A Framework to combine Corporate Budgeting with Agile Project Management

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Abstract—**Companies in all different sizes and industries have to deal with fast-changing environments and therefore run into troubles to keep the same pace in their internal governance processes supported in most cases by Enterprise Resource Planning systems (ERP). One dedicated situation lots of companies have to deal with is the challenge to fit fast, agile project management ideas into a relatively slow and classical budgeting model for monitoring reasons. There are several budgeting models described in theory, like activity-based budgeting, zero-based budgeting, value-based management, profit planning, and the very often applied rolling budgets and forecasting model. In this paper, the authors will elaborate on the troubles occurring by the combination of the agile and classical oriented concepts and will introduce a combined framework for better integration of the financial planning aspects into the agile project management ideology. The paper has to be seen as the starting point for a discussion of the elaborated situation.**

Index Terms—**agile project management, budgeting, corporate governance, ERP system implementation**

I. Introduction

Enterprise Resource Planning (ERP) implementation projects can be managed and deployed with different project management (PM) methods. In addition to classic, waterfall driven approaches that are most often used by ERP implementation partners, the usage of agile project methods is increasing [1]. The challenge in the method selection is based on the culture of the implementation partner and the companies culture itself. A lack of knowledge and missing environmental factors leads to troubles in the use of agile concepts [2]. The following overview in section II should give an orientation.

Hardly any company project presents a similar overwhelming challenge, as the introduction of an ERP system and there are no other system implementations combined with such high failure rates than ERP system implementations ranging from 50 to 70 percent - therefore the authors name different reasons [3]:

- Most of the failure rates are based on project management conceptions by measuring the success in terms of completion time and costs
- Even though the implementation project may be construed as a failure upon immediate completion based on project management criteria, the project may be considered a success during the larger life cycle of the ERP system
- The implementation context has a bearing on the ERP evaluation, and it may privilege certain measures other than project management effort to define ERP success

(e.g., the logic of patient safety was paramount due to the health service context)
- Appreciating the temporal nature of ERP implementation requires a life-cycle-based approach to ERP evaluation that goes beyond the immediate evaluation and incorporates outcomes from different phases of the life cycle.

Not only the project management organization (PMO) and the information technology department (IT) has to drive a successful implementation - almost all company areas have to get involved. It is about supporting the existing business processes, checking the requirements, and accurately determine the new ERP system and the fulfillment of the project goal to gain efficiency in the long run. Besides the challenges in ERP project planning, the second important aspect lies in the management of the financial situation of the company as a whole and especially the budgeting situation regarding all necessary tasks in the PMO. Lots of companies rely on their budgeting processes and stick to them for a long period neglecting a need for adaption regarding faster-moving company structures and support of innovations. Budgeting is sometimes politically influenced, and the following downsides can be named [4]:

- budgets are rarely strategically focused and are often contradictory
- budgets concentrate on cost reduction and not on value creation
- budgets constrain responsiveness and flexibility and are often a barrier to change
- budgets add little value - they tend to be bureaucratic and discourage creative thinking
- budgets are time-consuming and costly to put together
- budgets are developed and updated too infrequently - usually annually
- budgets are based on unsupported assumptions and guess-work
- budgets encourage gaming and perverse (dysfunctional) behavior
- budgets strengthen vertical command and control
- budgets do not reflect the emerging network structures that organizations are adopting
- budgets reinforce departmental barriers rather than encourage knowledge sharing

- budgets make people feel undervalued

Overall, the predominant theme in the literature is that planning and budgeting processes traditionally used in many organizations are failing to deliver results. Fundamentally, the problem is that they add limited value to the management of businesses and can be seen as an obstacle for agility and innovation [4].

Thinking about ERP implementation projects, the following situations have to be taken into consideration: (1) initial ERP implementation, (2) roll-out of an existing system to different subsidiaries or branches, (3) ERP upgrading as well as (4) external maintenance and system support to assist post-implementation monitoring [5]. These mentioned types of situations combined with the project factors like risk tolerance of the stakeholder, geographic distribution, organizational structure, and quality standards can give a good indicator for the selection of the right project management methodology. Moreover, if it is not clear if to go for classic or agile project management concepts, the hybrid methodologies try to overcome the cons of both to use the benefits of them, as explained in the next section.

The authors used the methodology of literature research [6] to gain knowledge about the current state of discussion and enriched the findings with a design thinking workshop [7], [8] to develop the framework and to answer the given research question: How could a framework look like to combine agile project management with budgeting approaches?

II. PROJECT MANAGEMENT AND BUDGETING

This section gives an overview of project management methods and explains the principles of budgeting. The developed framework is a synergy of the explained concepts to overcome the challenges which are described in section I.

A. Classical Project Management Methods

Classical project methodology based on a waterfall approach defines different phases, which can be distinguished by striking "milestones". These milestones offer the advantage of having binding phase results, which can be easily verified and documented in a project schedule, which is a binding set of tasks to estimate the economic volume of the upcoming project. As in the classical project management approach, well-founded planning is required, such a project starts with the contracting phase, because. Central contract components are the descriptions of the scope of the project in the form of a specification document, a binding project timetable, and corresponding budgets of time and financial volumes. These contract details build the base for all upcoming project activities.

After the project initialization and the creation of technical concepts based on the specifications, the implementation phase starts. Within the implementation phase, the main work is to implement the concepts of the specialists to support the given business processes best in the new ERP system. The external implementation partner mostly drives this phase.
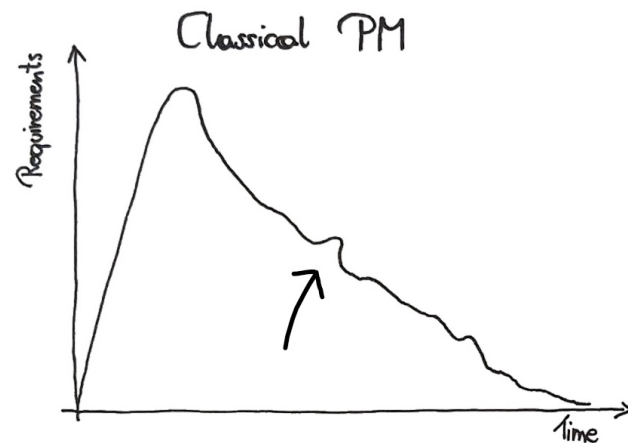

Figure 1: Classic Project Management - Amount of open Requirements.

A variety of tasks, such as configuration, data migration, the realization of interfaces, customization, the creation of forms, lists, and evaluations, are performed to finally reach a well-integrated system. After successful integration tests, a test operation time frame will start, and the training of employees has to be finished. The Go-Live date starts the real work in the new system, which is normally the end of the project. The responsibility of the system can then be transferred. After the first months of the life system used, further business unit roll-outs can be performed. As shown in figure 1, the amount of open requirements is defined at the start of the project and later on implemented with a shrinking backlog except some additional requirements coming into the project by change request (shown with the arrow) over the time.

B. Agile Project Management Methods

The agile project methodology is based on a cyclical procedure and was developed in the 1990s based on four values and 12 agile principles [9] as a consequence of the not satisfactory situation of classical project management methods. The enormous time lag between blueprints (requirement specifications) and the delivery of the finished product led to many unfinished projects. Business process requirements and customer requisites are changing over this lag time, and the final product did not meet the expectations of the users defined in the blueprints. Waterfall based software development models were not meeting the demand for speed and did not take advantage of how quickly software could be altered.

Well documented agile methods like Scrum can also be used for stringent tasks like ERP implementation [10]. Therefore the whole set of requirements is implemented in cycles (sprints) lasting two to four weeks, and each sprint becomes a sub-project fully realized. A reliable and well-educated team is essential to handle the daily challenges and manage the project with all dynamics. Every sprint has to be tracked and finished by the customer's signature of the requirement specification. Based on this cyclical procedure, the scope of the project remains dynamic: setbacks and additional work in dedicated

cycles may or may not be necessarily compensated by quick results in others.

As shown in figure 2, the amount of open requirements is defined by the sprint cycles, and only the first requirement set would be a higher amount. The following sprint amounts can be seen as flexible. Many ERP project contracts are not up to this dynamic, and when thinking about the budgeting procedure in such a situation, it gets tricky, especially in big companies [1]. In some cases, the application of agile methods can lead to a one-sided postponement of the project risk to the client, this under the circumstances with higher expenses and not planable budgeting situation.
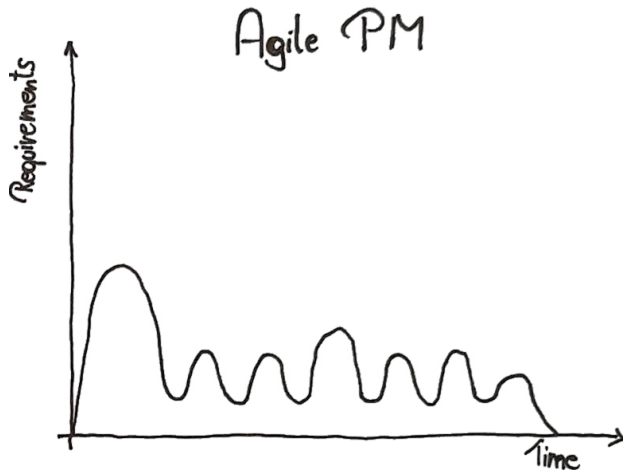

Figure 2: Agile Project Management - Amount of Open Requirements.

In science, lots of different studies can be found about the selection of the right approach for every particular project situation. As an example, the paper from Vasileva and Berezkina [5] determines that the combination of project factors and project types has to be taken into consideration to select the corresponding methodology which is in case of agile methods Scrum as the by far most often used one.

C. Hybrid Project Management Methods

The disadvantages of agile project methods can be overcome by compensating for a hybrid ERP implementation methodology. It will be on the upper levels and, therefore, also in the first project phases (mostly pre-project, requirement analysis, ERP selection, and technical concept) the classical, phase-oriented methods can be applied. That helps to establish the project contracts with the needed information about a binding time and performance frame. It can help to create a more or less possible complete and consistent requirement description.

ERP systems do not only offer an unusually high-level range of functions, but additionally, these functions are still highly integrated. The result is a strong dependence of functions among each other. At the end of the technical concept phase, the translation to a binding requirement specification fixes the needs within the project.

The realization of the requirements will be done during the sprints for all defined requirements (backlog) and further on tested on a functional level. In the final stages, such as integration and system testing, project management comes back to the phase-oriented methods of classical project management. Selecting the right mix of methods can be seen as an absolute challenge for every company and one possible way is explained by the paper of Binder, Aillaud and Schilli [11], which combines the ISO 21500 with the agile idea.

D. Budgeting Methods - Beyond Budgeting

One of the classic methods used for budgeting is the rolling budgeting, which is highly integrated into the strategic view of a company [12]. The principal idea is to combine the upcoming year with the planned financial perspective and then within the next year reveal and improve the picture by doing under-yearly reviews in the form of forecasts (FC). This is the current way lots of companies are dealing with their budgeting situations [13]. This way of budgeting is shown in figure 3.
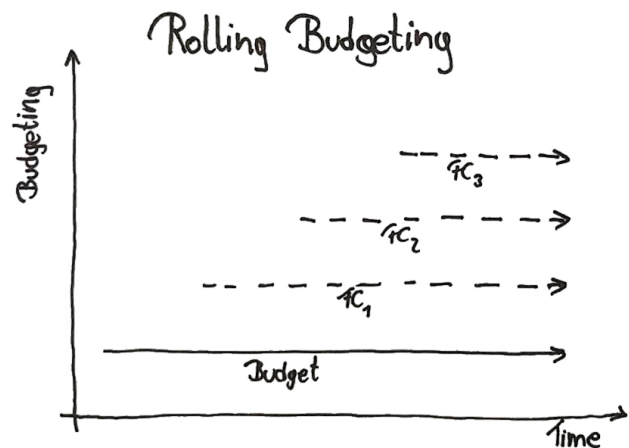

Figure 3: Basics of Rolling Budgeting.

There is a long discussion in science and practice about the improvement of budgeting concepts. Historically, budgeting plays an essential role in companies based on the control aspect of the used tools [14]. However, Gurton [15] claimed budgeting "a thing of the past". There exist several techniques which have a particular influence on budgeting constraints. Taken into consideration that income influences budgets, one example is earnings management [16]. Different surveys, especially in Europe, report an unsatisfactory budgeting situation in companies [4]. They mostly have implemented a rolling budgeting process, as shown in figure 3. Hope and Fraser [17] developed the Beyond Budgeting Roundtable (BBRT) which is a conglomerate of individuals and companies which trust in management without budgets. Their less radical idea is not about improving existing budgeting methods but the total elimination of budgeting with the classical approaches [17], [18]. For this development three different arguments can be named: (1) the missing link of the view of academic research and practically useful methods [19], (2) there is low

evidence on how companies implement different budgeting methods or overcome them totally [20] and (3) there is an antithetical correlation between budgeting and a fast-moving environment that needs adoptions and changes combined with uncertainty [21].

Based on the work by Libby and Lindsay [13] they are not suggesting a company to take a decision for or against traditional or beyond budgeting - they suggest to deeper analyse the different situations found in companies to find out more fruitful use-cases. This is the starting point for the framework developed by the authors of this paper, focusing on the particular situation of budgeting dissatisfaction in a company: agile managed ERP implementation projects. Therefore in the following paragraph, the principles of beyond budgeting are explained, and later on in section III, all the principles are integrated into the framework, and implementation scenarios are suggested. The BBRT published 12 principles which are divided into two groups: Leadership Principles and Management Processes [17].

Leadership Principles:

- Purpose - Engage and inspire people around bold and noble causes NOT around short-term financial causes
- Values - Govern through shared values and sound judgment NOT through detailed rules and regulations
- Transparency - Make information open for self-regulation, innovation, learning and control NOT restricting it
- Organization - Establish a strong sense of belonging and organize around accountable teams NOT going for hierarchical control and bureaucracy
- Autonomy - Trust people with the freedom to act NOT punishing everyone if someone should abuse it
- Customers - Connect everyone's work with customer needs NOT going for conflicts of interest

Management Processes:

- Rhythm - Organize management processes dynamically around business rhythms and events NOT around the calendar or planning cycles only
- Targets - Set directional, ambitious and relative goals NOT go for fixed and cascaded targets
- Plans and forecasts - Do planning and forecasting of lean and unbiased processes NOT rigid and political exercises
- Resource allocation - Foster a cost-conscious mindset and make resources available as needed NOT through detailed annual budget allocations
- Performance evaluation - Evaluate performance holistically and with peer feedback for learning and development NOT based on measurement only and NOT for rewards only
- Rewards - Reward shared success against competition NOT against fixed performance contracts

E. Problem Statement

Based on the given models for project management and budgeting, the challenge which the authors will focus on can be described as follows. The traditional budgeting models are too inflexible to support agile project management methods. One possible solution could be the implementation of the beyond budgeting method to use it for the PMO related monitoring. Therefore a general set of rules has to be defined to implement the given principles. The following section will present the model and explain it based on the principles and their concrete implementation.

III. CONTINUOUS FORECASTING FRAMEWORK FOR AGILE PROJECT MANAGEMENT

By combining the needs for a more flexible, innovation-friendly, and flexible ERP implementation tool-set (maybe a hybrid one) with the idea of an appropriate budgeting method, the authors developed the Continuous Forecasting Framework shown in figure 4. The financial truth can be reached over time by assessing the current situation based on the given 12 principles in subsection II-D and therefore some concrete implementation aspects are given by the authors based on their experience in ERP implementation and budgeting scenarios.

Leadership principles for Agile Projects:

- Purpose - Establishing Engagement for a project by transparent communication and good choices of project members
- Values - Setup a base set of "rules of the game" but be free to change and develop these over time and also externals have to comply with these rules
- Transparency - Not only go for project newsletter, open all activities regarding the projects (open PMO meetings, open strategic information)
- Organization - Establish a strong sense of belonging in the project team by team events and team training - give support to go for the new work paradigm
- Autonomy - Trust people within the project based on their selection and knowledge - Train them in agile methods and budgeting methods
- Customers - Define the clear and realistic responsibility of the customers in the sprint cycles

Management processes for Agile Projects:

- Rhythm - Organize all the management processes around the sprint ideas of the agile method and do not base it on timelines
- Targets - Decide on relative targets with coupling them to sprint intervals for observation and control
- Plans and forecasts - Try to support the planning and forecasting on existing project data with a support software solution to keep traction
- Resource allocation - Communicate clearly if there are wastes recognized and foster a cost-conscious mindset at all project members - also communicate it to the external partners
- Performance evaluation - Evaluate performance holistically ongoing and based on sprint cycles at least four times a year - not once at the end of the year for the project manager bonus
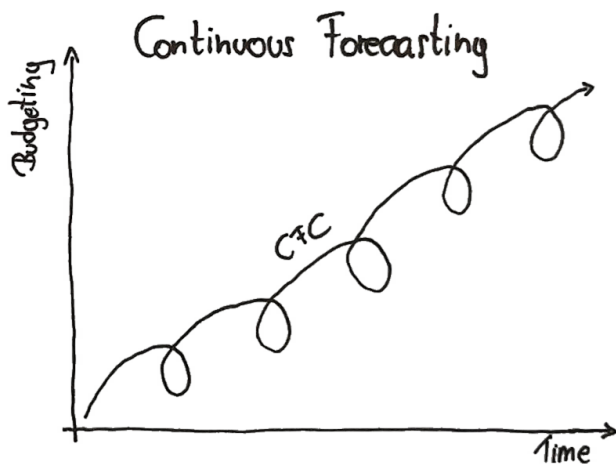
Figure 4: Continuous Forecasting - Quality of Budget.

- Rewards - Reward all people officially - for example, at the Christmas Party and give any recognition (one special day off)

The given scheme in figure 4 shows the framework and tries to figure out its development character. With every time a new sprint has ended, the system will get new financial information which first increases the gap of the target-actual comparison and then gets more substantial, and the resources needed for the inputs will get more efficient. This should at least increase the performance in the projects with a high quality based monitoring possibility. The Continuous Forecasting Framework has to be supported by a project management software tool that might be based on NoCode or LowCode technology for better integration of user-needs without the risk of the establishment of shadow IT [22] to use the data available for the budgeting process support [23] to gain a flexible company culture based on a service oriented IT infrastructure [24].

IV. CONCLUSION AND LIMITATIONS

The given Continuous Forecasting Framework developed by the authors to overcome the problems of combining classical budgeting methods with agile project management methods is one solution derived from literature and the experience of the authors. For future research, the critical discussion of the framework combining scientific and practical participants would be the next step to ensure the concept. Later on, the model has to be validated with known empirical methods and afterwards be proven by at least one implementation in a company's ERP implementation project.

The limitations of this research are currently based on the early stage of this research topic, which the authors are aware of and will, therefore, use the possibility to participate in a workshop format.

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