

16 Architecture Planning for Global Networked Enterprises

Sven Pohland, Elgar Fleisch

16.1 Introduction	306
16.1.1 Challenge of Architecture Planning	306
16.1.2 Goals of Architecture Planning	307
16.2 Business Architecture	309
16.2.1 Organization Profile	309
16.2.2 Process Architecture	311
16.3 Application Architecture	313
16.3.1 Distribution Concepts in Packaged Software	313
16.3.2 Integration Areas at the Application Level	313
16.3.3 Structure of Application Architecture	314
16.4 Methodological Procedure	316
16.4.1 Existing Approaches	316
16.4.2 Deficits of Existing Methods	318
16.4.3 Proposed Method	318
16.5 Conclusions and Outlook	321

16.1 Introduction

16.1.1 Challenge of Architecture Planning

An international chemicals group decides to introduce the packaged software SAP R/3 throughout the organization. This decision will affect eight divisions, 200 legally independent companies and some 150 different countries. Initial implementations were based on individual companies within the group. However, an investigation of the global supply chain revealed a lack of consistency in core processes. This investigation made it clear that future implementations will have to be coordinated throughout the group. The first question to be clarified is the significance which the legal entities, divisions and regions are to have for the group in the future and the dependencies which will result. The integration requirements can then be derived from this analysis of the business relationships involved.

Alliances in the airline industry are another example. The corporations concerned share a common strategy: the customer should receive the same level of service throughout. However, as soon as the customer contacts one of the airlines, the limitations of cooperation become apparent: double check-in for connecting flights or no means of reserving seats through the partner airline. In some cases the processes are coordinated, e.g. through the presence of ground staff from both airlines at the check-in. This is not the case with the architecture of the information systems however. Depending on the cooperation depth and the existing applications, the question is whether concurrent use of check-in systems would be useful or whether a common application should be used.

These examples show typical questions facing large corporations. Business strategies are developed and translated into processes. However, they bear no relationship with the architecture of the information systems, despite the fact that a suitable architecture provides the basis for huge cost savings. In a study for an international electronics corporation it was proven that up to USD 1.1 billion could be saved through the use of synergies [cf. Fleisch 1998]. In the available literature on the subject, authors also underline the necessity for organization and information system to be calibrated: “The information system must be designed so that the information system architecture¹ and the organization structure are homologous” [Wall 1996, 76]. [Jagoda 1999, 4] also stresses the integration of business strategy and information systems: “On the one hand, because data processing can be expected to lead to the creation of new business fields. On the other hand, because

¹ For the purposes of this Chapter, a target application architecture is understood to be the totality of all applications, requirements and concepts which a business should possess in three to five years' time (cf. [Schwarze 1998, 128] and [Brenner 1996, 354]).

the efficient and effective use of information and communication systems is imperative for certain strategic realignments”.

Businesses are becoming increasingly decentralized [cf. Wigand et al. 1997, 199]. Geographical divisions and organizational splits are a reflection of this development [cf. Österle/Fleisch 1996, 8]. The aim is to combine the advantages of the small business with those of large corporations. These changes imply new inter-organizational business processes and thus new demands on the information systems. Packaged software must allow the business to be split into smaller units and at the same time provide for the integration of distributed business units. This Chapter considers structures within large corporations with a special focus on the distributed use of business management, transaction-oriented packaged software (ERP systems). The following critical success factors have been derived as driving forces for designing application architectures:

- The application architecture must be planned at the strategic level,
- Cross-organization business management relationships must be transparent when planning the architecture,
- Business architecture and application architecture must be matched, and
- Coordination is essential in the case of a distributed concept and implementation of business management packaged software.

16.1.2 Goals of Architecture Planning

Up to now, manufacturers of packaged software have adopted the approach of depicting a business in precisely one system. A coordinated approach to combining systems to form a network of systems (referred to as ‘distributed systems’) improves the support for business networks. The task is to find a suitable application architecture. At present, the application landscape reflects a functional, formal organization structure. The ‘owner’, usually a specialist area, is responsible for implementations. There is a lack of perspective on cross-organizational questions, such as e.g. centralization, harmonization or at least coordination of customer information, one of the core problems in the cases mentioned at the beginning of this Chapter. There is also a lack of transparency with regard to the consequences of not integrating or failing to adequately integrate processes which extend beyond an individual area. The consequences include the following:

- Reintegration involves high costs, e.g. as a result of the interface complexity required to integrate isolated solutions.
- Avoidable costs are generated through duplication within the company, e.g. similar implementation tasks.

- Inadequate structuring of the architecture results in a high level of application complexity, which in turn increases the complexity of interfaces, for example, when parts of the architecture migrate.
- Integrated packaged software concepts do not fully exploit potential, e.g. there may be no cross-system reporting facility despite worldwide product responsibility.

The following graphic shows possible cost savings where application architecture planning is driven by business management considerations. Here our approach is based on the concept of total cost of ownership (TCO)²: We consider all the costs incurred in the life cycle of an ERP system.

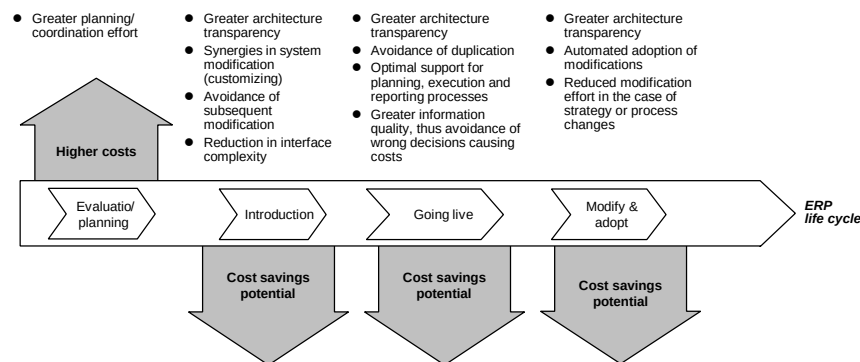


Figure 16-1: Cost Savings in the ERP System Life Cycle

Although a distribution project initially means higher costs for planning and coordinating the implementation, major cost savings can be realized in subsequent phases of the ERP Life Cycle (implementation, going live plus modifications and adoption). The most important source of savings is the utilization of synergies in the planning and implementation phases. Lower investments for interface programming and system maintenance should also be mentioned in this context.

When planning application architectures, benefits which are not immediately quantifiable, such as increasing the level of service, are also a major issue in addition to cost savings. The following can be said in respect of benefits [cf. QED 1985, 4]:

- Concepts embedded in the software are optimally utilized,
- The complexity of the application architecture is reduced,

² For an explanation of the relationship between TCO and other approaches to cost analysis [cf. Pottholf 1998, 8].

- The involvement of top management and users in the design process is guaranteed,
- The use of cross-system processes becomes possible, and
- The global supply chain becomes transparent.

16.2 Business Architecture

The aim of analyzing the business network is to identify areas of the company with a high integration requirement from a business management point of view. For this purpose we document subsystems in the company which we refer to as 'Business Clusters'. A wide range of concepts are used in business management theory: integration areas are identified by terms, such as the formation of 'subsystems' [Schmidt 1991, 70], 'moduls' [Wigand et al. 1997, 199] or the 'manufacturing segments' [Wildemann 1994]. Existing approaches can be applied to the question of business architecture with certain limitations [cf. Rolf 1998, 261].

16.2.1 Organization Profile

The starting point for architectural considerations is usually the formal structure of the organization, where the basic principles of organizational distribution start to become visible. Product responsibility, functional separation, the significance of various customer groups or regional structures assist in the appraisal of company structures. However, there are clear differences between formal organizational structure and the structure which is of relevance to the architecture. An organizational structure has usually grown historically and is characterized by tradition, departmental thinking and functional alignment. The application architecture must be oriented towards the company's medium and long-term structure and not its present setup. Otherwise there will be a discrepancy between business and application architecture as a result of what are often relatively long implementation phases. We introduce what we call an 'organization profile' in order to characterize the company. This comprises three aspects: dimensions showing possible structuring criteria, the permanency and topology of the company representing the underlying conditions for the architectural design.

Dimensions

We use the clustering dimensions shown in Figure 16-2 to delimit the integration areas. The individual dimensions represent idealized, typical characteristics which are not without overlap. In most cases, for example, an organization unit also represents an individual area of responsibility. Conversely, however, not every area of responsibility necessarily corresponds to an organization unit.

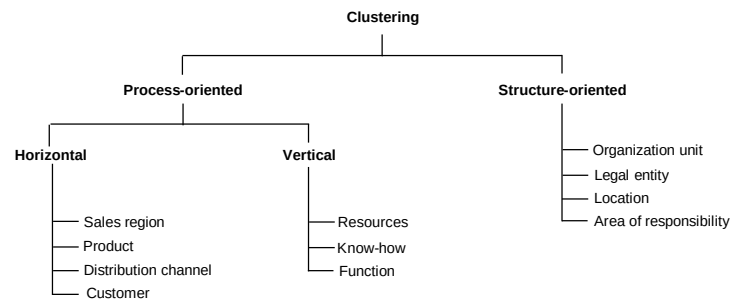


Figure 16-2: Dimension Tree

Dimensions are used to identify areas along them, which are largely independent of one another. In other words, there are few dependencies to be found along these dimensions. Here we speak of ‘rated breaking points’. One example is the dimension ‘product’ in the case of corporations with a particularly heterogeneous product range, such as Mitsubishi, which produces video recorders as well as automobiles. Another example is the concept of a purely financial holding company where the individual companies (dimension ‘legal entity’) play an important role.

Yet another example is Henkel: traditionally, the corporation tends to be organized on a decentralized basis. As the corporation developed - frequently through acquisitions - the affiliated companies in the group enjoyed extensive freedom. The corporation now wants to increase the responsibility for business areas. This means shifting the focus from the affiliated companies (dimension ‘legal entity’) to the business areas which are structured according to product groups (dimension ‘product’, referred to as ‘business’ at Henkel). IBM is a further example: this corporation gave up its regional orientation (dimension ‘region’) in favor of a global approach with distribution and product responsibility (dimensions ‘distribution channel’ and ‘product’). The ultimate goal is to achieve uniform customer care across the globe.

Permanency

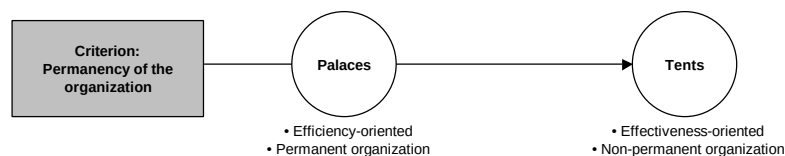


Figure 16-3: Permanency of the Organization

The criterion of permanency of the organization is defined by the opposing poles of ‘Palaces’ and ‘Tents’ after [Gomez/Zimmermann 1993]. An efficiency-oriented organization strives for a strict division of labor in order to exploit rationalization

and cost savings potential, while an organization geared towards effectiveness sets up flexible structures to ensure rapid striking power when it comes to implementing strategies. We also introduce the time horizon: at one end of the scale there is the organization established in advance for an indefinite period of time, at the other, structures designed to fulfil tasks over a limited time span. An application example is the telecommunications sector: since liberalization of the market the previously state-run organizations ('palaces') have shown a realignment towards flexible businesses with the capacity to offer short-term responses ('tents').

Topology

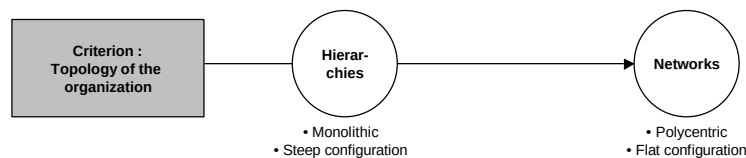


Figure 16-4: Topology of the Organization

The criterion of topology is defined by the opposing poles of 'hierarchies' and 'networks' after [Gomez/Zimmermann 1993]. The topology expresses the degree of centralization of an organization: traditional corporations with a pronounced hierarchy and a leader at the top are termed 'hierarchies', as opposed to 'networks' which are characterized by a small number of hierarchical levels and a high level of decentralization. The two extremes are to be found in the chemical industry: some corporations place the focus on highly independent business areas (e.g. in the Hoechst corporation), others present themselves as a single entity throughout the group (e.g. the Bayer corporation).

16.2.2 Process Architecture

For the analysis and visualization of business networks we rely on proven techniques. Flow charts [cf. Hess 1996, 140] are used for visualizing processes and communication charts [cf. Grochla 1982, 313] for documenting dependencies. By and large, the size and complexity of the corporations looked at here do not permit a detailed description of all processes. Analysis has to focus on core processes with high granularity plus cross-organizational process dependencies. A process architecture is derived from strategic statements. The findings are depicted in rules for process structures. When documenting the process architecture the following aspects are considered: the assignment of processes to organizational areas, the demonstration of dependencies between processes and the categorization of processes.

SAP R/3 reference processes, for example, or processes specific to the corporation can serve as the basis for the processes architecture. The processes are assigned to organization units and/or business areas. At this point it is important to use processes which apply throughout the business or corporation. Process categorization describes the dependencies between the processes of different business areas. The characterization performed will have a major influence on system distribution.

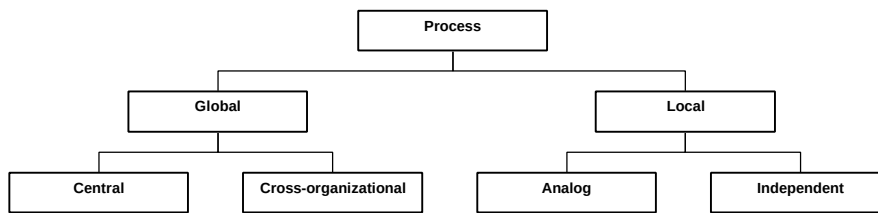


Figure 16-5: Process Categories

These categories indicate whether a process is ‘global’ or ‘local’. A global process will always affect several business areas. Here we distinguish between global cross-organizational processes (the process runs in several areas of the corporation) and global central (the process is executed at one point in the corporation for various areas). Local processes run within an area of the corporation and do not lead to immediate dependencies with other areas. At the same time there are local analog processes which run similarly in various areas while local independent processes are not coordinated within an area.

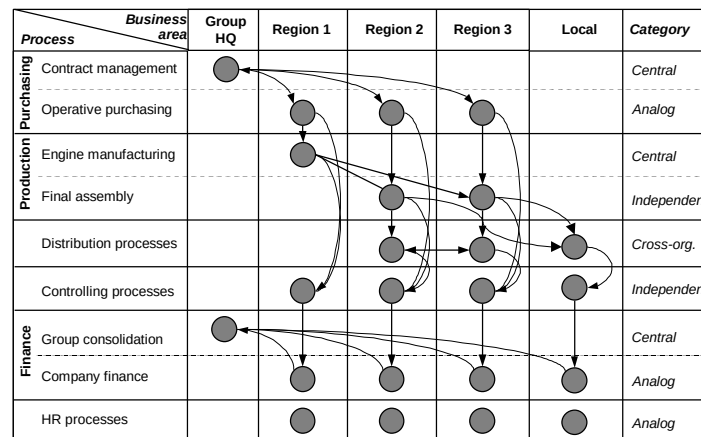


Figure 16-6: Example of Process Distribution³

³ The table reflects the simplified visualization of an international automobile manufacturer.

A few central processes are characteristic, usually group consolidation and group procurement. Many central processes are subsumed under the term ‘shared services’ [cf. Schuurmans/Stoller 1998]. Operative purchasing activities in the various business units are usually standardized within the framework of group procurement, i.e. they are analog processes. Production processes are mostly local independent due to heterogeneous product structures, distribution processes differ according to region and distribution channel, but seldom according to product.

16.3 Application Architecture

16.3.1 Distribution Concepts in Packaged Software

Distributed businesses are modeled by looking at the relationship between distributed and integrated information systems. The concept behind integrated systems is to depict the entire corporation in precisely one information system. A major question here is the distribution concepts supported by the software. Investigations [Kranz 1997] have shown that while it is possible to find examples of packaged software distribution, such as the application link enabling (ALE) concepts from SAP AG, all manufacturers place the main emphasis on the isolated implementation of software packages. All manufacturers offer integration mechanisms at the technical level. However, these technical solutions do not generally include support for business management distribution at the conception level. Here we understand a system to mean software components with strong interdependencies and which typically access a common database. A system is thus a logically integrated software package. In this Chapter we look at distribution in the logical sense, rather than adopting the more technically oriented view of distribution⁴: here we understand distributed systems to be several integrated systems which exchange data.

16.3.2 Integration Areas at the Application Level

It is not possible to depict corporations of unlimited size and complexity in an integrated system. There are a large number of restrictions at the technical level. Typical restrictions are multilingual capability, multicurrency capability, performance or failsafe operation. At the same time there are organizational restrictions,

⁴ Although a common understanding is usually assumed in the relevant literature, discrepancies are found on further reading. [Turowski 1997] gives an overview of various interpretations of system distribution in the technical sense.

such as the chances of pushing through an integrated solution or an unacceptably high level of project complexity.

In view of such limitations on distribution it is necessary to strike a balance between what is desirable in terms of business management and what is feasible in terms of applications. Application clusters are 'feasible business clusters'. The requirement for integration at the information system level can be derived from the intensity of business management dependencies. A high cooperation intensity favors a high level of linkage at the technical level. Conversely, if the level of exchange is low, a solution without system support might be useful. The diagram below assigns various integration possibilities to their respective integration depths. In extreme cases we can talk of 'integration by user' (low integration depth) or an integrated system (with a high integration depth).

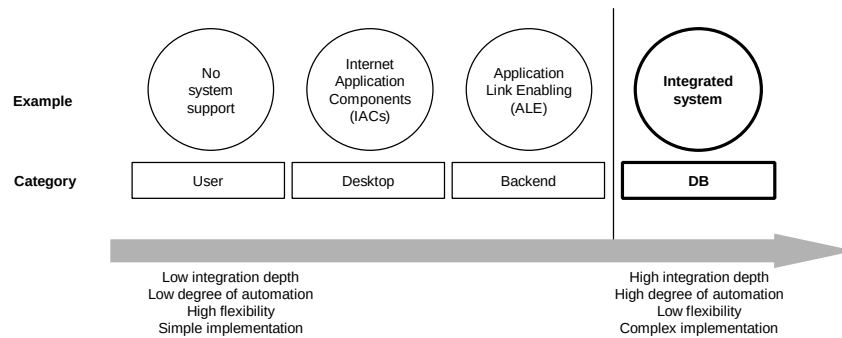


Figure 16-7: Integration Depth

We start off by assuming the highest possible level of integration. In our minds we depict all the functions of a business in precisely one system on a 'virtual megaserver'. Other requirements in terms of integration depth may arise from the business management constellation. For collaboration in project-like conditions it may be useful to merely opt for a desktop integration. Other integration possibilities will be excluded by the underlying business management environment. Integration with the ALE concept from SAP AG, for example, is only realistic in the case of a long-term business relationship with partners in view of the high coordination effort involved. Business clusters are checked for feasibility and adapted as necessary on the basis of the desired integration depth in business management terms and the above mentioned applications-related and technical factors.

16.3.3 Structure of Application Architecture

Figure 16-8 illustrates an application architecture by way of example. It shows the worldwide use of SAP R/3 in the case of the automobile manufacturer (cf. Chap.

16.2.2). The diagrams will vary depending on the modeling possibilities of the application types. However, functionality and data are always assigned to business areas.

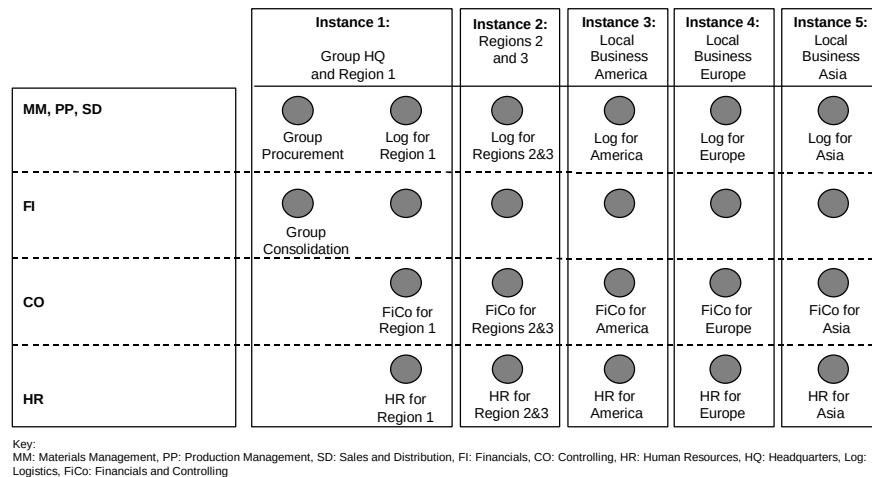


Figure 16-8: Example of an Application Architecture⁵

It is typical to form a central cluster or system to which central or cross-organizational functionality and central data are assigned. In this example, functionality to implement group procurement and group consolidation is depicted at group level. In order to make this possible, certain business objects, such as material, customer, supplier, standard chart of accounts or contract, have to be standardized throughout the organization and centrally coordinated. In most cases a central master data server will be the solution, but a central directory with distributed data storage is also conceivable. In cases where only certain elements are exchanged between systems rather than complete data records, we talk about a 'reduction'. In addition, it is important to visualize which data records are valid for the complete organization and which are only relevant for specific areas of the organization (referred to as 'filters'). It is conceivable, for example, that only certain procurement materials will be relevant for each product group and therefore only certain data records will be transferred.

⁵ Note that this is a simplified view without integration relationships.

16.4 Methodological Procedure

16.4.1 Existing Approaches

In organization theory we find approaches to the analysis and design of organizations. While the terminology employed by the various approaches to the formation of subsystems may differ, the basic intention is the same, i.e. to identify areas in an organization which are closely linked to one another. Another focus for methodology is the implementation of processes in information systems. Some approaches go from statements on business strategy via processes and on to application architecture. These are to be found e.g. in Strategic Information System Planning (SISP) [Riedl 1991], in St. Gallen Information System Management [Österle et al. 1993]. The table below gives aspects of existing methodological approaches which were of particular relevance for the development of the PROMET eBN⁶ method.

Approach	Aspects Relevant to a Distribution Method
Subsystem Formation (cf. [Wildemann 1994], [Osterloh/Frost 1998, 139], [Wigand et al. 1997, 199])	Identification of business management integration areas within the framework of segmentation / modularization of organizations.
Implementation Methods (cf. [Lozinsky 1998, 70], [Arnold 1998], [Scheruhn 1997], [Buck-Emden 1998, 305], [Ullmann 1997])	Conventional projects for the implementation of packaged software are based on the assumption that it is possible to depict all processes in precisely one integrated application system. These are nevertheless far-reaching methods which build on the concept of the relevant software.
Calibration of Business and Information Strategy (cf. [Kreikebaum 1997, 208], [Norman 1992], [Parker et al. 1988, 79], [Wall 1996], [QED 1985], [Wexelblat/Srinivasan 1999, 266])	The process of comparing business and information system strategies aims to achieve a better understanding of the business requirements and to ensure that application architecture planning is business-driven. The idea is to help the method user in deriving an architecture with ‘design recommendations’. A positive feature is that it investigates the interplay between long-range and operative planning. The concept of ‘Business / IS plans linkage’ thus attempts to combine various approaches to information system planning, using proven methods. Linkage activities make it possible to calibrate business and IS planning.

⁶ PROMET is the acronym for project method and is a registered trademark of IMG AG. eBN stands for electronic Business Networking.

Strategic Information Systems Planning (SISP) (cf. [Prujm 1990], [Kruse 1987], [Martin 1989], [Nüttgens 1995, 30])	The approaches to strategic information system planning presented here are on the whole comprehensive concepts based on a business-driven approach. These approaches incorporate various levels and views of the relevant questions. Attempts to combine business strategy and information system planning are always positive. However, the proposed procedure cannot be used in large corporations as common planning does not exist, the main emphasis being instead on coordinating distributed activities.
St. Gallen Information System Management (cf. [Österle et al. 1993], [Hilbers 1989])	The approach proposed by the St. Gallen Information System Management concept is based on the idea of a large, decentralized corporation. This corresponds to the reality in most large organizations. An important point is the fact that decentralized organizations do not have a detailed, cross-organizational information system architecture. A positive feature is the formation of integration areas for structuring such organizations, also the structuring of various forms of realization.
Business System Planning (BSP) (cf. [Prujm 1990, 64], [Martiny/Klotz 1990, 94], [Heinrich 1992, 290], [Brenner 1994, 101])	This involves a far-reaching, proven procedure where cross-organizational information systems are planned from the top down and implemented from the bottom up. A cross-organizational team comprising managers, representatives of the specialist departments and IS specialists is formed to structure statements regarding business strategy and processes. Company processes and classes of data are grouped together in matrices to form larger system areas. Origin and use of data are documented and dependencies shown.
Information System Study (ISS) (cf. [Neu 1991, 147], [Prujm 1990, 64])	A characteristic feature here is the heavy involvement of qualified managers and/or decision-makers. There is a focus on ensuring an orientation towards optimal data flow based on data use.
System Development (cf. [Becker 1998], [Gutzwiller 1994], [Scheer 1990b, 403], [Nüttgens 1995, 19], [Lehner et al. 1991], [Winter 1998, 6])	Within the framework of system development, the importance of a flexible procedural model has become paramount. The top-down approach has also proved to be advantageous for the issue of distribution. Clearly defined phase completion is again of central importance, particularly in the case of the waterfall model. However, in the case of more recent analyses – based on packaged software – there is a big difference in the granularity applied: “Up until now we were dealing with micro-structures in the software; now it’s the turn of the macro-structure which can extend to complete application components” [Bues 1994, 185].

Table 16-1: Existing Approaches to Architecture Planning

16.4.2 Deficits of Existing Methods

At the present time there is no procedure which covers the question of distribution all the way through from the corporate strategy level to the application architecture. What is required is not a complex method for planning the architecture but a coordination framework for implementation projects in individual business areas.

With all the approaches looked at – with the exception of the implementation methods – ERP packaged software plays a secondary role. The question of distribution is increasingly moving away from the detailed, step-by-step development of applications in favor of the conceptual approach, i.e. towards a distribution of integrated systems. Approaches, such as the BSP, analyze and distribute functionality and data at a detailed level. However, as distribution is now largely based on packaged software, the focus is on the optimal use of existing IS concepts, rather than on the technical solution.

This becomes evident in the case of the Information System Study, for example. The real challenges become somewhat obscured against the background of a more quantitative approach with automated information processing. The analysis neglects a business-driven, revolutionary view in favor of the wishes of decision-makers and/or users. Political aspects, which are of particular significance in the case of change processes in large corporations, can be introduced into the evaluation without critical analysis, thus preventing massive realignments. Against the background of ERP standard solutions, the analysis appears to be too detailed and as a result misses the real questions, such as the degree of centralization or structuring dimensions.

Up to now, methods have placed the emphasis on an isolated analysis of individual business areas [cf. Schwarzer 1994, 363]. One deficit is to be found in the way in which the coordination between business areas is considered. This becomes particularly clear with the classic approach of business process redesign in the context of implementation methods: the design emphasis is on the optimized operation of a process, such as order processing. Dependencies between processes, on the other hand, hardly enter into the analysis as ought to be the case when considering the overall optimization of a large area.

16.4.3 Proposed Method

The PROMET eBN method is used to implement strategies in a distributed process and system environment. For this purpose, the requirements at the organizational level are calibrated with the possible solutions at the technical level: cross-organizational business processes lead to a distributed requirement for functionality and data. A methodologically sound decision determines whether the required

functionality and data should be provided by one or more systems. The implementation of business networks calls for a calibrated set of tools which:

- allow the depiction of global, regional and local processes as well as reporting structures in systems, thus ensuring the transparency of the global supply chain,
- set forth the conceptual steps for engineering an application architecture which will be workable in the long term,
- support the standardization of processes and the data on which they are based,
- lead to the selection of the right integration technologies and concepts and
- result in practicable migration planning including project portfolio.

The aim of this method is:

- to develop a common understanding of strategy and global processes,
- to find a suitable process and application architecture,
- to support consistent implementation planning for the architecture solutions found as well as
- to secure the coordination of the resulting distributed projects.

The structure of PROMET eBN is oriented towards the method engineering approach. The procedure corresponds with the basic idea behind business system planning: we start off with a business-driven top-down approach which is then realized bottom-up in one or more implementation projects. Figure 16-9 shows the procedural model which we subsequently adapt to suit the concrete point of departure and the task of the specific project. In the case of PROMET eBN we distinguish between the four phases of *set-up*, *business architecture*, *application architecture* and *distributed implementation*. The set-up phase ensures that the architecture project is properly situated within the organization and also that it is run by the right people. The tasks of analyzing the business architecture and deriving the requirements which the application architecture will need to meet (referred to as ‘architecture drivers’) are dealt with in the second phase (business architecture). The development of technical application drivers and their implementation in the form of an application architecture takes place in the third phase (application architecture). Preparations for implementing the architecture are then covered in the final phase (distributed implementation). Some of the core techniques belonging to this method are outlined below.

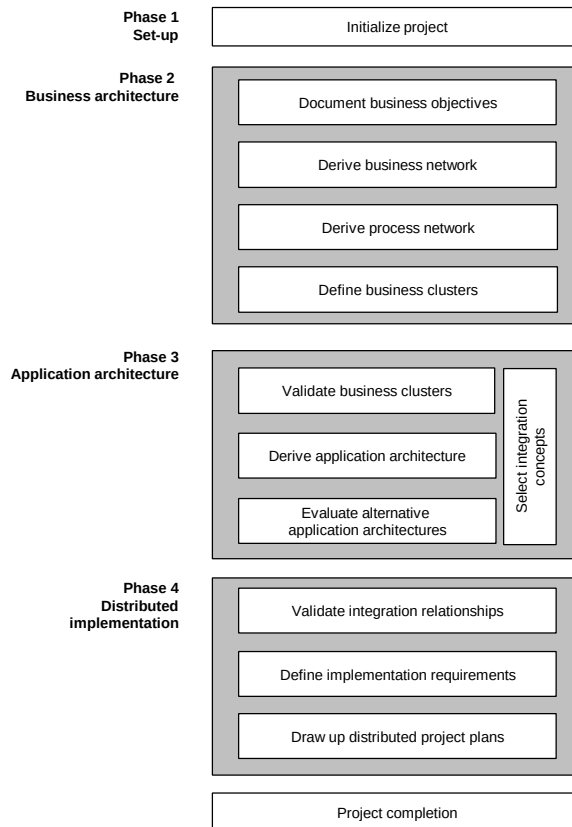


Figure 16-9: Procedural Model of PROMET eBN V2.0

Analyzing the Business Network (Phase 2)

The process architecture is derived from the business strategies. Process design is performed at global, regional or local level. The clustering of processes, the establishment of reporting requirements and the classification of existing organization units are all factors which will influence the application architecture.

Deriving the Architecture Requirements (Phase 2)

An initial distribution hypothesis is documented by business clustering. These business clusters can be formed on the basis of various dimensions. We document the requirements, which the application architecture must meet from a business management point of view. An initial distribution hypothesis represents the completion of the second phase and the starting point for the third phase.

Engineering the Application Architecture (Phase 3)

In addition to the requirements derived from the business network and from application restrictions, the integration concepts are the most important factors influencing the application architecture. Documentation of the application architecture takes the form of instances, their integration relationships as well as a migration strategy [cf. Barak 1997]. We document and evaluate possible distributions on the basis of the business drivers established in Phase 2.

Managing the Distributed Implementation (Phase 4)

The migration objects from the business network and the application architecture are calibrated with the existing project portfolio. Standardization activities, the use of group templates and system development are defined. The resulting project portfolio also includes a cost/benefits analysis which shows the profitability of the cross-project and cross-organizational approach. Clear specifications for future projects are outlined in the final stage of the project. An architecture project based on PROMET eBN typically results in several implementation projects which are coordinated through the use of suitable predefined settings. This avoids duplication and creates the right conditions for a high integration depth.

16.5 Conclusions and Outlook

The method presented supports the critical success factors outlined at the beginning of this Chapter: the documentation of strategic considerations, the visualization of the business network and the analysis of the process network provide a clear picture of cross-organizational business management relationships. The clear formulation of the requirements to be met by the application architecture from a business management point of view aids the subsequent calibration of business and application architecture.

The methodological planning of the application architecture and the requirements derived for the implementation projects support the coordinated introduction of distributed systems. This planning of the application architecture must have the support of the corporation's top management. The documentation of results and the transparency of the issues involved can be helpful when planning the architecture. The application architecture will only ensure the proper interaction between business network and application architecture if planned at the strategic level.

However, there is one central question which cannot be resolved by methodology: while 'soft facts', i.e. restrictions at the political and personal level, can be supported by the methodology, this is no replacement for the personal commitment of the project team and huge support from the corporation's top management. The creation of architecture teams incorporating both IS and specialist departments is

also significant. A 'business sponsor' must be found at corporate level in order to ensure that business-driven architectures can actually be implemented. In addition to this sponsor, people in positions of responsibility who are committed to the process are needed at the decentralized level.

This Chapter has shown the potential provided by cross-organizational planning. However, the risk of overregulation should also be borne in mind. If constraints are too narrow they will limit the flexibility of business areas unnecessarily and make it difficult to realize innovative solutions. It is therefore important to aim for a planning framework based on the principle of 'as much as necessary and as little as possible'.

