

Sponsorship Models for Data Warehousing: Two Case Studies

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ABSTRACT

Data warehouse projects can be characterized as very complex, cross-functional and long lasting. Slogans like ‘think big - start small’ or ‘act local - think global’ can be found in literature. But most methodologies for data warehousing only focus on technical aspects or short-term project management and do not provide applicable recommendations for coping with the evolution of data warehouse systems. Sponsorship models are often proposed to support long-term data warehouse success, but most descriptions are shallow and do not consider data warehouse characteristics or other factors, which influence the organizational design of the sponsorship structures. Therefore, this paper presents a two-tier sponsorship committee structure for mature data warehouse systems. Based on two descriptive case studies, underlying data warehouse characteristics as well as contextual conditions are illustrated and the appropriate organizational setup of the committee structures is specified in detail. This setup comprises duties, competencies and responsibilities as well as recommendations for business and IT representatives to be included into the committees.

Keywords

Steering committees, organizational structures, data warehousing, sponsorship.

INTRODUCTION

Data warehouse systems are an established component of today’s information systems landscape in most large companies. They are often characterized as enterprise-wide, expensive, and large information systems (e.g. Wixom and Watson, 2001; Devlin, 1997). Data warehouse systems undergo a complex lifecycle comprising permanent development, administration and evolution tasks (Vassiliadis, Quix, Vassiliou and Jarke, 2001; Kosar, 1997). This lifecycle is called data warehousing and can be defined as “... a process, not a product, for assembling and managing data from various sources for the purpose of gaining a single, detailed view of part or all of a business” (Gardner, 1998).

Data warehouse departments are usually confronted with a large amount of requirements from data warehouse stakeholders in the company. Stakeholders are people whose departments are affected somehow by the data warehouse system. They include for example end users, data warehouse sponsors, and operational IT departments (see Figure 1). Due to the large number of stakeholders, the amount of requirements regularly exceeds the available resources for their implementation. Time-to-market is often a critical success factor for the data warehouse system. Therefore, data warehousing is not a temporary project but a permanent process of continuously improving and extending the data warehouse system (Meyer and Winter, 2001).

In literature most methodologies for building a data warehouse system are focusing on a single project. Either technical aspects like architectural concepts and data modeling are emphasized (e.g. Inmon, 1996; Kimball, 1996; Simon, 1998) or project management issues like staffing of the project team or controlling project progress are primarily addressed (e.g. Adelman and Moss, 2000; Kachur, 2000). The evolution and long-term viability of a data warehouse system are often not part of the development methodology (O’Donnell, Arnott and Gibson, 2002) although most studies of critical success factors of data warehousing underline the importance of long lasting management support and sponsorship (e.g. Wixom and Watson, 2001; Frolick and Lindsey, 2003; Little and Gibson, 1999; Finnegan and Sammon, 1999). Therefore, this paper focuses on how to ensure long-term viability and success of data warehouse systems in companies. Organizational measures supporting successful data warehouse evolution are institutionalized committee structures. Based on two case studies the organizational setups of committee structures for mature data warehouse systems are presented.

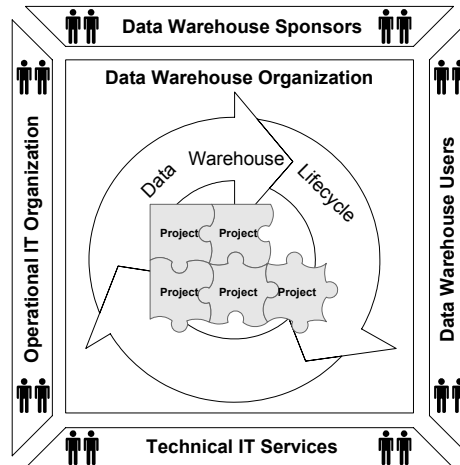


Figure 1. Data Warehouse Stakeholders

The paper proceeds in Section 2 by reviewing related work on organizational measures for data warehouse evolution. Section 3 describes the underlying research design, especially with respect to the particular characteristics of the case studies. In Section 4, cross-case findings are presented comprising a two-tier committee structure with duties, competencies and responsibilities as well as recommendations for business and IT representatives to be included into the committees. The paper concludes with discussion on future research.

RELATED WORK

In literature several sponsorship concepts for data warehouse systems can be found. Nearly all work has been published by consultants or vendors. Research has not yet focused this specific aspect although the importance of ongoing management support for data warehousing is often emphasized. In this section six selected publications often cited in the data warehouse community are presented. Only those organizational structures and roles are described which are not part of the project team.

Adelman and Moss (2000) propose a business and a technical advisory board. These advisory boards are responsible for the strategic development of the data warehouse. The business advisory board prioritizes data warehouse projects and defines the data warehouse objectives. It ensures the necessary budget and reviews the progress of projects on a high level. The technical advisory board is not data warehouse specific, moreover it is a general IT steering committee for coordinating and allocating IT resources as well as for approving standards. The description of the organizational setup of both boards is very shallow and lacks important details regarding its realization in practice.

Kachur (2000) presents a single sponsorship committee. This project steering committee oversees the whole data warehouse lifecycle. The committee is responsible for scope, objectives and budget of all data warehouse projects. It ensures the availability of sufficient business resources for the data warehouse implementation. Chairman of the project steering committee is the project sponsor who is the champion for the data warehouse program.

A similar concept is presented by Kimball, Reeves, Ross and Thornthwaite (1998). They suggest a single data warehouse steering committee staffed with business and IT management representatives. Duties of this committee are the prioritization of major data warehouse initiatives and the establishment of data warehouse funding procedures and levels.

A two-tier committee concept is recommended by Devlin (1997). The steering committee is responsible for managing the expectations of the business divisions and for prioritizing projects. High-level executives representing all these business units should be member of this committee. The project office carries out the decisions of the steering committee defining, maintaining and monitoring a staged implementation plan for the data warehouse system. The project office should be staffed with senior professionals comprising project management, business and broad technical skills. Devlin's committee concept is very business-oriented and incorporates the cross-enterprise characteristic of a data warehouse system. But its description remains on a generic level and does not fulfill the requirements for an organizational implementation.

Author(s)	Sponsor(s)	Short Description and Staffing	Main Duties	Special Features
Adelman and Moss, 2000	Business Advisory Board	Advisory boards will make critical decisions on the direction of the data warehouse. They should meet on an ongoing basis and are a critical success factor for a data warehouse.	- Prioritize projects (costs, benefits, political significance) - Approve data warehouse objectives - Approve budgets - Review high-level project agreements	
	Technical Advisory Board		- Coordinate and authorize IT resources - Allocate people - Resolve issues among different IT groups - Approve standards for architecture, hardware and software	Not data warehouse specific
Kachur, 2000	Project Steering Committee	The committee oversees the whole data warehouse program and is responsible for achieving the associated business goals.	- Set and approve scope, objectives and priorities of program and project iterations - Ensure funding for the project - Provide business resources	Chaired by the project sponsor
Kimball, Reeves, Ross and Thornthwaite, 1998	Data Warehouse Steering Committee	Cross-functional steering committee for overall direction and basic rules for growing the data warehouse. Staffed with representatives from both the business and IS management.	- Prioritize major data warehouse initiatives - Establish overall infrastructure funding levels - Determine priorities for growth and evolution - Establish data warehouse funding procedures	Should not meet less than quarterly
Devlin, 1997	Steering Committee	An executive group, drawn from all parts of the business.	- Manage the expectations of different divisions (benefits, implementation time) - Prioritize projects	
	Project Office	Supporting and carrying out decisions of the steering committee. Staffed with senior professionals with project management skills as well as high-level business and broad technical knowledge.	- Define and maintain staged implementation plan - Ensure project initiation and monitoring	
Inmon, Welch and Glassey, 1997	Iteration Sponsor	Executive sponsor from the business for an iteration of the data warehouse. May change over time according to the functionality of the data warehouse.	- Set scope and business requirements for iteration - Provide key user resources - Provide funding for iteration	Individual
	IS Executive Sponsor	IS sponsor should be the highest ranking IS manager (CIO or CFO).	- Ensure support of the IS organization for the data warehouse - Provide funding for data warehouse environment - Resolve escalated issues	Individual
Kelly, 1996	Corporate Sponsor	The corporate sponsor has a strategic role in coordination and ensuring the realization of the data warehouse vision. This sponsor should be a senior executive with corporate responsibility.	- Authorize overall project plan - Ensure compliance with IT standards and strategies - Ensure security and contingency - Provide funding for hardware and software - Monitor benefits of investments	The corporate sponsor is chairman of a corporate steering committee, which should meet not less than quarterly.
	Functional Sponsor	The functional sponsor defines and reviews the deliverables in each phase of the data warehouse lifecycle. This sponsor is phase-specific and should be a senior manager with functional responsibility for a certain subject area of the business.	- Define and maintain plan for all activities and products in the sponsored phase - Prioritize functionality to be implemented in the phase - Manage organizational change (e.g. end user training) - Define goals and objectives of the data warehouse - Plan and implement system deployment - Provide funding for equipment necessary to access the data warehouse	The functional sponsor is chairman of a subject-area data warehouse steering committee, which should meet not less than monthly.
	Application Sponsor	The application sponsor has expert knowledge in a specific application area and should be a middle manager of that application area.	- Provide requirements and functional specifications - Ensure quality of application (e.g. acceptance test) - Define software modifications	Individual

Table 1. Summary of the Sponsorship Concepts

Inmon, Welch and Glassey (1997) propose two kinds of sponsors. The iteration sponsor is an executive manager from the business responsible for a certain iteration in the data warehouse lifecycle. The iteration sponsor defines the scope of the iteration and provides funding and business resources for its implementation. The IS executive sponsor ensures the continuous support of the IS organization and provides funding for the data warehouse infrastructure apart from the iteration budget. The highest ranking IS manager in the company (in most cases the CIO) is recommended to own this role. Unlike other sponsorship concepts, Inmon et al. do not recommend committee structures but individuals holding the sponsor roles for the data warehouse.

Kelly (1996) suggests a three-tier sponsorship model for data warehousing. He distinguishes corporate, functional and application sponsors. The corporate sponsor is in charge of coordinating all data warehouse activities, ensuring the strategic development and providing sufficient funds for software and hardware. The functional sponsor is responsible for the deliverables of one or more phases of the data warehouse lifecycle. This includes prioritizing the functionality, which has to be implemented in a specific phase, and managing the organizational change, which is necessary due to the introduction of the data warehouse system. Both the corporate and the functional sponsor are chairmen of a corporate and a subject-area steering committee, respectively. The application sponsor is an individual who provides detailed functional requirements for a specific application of the data warehouse system and ensures their adequate implementation. This sponsorship concept provides the most detailed organizational setup comprising responsibilities and members on each sponsor level. Kelly is the only author who suggests a three-tier sponsorship structure.

The alternative sponsorship concepts are summarized in Table 1. Their characteristics and attributes can be used as a framework for the following sections. Besides the naming, the organizational setups of the discussed sponsorship models differ substantially. The number of sponsorship levels ranges from one to three. As a result the responsibilities and tasks are unevenly distributed among the sponsors. Most authors recommend sponsorship committees consisting of groups of people, but also individuals are proposed as sponsors. Further distinctions include number and function of the committee members. Some authors propose primarily business driven sponsorship models whereas others suggest IS managers for chairing the committees.

Most publications only provide a blurry and incomplete description of the sponsorship concept, which is insufficient for properly designing the organizational structures in practice. In addition, factors like the data warehouse architecture or the number of user groups which affect the organizational setup of the sponsorship structures are often not taken into account. Thus, this paper aims at analyzing the sponsorship concepts and the underlying influencing factors of two case studies in detail.

RESEARCH DESIGN

As already depicted in the previous sections, the focus of this paper is on describing ‘what and how’ characteristics (Yin, 2003) of organizational sponsorship structures for mature data warehouse systems. Case study research methodology is applied, which is one of the most common qualitative methods used in information systems research (Orlikowski and Baroudi, 1991). It seems to be well suited for studying sponsorship concepts due to the organizational nature of the research problem.

A telecommunications and a financial services corporation were selected for studying their data warehouse sponsorship concepts because both have an information-intensive business and are among those corporations which have long-term experiences in data warehousing (Watson and Haley, 1998). Consequently, both companies have full-scale, enterprise-wide, and mature data warehouse systems. The data warehouse systems have several application areas which each consists of all applications based on the data warehouse and dedicated to a certain business unit, e.g. customer relationship management and credit and risk management. Table 2 gives an overview of the two companies studied as well as of the contextual conditions.

The unit of analysis for this study was the sponsorship construct for the data warehouse system focusing its complete organizational setup. According to the sponsorship framework of Section 2 the numbers of sponsor levels, the tasks and responsibilities as well as the staffing were subject to detailed examination. The data was gathered through unstructured and semi-structured interviewing and document examination. For analyzing the collected data, cross-case synthesis was used (Yin, 2003). The results are presented in the next section.

Categories	Sub-categories	Firm A	Firm B
Company	Nature of business	Telecommunication services	Financial services
	Country (headquarters)	Germany	Switzerland
Data warehouse system	Number of end users	approx. 8500	approx. 6000
	Maturity	8 years	15 years
	Number of data sources	approx. 100	approx. 300
	Size of the data warehouse	13 TB	7 TB
	Number of application areas	4	9
Data warehouse organization	Number of employees	70	150
	Organizational characteristics	A dedicated organizational unit called competence center 'data warehouse' is responsible for data warehouse development, maintenance and administration. All technical tasks are conducted by a subsidiary company.	Data warehouse development and maintenance/administration are part of two different top-level IT units of the company. Only data warehouse development has its own dedicated organizational unit.

Table 2. Profiles of the Companies

CROSS-CASE FINDINGS

Both examined companies just recently introduced a new sponsorship concept for the data warehouse system due to some major problems. The most pressing challenges which are also requirements for a sponsorship model for data warehousing are summarized below:

- Both data warehouse organizations had to cope with numerous requirements from business units and operational IT departments. The amount of work needed to fulfill the requirements regularly exceeded the available resources for their implementation. Regulations for prioritizing and selecting those requirements which are most beneficial for the whole company had to be installed. The prioritization should be based upon business needs rather than upon availability of resources of the data warehouse organization.
- Both data warehouse systems supply several business units comprising a large number of end users with analytical information. But communication and information exchange between different business units did not take place, even though all of them used similar data and their requirements were overlapping. As a result, cost saving opportunities that would arise from a joint effort were realized seldom or only partially with unreasonable efforts.
- Funding for data warehouse infrastructure projects, like metadata management or security management was difficult to acquire from the business sponsors because of their cross-functional nature. Business sponsors were not willing to provide budget for projects also beneficial for other business units. Therefore, such projects were either not carried out at all or financed through intransparent funding procedures.
- In both companies the overall direction and strategy of the data warehouse system was decided by the data warehouse manager. It was not aligned to the business strategy or to long-term objectives of the company or the business units.
- Both data warehouse organizations struggled to acquire new customers, although this was vital for ensuring long-term success and funding of the data warehouse system. Therefore, internal marketing activities were launched but it turned out to be difficult to reach new potential users who were not yet aware of the data warehouse's capabilities.

In order to overcome the depicted problems both companies introduced and established a sponsorship concept. As a primary setup they used a two-tier committee structure according to their data warehouse architecture. The data warehouse system consists of two materialized data layers (see Figure 2). Operational data sources provide data for the data warehouse layer which consists of several shared data warehouse databases. They are organized according to major subject areas (e.g. customer, transactions) and provide data for the dependent data marts. These are application- or tool-specific subsets of the data warehouse databases and their data is often more summarized and pre-arranged for end users. The data marts, their

corresponding extraction, transformation and loading processes (ETL processes) as well as the end user access tools, like reporting or data mining tools, can easily be assigned to utilizing business units. In contrast, the components of the data warehouse, metadata and data staging layers cannot be allocated to a single end user group or business unit due to their infrastructural character. Thus, both companies decided to introduce two types of sponsorship committees. The so called application area committees are responsible for all components of the data warehouse system that are dedicated to a certain application purpose. All components which cannot be assigned to a single application area are owned by the data warehouse steering committee. In addition this steering committee is also responsible for all cross-application area issues on the upper three layers of the architecture.

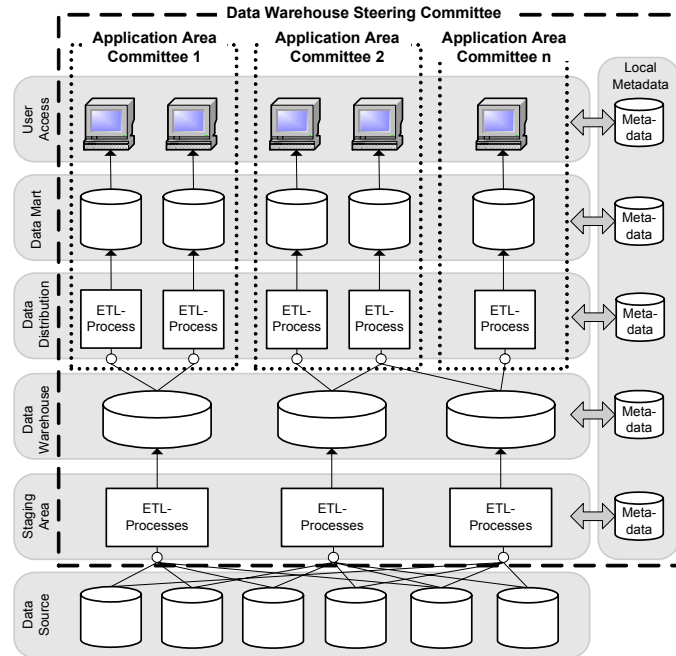


Figure 2. Ownership of the Committees

Both types of committees have clearly defined duties, authorities and responsibilities. The data warehouse steering committee has to define and approve the overall strategy and direction of the data warehouse system in accordance with the corporate strategy and the IT strategy. It has to cope with the enterprise-wide nature of the data warehouse system and ensures its business-oriented evolution, which has to be aligned with the long-term business requirements. Therefore, the steering committee monitors and controls the overall project portfolio. In particular, infrastructure projects (e.g. metadata management or data quality management) are initiated and owned by the steering committee due to their cross-application area character. Another important task is to establish a continuous exchange between application areas in order to identify overlapping requirements and functionality and thus reduce costs and prevent redundancies. Furthermore members of the steering committee have to fulfill internal marketing purposes. They should spread and communicate the value of the data warehouse system for the whole company, thereby acquiring new end users and ensuring continuous extension and long-term institutionalization of the data warehouse. In accordance to its tasks, the steering committee is authorized to decide on the realization and funding of data warehouse-wide projects, on the data warehouse strategy and on fundamental modifications of the system.

The application area committees are responsible for all projects and components within the application area-specific part of the data warehouse system. According to the number of application areas, firm A has four and firm B nine such committees. Relevant business requirements for each application area are selected by the committee. The new releases for the evolution of each application area are planned, defined, prioritized and packaged. Appropriate projects for implementing a new release are initiated and funded by the committee. The status of those projects regarding timing, milestones and budget are monitored and controlled by the committee. Another task is to manage the organizational change due to new releases of the data warehouse system. This comprises the communication of the changes, training measures for end users and adaptation of supported business processes. The committees are authorized to decide on business requirements to be implemented in their particular application area, on the realization and funding of projects, on the involvement of business resources (e.g. key end

users), and on the extension to or involvement of new business units. The organizational setups of both committee types are summarized in Table 3.

Data warehouse steering committee	Application area committee
Duties	
• Define overall development direction of data warehouse according to corporate strategy and long-term business needs • Develop and approve data warehouse vision including future benefits • Identify and uncover overlapping business requirements between application areas • Define and authorize data warehouse-wide projects, in particular infrastructure projects • Monitor and prioritize project portfolio of data warehouse • Ensure infrastructure funding • Communicate and spread usefulness and success of data warehouse in the company	• Select business requirements for application area of data warehouse • Plan, define, prioritize and package further development of application area • Initiate application area-specific projects • Ensure and provide funding for projects • Monitor and control status of projects and project portfolio (timing, milestones, budget) • Manage organizational change
Decision-making authorities	
• Decide on realization and funding of data warehouse-wide projects • Decide on data warehouse strategy • Decide on long-term and fundamental modifications of the data warehouse system	• Decide on and sign selected business requirements • Decide on realization and funding of application area-specific projects • Decide on involved business resources • Decide on extension of application area to new business units
Responsibilities/Ownership	
• Responsible for business-oriented development of the data warehouse • Ownership of data warehouse-wide projects, especially infrastructure projects	• Responsible for project portfolio of application area • Ownership of application area-specific components of the data warehouse system

Table 3. Organizational Profiles of Data Warehouse Steering Committee and Application Area Committee

According to the tasks and responsibilities described above both committee types are tightly coupled and interchange information. This information exchange is depicted in Figure 3. The data warehouse steering committee provides a strategy for the entire data warehouse system and long-term requirements of all business units. In addition, the overall direction of the data warehouse-wide project portfolio is handed over to the application area committees. They have to incorporate those strategic directives into their particular project portfolio. In return, the application area committees are obliged to inform the steering committee about changes in each application domain of the data warehouse and they supply the steering committee with ideas for infrastructure projects, for which it is not reasonable to be conducted within a single application area.

Each application area committee runs its own project portfolio. Therefore the committee has to ensure funding and to specify detailed business requirements and schedules for the projects. The project managers have to report on the actual project status and on changes in the project. In addition, they submit milestone papers to the committee, which has to approve them.

In order to establish the sponsorship structures for the data warehouse system in the company adequate members for the committees have to be selected. All committees are staffed with both business and IT representatives (see Figure 4). According to the organizational profiles of both types of committees, members with appropriate know-how and decision-making authorities are necessary. All committees are chaired by business managers to ensure business-oriented decisions and evolution of the data warehouse system.

In each case the application area committees are chaired by the manager of the corresponding business unit. Other members include the manager of the data warehouse organization, project managers as well as representatives of the business unit, which have sufficient technical knowledge. The data warehouse steering committee is chaired by a high-level management representative of the business. All business unit managers who act as a chairman of an application area committee are also

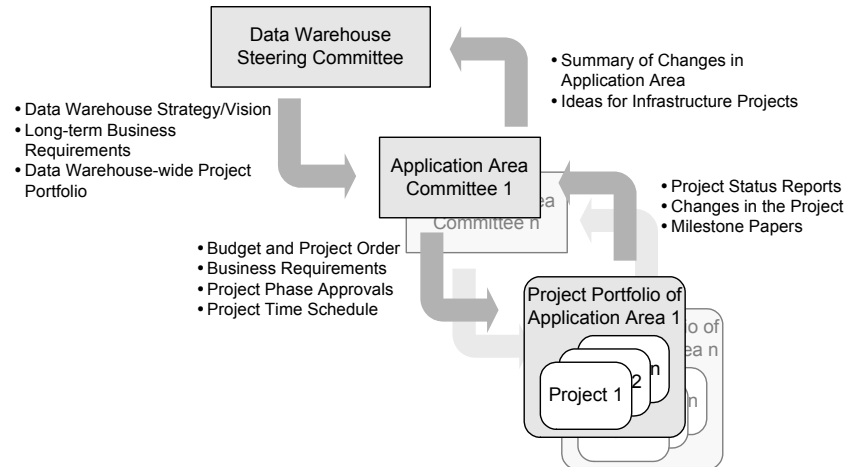


Figure 3. Information Exchange Between Committees

member of the steering committee. IT representatives include the manager of the data warehouse organization as well as the manager of the higher-level data management division. All members have defined substitutes to ensure the committees' ability to decide and act even in the case of absence. In firm A the steering committee meets two times a year whereas in firm B it meets quarterly. The frequency of meetings of the application areas committees is far higher. It ranges from every two weeks to every two months depending on the status of the specific project portfolio.

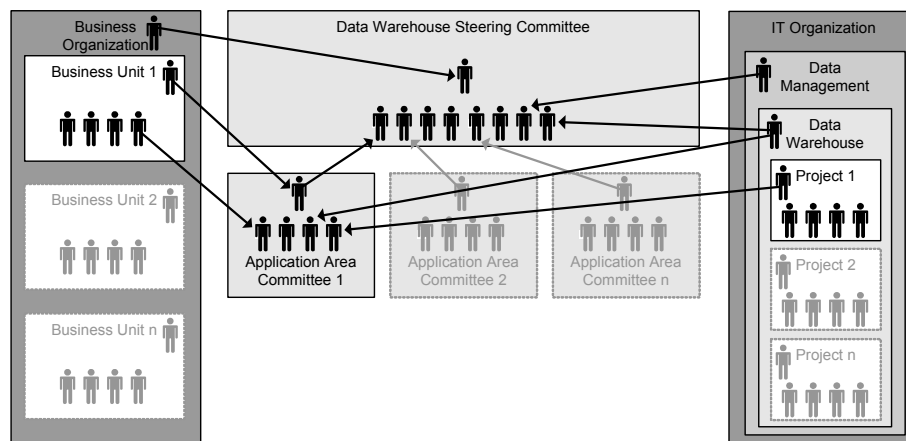


Figure 4. Staffing of the Committees

Due to the fact that the two-tier sponsorship structures were just recently introduced and established in both studied firms, only short-term experiences are currently available. Coordination and communication between business units and within the application areas has improved. Especially requirements management is more effective and efficient because new business requirements can now be discussed, prioritized, and selected in a dedicated organizational structure embracing all affected parties. In addition, IT project managers are now much more focused on business needs. Besides, both companies expect significant contributions of the committee structures to long-term success of their data warehouse systems in the future. This includes the following aspects:

- The coordination between the heterogeneous end users and stakeholders of the data warehouse will be improved and much more efficient. In particular, identification of overlapping requirements and allocation of new implementation priorities according to new requirements will be facilitated. In addition, the committees are expected to support a fair and reasonable

selection of requirements to be implemented. This will result in less redundant implementations and cost and time savings. Furthermore it is expected to acquire funds for infrastructural improvements of the data warehouse system much faster and easier.

- Especially the data warehouse steering committee shall increase the level of awareness of the data warehouse system among executive management. This could support and facilitate justification and marketing of certain projects and of the whole data warehouse system resulting in long-term viability.
- Due to the fact that business representatives are chairing the committees, it is expected that data warehouse evolution is tightly aligned to the business strategy resulting in an increased value of the data warehouse system for the whole company. In addition, monitoring and control of the long-term evolution are institutionalized and continuation of the data warehouse strategy is ensured.

Besides cost and time savings, the committee structures shall lead to a higher end user satisfaction and a higher flexibility to react quickly on external influences. As already mentioned, objective evidences for the long-term success of the committee structures are not collected yet, but it is intended to analyze these issues in the future.

CONCLUSION AND FUTURE RESEARCH

In literature alternative sponsorship models for data warehouse systems are proposed, whereas hardly any research exists regarding the applicability of the different models in data warehousing practice. In particular, contextual conditions and characteristics of the data warehouse system influencing the organizational design of sponsorship structures are not taken into account. Thus, this paper aims at presenting a detailed analysis of data warehousing sponsorship structures of two case studies. Due to the fact that both companies have mature and full-scale data warehouses serving multiple business units and end user groups, committee structures seem to be well suited for data warehouse evolution. Both companies have implemented a shared data warehouse and dependent data marts. So the two-tier structure corresponds to the underlying data warehouse architecture distinguishing between business unit specific and infrastructural components. On the upper level the data warehouse steering committee brings together all business stakeholders of the data warehouse and ensures long-term management support as well as an enterprise-wide view on the system. On the lower level the application area committees assure a business-oriented evolution of the data warehouse system. The paper provides a detailed, applicable and complete description of the organizational setup of data warehouse committee structures which goes beyond most descriptions found in literature. Therefore, it can be used as a blueprint for other companies with similar contextual conditions and data warehouse systems.

Because the generalized sponsorship structures are only based on two case studies, further validation is needed. Especially quantitative empirical research on this topic could provide deeper insights. Future research will also include a study about differences in sponsorship concepts according to the data warehouse maturity level or other contextual conditions. Besides, other organizational or technical measures for data warehouse evolution and their interdependencies should be subject to further research.

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