Improving IT Management at the BMW Group by Integrating Existing IT Management Processes

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Abstract

The management of IT landscapes consisting of thousands of business applications, different middleware systems, and supporting various business processes is a challenge for modern IT management. The BMW Group has addressed this challenge by establishing an integrated IT management process which covers strategy, architecture, planning and controlling.

The BMW Group integrates the following pre-existing IT processes in a continuous management process:

"Architecture and standardization" defines blueprints in terms of architectural patterns; "Landscape management" maintans an overall model of the (present and future) IT landscape; "Portfolio management" coordinates, evaluates and prioritizes action items with IT impact; "Synchronization management" manages ongoing (IT) projects, their dependencies and the cross functions; "Strategy and objectives" generates action items, defines guidelines for the other processes and adjusts strategies based on feedback from the other processes.

This paper describes the problems that arise if such an integrated, continuous management process is lacking.

1. Introduction

The number of IT systems and especially the number of IT projects at the BMW Group requires an integrated IT management process. This IT management process has to document the whole IT landscape, plan its further development, identify weaknesses, etc. Right now, thousands of information systems support various business processes using different middleware systems running on thousands of hardware systems located in different countries.

In literature, frameworks for implementing an integrated IT management process focussing on the above problem do exist (e.g. ITIL from OGC [1], TOGAF from The Open Group [2], Cobit from the IT Governance Institute [3]). But they all do not consider existing IT processes and structures. In this case study we present an approach the BMW Group uses to establish an integrated IT management process on the basis of existing loosely coupled IT processes. We discuss which problems the process addresses and how they should be solved. The main questions to be answered by the IT management are:

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

To achieve the addressed objectives we distinguish between four IT governance processes (Figure 1): The strategy process supervising the IT architecture and defining frameworks and guidelines, the architecture process defining blueprints for software architecture and platforms (consisting of middleware systems, hardware systems, etc.), the planning process managing the IT portfolio and prioritizing projects and actions and the controlling process managing, monitoring and synchronizing different projects and on-going changes.

Figure 1: IT governance processes and project life cycle

The BMW Group already partially introduced the four IT governance processes, therefore the challenge was to map existing processes to an integrated IT management process. In the following sections we discuss each process (Sections 2 to 5) and finally present the approach the BMW Group uses to link the processes.

2. Strategy process

The strategy process takes control of the goals to be achieved and the objectives leading to action items, which may result in projects after calculating, prioritizing, accepting and synchronizing. Long-term goals, which are not addressed by existing or planned IT projects are defined, controlled and evaluated in the strategy process. The problem that arises is how to control and especially evaluate defined goals. The BMW Group uses an approach based on the balanced scorecard model [4] to evaluate and supervise the defined strategies.

To calculate the costs and benefit of an action item the BMW Group distinguishes between a financial and non-financial value. The financial value is calculated using methods for calculating cost efficiency and capital value, etc. The comparison of "What do we invest?" and "What do we get back?" leads to a financial perspective. The non-financial value is calculated using a BMW Group specific scoring model and business/IT value calculations. Both values, the financial and non-financial, are considered when a positive or negative decision has to be made for an action item.

During the prioritization the different action items are considered with the effect on the whole IT portfolio. The importance and urgency of each action item is balanced with the risk connected to each action item: "What will happen if we do nothing?" or "What will happen if the project fails?" together with the synchronization of the action items (see Section 5) leads to an overall view. The strategy process builds the conceptual framework for the portfolio management, defining the measures and metrics for the portfolio management.

But not only measure driven processes are part of the strategy process. Guidelines for the development of the IT landscape are created and turned into action items, which will be implemented by IT projects. Especially this management of action items is a central task of the strategy process. During the budgeting process the planned IT projects must be evaluated and ranked.

3. Architecture process

The architecture process covers different aspects of the IT landscape:
- The enterprise business architecture describes the business goals, objectives and processes.
- The enterprise information architecture considers data and object management.
- The enterprise application architecture covers the applications – as a logical aggregation – supporting the business processes.
- The enterprise technical architecture covers the software and hardware systems, network components, etc.

The main focus of the architecture process is to cover the business applications and how they work together in the IT landscape. Before the BMW Group started to connect the different aspects, only loosely coupled information platforms existed. E.g. the Data Model Navigator holding information about the data
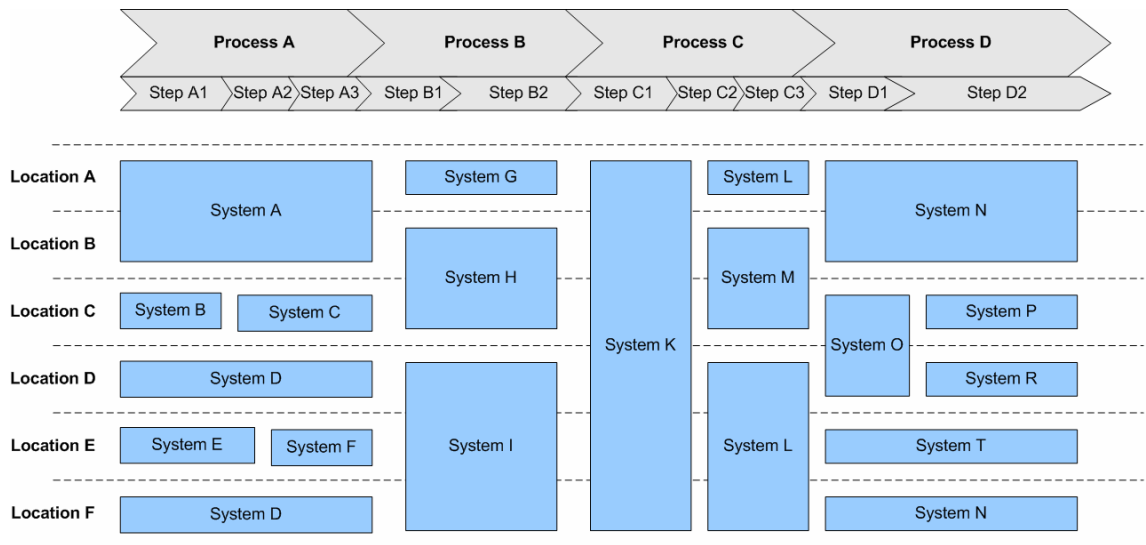
Figure 2: Exemplary IT map

models of the central applications running at the BMW Group or IT Map covering the main aspects of the IT landscape (information systems, interfaces, etc.).

The BMW Group already developed an application blueprint [5], which defines architectural patterns and solutions for business applications. The architectural blueprint consists of different architectural patterns (e.g a web application with an application server and RDBMS), which cover different scenarios for different requirements of business applications. For each architectural pattern one or more architectural solutions exist (e.g. J2EE), which consist of one or more building blocks (e.g. Oracle DB 8.1). The application blueprint is based on different frameworks like the IBM Patterns for e-Business [6] or Sun's J2EE Patterns [7].

The BMW Group decided to develop an architectural blueprint due to various reasons: The increasing number of software components needed standardization (homogenization); recurring problems should be solved with best practices (architectural patterns); specialized product knowledge can be aligned to the standardized software components.

Beside the architectural blueprint, the BMW Group is documenting its IT landscape using a tool called IT Map. Functions, processes, application systems and infrastructure elements are documented and visualized, and can be accessed via the corporate intranet. The questions "Which IT do we have in use and where?" and "Where are weaknesses and unused potential?" have already been addressed by IT Map. E.g. the diagram in Figure 2, which we call an IT map, shows the business process support of applications and the locations where these applications are used.

Other map types also show interconnections between the application systems or life cycle phases of the applications (plan, development, test, production, ...). Unfortunately these diagrams are built with high manual effort. Also the information gained from the IT maps are not directly sent to the planning and controlling processes, because changes in the IT maps do not change the IT portfolio (Section 5) or activates synchronization tasks for resolving dependencies.

The BMW Group and TU München have established cooperation in the research project software cartography [8] to analyze existing and develop new IT maps. The research projects focuses on methods and modelling techniques for documenting, evaluating and planning of application landscapes.

When the information about the current IT landscape is available, this information should be used to plan further development of business applications and the application landscape. The problem arising is that projects in the planning phase use IT maps representing the existing landscape today and not the planned or target landscape. Changes by other ongoing projects, which will also contribute to the IT landscape are not considered.

Figure 3 shows that "Project X" has to consider the planned landscapes for 2005 and 2006 and the target landscape. Projects changing the landscape (Projects B, C, and D) until "Project X" starts have entered their information to the planned landscape of 2005 and "Project E" its information to the planned landscape of 2006. The target landscape is a long-term view, which also shows strategic goals without being directly connected to existing or planned IT projects.
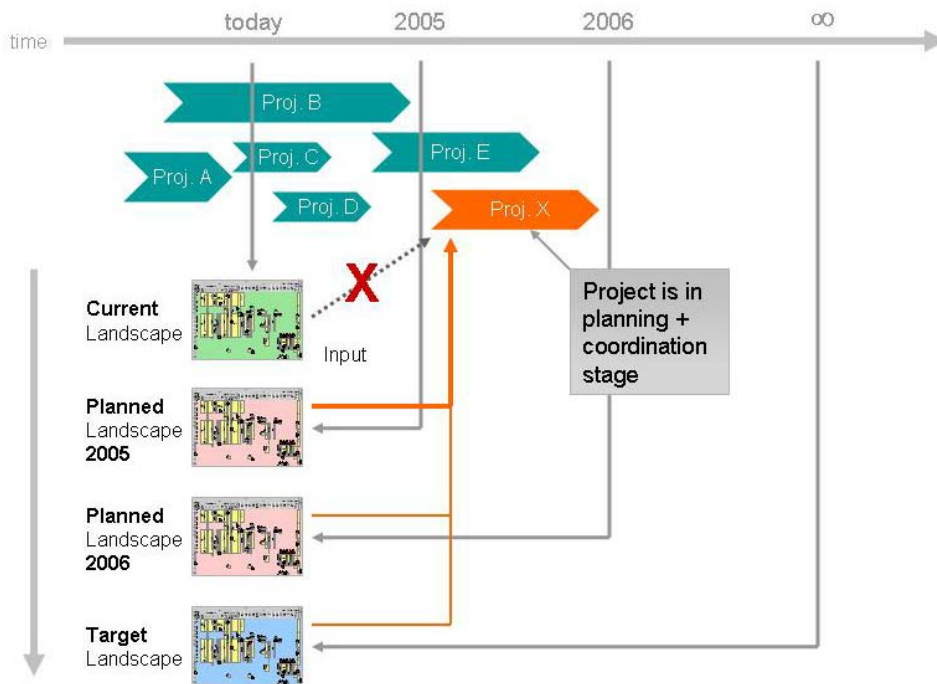
Figure 3: Current, planned and target landscape

Of course "Project X" has to keep in mind, that projects may be delayed or stopped for unknown reasons. Therefore "Project X" must update its planning before the project starts and while the project proceeds. The benefit of this approach is that "Project X" has more information about the future landscape and the assumptions in the project plan are closer to the upcoming conditions.

Additionally the intervals that the planned landscapes (2005, 2006, ...) cover must be aligned with the planning periods of IT projects and the budgeting/prioritizing processes. If IT budgeting/prioritizing takes place once a year, landscapes should have the same or a smaller analyzing interval. Changes due to financial or other reasons are covered better when these periods are aligned to each other.

4. Planning process

The portfolio management is the main task of the planning process. At the BMW Group it controls and manages the action items, plans resources and the costs. META Group defines IT portfolio management as follows: "IT portfolio management is a disciplined and structured approach of continuous, repeatable, and easily sustainable processes designed to map business requirements to technology decisions." [9]

When a new action item is created (e.g. a business process should be supported by IT) its requirements must be documented and made available to the portfolio management. The goals and conformance with the architectural processes are evaluated together with other created action items. During the approval/budgeting process existing resources (human and monetary) are matched with the action items. The resulting prioritization with budgets for each approved IT projects leads to a new landscape map (see Section 3).

During the IT projects the BMW Group controls and adjusts the portfolio at predefined checkpoints. Projects which are not in time, running out of budget, etc. are analyzed. The portfolio is updated at these defined checkpoints to confirm that the original planning fits with the goals in the portfolio.

The synchronization management addresses the problem that IT projects have dependencies with other projects. For example, an IT project waiting for interfaces implemented by other projects has to be synchronized with the plans of these projects (see Section 5).
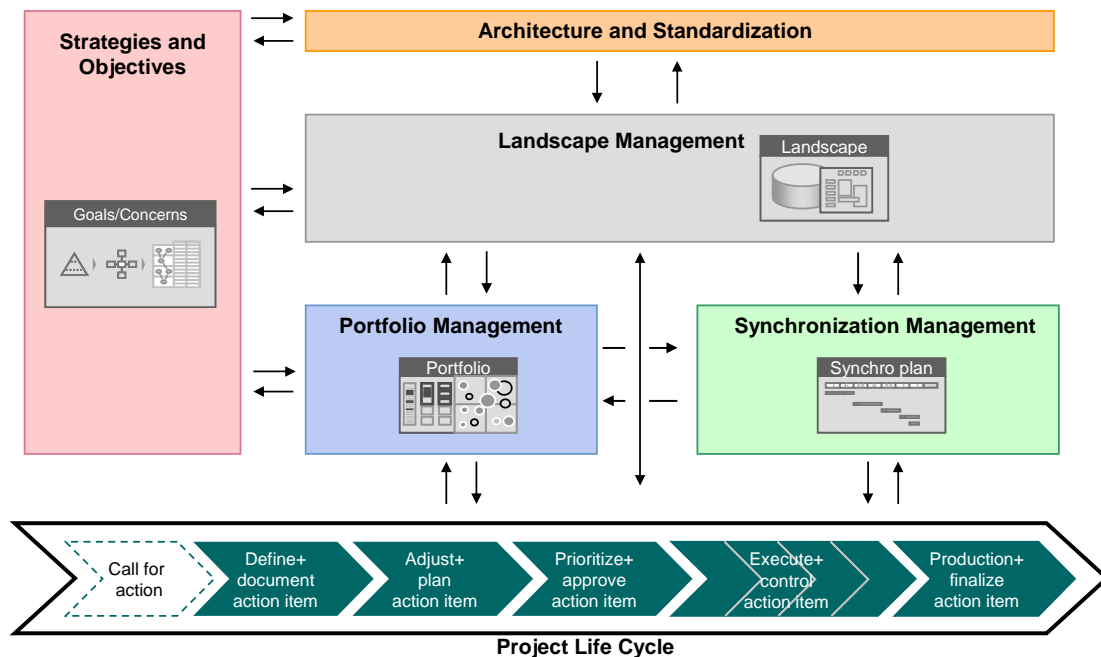
Figure 4: Modules of the IT governance process

5. Controlling process

The controlling process consists of the synchronization management, which checks project plans and their dependencies. The information collected in the portfolio management is the initial source for the synchronization management. New action items are registered in synchronization plans (synchro plans) and the hereby-gained information is returned to the portfolio management for prioritizing projects.

After a new action item is approved, a more detailed project plan leads to a new version of the synchronization plan; now also covering the main project phases. During the project the synchronization plan is updated in predefined intervals like the information in the portfolio management.

The ongoing controlling process has to deal with different changes during the projects: E.g. projects which are not in time, projects overrunning budgets or projects dealing with changed requirement. Also general budget cutting or changes in strategies and business goals must be controlled.

Important is that the integrated process has to deal with each change independent from the point where it arises in the whole IT management process. The adjustment and synchronization between the whole portfolio, the architecture, etc. must be done or is delegated to other processes by the control process.

6. Integrating the process

The different processes described in Sections 3 to 5 did already exist at the BMW Group prior to the introduction of the IT Management process in Figure 1. But not every process was fully established and especially a continuous integrated process did not exist. Figure 4 shows the modules, which establish the process cycle in Figure 1. The modules map existing known structures at the BMW Group to an integrated model, which supports the governance process.

The strategies and objectives (Section 3) cover the guidelines for the architecture and standardization and the landscape management (Section 3). The evaluation of the goals, which should be achieved is done using a balanced scorecard approach. The alignment of the strategies and objectives and the portfolio and synchronization management (Section 4 and 5) ensure that these goals fit with strategies and objectives.

The architecture and standardization influence the landscape management by defining guidelines for further development and new IT projects. Action items created in the portfolio management are matched and integrated in the landscape management to ensure a consistent and sustainable IT landscape. The
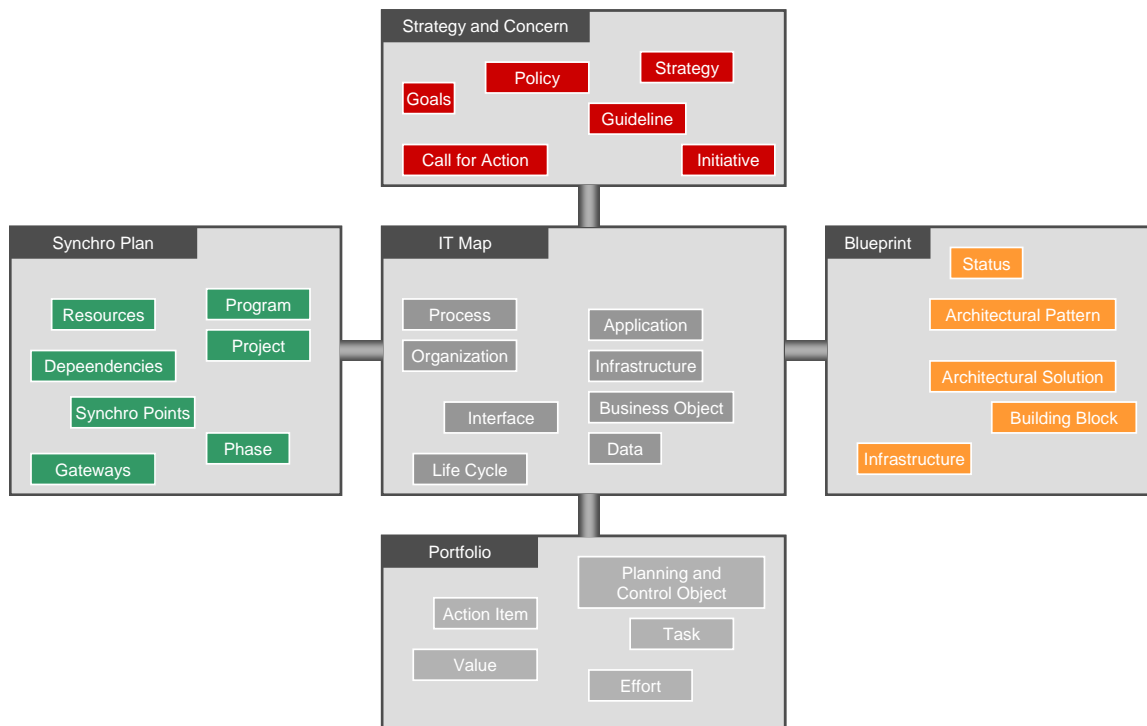
Figure 5: High level view on the information model

synchronization management ensures that dependencies between projects are dissolved and changes during the project life cycle are handled in the landscape and portfolio management. Finally the project life cycle with its different phases is linked to the modules to ensure that projects are linked to the superior IT management and governance processes.

To ensure that processes and the modules are linked adequately an information model [10] has to be developed. Additionally the existing tools supporting different modules of the IT governance processes have to be integrated or displaced by a tool which supports each module.

The BMW Group has built an information model (high level view in Figure 5) covering the different aspects of each process and each model [11]. The information model covers different aspects like business processes, deployed applications, technical platforms, goals, etc. The platform that integrates the information model will be used as a single point of information and is build by the BMW Group together with alfabet meta-modelling AG [12].

By now the BMW Group has started to enrol the modules (Figure 4) and has already defined new roles and responsibilities. The new IT landscape manager builds the interface between the four different processes and takes care of the synchronization between the processes. This role has to interact with IT and business to increase the business alignment of IT.

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