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THE APPLICATION OF ARDR IN IT PROJECT MANAGEMENT AS A BASIS FOR THE PROCESS MODEL ‘REFPM’

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Abstract

Qualitative Research Methods can be used for the improvement of processes but also for designing information systems properly. In combination of these two it is an addition for project managers who need both: knowledge about reflections on project work and a bridge to reflect on technical developments. By enriching the project management discipline of the exemplary iterative model Unified Process a better understanding for the proposed model ‘refPM’ will be given which leads to more efficient project work; an example will show the necessary interventions of Action Research and Design Research for explaining the shortcomings of the current approach of the Unified Process in regard to the proposed reflection activities. The main purpose of this model is that it leads to a better understanding of time, cost and quality in project work. If project managers integrate these reflection activities into a project more consciously, they will have the option to pay more attention to the economic effects of their projects because invested money is tied up in projects and a payback is therefore necessary for raising the companies’ shareholder values. Several figures will point to this circumstance to introduce a solution to this efficiency problem especially for project oriented companies.

Keywords: Project Controlling, IT Project Management, Qualitative Research Methods, Project Success, Project Oriented Companies
1. Introduction

Action Research (AR) and Design Research (DR) often appear as two controversial disciplines because there are publications which see the term Design Research as the research about how to design artefacts (Hevner (2004), Cole (2005), Becker (2009), Weedman (2010)). Hevner (2004) refers to the situation that the design-science paradigm seeks to extend the boundaries of human and organizational capabilities by creating new and innovative artefacts. Becker et al. (2009) reported on the development of a banking application where artefacts of a project have been developed, the Design Science Research Methodology has been applied for this. Furthermore in Weedman’s publication (2010) she speaks about Design Science as the study of design. This is in contrary to researchers who see Design Research as the process of how to design research in general or how to design a new research method (Gregor (2007), Ivari (2007)). Based on the early works of Mingers (2001) in which he put forward arguments in favour of a pluralist approach to IS research, he suggested that research results will be richer and more reliable if different research methods, preferably from different (existing) paradigms, are routinely combined together. The intention of the underlying research paper is to show a deeper insight on the process on how to design artefacts as it is also described by Cole et al. (2005) who maintain that Design Science and Action Research (Lück (1996)) share important assumptions regarding ontology and epistemology. The motivation for the work in terms of a research problem is the lack of efficiency in current project management processes as well as the justification of this problem. Referring to Rossi (2005), AR simultaneously assists in practical problem-solving and expands scientific knowledge, while collaboratively acting in a situation using data feedback in a cyclical process aiming at an increased understanding of change processes in social systems. In AR, investigators try to fulfil the needs of their study subjects and, at the same time, generate new knowledge. One of the reasons for the emergence of AR and its subsequent use in the information systems (IS) field is the recognition that a research environment can be more deeply understood if the researcher becomes part of that environment. The involvement of the researcher with the environment under study is also believed to foster cooperation and information exchange between the researcher and those who are being studied well beyond what can be expected in other research approaches, such as experimental, survey and even case research (Kock (2007)).

2. Combined Interventions of Action Research and Design Research

Project Managers, working on IT-projects, are often confronted with the situation of inefficient use of time and cost resources due to inadequate reflection activities, because in software development reflection often means a redefinition of stated goals (i.e. programming, etc.) and this further means more effort on certain activities with the risk of delays in the project plan. Therefore many project managers reflect only in the finishing sequence of the project, for adequate project management this reflective approach is much too late. Project managers using DR as their developing approach need to add reflection to their activities, because one shortcoming in DR is the lack for reflection to specify learning. This requires reflecting on the outcomes to understand how they have contributed to the change sought, and why the success or failure is observed in the organizational settings (Cole (2005)). On the other side project managers need to learn from Design Researchers about intensified learning by adding build to AR projects. As it is proposed in literature by Cole (2005) a possibility for more formalizing learning in an AR project is to frame an output as DR artefact (prototypes, models, patterns, etc.). In AR it is common to reflect on social aspects by defining actions to plan and to take, but no precise artefacts are defined as such what causes that new knowledge about social aspects in companies is generated but not defined as it. Cole et al. (2005) think that the conversion of outcomes of an AR process into an artefact can serve as the theoretical premise for the next cycle of AR. According to the explained steps of AR and DR they are summarized as follows: the mentioned reflective method begins with the analysis of the situation and identifies the focus.
After that it is necessary to elaborate the sketch and the strategy for a new solution. Step 3 performs the construction and accompanies in action. Following step 3 the evaluation of the construction needs to be done. Finally in step 5 the researcher (or project manager) reflects, learns and disseminates the knowledge for further actions.

3. The Unified Process, the Interventions of Action Research and Design Research and the Combination with the International Project Management Association Methodology

The Unified Process (UP) can be used to address the complete software development lifecycle including all activities necessary to deliver quality to the customer (Emery (2002)). UP+AR or UP+DR can be used when developing software but applied on different levels and phases of the model. Therefore a combination of the two methods AR and DR focuses more on the use within single disciplines of the UP. The optimal use of such a combination is reducible to the controlling aspects of the PM discipline because at this point of the project the project manager needs to decide on several issues due to the achieved project work packages so far. Although analyzing and modelling can have reflective effects, it is the project manager’s task to decide whether further analyses have to be done or not, therefore the controlling activities happen only in the project management discipline of the UP. Another advantage for this approach is that the use of AR elements in project management reflects the social aspects of this combined model while DR prefers to build artefacts which need to be controlled in the project management discipline. The project management process, as it is defined in the UP, does not fit well enough to the UP project management principles because e.g. the activities project controlling and project coordination are defined differently. Regarding the UP, project controlling happens by doing an evaluation on the project scope and the project risks in each iteration of the project. But identifying possible risks and comparing them to the business case is far not enough for improving the project quality. On the other hand there is another UP activity monitor and control project which needs to be done daily and is not well-structured which makes it very difficult for project managers to keep an overview of the project as several artefacts have to be reconsidered on this stage of the project. Due to the shortcomings of the UP project management discipline another international standard needed to be applied to the UP, the methodology from the International Project Management Association (IPMA): project managers need structure for fulfilling their project goals, without this a project manager wastes time and company resources and finds it hard to end a project successfully. In the IPMA methodology there is a clear path of how to do a project and at what point a project manager needs to do the project controlling activities, in general the steps of the project management process are as follows: project start, project coordination, project controlling and project end. To make project work more efficient for a company it is necessary to focus more on the project controlling.

3.1 The Unified Process and the Combined Interventions of Action Research and Design Research for Project Controlling Purposes

There is a need for a combination of AR and DR, but not exclusively by finding the similarities of both approaches but more on how the two methods can be best implemented together (or at least in addition to each other). In the sense of a project management toolbox a project leader has the ability to choose between the two approaches in regard to each specific situation of the project process. In the UP the project management approach is still defined as a support discipline, which is more an indication for an appendix than a well accepted methodology as proposed by the IPMA. On the other hand controlling is important in both frameworks and therefore a further missing link could be found and introduced in the last section: the project controlling. The Table below shows the combination of AR and DR which can be seen in the yellow box: after each reflection cycle a so-called single-loop-learning effect takes place and helps the whole project team to learn from previous project work. As previously stated ARDR can be used through-
out the whole project, the four phases (*inception, elaboration, construction and deployment*) of the UP indicate this circumstance.

![UP Project management workflow (IPMA)](image)

<table>
<thead>
<tr>
<th>Phase</th>
<th>Inception phase</th>
<th>Elaboration phase</th>
<th>Construction phase</th>
<th>Deployment phase</th>
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<tbody>
<tr>
<td>Project start</td>
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<td>Project coordination</td>
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<td>Project controlling</td>
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<td>Project end</td>
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*Table 1: reflective project controlling in the UP project management discipline/workflow (Malus 2010)*

### 3.2 The Combined Action- and Design Research influenced Project Management Process Model ‘refPM’

In the last sections the reasons and steps have been introduced why and how it is necessary to reflect in projects. Project managers often need to decide whether they should follow a more social style of management or an even more technical (or artefact-) oriented way. The combination of both enables project managers to apply both approaches depending on specific situations. The figure below explains how this is done in practice:

![Figure 1: The refPM Process Model in a Project Oriented Company](image)
In figure 1 the project work in a project oriented company (POC) is presented: the front side of the model shows the project work of one project manager. In this case this person is responsible for the implementation of an information system and applies the Unified Process. Within this UP there is the project management discipline and after the interventions of ARDR it becomes refPM, an enriched approach of project management. During the project work several ARDR interventions take place and are monitored in the project controlling sub-discipline of the project management discipline of the Unified Process. Project Controlling supports the interventions (Malus 2010) by controlling the project team’s activities and decisions.

During a project the project organization touches the refPM approach but with different characteristics. In a project a project leader reflects on several activities close to the project context, furthermore he or she needs to talk to many other stakeholders like the project sponsor (Malus (2010)) et al. The influence of the project stakeholders is presented on top of the inner cube of the introduced model.

A project oriented company consists of several projects, it is “managed by projects” (Gareis 2005) and all projects contribute (directly or indirectly) to the economic development of a company. The higher the maturity of a project oriented company the more directly projects contribute to the welfare of a POC and therefore to aspects like the shareholder value of a POC. An ongoing research study focuses on the relations between project work and economic aspects.

3.3 Proposed Process Model Demonstrated: A Project Owner Meeting

As mentioned earlier in project management it is necessary to inform several stakeholders; one of them is the project owner, in regular intervals the project manager has to organize these meetings for informing on the project progress. Based on research work of Cole (2005) and Malus (2006b) these meetings are a good example for explaining the necessary ARDR reflections in IT-project management:

![Diagram](image)

**Figure 2: reflective ARDR interventions in the Unified Process (Malus 2010)**

In the above figure it can be seen how Malus (2010) described the reflective process of ARDR in practise. The most important step is number 3 (Action Taking) because at this point the project manager needs to distinguish whether he or she follows the Action Research or the Design Research approach. The project manager’s decision refers to the different phases a project is in at a certain point of time. In the beginning of a project social steps can be of more importance than technical artefacts. In the UPs construc-
tion phase the evaluation of the outcomes are more important than e.g. the improvements of team members’ behaviours.

4. Conclusions and Further Research

In summary, reflections during project management cause a more sensitive view on projects. For this reason a combination of Action Research and Design Research is needed for improving the work in specific project environments, as it is introduced by Rossi (2005), Cole (2005) and Sein (2011), like IT projects. Projects last longer than they were originally planned which leads to a waste of resources and to an increase of costs and consequently to a reduction of the expected returns from this project investment. A proper controlling of projects can reduce development time and costs which will be achieved with modified interventions in the Unified Process project management discipline. The consequent usage of the reflections leads to the solution that developments in IT projects can be done much more effectively. A project manager developing an IS system needs to know when it is necessary to do further reflections in the projects. The lack of reflections causes uncertainty and a prolongation of projects and this further concludes in the increase of project costs and a decline of the project’s liquidity. With this research work the author intends to find out the long-term relationship between effective reflections and companies’ shareholder values. A currently ongoing empirical study accompanies this paper to gain further in-sight on the potentials of enriching project management for business reasons.

5. References