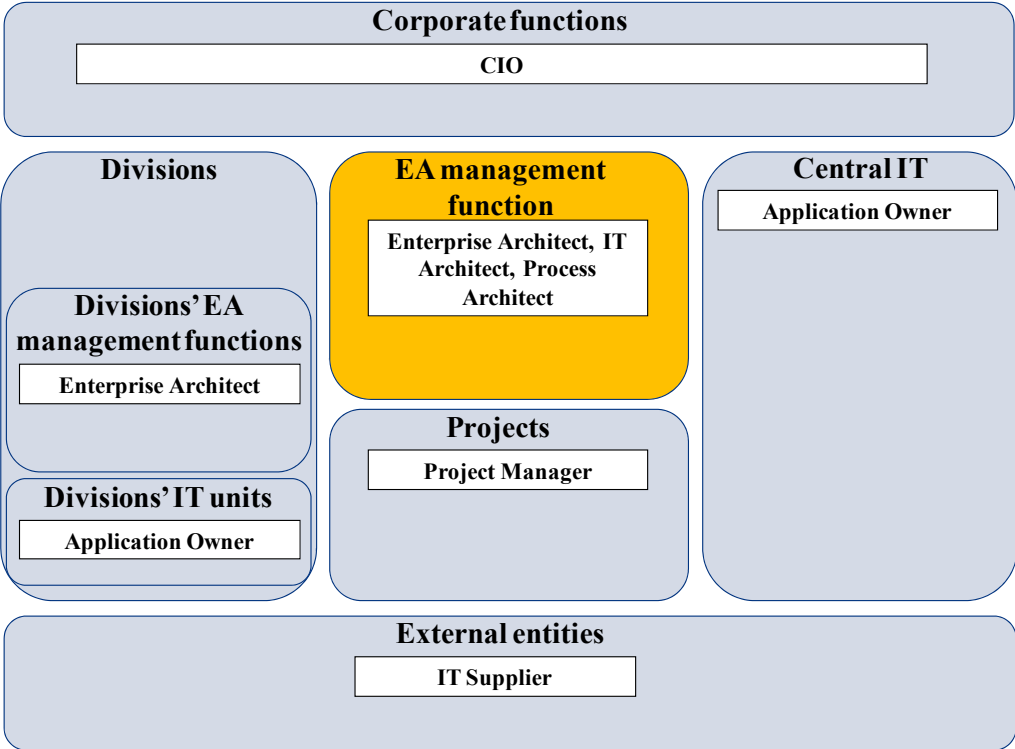


Figure 30: Stakeholder roles mapped to stakeholder model for project type data collection

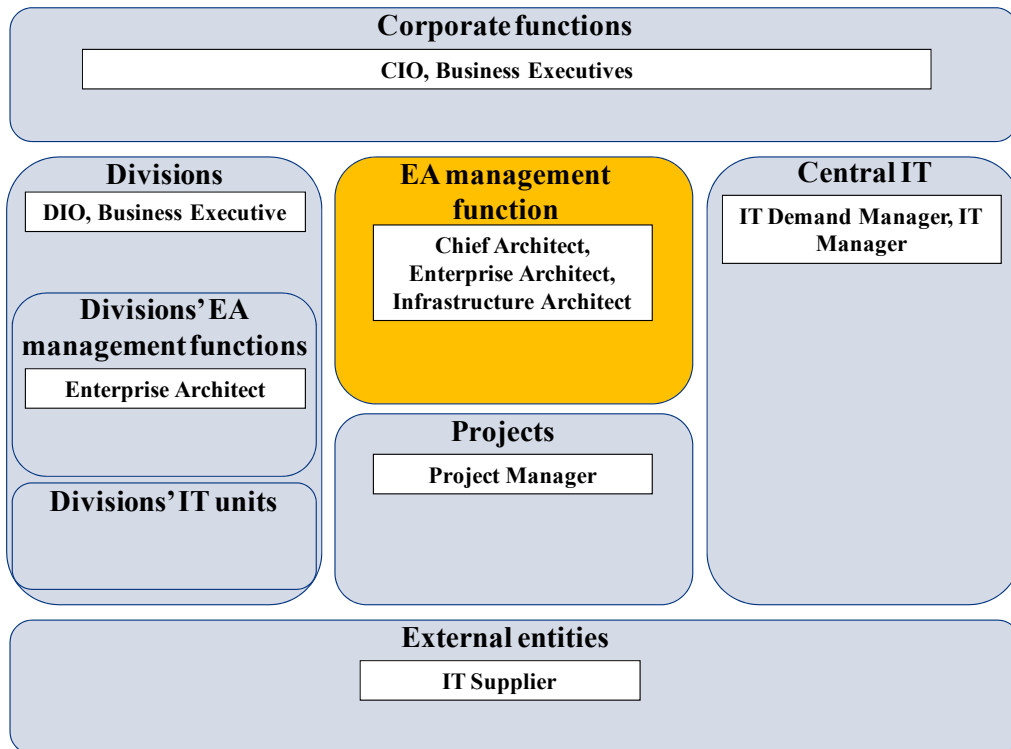


Figure 31: Stakeholder roles mapped to stakeholder model for project type method development and communication