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EVALUATION OF PHENOMENOLOGICAL FINDINGS IN IS RESEARCH: A STUDY IN DEVELOPING WEB-BASED IS

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Abstract

This paper presents a phenomenological investigation of project managers' experiences with the implementation of web-based employee service systems (ESS), a domain that has witnessed sharp growth in Australia in recent times. The rich, multidimensional account of project managers' experiences with the implementation of ESS revealed the social obstacles and fragility of intra-organizational relationships that demanded a cautious and tactful approach. While arriving at such findings usually concludes the cyclical process of phenomenological study, Information Systems (IS) research usually demands some independent assessment of the empirical discovery, which led us to conducting a further study focusing on the evaluation of the collected and packaged project managers' experience. This phenomenological evaluation is in the focus of this paper. By means of a small case study, this project engaged a number of professional teams to reflect upon the previously captured problem-solving experience and determine its applicability, usefulness and relevance in developing new web-based ESS products and services.

Keywords: Phenomenology, Confirmability, Web-Based Information Systems, Patterns

1   INTRODUCTION

The concept of the phenomenology was proposed by Edmund Husserl (1965) to allow investigators to centre their attention on the structure and meaning of phenomena, the essence of human experience. According to phenomenology, the true understanding of the phenomenon of interest can only be reached by suspending or removing all researcher's presuppositions and preconceptions. By means of phenomenological reduction, a method that essentially proposes the "peeling off" the layers of presuppositions, the essence, structure and meaning of the phenomenon can be obtained and understood. Heidegger (1962), however, argued that it is impossible to simply take away all the preconceptions and presuppositions of the researcher. Instead, he suggested the incorporation of researcher's biases in the record of observed phenomena. In dealing with these biases, he proposes the method of their explicit "bracketing", or highlighting, during analysis to clearly identify researcher's preconceptions and prejudices regarding the phenomenon. Gadamer (1976) extended the phenomenological approach by emphasizing the importance of the role of prior experience of the researcher in the actual interpretation of meaning and essence of the phenomenon that is being studied. This involves cycles, collectively referred to as the *hermeneutic cycle*, of reciprocal dialogue between the researchers and the subjects of the study. This intersubjective process is not only confined to dialogue with subjects who have experienced the phenomenon but extends to the representation of the experience in the form of text, the main medium of hermeneutic enquiry. With each cycle of the process, the researcher acknowledges her/his presuppositions and prejudices, thereby leading to further and enhanced interpretation and reinterpretation of the experiences of the phenomena.

Researchers in various academic disciplines have adopted the phenomenological method in carrying out their empirical investigations, e.g. psychology (Moustakas 1994), nursing (Sorrell and Redmond 1995), education (Stone 1978), and management (Sanders 1982).

Boland (1979) was among the first to strongly recommend application of phenomenology to information system (IS) research, arguing that as a research method, phenomenology supports and greatly enhances the fundamental principles of interpretive investigation. This proposition was also supported by Walsham (1993), who stressed high suitability of the phenomenological method to the interpretive researcher in information systems. Boland and Day (1989) further maintained that the phenomenological method plays a significant role in the subjectivist, interpretive slant towards the investigation of direct and personal experience of some phenomena, rather than the study of a system providing the mere context for these phenomena as commonly employed in the case study research (Yin 1994). Over the years, phenomenology has become an established research practice in information systems, with applications to studying BPR (Moreno Jr. 1999), team dynamics (Harmer 2003), and IS evaluation (Introna and Whittaker 2002), to name just a few.

Being concerned with the investigation of individuals' lived experience of events (Hancock 2002), phenomenological research, at its highest level of abstraction, is considered a holistic examination of the phenomenon of interest (Harmer 2003). Eminent phenomenologists, thus, generally agree not to prescribe any rigid rules for conducting phenomenological research (van Manen 1990). Others (Moustakas 1994, van Manen 1990) nevertheless offer suggestions with regards to the activities that they considered imperative to the purpose. For example, Moustakas (1994) identifies four prime stages in phenomenological research (conducted iteratively), which are *epoche* focusing on identification and suspension of researcher's preconceptions, *phenomenological reduction* which leads to the construction of rich, accurate, and complete textural account of the phenomenon as experienced by the co-researchers (or participants of the study), *imaginative variation* aimed at generating the structural meanings behind the textural descriptions, and finally, *synthesis* unifying the meanings and essences of the experience of the phenomenon as a whole. Moustakas (1994) argues that grasping the "nature, meanings and essences" of these four stages is a prerequisite to the undertaking of a phenomenological inquiry.

Phenomenological findings are also loosely expounded in the requirements for presentation, contents, and their ultimate fitness for any subsequent research. In a typical IS investigation, however, regardless of the contents and presentation form, one might at least expect some kind of evaluation of empirical results. In previous phenomenological research studies, indeed only a weak form of empirical validation was undertaken by dispatching the synthesis of textural-structural descriptions to the co-researchers themselves, who then responded by indicating whether their accounts were accurately depicted and proposed additional comments if there were bits of information missing (Moreno Jr. 2001). In fact, Moustakas (1994) recommends this approach. At the same time, Moreno (2001) draws our attention to the underlying objective of the phenomenological method being the identification of commonalities in the observed phenomena as they appear in the co-researchers' consciousness, which, as Forbes (1999) argues, enable the researcher to inductively construct a theory of observable phenomena. Any emergent theory, however, necessitates independent *evaluation* and possible *generalization*. Note, however, that since the issue of phenomenological generalization is in the centre of methodological debate (Forbes 1999, Wilson and Hutchinson 1991), our research adopted a weaker concept of *confirmability* as a critical criterion for evaluating qualitative data analysis (Drisko 1997). According to Reid (1994), confirmability essentially describes the researcher's substantiation of empirical data and attempts at instituting (or questioning) interpretation or theory.

This paper is therefore looking at the practical issues in the phenomenological evaluation in IS. It identifies the essential steps in the development of the evaluation process and demonstrates how the process can be conducted, with particular emphasis placed on the findings confirmability and on strict adherence of the evaluation process to the spirit of phenomenological enquiry. It should be noted that for the sake of brevity in this paper, many laborious details of the presented phenomenological study have been omitted, e.g. those in respect of epoche, reduction, horizon constructions, imaginative variation, textural-structural representation, and other phenomenological process elements as recommended by Moustakas (1994).

2   THE PHENOMENOLOGICAL PROJECT

Web-based information systems (WBIS) are designed with the aim of improving productivity, data accuracy, and the reduction of paperwork and administrative overheads. Unlike their conventional non-web-based predecessors, the WBIS are typically aimed at users who are casual and untrained, geographically distributed and non-homogenous. It is also quite common that the target user community cannot be easily identified and characterised until the WBIS application is actually deployed. As WBIS are often developed using an evolutionary approach, their initial deployment usually causes great many user concerns in respect of their security, workflow, transaction management, and web administration. To date, there is very little empirical data collected to elucidate lived experiences of project initiators and managers in pursuing the evolution of web services in response to the inflow of stakeholder concerns, a process that involves identification, management and resolution of such stakeholder issues.

To this end, six Melbourne-based organizations were approached to investigate their project managers' experience in implementing web-based Employee Service Systems (ESS) (Sarkar and Cybulski 2003b). Four of these organizations were universities and the other were the only two outsourced payroll companies in Melbourne adopting web technology to provide payroll services to their clients. Our interests were on project managers' experiences in dealing with concerns of the prime web-system stakeholders in the Human Resources (HR) environment. In typical ESS projects, the stakeholders include project initiators, namely the HR divisions of the universities and the outsourced payroll providers, IT personnel (if separate from HR), clients of outsourced payroll companies, employees, and supervisors.

A set of semi-structured interviews were conducted with the participants who headed web projects. The interview protocol used for the interviews consisted of questions that were targeting elicitation of project managers experiences with the implementation and continual evolution of ESS, due to strategic

initiatives of the organization and its business needs for a WBIS, characteristics of the baseline stakeholders, and the roll-over of the web-based solution. The questions were also directed at obtaining information about the project manager's experience with the concerns of stakeholders, their viewpoints regarding the issues of dissonance voiced by the users and the various players in the organization's power structures, as well as the perceived consequences of measures taken by the project team to alleviate discord or lessen user resistance toward the usage of web-enabled HR services. In companies that provided outsourced payroll services, the protocol also focused on the experience of project managers with the impact of promotional campaigns and incentives offered to clients in order to motivate their signing up for web services. In some cases, follow-up interviews were conducted either in person or by email communication to seek clarifications on narratives or to urge additional information. What was also of great importance was the researcher's engagement with the practice of *epoche* prior to embarking on the data collection as a preventive measure against any preconceptions and biases from influencing our conduct of the interviews and our interactions with the participants. Interviews were transcribed in order to subject the narratives to the analysis.

The process of transcript analysis followed a *hermeneutic cycle*, which involved the repeated examination of the data until it was determined that no more new issues could be uncovered. The hermeneutic analysis has been employed in the study in order to fathom out the whole, and the relationship between stakeholders (project teams and the user-stakeholders), the organizations, and the web-enabled services. Through iterative reading and analysis of the transcribed interviews of the co-researchers, a number of statements covering all explanations of the phenomena of interest were generated. The phenomena of interest were determined from the research objectives. Each and every statement in the individual account (transcription of each project manager's narrative) was given equal importance. When the iterative process was deemed to be complete, the statements were subjected to *phenomenological reduction* and *elimination* in order to identify their invariants. Statements that were irrelevant to the experience of the phenomena, overlapping, repetitive, or vague were removed, and the rest presented themselves as the textural meanings and invariant constituents. Through clustering and thematizing the invariants, the core themes of the experience were generated. These included project manager's experience with stakeholder concerns in requirements establishment and system evolution, especially when dealing with data entry, workflow and other critical system functionality. The multidimensional account of project managers' experiences with the implementation of ESS revealed the social obstacles and fragility of intra-organizational relationships that demanded a cautious and tactful approach from project management.

In the absence of any particular prescriptive method to representing phenomenological findings, the pattern notation (Gamma, Helm*, et al.* 1995) was deemed most suitable for capturing the *synthesis* of the invariants in the project managers' experience. In general, patterns provide a structure for the textual descriptions of problem-solving situation, and in this simple manner have been found to effectively capture developmental experience, facilitate communication and sharing of this experience among developers, and are considered an effective learning tool for inexperienced developers (Rossi, Schwabe*, et al.* 1997). The patterns resulting from the phenomenological synthesis in our project represent the structural descriptions of the experiences of the project managers, our co-researchers, to clearly indicate the commonalities in dealing with stakeholder concerns. The details of the collected patterns are not essential to the understanding of the phenomenological process and as such will not be given in this paper. Their synopsis, however, can be found in Table 1.

This paper takes the study further in order to add strength to the issue of possible *confirmability* of the collected project managers' experience. In particular we have strongly focussed on evaluating of the following propositions:
- What commonalties in the experience of project managers could be confirmed across the domain of web-enabled ESS information systems?
- To what extent the collected domain experience could be confirmed in terms of its relevance and usefulness to managers involved in new projects in the same domain?

Pattern name	Problem solved by the pattern
The Usage Trainer	How to familiarize users with the particular web application?
The Automated Input Validator	How to enforce the integrity of data entered through the web?
Online Demo	How to re-experience the training program?
Precise Errors	How to effectively inform client users of erroneous data entry?
Effective Help Features	How to provide online assistance to the user on data entry errors?
The Aide Memoire	How to remind employees of overdue tasks?
Application Rejection	How employees are notified when their application is rejected?
No Comments Please	How to reduce supervisors' effort approving applications online?
Comments Needed	How to ensure that supervisors state reasons behind the rejections?
The Status Indicator	What is the status of the application process?
Simple but Secure	How to alleviate concerns with the use of digital signatures?
The Electronic In-Tray	How to find the documents submitted to supervisors?
The Authorizer	How to identify the authorizer of an applications?
The Web Coordinator	How to ensure the web system functioning optimally?
Approval Escalator	How to handle disruption to the workflows during absences?
Application Confirmation	How to assure the successful submission of application?
Parallel Workflows	Suggested by novices to allow for the failure of web services.

Table 1.   Collected experience patterns (synopses only)

Thus, to enhance the confirmability and credibility of the synthesis of the study, direct observations were initiated with a group of novice developers, an independent ESS development team, and another project manager involved with a new ESS project.

Observations were employed as they allow the investigator to study group behaviour in a naturally social setting (Fox 1998). The sole aim of undertaking the observations in our project was to evaluate perceived usefulness of the patterns as problem solving tools, and their relevance to the experiences of new ESS managers. Since, it was impractical for project managers to apply the patterns in their own ESS projects, a small case study was created on the ESS project of fictitious company called the MAGMA (see Table 2 for the case summary). The case, written in consultation with an ESS domain expert, was employed to simulate a typical problem-solving environment in a project, in which the patterns could be used by the participants, also known as co-researchers, to assist their problem solving, and subsequently, to provide feedback on the usefulness of these patterns.

The direct observations started with a pilot study with three PhD students in E-Business and Information Systems, also referred to as novice developers, in order to fine-tune the structure of the MAGMA case study. As the PhD students were not familiar with the domain of ESS applications, their perceptions regarding the relevance of the patterns to their experience was not sought. The subsequent studies were carried out with ESS managers in ESS projects, as initiated by their organizations, and designated as ESS-A and ESS-B. In the subsequent sections, due to paper's limited space, the findings from only one of the evaluation sessions, ESS-A, have been reported (findings from other teams' sessions are in Table 4). For methodological consistency, all data collection and analysis at this stage of research also embraced the framework of phenomenological inquiry.

3   PHENOMENOLOGICAL EVALUATION OF THE PROJECT

ESS-A is a team of five members who work on a number of system development projects in the university, but are currently focussed on the implementation and further evolution of web-based HR services within the university. Having completed the development of phase one of the system, the developers are now examining various stakeholder concerns, elicited via the feedback mechanism put in place, and undertaking steps to roll over phase two. Thus, they expressed great interest when approached for the *direct observation* study using patterns reflecting developer experiences.

MAGMA Publishing
MAGMA Publishing is a printed media business. It owns several magazines and a major business newspaper. It employs over 200 full time staff, and over 150 adjunct staff nation wide. Employees consist of reporters, copy editors, layout artists, and senior editors (who assume a supervisory position). Full-time reporters work on-location, while a large number of the copy-editors are part-time employees working on an hourly basis.
Motivation for Web-based Human Resource IS
There was a lot of unnecessary work associated with processing leave and overtime pay applications from reporters who were on-location. Timesheets used to come from a large number of part-time copy-editors. Some supervisors (senior editors) were themselves on-location or on leave. HR staff were burdened by unnecessary processing work as a result of late receipt of leave applications and timesheets. Employees were complaining about late notification of leave approval or late receipt of remuneration. To reduce overhead and streamline operations, HR management considered the adoption of a web-enabled Human Resource IS (HRIS). The decision was welcomed by all, as it was aimed at eliminating the grievances of all parties. The new system, however, was viewed as a simple web front-end to the existing non-web HRIS, and as a result no formal requirements elicitation was conducted. Limited prototyping of some new functions was used instead.
Problems encountered in the deployment
Part-time copy editors complained that the meeting hours entered in the web timesheets were not paid for, even though, supervisors approved them. The meeting hours were not showing up on the HR staff interfaces. Leave requests submitted by reporters also received no notification from their supervisors, who complained that they were unaware of documents sitting in their web in-trays awaiting their approval. Staff reiterated that once they submitted the documents online, they were unaware of any further processing to these documents. Despite correct data entry and following the workflow steps, the system kept on issuing error statements instead, and the Help desk staff had problems resolving these problems.
Project Outcome
Problems delayed the subsequent steps of the workflow, such as approval and processing. Eventually, HR had to go back to the manual processing of payroll data for a few pay cycles.

Table 2.   Summary of the MAGMA case study

Before the study was conducted, a short seminar was organized to introduce and familiarize the team with the concept of patterns. It was discovered that they were indeed interested in patterns as a design aid and some of them had even consulted the relevant literature. At the same time, they were actively seeking patterns specific to their specific project tasks. Prior to the seminar, a summary of the research project and the collected experience patterns were presented to them.

The study took place a week later to allow the co-researchers familiarisation with the patterns. The study was conducted in a manner typical of the decision-making sessions held over the web-based HR projects. The actual case study for the problem solving session was presented first. About 20 minutes time was allowed for the participants to read the case. Subsequently, the discussion commenced. For reasons of privacy and confidentiality, the names of the five participants will not be disclosed, and instead, P1 – P5 will be used to refer to them, P1 being the team leader.

3.1   Identification of Stakeholder Issues

The first issue identified by the team was the absence of any formal requirements elicitation program employed in MAGMA. The ESS-A team also claimed that the MAGMA executives had not conducted any form of research or fact-finding done on similar HR web offerings employed in other organizations. This was the prime reason why the ESS team at MAGMA were unable to study and understand the expectations of the system users.

P2 (Quote 3.1a):

"They should have identified the different types of clients, as well as the issues around the different types of clients"

ESS-A also decided that owing to the lack of formal and proper requirements elicitation, the omission of certain business rules, meant to be embedded into the ESS, took place. This resulted in the employees' meeting hours not getting processed for payment.

The third issue identified was the fact that supervisors were not checking their inboxes and dealing with applications sent by their staff. The members of the ESS-A crew blamed this on poor time management in part of the supervisors, and the lack of communication in the relevant business processes.

The fourth issue was related to the issue of the delegation of approval authority during the absences of supervisors. There was no approval contingency set up during escalation of approval tasks. They attributed the problem to the lack of proper and thorough planning prior to implementation.

P5 (Quote 3.1b):

> *"My point was that the person who was going to approve the leave was on leave himself, so obviously there was no contingency, like we're going to have built in, after that escalation period has elapsed. After that, it goes up to the next person and after that a default person. So they had no contingency set up in case the main supervisor was absent."*

Last but not the least, the team attributed the difficulties faced by employees in submitting their timesheets to the lack of formal requirements elicitation exercises.

P5 (Quote 3.1c):

> *"I imagine they would have identified the problems earlier on in the piece rather than.... and there were two issues they were completely unaware of...one was the user and the other the help desk. Someone is going to the Help Desk and they had no idea how it works, so obviously you've got an application that you haven't put through its paces. You would have picked it up initially."*

3.2   Application of Patterns

The first and core drawback of the ESS project in the MAGMA case study was the fact that no formal requirements elicitation or awareness programs were conducted. The co-researchers did not think any of the patterns specifically addressed this issue. In fact, they suggested improvements to the pool of patterns to address this very issue.

The Application Confirmation pattern was selected for application to the issue of meeting hours not getting processed. When it came to addressing employee concerns about supervisors not checking their electronic in-trays, the patterns of Status Indicator, Electronic In-tray, Aide Memoire, and the Authorizer were considered to be suitable. The Authorizer was considered useful as it enabled HR staff and departmental administrators to monitor employee submissions that were gathering in the supervisory inboxes. Thus, if the documents remained unattended after a certain period of time, the ESS management could pursue the matter with the supervisors concerned. One of the ESS-A members was of the view that the supervisors were unaware of the importance of checking their electronic in-trays from time to time. She added that further training programs, aimed at educating and creating awareness among supervisory staff, should have been designed and undertaken. Thus, the Usage Trainer pattern was also considered useful.

To the fourth issue associated with the delegation of approval authority, the members of ESS-A found the application of the Aide Memoire, Status Indicator, Authorizer, and the Approval Escalator patterns to be appropriate. When it came to the final issue of error messages reappearing despite employees entering timesheets correctly, the co-researchers stated that the error messages failed to effectively explain where the errors were occurring, even though the bugs were responsible for the situation. In view of this, the Automated Input Validator was considered for application, as the ESS-A team believed this would reduce the possibility of data entry errors, thereby ensuring that the problem lay not with the users. In connection to this, they also found the Precise Errors and Effective Help

Features patterns to be useful. The latter pattern was considered important as it proposed documentation to explain the nature of the errors. The co-researchers felt that MAGMA employees were confused with the steps of the timesheet entry process, and decided to apply the Online Demo pattern as well. The Parallel Workflow pattern was rejected on grounds that in an organization in which an ESS was being implemented, manual or pre-web processes are to be discouraged as they offset the effectiveness and investment on the web system. On the other hand, the Web Coordinator pattern was deemed to be useful as user support and guidance was of great importance in this situation. The issues and the corresponding patterns have been matched and illustrated in Table 3.

Issue	Pattern(s)
1. No formal requirements elicitation, investigation of other ESS projects, or awareness programs	No patterns specifically address the issue.
2. Employees not getting paid for meetings as the hours were not showing on HR screens	Application Confirmation
3. Supervisors not checking their web-enabled in-trays.	Status Indicator, Electronic In-tray, Aide Memoire, and the Authorizer
4. Leave applications not getting approved owing to the absence of the supervisor.	Aide Memoire, Status Indicator, Authorizer, and the Approval Escalator
5. Employees unable to submit timesheets online.	Automated Input Validator, Precise Errors, Effective Help Features, Online Demo, and Web Coordinator

Table 3.   pplication of the patterns to the case study issues (ESS-A)

3.3   Perceived Usefulness and Relevance of the Patterns

Indeed, the participants of the observation study considered the patterns a useful tool not only in dealing with the problems inherent in the MAGMA case study but also to problems in ESS projects in general.

P2 (Quote 3.3a):

"This (the case study and the pool of patterns) is so relevant to what we're grappling with"

In fact, the co-researchers indicated that the patterns had the potential to assist them in solving some of the issues associated with their own ESS project.

P1 (Quote 3.3b):

"In that regard your patterns are very useful. We have seen these (problems the patterns deal with) in our work."

The co-researchers stated that the patterns were logical in sequence and structure, and easy to follow for even people with minimal technical leanings. Moreover, they expressed the fact that they were impressed by the patterns.

P2 & P3 agreed (Quote 3.3c):

"The patterns were well structured and easy to follow for a non-technical person. These are also excellent for planning".

One pattern that the co-researchers found especially useful and expressed their intention of applying to their own project was The Authorizer pattern, owing to its proposition of monitoring administrative workflows, such as pay and leave approvals.

P5 (Quote 3.3d):

"That's (The Authorizer) an interesting one we've got with the administrator because we don't really have anything in place to let us know if the whole process has fallen down until someone

lets us know. We know we have 1000 escalations, but do we know who the default approver is during a breakdown somewhere in the system?"

The ESS-A team emphasized the need to monitor the workflows, especially in times of approval escalations. Thus, they decided to insert the monitoring mechanism into their own ESS.

3.4   Suggestions for Improvement

The co-researchers at ESS-A also suggested to the experience base of patterns. Firstly, they claimed that none of the patterns focussed on the first issue, i.e. the lack of formal requirements elicitation. On the other hand, they held the view that the patterns presented to them were effective, with the exception of Web Coordinator pattern. The team leader, P1, shed light on the pattern by explaining that it was not specific enough to be applied in a project. Thus, he recommended the pattern to include aspects such as the synchronization of support areas.

3.5   Confirmability of Phenomenological Findings

The evaluation study, in a manner similar to the main inquiry, followed the hermeneutic cycle of evaluation and confirmation, where findings from each consecutive observation were subjected to strict phenomenological analysis, reduction and synthesis.

Commonalities and Variations. In the process, co-researchers in all the three observation studies identified the main issues prevalent in the MAGMA case study, though these were a subset of those extracted and established by the domain expert who participated in its creation. While determining the commonalities and variations in each teams' observations, it was noted that the selection of patterns for application into their problem-solving activities was indeed similar to those advised by team ESS-A (as was depicted in the Table 3). Table 4 presents a consolidated view of the commonalities in application of patterns by the observation participants to the issues identified by them.

Issue	Novice Developers	ESS-A	ESS-B
a. No formal requirements elicitation, investigation of other ESS projects, or awareness programs	Issue not identified by the novice developers.	No patterns specifically address the issue	No patterns specifically address the issue.
b. Employees not getting paid for meetings as the hours were not showing on HR screens	Application Confirmation	Application Confirmation	Application Confirmation
c. Supervisors not checking their web-enabled in-trays	Electronic In-tray, Status Indicator, and the Aide Memoire	Status Indicator, Electronic In-tray, Aide Memoire, and the Authorizer	Status Indicator, Electronic In-tray, Aide Memoire, and the Authorizer
d. Leave applications not getting approved owing to the absence of the supervisor	Electronic In-tray, Status Indicator, and the Approval Escalator	Aide Memoire, Status Indicator, Authorizer, and the Approval Escalator	Status Indicator, Authorizer, and the Approval Escalator
e. Employees unable to submit timesheets online	Parallel Workflows and Web Coordinator	Automated Input Validator, Precise Errors, Effective Help Features, Online Demo, and Web Coordinator	Automated Input Validator, Precise Errors, Effective Help Features, and Web Coordinator

Table 4.   onsolidated application of patterns to the issues

The first issue (a) in Table 4, the lack of formal requirements elicitation, was identified by both ESS-A and ESS-B. However, novice developers failed to identify this as a problem. Interestingly, both professional teams complained that there were no patterns specifically addressing this issue.

The remaining four issues were identified by the participants in all three observation exercises. In fact, the Application Confirmation pattern was applied as a solution to the issue (b) in Table 4 by all three of them. Similarly, the Electronic In-tray, Status Indicator, and the Aide Memoire patterns were applied to issue (c) in which supervisors were logging into their electronic in-trays and attending to employee submission. However, the Authorizer pattern was not applied by the novice developers as a partial solution to this issue. This could be attributed to the lack of experience of these participants in the domain of ESS applications. Moreover, the novice developers proposed a new pattern Parallel Workflows (listed in Table 1) to address employee concerns over not being able to successfully submit the web-based timesheets. Neither ESS-A or ESS-B saw the problems with this very issue and held the view that allowing employees to revert to manual or non-web workflows diminished the productivity gains that could be obtained from the ESS, i.e. using parallel non-web workflows defeated the very purpose behind the introduction of the web technology. Once again, this could be attributed to the experience of ESS-A and the ESS-B project leader with their own ESS projects, or to the lack of ESS experience of the PhD participants. Nevertheless, Table 4 indicates that the patterns do tackle the problems and suggest partial solutions, as perceived by the participants of the observation exercises we undertook.

Usefulness. With regards to the perceived usefulness of the patterns, the participants in all the three observation studies stated explicitly that they found the patterns provided assistance as a set of problem-solving tools. Furthermore, the ESS-A team members and the ESS-B project manager voiced the fact that the patterns were potentially useful to their own projects as well, and recommended their use as a guide or learning tool for project personnel at the outset of or during ESS implementation. Hence, the findings have been instrumental in answering the fourth research objective – the evaluation of the patterns has established their perceived usefulness as problem solving tools. This is illustrated in the first row in Table 5 – the patterns were perceived as a useful problem solving tool in addressing the issues of concern in the MAGMA case.

Participants	Novice Developers	ESS-A	ESS-B
Perceived usefulness of the patterns	Perceived as useful	Perceived as useful (Quotes 3.3b-c)	Perceived as useful
Relevance of the patterns	No comment owing to lack of ESS experience	Relevance confirmed (Quotes 3.3a & 3.3d)	Relevance confirmed

Table 5.   erceived usefulness and relevance of the patterns

Relevance. The last aspect of evaluating the commonalities of the ESS managers' experiences, was to establish their relevancy to the developers across the problem domain. Co-researchers from both ESS-A and ESS-B emphasized the high pertinence of the patterns to their own experiences. The fact that the project managers in the two remaining universities acknowledged that they shared the same experiences as that imparted by the patterns, leads to the induction that the synthesis of the textural-structural descriptions of the individual project managers is an embodiment of the generic experience in the domain of ESS applications. The relevance of the patterns to the experiences of the project managers in ESS-A and ESS-B are indicated in the second row in Table 5. Of course, the PhD students (novice developers) made no comments about the relevance of the patterns owing to their lack of experience with ESS projects.

Extensibility. The co-researchers also expressed their views on the limitations of the patterns and suggestions were made. The patterns were suggested to be inadequate to support the fundamental areas of project planning, software procurement, formal requirements elicitation, and business process reengineering. These comments were considered beyond the scope of this research study. However, many suggestions were offered as to the improvement of the presented patterns (see Table 6).

Participants	Novice Developers	ESS-A	ESS-B
Suggestions for Improvement	Expansion of the pool of patterns	More patterns about project planning and initiation, formal requirements elicitation, risk assessment and success criteria (Quote 3.4a)	More patterns about project planning and initiation, formal requirements elicitation, risk assessment and success criteria, and also for change management, platform compatibility, and basic functionality.

Table 6.   Summary of suggestions for pattern improvements

As can be seen from our phenomenological evaluation of out phenomenological findings, which were captured and presented in the form of experience patterns, the elicited ESS domain experience can indeed be useful in problem-solving across domain projects. In many cases, patterns reflect domain experts own knowledge, and they can used to disseminate domain experience and be further extended and enriched by developers. Strong confirmation of the findings has therefore been found across the application domain of ESS.

4   CONCLUSIONS

Phenomenological inquiry has found its way into information systems research. It is used mainly to probe deeply into the consciousness, memory and experience of the co-researchers, who in IS context are typically represented by project stakeholders, users, developers, project initiators and managers. The discussion thus far has shown that phenomenology can be successfully deployed in the rich investigation of project managers' lived experience in dealing with various development issues and user concerns. While in the phenomenological arena the evaluation of research findings is commonly accomplished by mere acknowledgement from the co-researchers of the findings accuracy, in the information systems research it is expected that research evaluation should provide a far stronger confirmation from independent sources. This *confirmability* of phenomenological results was in fact the crux of this paper.

By means of illustration, we have elaborated the path through the phenomenological evaluation of phenomenological findings. The process was highly focussed on assessing usefulness, relevance and extensibility of empirical results, which overall assured us of the findings' confirmability within the constrains of the studied domain. It was also noted, however, that the stronger concepts of "generalizability" or even "transferability" of phenomenological results are currently debated by phenomenologists, and were therefore not adopted in this research.

Great care was taken to ensure that the evaluation process itself also conforms to the spirit of phenomenological enquiry. Although for the purpose of triangulation a different method of data generation was used (observations rather than interviews), the research process followed the familiar hermeneutic cycle of knowledge discovery, with its iterative phases of epoche, data reduction, imaginative variations and synthesis. In this way, a phenomenological IS researcher can attain theoretical and methodological consistency and purity.

We find that our phenomenological project has valuable contributions to the ESS practice (via the set of experience patterns), it also advanced the theoretical notions of the impact of stakeholder concerns on the development projects. However, what this paper also shows is that phenomenological inquiry in IS can be made rigorous (by mean of confirmability of findings) and could therefore become a useful and accepted research methodology to the IS investigators.

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