Building an integrated IT governance platform at the BMW Group

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Abstract: IT management has many facets, defining blueprints and guidelines for application architectures or planning the further development of the IT landscape are two typical examples. The BMW Group established four IT management processes for strategy, architecture, planning and control, which are linked to the IT project life cycle. But if these processes are not supported by an enterprise architecture management process, concentrating on the architecture on a holistic and abstract level, there still retains room for improvement. In this paper, we describe each process and how IT efficiency and IT effectiveness can be greatly improved by linking these processes using an integrated IT governance platform. We give some insights, which techniques are used in the processes, how the processes are linked and which functionalities for an integrated IT governance platform are needed.

Keywords: IT governance; IT management; IT management processes; enterprise architecture management; IT landscapes.

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1 Introduction

The BMW Group uses some thousands of applications supporting different business processes at various departments all over the world. New requirements on IT arising from new or changed business demands or requirements from technology aspects are continuously leading to IT projects changing the IT landscape.

This number of applications and IT projects require an integrated IT governance process to align demands, to increase transparency of IT, to reuse existing solutions and last but not least to *manage complexity*.

The integrated IT governance process has to link with existing IT management processes, which have been established in the BMW Group and which also have proven their effectiveness. These processes together with the integrated IT governance have the goal to document the whole IT landscape, to plan the further development of the IT landscape, to identify weaknesses in the IT landscape and to *align business and IT*.

Unfortunately, existing frameworks in the literature for establishing IT management process concerning enterprise architecture, governance models, etc. do not consider existing IT management processes, for example, TOGAF from The Open Group (2002), ITIL from OGC (2000) or Cobit from the IT Governance Institute (2005).

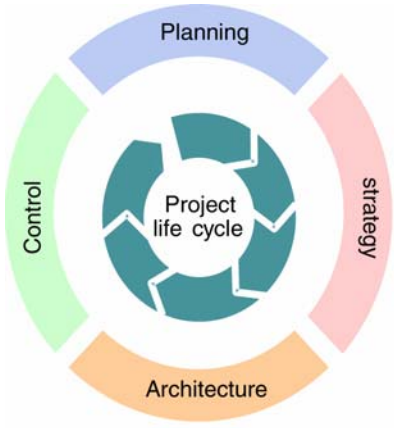
In this case study, we present the approach of the BMW Group to establish an integrated IT governance process on the basis of existing loosely coupled IT management processes. We discuss which specific problems each process addresses and how they are solved. The main questions behind the processes are:

- Which IT do we have in use and where?
- Where are weaknesses and unused potentials?
- Where and how IT is changed and what does the IT look like after the changes?
- What will IT look like in short-term and in long-term?
- How can IT be migrated/adapted adequately?
- How should IT and business evolve?
- How to increase the alignment of business and IT?

To achieve the addressed objectives arising from an integrated IT governance process we distinguish four IT processes (Figure 1):

- the planning process managing the portfolio by prioritising projects and initiatives
- the strategy process managing objectives and strategies by using scorecards and key indicators
- the architecture process defining and managing the IT architecture
- the controlling process monitoring and synchronising different projects and on-going changes.

Figure 1 Existing IT processes and IT project life cycle



These processes had been documented at the BMW Group and were established in all IT departments of the BMW Group. As a consequential next step, these processes have to be linked into an integrated IT governance process, which should be supported by an IT management system. Furthermore, these processes must be aligned with the project life cycle (see Figure 1), which is documented in the BMW Group IT Project Model.

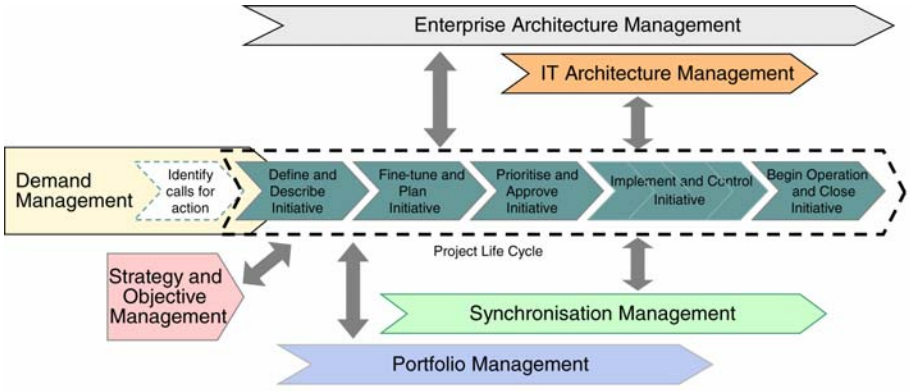
Figure 2 sketches how the integration of the processes from Figure 1 should be done, visualising the four processes as modules:

- the planning process is mapped to the ‘Portfolio Management’ module (see Section 3)
- the strategy process is mapped to the ‘Strategy and Objective Management’ module (see Section 4)
- the architecture process is mapped to the ‘IT Architecture Management’ module (see Section 4)
- the control process is mapped to the ‘Synchronisation Management’ module (see Section 5).

The two new modules ‘Demand Management’ (see Section 3) and ‘Enterprise Architecture Management’ (see Section 6) complete the *integration* towards an integrated IT governance process.

The modularised way of the visualisation in Figure 2 is chosen to explicitly show the interfaces between the modules, which will be described in Section 7. The role of an information model enabling the integration is discussed in Section 8.

Figure 2 Modules of the integrated IT governance process



To gain a deeper understanding of why the BMW Group has chosen this particular approach, Section 2 starts with a short introduction to the IT organisation structure of the BMW Group, hence, this structure influences the IT processes and how the integration of these processes can be achieved.

2 IT Organisation structure at BMW group

The structure of IT organisations in an enterprise does have a significant influence on the IT processes and their stakeholders. Enterprises with only one central IT division, bundling demand management, development, support and operations, do not have to deal with different business departments building and operating their own IT applications. Major problems of IT organisations designed in such a centralised way are the distance between IT departments and business departments, using the applications and requiring functionalities. Furthermore, the agility to react on changing business requirements is leaking at a completely centralised IT organisation.

A decentralised organisation, in which each business department does have its own IT department, fills the gap between IT and business. On the other hand, economies of scale in IT development, support and operations are shrinking. Also, an efficient management of IT resources is more difficult, because each business department does have its own IT resource pool. Another drawback is the jungle of applications arising when a centralised steering organisation is missing.

Therefore, the BMW Group and many other enterprises try to combine the advantages of the centralised and decentralised approach in the IT organisation structure, which is sketched in Figure 3.

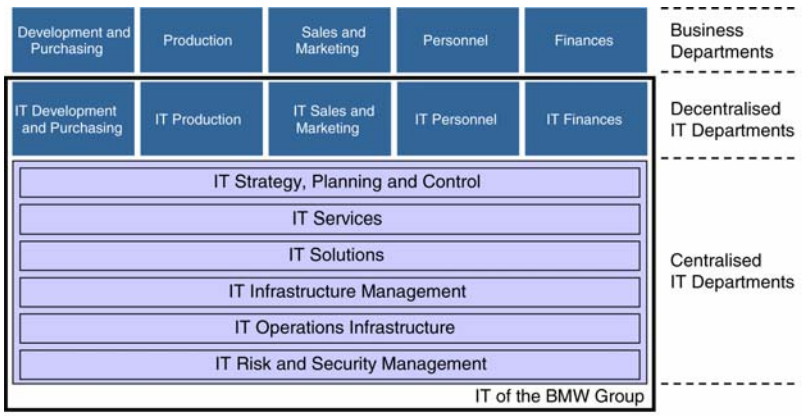
Each business department does have an IT department to guarantee agility on business demands and a centralised IT department to increase economy of scale, etc.[1] A similar approach, which also includes details about the tasks of centralised and decentralised departments, is discussed by Mark and Rau (2006).

The described organisation structure combining centralised and decentralised IT organisations leads to a diversity of stakeholders interested in the enterprise architecture, which are furthermore involved in the planning and management processes of the IT at the BMW Group. Therefore, the BMW Group started to establish a platform involving all stakeholders in centralised and decentralised departments. The purpose of this platform is to increase economies of scale and to create an *integrated IT governance platform*, which supports all stakeholders in the IT governance process.

3 Demand management and portfolio management

The demand management module (see Figure 2) is the entry point for new IT initiatives, which may result in one or more IT projects. If a new demand arises it has to be documented in a standardised way, containing the information described in the following paragraphs.

Figure 3 Organisational structure of the IT departments



Initially, the initiator of a demand has to describe the demand informally in a textual way and of course also the initiator must define a contact person in order to be able to make call-backs, etc. Furthermore, the demand is linked to the supported strategies and addressed objectives (see Section 4) to achieve traceability with the strategy and objective management module.

Additionally, it has to be documented which architecture elements (applications, hardware systems, etc.) are affected by the demand. For example, an initiative derived from a demand may retire an existing application or connect two existing systems by a new interface.

Collecting all this information enables the BMW Group to identify similar demands arising from different departments. For example, queries searching for demands affecting the same architecture elements or the same objectives increase the possibility to bundle demands addressing the same problem or even changing the same architecture elements.

Finally, the demand management also defines indicators for evaluating demands, which are globally defined to guarantee a comparability of evaluations. Examples for these indicators are ratios of *strategic and operative impacts* or of *problem-solving versus problem-preventing solutions*.

After all information have been collected and each demand has been evaluated the status of a demand is changed to 'defined' and a committee can reject, approve or refine a demand. If a demand is approved the portfolio management is the next module to be affected.

The portfolio management[2] first bundles different demands into one or more project proposals, which have to be complemented by concrete work items, milestones, etc. This information is typically also part of an initial project description, but the additional benefit using an integrated approach supported by an IT governance platform is the transparency gained. Such project documentation is typically only a textual document based on a corporate template and therefore it is difficult to identify similarities if many of such proposals exist. But if some aggregated information is also entered into an IT governance platform, this also allows easier access for more stakeholders, enables the support for queries and supports linking information from other modules.

The main purpose of the portfolio management is to identify those project proposals, which should be accomplished and are finally stated as approved. Factors leading to these decisions are financial values, dependency analysis of proposals, strategic interests, etc. One instrument used for evaluating the portfolio is the well known bubble diagram (see Figure 4), in this context also known as portfolio matrix (ten Have et al., 2003). The matrix shown in Figure 4 analyses the project portfolio by using the economic impact (*x*-axis), strategic impact (*y*-axis), project volume (bubble size) and risk (bubble colour).

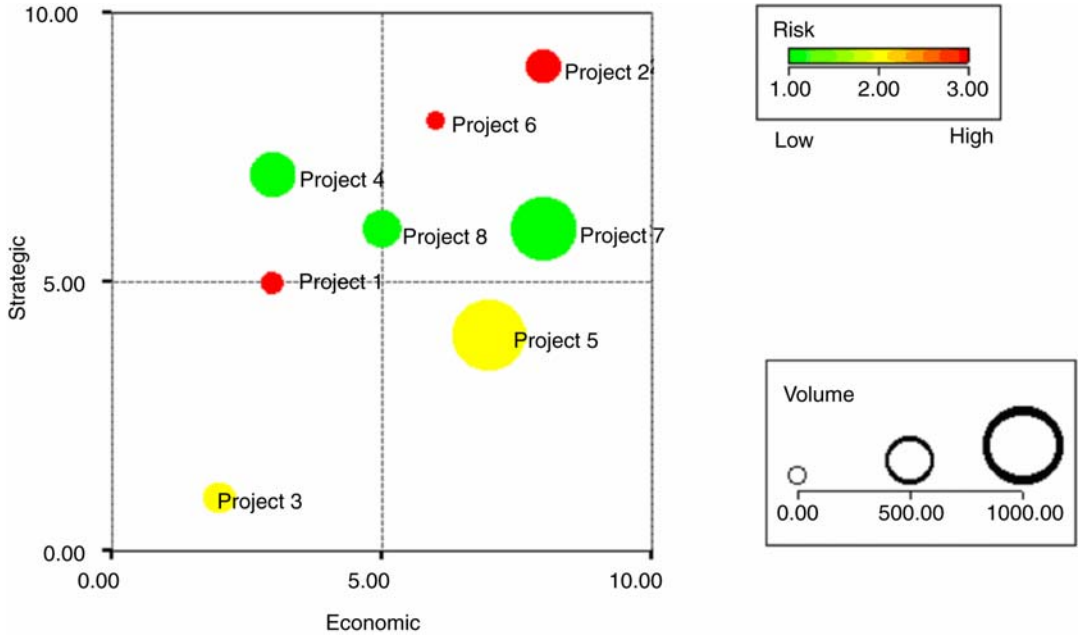
Typically, the overall planned budget from the projects is higher than the budget for the next planning period. Therefore, projects in the upper right corner of the matrix (projects 2, 6–8) with a high economic *and* strategic impact will be on the shortlist for the portfolio to be approved, if the risk is acceptable.

The result of this planning process, implemented by the portfolio management module, is *the portfolio* of IT projects for the next planning period, which is also aligned with the strategy and architecture process described in the following Section 4.

4 Strategy and objective management and IT architecture management

Strategies and objectives, which are linked to the demands and project proposals, are defined in the strategy and objective management module. The goal of this module is to align projects with strategies and objectives and also manage and control their realisation.

Figure 4 Exemplary portfolio matrix (for colours see online version)



A side-effect gained by linking demands and project proposals to strategies and objectives is transparency. Even when projects are finished, it is possible to reconstruct, which strategies and objectives have been addressed.

The BMW Group approach to document, control and evaluate strategies and objectives is based on the balanced scorecards by Kaplan and Norton (1991). The methods for evaluating objectives rely on performance indicators specific to the BMW Group and adapted cost/benefit analysis. For example, financial values are calculated by indicators such as cost efficiency and net present value, such as return on investment and return on asset. Additionally, non-financial values like risk or strategic value are supplementing the financial value.

In combination with the portfolio management, a prioritisation of the initiatives is developed, leading to the project portfolio as described in Section 3.

Since the IT governance process does not only focus on a single application, but on the IT landscape as a whole, all decisions made are aligned with an architecture process. This architecture process is implemented by the IT architecture management module, which develops guidelines for applications and corporate standards.

The IT architecture focuses on the implementation of applications. Operating thousands of applications using various database management systems, transaction servers, etc. needs an architecture process (see Figure 1) to ensure homogenisation of the operated IT components.

Therefore, the BMW Group established a reference model for applications, based on the patterns of IBM (2004) and SUN Microsystems (2001). This reference model consists of industry standards for application blueprints and technology blueprints.

For example, the application blueprint defines different blueprint architectures and architectural solutions for developing applications. Figure 5[3] shows a blueprint architecture for an online transaction processing application consisting of five tiers. The five tiers (Client, Presentation, Business, Integration and Resource) document the architecture from different perspectives. Figure 5 shows a functional perspective describing the componentisation of the system, allowing for example, three different types for a client interface.

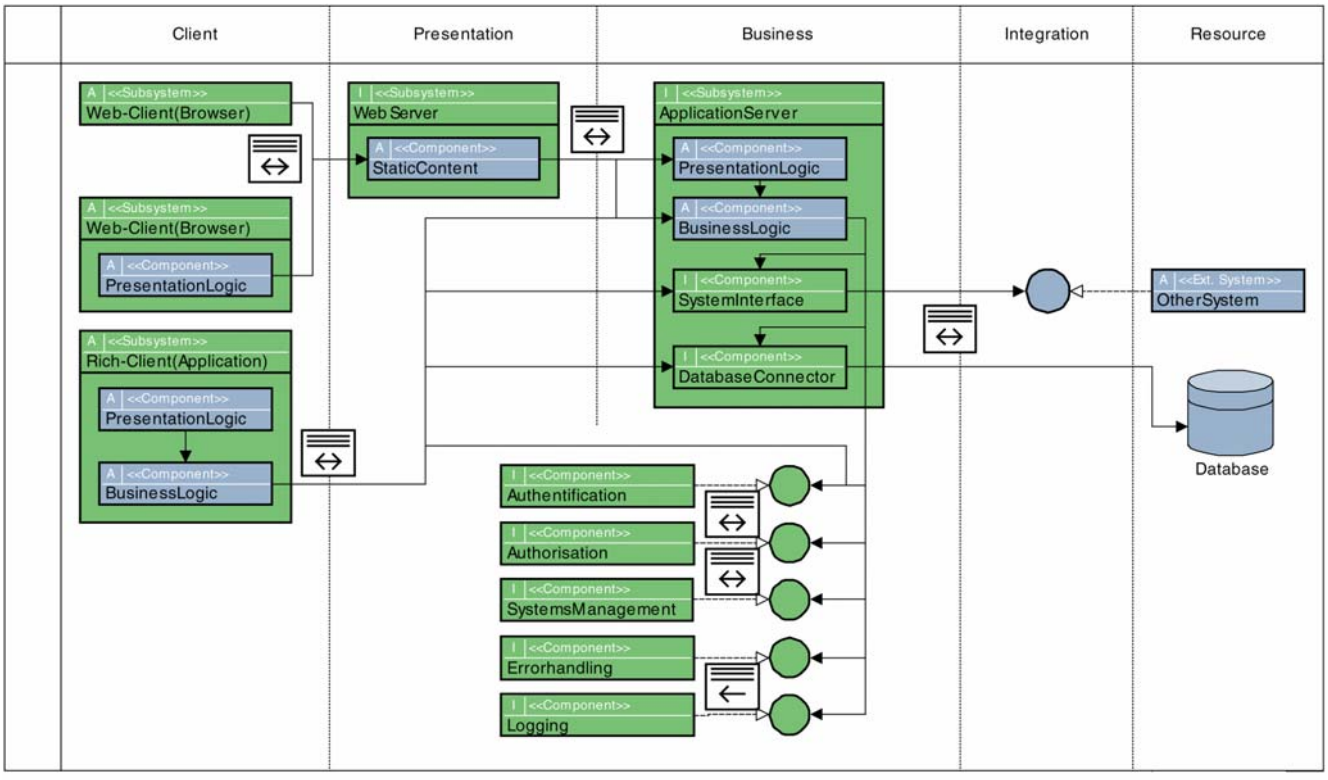
Since this blueprint architecture shows *abstract* components, it is further complemented by one or more architectural solutions, which *instantiate* the blueprint architecture. For example, the abstract technology 'Database' from Figure 5 may be instantiated by 'Oracle DB 9.1' or the 'Web-Client (Browser)' is instantiated by 'MS Internet Explorer 6.0'.

The BMW Group maintains a library of such blueprint architectures and architectural solutions. The main reasons for developing this library have been the increasing number of software components operated, an increasing need for standardisation/homogenisation of components and solving recurring problems with best practices.

5 Synchronisation management

Demand management (Section 3), portfolio management (Section 3), strategy and objective management (Section 4) and IT architecture management (Section 4) all take place before a project enters its active 'implementation' phase (see Figure 2, project lifecycle 'Implementation and Control Initiative'). Changes during the execution of an

Figure 5 Blueprint architecture for an online transaction processing application



initiative are not covered by these modules. Therefore the synchronisation management continuously *synchronises* multiple projects and project proposals, which may become necessary to react on delays, changes in budgeting, etc.

The term 'Synchronisation Management' is originally used at the BMW Group in the manufacturing process. The process step in which the engine and the body of the car is assembled is called *wedding*. The alignment of the process steps towards this wedding is called synchronisation management. The same idea is used in the IT management process with the difference that two or more IT projects or project proposals have to be synchronised, in order to resolve dependencies.

A typical task of the synchronisation management is an early detection of projects running out-of-time and their effects on other projects. The rescheduling, tightly aligned with the portfolio management, is of major interest.

Furthermore, the roll-outs of new applications at different locations have to be managed by the synchronisation management module. Manufacturing processes at different factories have to be considered when a roll-out is planned, in order to guarantee high availability with the lowest interruption of the production process. The models the BMW Group uses to synchronise these events are called; 'Synchro Maps', which are based on Gantt-like diagrams.

6 Enterprise architecture management

The enterprise architecture management module can be interpreted as the glue between the other modules leading to the integrated IT governance process. Before we describe in Section 7, how the interaction of the modules takes place, this section concentrates on the functionalities of the enterprise architecture management module.

Aligned with the 'Enterprise Architecture Desk Reference' from META Group (2002) this module is split into the following views on the overall architecture:

- Enterprise Business Architecture
- Enterprise Information Architecture
- Enterprise Application Architecture
- Enterprise Technical Architecture

The enterprise business architecture covers the abstract business processes and the organisational structure of the BMW Group. The existing detailed models of the business processes are abstracted and aggregated for the enterprise business architecture, because the enterprise architecture focuses on the linkage of the four views on an abstract level. A detailed view of each business process step would result in a high maintenance effort and decreased data quality, therefore only business processes on levels 0–2 are considered.

The enterprise information architecture links the enterprise business architecture and enterprise application architecture. The same information objects documented by the enterprise information architecture are used in various business processes and are also implemented in many applications. Therefore, the enterprise information architecture ensures a global and consistent view on the main information objects of the IT landscape.

The enterprise application architecture and the enterprise technical architecture are tightly linked to the IT architecture (see Section 5) focussing on the architecture of applications.

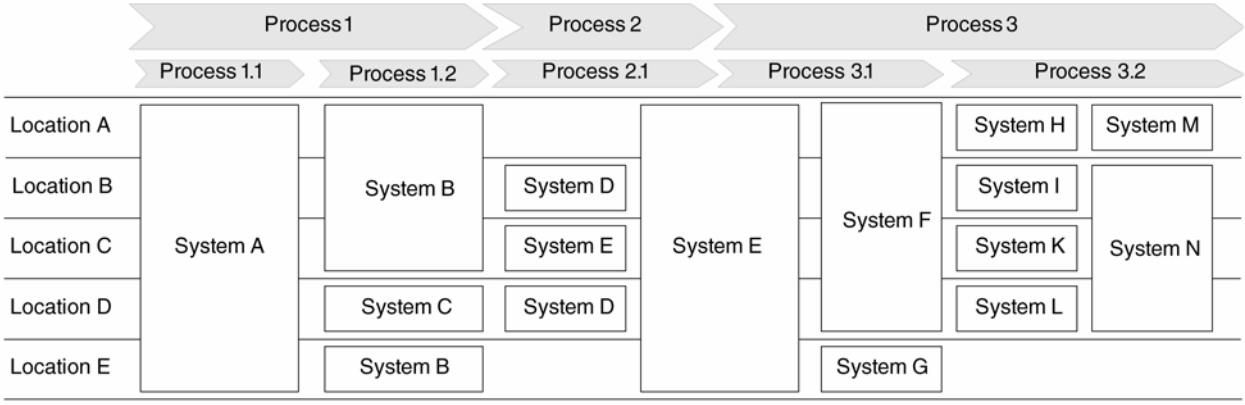
The main purpose of this module is to align business and IT. The main tool used for achieving this alignment are different types of master maps visualising the IT landscape with business processes, information objects, etc. An exemplary master map is shown in Figure 6 visualising the IT support for business processes used at different locations. Other maps for example, show the operations (create, read, update and delete) performed on information objects.

Figure 6 shows that 'System B' is for example, used to support business process 'Process 1.2' at locations 'Location A', 'Location B', 'Location C' and 'Location E'. It can also be derived that 'Location D' uses a different application ('System C') to support this business process.

Changes in the landscape can be classified similar to patterns, for example, integration, decoupling, introduction. Increasing integration means that one application takes over the support for more business processes and/or more organisational units. A master map is for example, used to identify high heterogeneity and to make suggestions for improvements.

In this use case, the BMW Group furthermore distinguishes between vertical and horizontal integration.

Figure 6 Exemplary master map



Increased vertical integration means that the number of the same application systems used to support the same business process at different locations increases. In Figure 6, the vertical integration can be increased if 'Location D' also uses 'System B' to support 'Process 1.2' instead of 'System C'. Decoupling in the landscape refers to changes opposite to integration.

Introduction refers to the situation that a white spot in the landscape will disappear, when an application will support a process at a location not yet supported by an application.

Another use case using these master maps is to plan the further development of the landscape. Therefore, the BMW Group distinguishes between master maps for *as-is landscape*, *planned landscapes* and *to-be landscape*. The as-is landscape refers to the status quo and the corresponding master map reflects this situation.

The difference between the planned landscape and the to-be landscape are changes by approved IT projects and a long-term vision. A master map for a planned landscape shows the IT landscape at a given date, for example, '2008-08-01' including the changes by IT projects and the statuses of systems at the given date.

The master map for the to-be landscape is a long-term vision of the software map, which is used to align new demands and initiatives with a common vision of the IT landscape resulting from strategies and objectives.

Figure 7 shows the idea of evolving landscape objects exemplifying the different possibilities for landscape objects, which are visualised in the master maps. Consider that the current date is '2008-04-01' then the 'Application 1' would be marked as productive in the as-is landscape. At '2008-08-01' the status of 'Application 1' has changed to legacy, therefore the status in the planned landscape for '2008-08-01' differs from the as-is landscape. Finally, at '2009-04-01' 'Application 1' is retired and will not appear in the planned landscape for this date. The other examples in Figure 7 show more possibilities for landscape objects, which may evolve over time.

The benefit of controlling the landscape objects with different states and in different master maps is not only a gain in transparency about the upcoming evolution of the IT landscape. It is also possible to align a long-term to-be architecture with the planned and running initiatives: 'Do the changes lead to the desired to-be landscape?'.

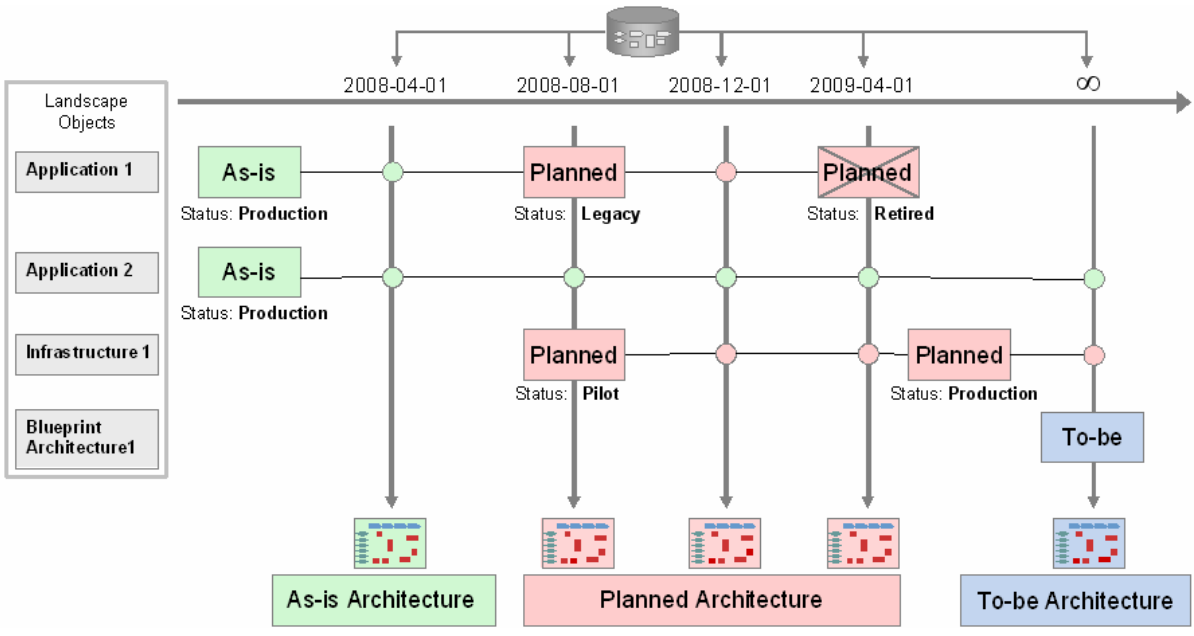
Furthermore, enhanced planning reliability is a benefit of this approach. New initiatives for example, the second half of 2009 can use the planned landscape as a basis. And in the case of Figure 7, it can be derived that 'Application 1' will be retired and a new infrastructure 'Infrastructure 1' is planned. Using the as-is landscape as a basis may lead to unforeseen changes, which affect the initiative.

Before the BMW Group started to integrate the different modules using the enterprise architecture management module, a software tool called *IT Map* was already used to create and store these master maps. But the handicap of this tool was that the master maps were build with high manual effort and more important the information from the other modules could not be reused automatically.

The planned landscape had to be derived manually by retrieving the information from the portfolio management, because the IT projects changing the IT landscape and their project statuses are managed in this module. Of course, also data quality increases, if the modules are linked. For example, updates and changes do automatically affect the other modules, guaranteeing data consistency and timeliness

To increase the use of master maps the BMW Group established a cooperation with the chair 'Software Engineering for Business Information Systems (sebis)' at the Technische Universität München in 2003. The research project 'Software Cartography' of sebis develops models and methods for documenting, evaluation and planning application landscape. So-called software maps (see Lankes et al., 2005; Matthes and Wittenburg, 2004), which also includes the master map in Figure 6, have been

Figure 7 Deriving master maps for the as-is architecture, planned architectures and to-be architecture



analysed at various industry partners in order to develop a library of viewpoints (see IEEE, 2000) addressing different concerns of stakeholders.

The presented kind of master map in Figure 6 is the most prominent example for a software map used by organisations, which either have many decentralised IT departments or are operating with different products in different markets. In literature, this kind of software map can also be found at Dern (2006), Keller (2006) or Niemann (2006).

Other types of visualisations for documenting enterprise architecture and IT architectures and how these visualisations can be generated are discussed in Ernst et al. (2006).

7 Linking the modules into an IT governance process

Figure 8 shows a detailed view (compare with Figure 2) on the interactions of the modules explained in Sections 3 up to 6 and the IT project life cycle, which is visualised in the middle of the figure. The interaction of the modules is a continuous process, involving many roles and responsibilities. Therefore, we will describe the interaction on an abstract level without explaining each interaction in detail.

A new call for action is at first recorded by the demand management. The overall set of demands is bundled, documented and evaluated as described in Section 3. The subsequent project steps request a more detailed description of the initiative, which also includes information about the affected landscape objects using the planned and to-be landscape as a basis (see Sections 4 and 6).

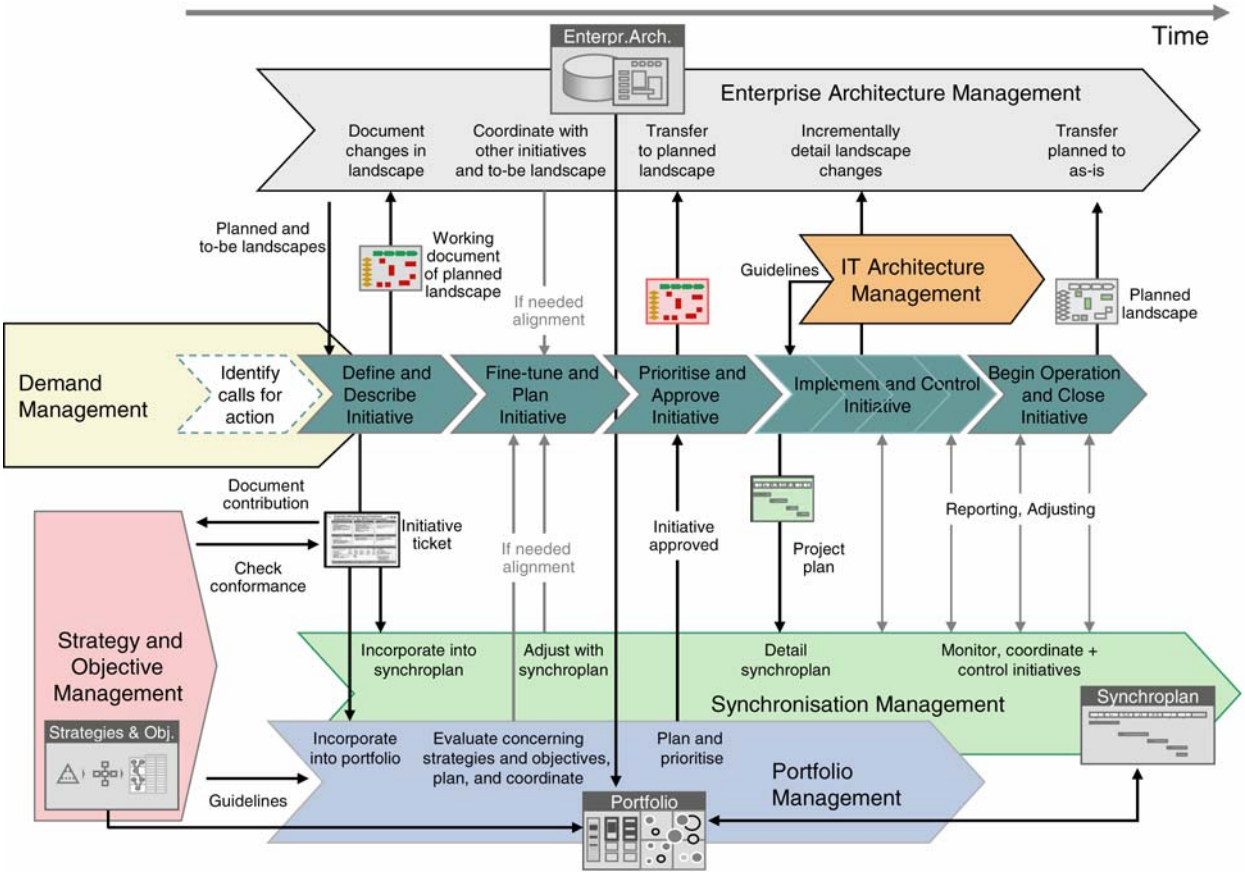
The 'initiative ticket' is an abstract description of the initiative, which must contribute to some strategies and objectives. The contribution is archived in strategy and objective management to measure and monitor the achievements of objectives.

The initiative ticket is further used in the portfolio management to create a new project proposal (see Section 3), which is compared and evaluated with other project proposals. The synchronisation management incorporates the initiative ticket due to scheduling reasons into its synchroplan. Additionally, the enterprise architecture management is used to describe the changes in the landscape, resulting in a working document of a planned landscape.

In the next step, the initiative has to be fine-tuned and planned. The portfolio management may request alignments of the initiative (see Section 3) due to reasons of budgeting, bundling of proposals, etc. Further the synchronisation management (see Section 5) may also request an alignment derived from other projects, on which the initiative may be dependent. Finally also the enterprise architecture management has to check if the initiative corresponds with the planned and to-be landscapes, before the prioritisation and approval is possible. The approval of the initiative leads to changes in the planned landscapes of the enterprise architecture management module (see Section 6).

At the beginning of the implementation, the IT architecture management module (see Section 4) supports

Figure 8 Linking the modules into an integrated IT governance process



the initiative with guidelines concerning the different architectures. For example, an architectural solution is chosen, guiding the implementation.

During the implementation, the initiative has to detail the changes in the landscape incrementally and the synchronisation management checks if other dependent initiatives have changed their schedule or if the schedules of other dependent initiatives have to be aligned.

As a last step, when the operation begins and the initiative is closed, the changes from this initiative, documented in the planned landscape, is transferred to the as-is landscape.

The team-play of all these process steps results in an integrated IT governance process, enabling the BMW Group to increase efficiency and effectiveness of IT initiatives.

8 Information model

The IT governance process sketched in Section 7 operates on large amounts of data, which originate from different modules. Since the modules are linked, referential integrity has to ensure that each process operates on consistent data.

The BMW Group has put special emphasise on building the information model (see Halbhuber, 2004) for the integrated IT governance process. This information model was designed using object-oriented methods and documents how the information elements (modelled as classes) relate to each other (modelled as associations).

As of today, no standard for such an information model exists, neither in industry nor at standardisation groups (see Buckl et al., 2007). The main difficulty when designing the information model is to choose a *best* level of abstraction. An information model which collects too detailed descriptions of the provided interfaces of applications may lose its focus. Moreover, the data quality will decrease, because keeping *all* information about the landscape up-to-date results in high efforts without true benefits through cost-savings.

The relevant information must be identified starting with the stakeholders and their concerns (see IEEE, 2000) in connection with an analysis, which evaluates if effort and benefit are positively correlated. The concerns are typically addressed by tabular reports and graphical visualisations (e.g. Figures 4 and 6), answering specific question arising in the IT governance process.

It has to be noted that *drawing is no management*. If symbols are used in graphical visualisations without any semantics, this information cannot be stored in the information model. Hence, this information cannot be reused in other reports, etc.

Therefore, a repository as a single point of information for the IT governance is of major interest. The repository contains the information model, which defines the semantics of the data used and which is employed to generate visualisations and reports addressing concerns of the stakeholders. Changes in the visualisations and reports are leading to updates in the repository aligned with the information model.

9 Related work

Weill and Ross (2004) define IT governance as 'Specifying the decision rights and accountability framework to encourage desirable behaviour in the use of IT'. This paper presents the approach the BMW Group has taken to establish the software platform for IT governance used to increase the *desirable behaviour in the use of IT*. How to specify decision rights and design the accountability framework is discussed in literature in many case studies, as for example, presented in the review on IT governance research by Brown and Grant (2005). Therefore, we focussed on the integration of existing IT management processes and the IT support for IT governance.

The structure of the IT organisation at the BMW Group was briefly introduced in Section 2, showing that the BMW Group has centralised and decentralised IT departments resulting in stakeholders from many IT departments involved in IT decisions. Weill and Woodham (2002) showed that the input for decisions and where the decisions are taken vary broadly between firms they have analysed. The IT governance platform we discussed in Sections 3 to 8 is decoupled from the point where the input arises or the decisions are made. This would only affect the customisation of roles and rights of the platform we presented.

In the area of enterprise architecture management, enterprise IT architecture management and IT governance there are some publications addressing similar topics. Keller (2006) and Niemann (2006) for example describe approaches for governing and managing IT in a comparable way to this paper. The main difference is that we describe an integration approach from the perspective of the user, the BMW Group. Keller and Niemann are using a consultancy perspective. Therefore, their approach has to be adapted to fit to existing IT management processes (as described in Sections 3–6) and a specific organisational structure.

Hence, Keller's approach partially overlaps with the approach of the BMW Group, we will sketch his approach and map it to our approach. Keller (2006) distinguishes between six IT enterprise architecture processes:

- IT strategy process, which derives the IT strategy from the business strategy
- IT application portfolio management process, which is the planning process to transform the IT strategies into the application and IT infrastructure portfolio
- modelling process, which documents the enterprise architecture
- guidelines development and implementation process, which documents, communicates and establishes guidelines concerning the enterprise architecture
- monitoring process, which continuously analyses the IT project portfolio
- project consulting process, which consults projects entering terra incognita.

The above processes can be mostly mapped to the processes introduced in Sections 3–6: the strategy process from Keller mainly focuses on the derivation of IT

strategies from business strategies, which is not addressed by the strategy process in Section 4. Our approach focuses on monitoring strategy achievement and the alignment of strategies and projects.

The IT application portfolio management process maps with our demand management and parts of the project portfolio management process. Our demand management process starts with the new demands, which have to be aligned with strategies and are evaluated before deriving a project proposal. The project portfolio management process is accountable for the budgeting and evaluation of all project proposals in a period.

The models used in Keller's modelling process are equivalent to the models introduced in Section 6, Matthes and Wittenburg co-authored the book section on models in Keller (2006).

Keller's process for developing and implementing guidelines is in our approach distributed into different processes. If for example, IT architectures (named blueprints in Section 4) are of interest, these guidelines are defined in the IT architecture management process.

Keller's monitoring process maps with our synchronisation management process. Both are continuously detecting dependencies originating in changes in the projects, changed demands, etc.

The project consulting process from Keller is incorporated into the demand and project portfolio management process in our approach, because projects entering terra incognita have to be evaluated in the same way as other projects.

Missing in Keller's approach is a concrete linkage to the IT project life cycle model, which we introduced in Section 7. Furthermore, the BMW Group already implemented many of the management processes before establishing the enterprise architecture management process and started to introduce an integrated IT governance platform covering all of the processes discussed above.

For the BMW Group, it is important to reuse effective and efficient practices and incorporate these into a novel approach for enterprise architecture management and IT governance as discussed in Section 7.

10 Conclusion and future work

The four processes shown in Figure 1 had already been established in the IT departments of the BMW Group (see Figure 3) before the integration of the processes into an IT governance process was started. In retrospective, the approach to introduce the processes consecutively suited well. A big bang, introducing all processes in parallel and also trying to integrate them immediately, would have been not successful.

Hence, the main difference to other approaches in literature like for example, TOGAF (Open Group, 2002) is that existing IT management processes are integrated into an IT governance process, as shown in Section 7. The integration has also a positive side effect since information already generated by the other processes can be reused, for example the information about blueprint architectures (see Section 4) defined by the architecture process is also used by the IT governance process. Furthermore, this leverages the acceptance of the approach, because people providing information for the process do positively notice that their existing work is reused.

By now, the BMW Group has defined new roles, like 'Enterprise Application Architect', 'Enterprise Information Architect', etc. and is rolling-out the new integrated process into the decentralised IT departments of the BMW Group.

This integration of the different IT management processes together with the IT project life cycle has to be supported by an adequate software platform. The BMW Group has documented their requirements on such a software platform and analysed the market for suitable tools. As a result of this analyses the BMW Group started an initiative to support the overall IT governance with a software platform.

The 'Enterprise Architecture Management Tool Survey 2005' from TU München, sebis (2005), which also analysed platforms in this area, has also used concepts of the approach for the IT governance from the BMW Group.

In the future, each IT department of the BMW Group will be connected to the process and the supporting software platform. Finally, more than 100 power users will use the platform intensively (chief architects, enterprise architects, chief modellers, etc.) and more than thousands users (mainly users responsible for applications) will use the platform on a non-daily basis.

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Notes

[1]Of course, there are also other approaches to analyse and design IT organisation structures, for example, a fine-grained separation with demand management, development, support and delivery or to look at authorities to issue directives, etc. But for this paper the high-level description of the IT organisation structure of the BMW Group is sufficient to explain the structure of the IT governance process.

[2]It has to be noted that in this article 'Portfolio Management' refers to IT portfolio management. The product portfolio of the BMW Group is not referred.

[3]The notation used for documenting blueprint architectures and architectural solutions was developed by the BMW Group.