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Deriving Good Practices from Project Management for IS Action Research

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Abstract

In this paper we explore the contributions of a project perspective to configure an Information Systems Action Research (IS-AR) project management approach. In particular, we give relevance to project management good practices to address the problems reported in the use of IS-AR. In this sense, our aim is to describe the methodological considerations that we have used to obtain the good practices for IS-AR in a manner that they address the IS-AR problems. In this way, we expect to contribute to the use of IS-AR from the project management area.

Keywords: IS action research, interpretive-qualitative research, PMBOK, project perspective, project management good practices

Introduction

The importance of Action Research (Lewin, 1946) in Information Systems Qualitative Research has been recently emphasized by several researchers (Avison et al**.,** 1999; ITP, 2001; Kock et al., 1999; McKay and Marshall, 2000). But also several problems had been reported (Avison et al., 1999; McKay and Marshall, 1999a). To cope with these problems, the Information Systems community has raised the need to have frameworks that allow to take advantage and to facilitate the use of Action Research as a more valid research method, while at the same time trying to overcome the lack of rigor of some of its applications (Avison et al., 1999; Baskerville, 1999; Lau, 1999; McKay and Marshall, 2000).

To address these problems, Estay and Pastor (2000a) presented the feasibility to use project management as a way to improve the use of Information Systems Action Research (IS-AR). In this paper, we develop this proposal by explaining the methodological considerations that we have used to obtain the good generic and specific practices for IS-AR under a project management perspective. In this work, we adopt the widely accepted *Guide to the Project Management body of knowledge*, PMBOK (PMI, 2000) as source of generic practices, while the specific practices are principally derived from quality and rigor criteria proposed for IS-AR projects (McKay and Marshall, 1999b, 2000).

A common opinion among many of its researchers is that qualitative research must not be restricted to doctrines and/or rigid or formalized visions, and many of them dislike structured and constrained approaches that could reduce the flexibility required by the researcher and the research process (Baum 1997; Bericat 1998; Mcken, 1996). Action Research is an approach and a method related with qualitative research, systems thinking and several philosophical perspectives (Checkland, 1997; Jackson, 2000; Myers, 1997). This suggests that Action Research could be used by following a systemic method (Morin, 1993), where to include the flexible, dynamic and adaptive nature of the research process in which the action-researcher is involved (Davison and Vogel, 2000), and where to promote the co-participative construction of the realities implicit in the Action Research process (Greenwood and Morten, 1998; Inteco, 2000).

In this sense, although project management may appear like a source of rigidness for Action Research, the PMBOK suggests that project management practices must be customized according to the specific technical domain of a project and used without rigidness in order to give liberty to the project manager inside the evolution of the project (PMI, 2000). Thus, project management

could be used as a way to obtain a set of practices for IS-AR, from which the action researcher may choose and use according to convenience, for conducting the research and anticipating potential problems. Moreover, project management could be framed in a systemic project perspective (Blasco, 2000) in order to provide a framework where IS-AR features are used in the study and change of organizational processes (Avison et. al, 2001; Baskerville, 1999).

In metaphorical terms, as in Bryant (2000), rather than viewing project management wrt. IS-AR as "a ruler to measure the beauty of a flower", we regard it as a source of practical knowledge and capabilities for improving the "cultivation" inherent to IS-AR research, as "good fertilizer for growing its flowers more beautiful and healthy." We aim at improving the art of IS-AR gardening rather than the craft of IS-AR engineering.
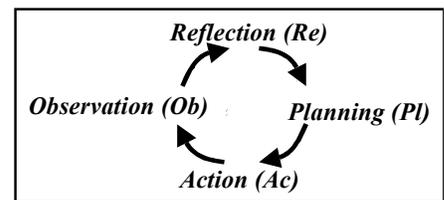
Along our vision, several proposals have been made. Mathiassen (1998) concludes: "Sustainable project management traditions are fundamental in successful improvements strategies" (ibid, p. 101), and "The traditional focus on projects needs to be more strongly supported by organizational perspectives and managerial practices [...]" (ibid, p. 106). McKay and Marshall (2000) present quality and rigor criteria for IS-AR. McKay and Marshall (2001) propose a project structure for IS-AR, and Avison et al. (2001) discuss three aspects of control in an IS-AR project: the procedures for initiating an AR project, those for determining authority within the project, and the degree of formalisation.

In context our proposal could be conceptualised with any papers oriented to improve the IS-AR rigor: Mathiassen (1998) has intended to use a projects perspective and project management to help to conduct the research; McKay and Marshall (2000) have proposed a group of quality and rigor criteria for IS-AR research; and, recently, Avison et. al (2001) have analysed three aspects of control of an IS-AR project (project initiation, determination of the authority and, degree of formalization).

The paper is organized as follows. After this introduction, section two presents IS-AR and its weaknesses. The third section presents project management and the PMBOK, while the fourth one exposes the improvement opportunities from project management for IS-AR. Section five presents the methodological considerations used to obtain the good practices for IS-AR. Finally we provide the conclusions.

IS-AR and Its Weaknesses

Action Research is a qualitative research method the essence of which is the juxtaposition of action and research, or practice and theory. For our purposes, out of the several features of Action Research, we highlight as main features: to search for solutions or improvements to practices and, to organize Action Research in a characteristic phased general cycle (Figure 1) which is used in IS-AR composing a bi-cycle with one characteristic cycle dedicated to the problem solving interest in action research and one characteristic cycle dedicated to the research interest in action research, McKay and Marshall, 1999c). In particular, the characteristic cycle represents Action Research as a solution searching and learning process composed commonly by four basic cycle phases (Kemmis and McTaggart, 1982): Planning (Pl),

Figure 1. Action Research

Action (Ac), Observation (Ob) and Reflection (Re), which includes Evaluating and Specifying Learning sub phases. Action Research is used in IS principally for two interrelated general purposes: to bridge the gap between theory and practice (Avison et al., 1999; Baskerville, 1999); and, as a way, to improve the IS discipline (Baskerville, 1999; Mathiassen, 1998).

Action Research presents several problems when it is used in IS (Avison et al., 1999, 2001; Baskerville, 1999; Lau, 1999). By reviewing the literature, we may say that these problems had already appeared in the use of Action Research in others research domains. For this reason, we point out four problem areas raised from both characteristic problems of Action Research in general as well as from IS-AR problems:

1. 'Epistemological change' problems area (P1), that considers the problems that appear when a researcher becomes an action researcher, adopts or assimilates, partially or completely, the beliefs and the attitudes specific to Action Research;
2. 'Ethics and values' problems area (P2), that includes problems of potential biases linked to the interventionist research natural to Action Research;
3. 'Reporting' problems area (P3), which contains the problems related with the generation and registration of resulting data, information and knowledge; and,
4. 'Methodological' problems area (P4), that includes diverse problems related to the absence of elements that facilitate the monitoring, the control, the evaluation or simply the setting of the research.

The analysis of these problems depicts the existence of two main causes. First, the lack of clarity in which IS researchers and practitioners think about and apply Action Research (McKay and Marshall, 1999c; Mathiassen, 1998). We believe that this situation arises from the difficulties of assimilating and adequately learning the Action Research paradigm. Second, the consultancy context in great measure implied (Kock et al., 1999) but that is the common way to use IS-AR (Mathiassen, 1998; West and Stansfield, 1999). In this case, consultancy imposes organizational interests and/or contractual obligations and responsibilities that may difficult the adequate application of Action Research.

From the analysis above, several general weaknesses arise. According to McKay and Marshall (2000), IS researchers that accept Action Research as valid are left without a well-defined method or guidelines (Avison et al., 1999). Furthermore, there do not exist well-established IS-AR quality, rigor and quality criteria. From another point of view, IS-AR does not yet have any framework enabling to take advantage of its potential for IS and facilitating its use to IS novel researchers and practitioners.

Project Management with the PMBOK

According to the Project Management Institute, project management is "the application of knowledge, skills, tools, and techniques to project activities in order to meet or exceed stakeholder needs and expectations from a project" (PMI, 2000, p. 3). Good project management can be considered as a means to address a project and to anticipate and solve its problems by balancing the competing demands related to scope, time, cost, quality, stakeholders and requirements. With this balance, project management is useful to avoid, to alleviate or to overcome the problems in a project.

In particular, project management can be defined as a set of practices used to manage projects. As a way towards fulfilling our goal of improving IS-AR project management, we propose to take and adapt the good practices from the widely accepted *Guide to the Project Management body of knowledge,* PMBOK, of the Project Management Institute (PMI, 2000). The opportunity and relevance of the PMBOK to our work permit us to facilitate the gathering and selection of good practices since this guide describes the knowledge and the practices "applicable to most projects of the time, and that there is widespread consensus about their value and usefulness" (PMI, 2000, p. 3), compiled and improved during the last twenty years. Such good practices in the PMBOK are contained in project management processes.

Nine project management knowledge areas describe the knowledge and practices of project management in terms of their component processes. These processes are the Project Management Processes. Furthermore, these processes are grouped into management processes groups.

- The Management Processes Groups are groups of project management processes related with the project phases: initiation (IP), planning (PP), control (CoP), execution (EP) and closing (ClP).
- The Project Management Knowledge Areas describe the project management knowledge and practice in terms of their component processes. These areas are Project Integration Management (IM), Project Scope Management (SM), Project Time Management (TM), Project Cost Management (CM), Project Quality Management (QM), Project Human Resources Management (HRM), Project Communications Management (CmM), Project Risk Management (RM) and Project Procurement Management (PrM).
- Project Management Processes "are concerned with describing and organizing the work of the project" (PMI, 2000, p. 7). Each process as inputs, outputs and tools/techniques to transform inputs into outputs and, a role of core or facilitating in a Management Processes Groups.

Table 1. Project Management Knowledge Areas vs. Management Processes Groups

	IP	PP	EP	CoP	ClP
IM		x	x	x	
SM	x	x	x	x	
TM		x		x	
CM		x		x	
QM		x	x	x	
HRM		x	x		
CmM		x	x	x	x
RM		x		x	
PrM		x	x		x

The relationships between knowledge areas and process groups are shown in the Table 1. There exist project management processes in the Xs in the same table. The full details of groups, areas and processes may be read in PMI (2000).

Improvement Opportunities for IS-AR from Project Management Through the PMBOK

We propose to use sound project management practices to avoid, alleviate or overcome the IS-AR problems stated in the second section. This proposal arises from several considerations, some theoretical and others drawn from experience.

The first consideration is the relationship between the concept of project and Action Research, in two ways. First, project is associated to Action Research practice. Several authors have mentioned the idea of *Action Research project* in various research areas (Kemmis and McTaggart, 1982; Greenwood and Morten, 1998; McNiff, 1988; McNiff et al., 1996; Stringer, 1996). In Information Systems there exists an expressed need to formalize the use of Action Research (Avison et al., 1999; Kock et al., 1999; Baskerville, 1999). However, it has been Mathiassen (1998) who has addressed more clearly the importance of using a project perspective to get successful improvement strategies (ibid, p. 101), and of project management to organize the Action Researcher's work (ibid, p. 106). Second, the concepts of project and Action Research share the intervention idea because any project implies an intervention upon some the reality (Blasco, 2000; Dahlbom and Mathiassen, 1997).

The second consideration is that IS-AR problems are similar to project management problems. The project management nature of IS-AR problems could be justified briefly as follows (Baskerville and Pries-Heje, 1999; Kock et al., 1999; Lau, 1997, 1999; Mathiassen, 1998):

- Commonly those aspects related with a formal commitment between the action researcher and the organization are absent, which implies a poor initiation phase;
- Often those aspects related with time and cost planning, human resources selection, and research planning are weak or absent, which implies a weak planning phase;
- Generally there is a lack of a formal and rigorous process in the production of theory, which implies an incomplete execution phase;
- Usually the monitoring of the results and of the schedule is absent, which implies a lack of the control phase; and,
- Often those aspects related with the formalization of the resolution and/or improvement obtained in the form of academic and organizational documents is weak, especially wrt. research process, which implies an incomplete closing process.

A third consideration arises from potential synergies between the PMBOK guidelines and Action Research:

- Lessons learned from project management are equivalent to lessons raised from the reflection;
- Constant re-planning in project management (PMI, 2000, p. 12) is similar to the inner loop of the Action Research characteristic cycle (McNiff et al., 1996);
- Expert judgment as a general tool/technique used within project management processes to validate results (PMI, 2000, p. 10) is similar to the meetings with experts used to provide validity to the Action Research results (McNiff, 1988; McNiff et al., 1996);
- Inspections are a general tool/technique used along project management processes (PMI, 2000, p. 11) and are equivalent to the meetings with practitioners, colleagues, friends and sponsors, in order to provide triangulation, to avoid biases, and/or to validate results of the Action Research process (McNiff, 1988; McNiff et al., 1996);
- Historical data consulted within project management (PMI, 2000, p. 8) corresponds to the data consulted about previous Action Research projects (Stringer, 1996); and,
- Additionally, there exists a straightforward mapping between the management processes groups and the phases of Action Research characteristic cycles, as presented in Estay and Pastor (2000a).

Table 2. Problems Areas vs. Philosophical Research Assumptions

Problem area	R	E	A	L	M
P1		X		X	
P2			X		
P3	X				
P4	X				X

Deriving an IS-AR Project Management Perspective

In order to build upon the above improvement opportunities, we first had analyzed the realm of IS-AR and then proposed an IS-AR project structure.

In Estay and Pastor (2000b) the realm of IS-AR has been arranged in order to organize the knowledge and practice of IS-AR under the philosophical research assumptions: rhetorical (R),

epistemological (E), axiological (A), ontological (L), and methodological (M). This work has helped us to provide a deep comprehension about the value of Action Research features in IS, and their utility to address the IS-AR problem areas (Table 2).

We, then, proposed in Estay and Pastor (2000c) a project structure for IS-AR. Such project structure arises from the observation of research and practice of IS-AR. First, that IS research happens in consultant scenarios (CINDA, 1996), and second, that the execution of IS-AR involves two characteristic cycles, a practical cycle and a research cycle (McKay and Marshall, 1999c, 2000). In this context, an IS-AR project structure is formed by two cycles: the practical cycle as a cycle to construct a solution and the research cycle as a cycle oriented to manage the research. Thus, the research cycle manages the construction of a practical solution

while supporting the learning to the action researcher, and the practical cycle is focused in the provision of solutions while nurturing with data the research cycle.

For examples of IS-AR in line with McKay and Marshall (1999c), the practical cycle used could be approached with methods such as SSM (Checkland, 1993), ETHICS (Mumford and Weir, 1979), Multiview (Avison and Nandhakumar, 1995), Reflexive Systems Development (Mathiassen, 1998), or prototypes (Baskerville, 1999), conveniently managed as projects, while the research cycle can be addressed directly with project management. More specifically, we propose to manage the practical and research cycles of IS-AR as coordinated (sub-)projects by taking, adapting, and combining good practices from the PMBOK and from IS-AR quality and rigor criteria.
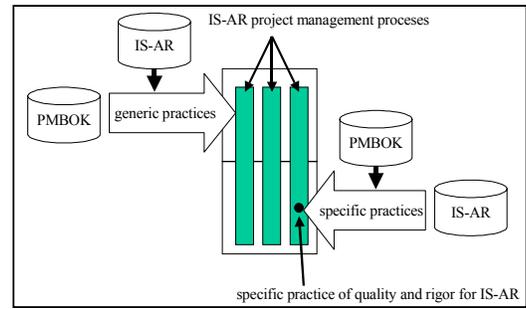

Figure 2. Deriving Good Practices

Using and Customizing the PMBOK for IS-AR

To draw the project management good practices relevant to IS-AR, which we believe constitute sound IS-AR project management, we take as reference Lubianiker (2000). This work points out that a sound project management approach for a particular domain must be addressed by selecting the generic and specific practices relevant to projects in that domain.

By taking advantage of the arrangement of the realm of IS-AR (Estay and Pastor, 2000b) and by using the IS-AR project structure (Estay and Pastor, 2000c), we have customized the PMBOK for IS-AR projects where (Figure 2): the generic good practices are derived directly from the PMBOK, while the specific practices are derived from quality and rigor criteria for IS-AR wrt. to the PMBOK.

Deriving generic good practices for IS-AR. From the PMBOK, we have taken the set of relevant project management processes and then we have customized them for IS-AR. The customization is the selection of the good practices of the project management processes, which are useful to solve IS-AR problems.

Table 3. Problems Areas vs. Management Processes Groups

Problem area	IP	PP	EP	CoP	ClP
P1	X	X	X	X	
P2	X	X	X	X	X
P3		X	X	X	X
P4		X	X	X	

By following the similarities between PMBOK and Action Research, we may address each IS-AR problem area with the PMBOK as follows (Table 3):

- 'Epistemological change' problems (P1) can be addressed, on one side, by including Action Research adequateness criteria at the initiation of the project, in order to validate the commitment of researchers and practitioners with the Action Research and, on other side, by introducing tools and techniques that facilitate the change in the practice along the project.
- 'Ethics and values' problems (P2) can be addressed with negotiation, participation and triangulation techniques as part of negotiation, inspection and expert judgment techniques included along project management processes in the PMBOK.
- 'Reporting' problems (P3) can be addressed with the specific project management processes from the communication and human resources knowledge areas.
- 'Methodological' problems (P4) can be addressed with project management processes from the scope, time and cost knowledge areas, which allow to define the IS-AR project plan, and second, with project management processes from communications and human resources knowledge areas, which allow to detect and to consider the constraints about the contents of IS-AR documents and the actors and their level of involvement in the IS-AR project.

This task has involved the addition, deletion and/or update of any of the inputs, outputs and/or tools/techniques related to the project management processes in the PMBOK.

So far, we may present some specific conclusions of the particular customizations already studied:

- The Organizational Planning and Staff Acquisition processes were changed from facilitating to core processes in Planning Process Group because the selection of actors is a key task in Action Research.

- The Activity Definition, Activity Sequencing, Activity Duration Estimating and Schedule Development processes were changed from facilitating to core processes in the Planning Process Group because the schedule of the research is usually constrained by the organizational schedule.
- The Communications Planning process was changed from facilitating to core process in the Planning Process Group because of the importance of the publication of results in order to gain more relevance.
- The project management processes of the Procurement Knowledge Area were not selected because they involve leasing or acquisition of materials or resources, which are activities not commonly assumed by an action researcher.
- The project management processes related to the Project Quality Management and Project Risk Management Knowledge Areas were not changed because they involve generic procedures oriented to gather, to assess, to evaluate and to monitor quality criteria and risks.
- The Resource Planning, Cost Estimating, Cost Budgeting, Cost Control processes will be fully considered in future work.

Deriving specific good practices for IS-AR. The selection of specific good practices of IS-AR depends on several issues considered in project management. In our case, we are interested in providing quality and rigor to IS-AR projects. In this sense, we have selected as core specific practices the quality and rigor criteria explained by McKay and Marshall (1999b, 2000). Such criteria are constructed from four categories fundamental to any positivistic or interpretative IS research. Explicitly citing McKay and Marshall (1999b), such categories are:

- *Conduct of the research* – This is concerned with issues of quality related to how the research has been conducted, whether it is positivistic or interpretative research. Appropriateness of methods and techniques used for the research questions and research context would be included in this category.
- *Conceptual significance of the research* – This category is concerned with topic selection, the use of appropriate theory, coverage of the significant literature, and contributions to knowledge in the discipline. Also considered here would be future research initiatives growing out of the undertaken study.
- *Practical significance of the research* – This reflects the applied nature of the IS discipline, and is an assessment of whether the research can be linked to real-life issues and challenges facing IS practitioners. Being able to have some impact on practice is of importance in this category.
- *Presentation of the Research* – The category reflects the professionalism of the reporting of the research, and it is concerned with elements of expression and structure, particularly as they affect the intended audience for the research.

In our work, we identify and define the specific good practices to support the criteria. In this task, we use again the PMBOK in order to facilitate the integration with the generic good practices. In this case, the PMBOK provides the vocabulary to derive specific practices coherent with generic practices. Thus, to each one of the criteria, we relate project management processes and, next, we derive the specific practice by taking again advantage of the arrangement of the realm of IS-AR (Estay and Pastor, 2000b) and by using the IS-AR project structure (Estay and Pastor, 2000c). Furthermore, to apply conveniently each one of the good practices, we view the application of each practice as part of a process of maturity where the action researcher learns about IS-AR and improves the way s/he produces research. In this case, a practice is divided in subpractices, ordered by according to levels of maturity or evolution.

Finally, we specialize the selected project management processes for IS-AR. In this case, each one of these processes is adjusted to consider the arranged realm of IS-AR. Moreover, the specific practices to provide quality and rigor to IS-AR are deployed conveniently along the IS-AR project management processes. For this purpose, we are presenting and clarifying IS-AR good practices according to the levels of maturity, which provide a base to apply incrementally IS-AR in line with the level of expertise of the action researcher.

Conclusions

The paper pretends to contribute to the improvement of IS-AR under a project perspective through a project management approach to address recognized IS-AR problems. In this way, we have explained the methodological steps followed to obtain good practices for project management, which is specific for the IS-AR area. We conclude that project management is relevant to IS-AR when the project management processes are viewed as a way to anticipate IS-AR problems. In this case, project management provides a way to avoid, alleviate and/or solve IS-AR problems. Moreover, with our work, the project perspective is a framework that enables to take advantage of Action Research for IS and facilitates the use of IS-AR through specific good practices for IS-AR.

Experience-based informal knowledge of project management could be enough to address IS-AR problems. However we believe that more formal approaches such as ours are useful because, then, project management provides an organized framework to apply adequate practices to improve IS-AR projects. This is especially opportune in the current situation when: IS-AR is still a relatively

young area; thus, the realm of Action Research is still diffuse; many IS-AR researchers are novel; and formal project management practices are being introduced in the IS discipline (Gorgone and Gray, 2000).

Finally, when project management processes are specialized and enriched, we may have a guide to IS-AR. In particular, this guide will assist IS researchers and practitioners, especially when they are novel in the use of the method. Our future work is to further evaluate these specialized and enriched project management processes for IS-AR in real cases. A first validation effort, of a retrospective nature, is presented in these proceedings (Estay and Pastor, 2001).

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