



available at www.sciencedirect.com



journal homepage: <http://www.elsevier.com/locate/scaman>



Orchestrating deviations in global projects: Projects-as-practice observations

Markus Hällgren ^{a,*}, Anders Söderholm ^{b,1}

^a Umeå School of Business, Umeå University, 901 87 Umeå, Sweden

^b Mid Sweden University, 851 70 Sundsvall, Sweden

KEYWORDS

Loosely coupled systems;
Managing deviations;
Practice approach;
Projects-as-Practice

Summary Contemporary projects in a global environment are challenging to manage on a daily basis because of the need for situation-specific attention, on one hand, and the desire for efficiency and standardisation on the other. On the basis of Weick's (1976) loosely coupled systems theory, this paper investigates how a project team responds to departures from the project plan, de-couples these deviations from other activities in the project, treats the deviations and re-couples them. Through participant observations, interviews, as well as vocabulary used by project managers, the paper identifies two general sequences of de-coupling and re-coupling in responding to deviations. In "good enough" practice flexibility initially dominates the sequence, postponing stabilization of the situation until later when the appropriateness of the previous actions is considered. "Carefully assessed" practice on the other hand is initially dominated by creating a stable situation, and secondly flexibility is required in the search for the solution.

© 2010 Elsevier Ltd. All rights reserved.

Introduction

Many contemporary projects are organised and executed within a complex global environment (Orr & Scott, 2008) in which work must be integrated, different conceptual and institutional frameworks confronted and management issues dealt with at various geographical locations (Evaristo & Van Fenema, 1999). Perhaps most importantly, globalisation presents challenges related to distance (Bengtsson & Eriksson, 2002), culture and institutional environment differences (Mahalingham & Levitt, 2004) and geography (Evaristo & Van Fenema, 1999). These challenges have become funda-

mental issues in project design and management. The impact that globalisation has had on managerial tasks is paralleled by a proliferation of project management tools and techniques (Besner & Hobbs, 2006) aimed at making projects more efficient, including concurrent engineering (Terwiesch, Loch, & Meyer, 2002:402) and agile methods, to name but two.

The challenges of globalisation require a project team to devote situation-specific attention in order to manage the integration, communication and execution. On the other hand, the pursuit of efficiency requires attention from standardised rules in order to uphold tight margins and coordination (c.f. Perrow, 1999). The need to achieve a balance between adapting to the specific situation and following standardised rules adds to the general managerial challenges of any project. The combination of globalisation and the development of lean project management methods thus make projects more vulnerable and sensitive (Perrow, 1999). No kind of deviation, defined as events that alter a project plan in terms of time, cost or scope and therefore require managerial

* Corresponding author. Tel.: +46 (0)90 786 58 85.

E-mail addresses: markus.hallgren@usbe.umu.se (M. Hällgren), Anders.soderholm@miun.se (A. Söderholm).

¹ Tel.: +46 (0)60 14 86 40.

attention (Alsakini, Wikstrom, & Kiiras, 2004; Hällgren & Maaninen-Olsson, 2005), and which includes everything from snags, difficulties and tensions (Hirschman & Lindblom, 1962) to full-blown crises (Hensgen, Desouza, & Durland, 2006; Loosemore, 1998), may be absorbed by the concurrent, standardised, and slim, global project organisation. As one experienced project manager said in an interview for this paper, "Project management – it's all about change and deviations!"

The managerial challenges that follow deviations are well known to project managers, especially in the global construction industry (Alsakini et al., 2004), and are recognised both in practice and in budgets (Love, 2002; Standish group, 1995). However, there is no clear academic understanding of how deviations are handled in practice to allow for the continued existence of projects. Deviations have traditionally been investigated from a structural or process approach (Cicmil & Hodgson, 2006; Packendorff, 1995; Söderlund, 2004) but these approaches have left out the fine-grained patterns of everyday practice (Cicmil, Williams, Thomas, & Hodgson, 2006; Hällgren & Wilson, 2007; Jarzabkowski, 2005; Johnson, Melin, & Whittington, 2003; Söderholm, 2008; Whittington, 2006). The question this paper addresses is *how the project team responds to deviations in practice and what general response patterns, in terms of practice, are utilised to mitigate deviations?*

This paper seeks to analyse and contribute to an in-depth understanding of the nature of deviations in global projects and, in particular, the practice of managing deviations. In theoretical terms, the paper draws upon the loosely coupled systems theory (Weick, 1976), a 'Projects-as-Practice' framework (c.f. Schatzki, Knorr-Cetina, & Von Savigny, 2001) and the application of these concepts to a global construction project context.

The paper begins by describing projects and deviations, as well as the implications thereof, from a Projects-as-Practice perspective. It does so by emphasising the need to analyse actual actions, activities, experiences and tools that professional project managers and their team members use when responding to a detected deviation. The paper then introduces the concept of loose coupling in order to explain how the project can persevere in spite of continuously occurring deviations. The discussion is based on a thorough case study of a project within a project-intensive construction company that provides power system deliveries to customers globally. The observations make it possible to identify patterns of practice associated with the management of deviations, and these patterns explain how the project can be open and closed at the same time.

From Projects to Practice: a literature review

Projects seem to have certain characteristics that draw people to them, perhaps the challenge of doing something new and the associated experiences. However, projects are also marked by their ability to achieve goals within set limits related to time, scope and cost (Gray & Larson, 2008:5). The managerial implication of this is that most projects tend to be approached by planning (Christensen & Kreiner, 1991:39; Dvir & Lechler, 2004). There are, of course, different types of projects (Shenhar, 2001; Turner & Cochrane, 1993), some of which are more certain in their execution and less ambiguous than others depending on their ability to describe goals and

the methods used to achieve them. Nevertheless, the above suggests that it is possible to bring most projects to an end within their limits. Accordingly, every project should have a plan that describes some of the uncertainties and ambiguities associated with transforming an idea to reality (Ekstedt, Lundin, Söderholm, & Wirdenius, 1999; Lundin & Söderholm, 1995). These plans are rational manifestations of the expectations for the upcoming project (c.f. Brunsson, 2006).

However, projects commonly experience unforeseen interruptions that disrupt their progress (Dvir & Lechler, 2004). These interruptions are not necessarily a consequence of poor planning (c.f. Simon, 1996:197), rather a result of a complex and lean organisation setup (in the sense that Simon intends). A construction project that should proceed with relative certainty (Turner & Cochrane, 1993) can be disrupted by unforeseen circumstances such as equipment damage or a delay in material delivery. Some of these deviations reach crisis level (Hensgen et al., 2006; Loosemore, 1998) while others are merely surprising (Cunha, Clegg, & Kamochi, 2006) and some are simply snags, difficulties or tensions (Hirschman & Lindblom, 1962). Nonetheless, they are all events that stand out from normal operations in the project (Weick, 1979) and are referred to here as deviations. Deviations are defined as unexpected events that require attention from the project team because they interfere with cost, time or scope goals; this is the so-called "iron triangle" (see also Berggren, Järkvik, & Söderlund, 2008; Hällgren & Maaninen-Olsson, 2005; Hällgren & Maaninen-Olsson, 2009; Hällgren & Wilson, 2007; Söderholm, 2008; Steffens, Martinsuo, & Artto, 2007 who discusses and defines deviations and related concepts).

Broadly speaking, the academic attention devoted to projects (and the understanding of the management of deviations) has traditionally been organised into two approaches, a structural approach and process approach, both of which tend to adhere to a top-down perspective (Cicmil & Hodgson, 2006). A *structural approach* pays attention to stages and predetermined remedies. This approach conceives deviations as entities that must be described with features and antecedents that must be explored. From this perspective, deviations are to be avoided and mitigated beforehand, and if they do occur, there should be a predetermined standardised structural way of managing them (agile methods, PROPS, etc.) (Dvir & Lechler, 2004; Gray & Larson, 2008; Jaafari, 2001; Nicholas, 2001; PMI, 2004). The structural approach is not especially suited to dealing with deviations that, by definition, cannot be predetermined. From an academic perspective, the insights are limited in terms of open-ended micro-activities and the fluidity of organising. Instead, a *process approach* is directed more towards longitudinal organisational processes and inter-human behaviours, but still from an organisational point of view and mostly through interviews and case studies. Following a process approach, De Meyer, Loch, and Pich (2002) suggested that deviations are leadership issues that require situational attention. This is similar to the framework introduced by Cyert and March (1963), who suggested that an organisation could respond to deviation-like situations in two ways: problemistic searches and slack searches. A *Problemistic search* is quick trial-and-error search (Levinthal & March, 1993:189) that is "stimulated by a problem (usually a rather specific one) and is directed toward finding a solution

to that problem" (Cyert & March, 1963:169). A *Slack search*, on the other hand, involves slow refinement (Levinthal & March, 1993:189–190) as a result of internal deficiencies (Greve, 2003:687) and is only "remotely related to any major organisational problem" (Cyert & March, 1963:189). Jin and Levitt (1996) suggested that the organisational response to "exceptions" (their term) follows a cycle of reworking, correction or ignoring. Orr and Scott (2008) described a three-phase process: (1) institutional ignorance, where the institutional exception (or deviation) becomes apparent, (2) sense-making, where the situation is interpreted and better understood and (3) response, which consists of taking action to deal with the exception and its consequences. While these studies show the importance of understanding the decision-making criteria on a project level, they cannot explain micro-behaviours. Cyert and March (1963) did not explain how the search patterns occur and Jin and Levitt (1996) did not analyse the complexities of human interaction. Orr and Scott (2008) reached a generic model concentrated on the institutional side of deviation that does not elaborate further on the practice of each phase, while De Meyer did not describe the practice of a project manager in detail. As a result, the process approach is pertinent in, for example, setting up organisational structures that aid the processes of execution and decision-making. From an academic viewpoint, a process approach offers a longitudinal understanding of how, for example, organisational levels adhere to each other. However, when the primary interest is in what people actually do (in detail), the process approach cannot provide a clear answer.

The existence and commonality of deviations are recognised in both approaches (structural and process). However, in order to understand the management of deviations, as well as other aspects of a project or organising process, it is necessary to take a step beyond rational structural prescriptions and high-level process analysis (Cicmil & Hodgson, 2006) to study the art and practice of project management. This includes serious consideration of the often mundane detailed work of the practitioners themselves (Johnson et al., 2003:3). The "practice turn" in social science (Schatzki et al., 2001), to which this study belongs, is firmly rooted in a belief that the key to understanding organisation lies in the actions of the practitioners and how embedded certain actions are in the knowledge domain or the community in which they take place. This approach has spread to fields of interests as diverse as ethics (Clegg, Kornberger, & Rhodes, 2007), management accounting (Ahrens & Chapman, 2007), problem-solving (Orr, 1996), institutional theory (Hallett & Ventresca, 2006), knowledge and learning (Brown & Duguid, 1991; Gherardi, 2006) and strategy (Jarzabkowski, 2005; Johnson et al., 2003; Whittington, 1996, 2006).

Because it deals specifically with projects and draws upon the practice turn, Projects-as-Practice (Blomquist et al., 2010) is related as much to ontology as it is to epistemology, along the lines suggested within the practice perspective (Schatzki et al., 2001). A practice perspective places "emphasis on the detailed processes and practices which constitute the day-to-day activities of organisational life and which relate to [project organising] outcomes" (Johnson et al., 2003:3). Essentially, the Projects-as-Practice argument is constructed around the notion that the way in which a project is organised is a result of interplay between *praxis*

(situated actions), *practices* (models, guidelines and previous experiences, norms and values that influence behaviour), *practitioners* (individuals and their profile) and *profession* (the institutionalised collective identity of project managers) (Jarzabkowski, 2003, 2005; Whittington, 2006, 2007). This all comes together in episodes of practice (Hendry & Seidl, 2003).

The practice turn, therefore, indicates an interest in what is actually happening in local settings as knowledge, experiences and expectations come together in practice. For example, in terms of deviations, when a project manager (practitioner) is informed of damaged equipment, he or she will recall previous situations and how they were resolved (practices) and contact the subcontractors responsible for replacement (praxis). This is not only expected from the job description but from a project manager in general (profession). The course of events would be equivalent to one distinguishable episode of practice. By focusing on these episodes (Hendry & Seidl, 2003) or "points of convergence" (Whittington, 2006:621), it is possible to investigate how organisational structures are changed. This makes it possible to examine how micro-activities are created and shaped by (macro) practices, that is, structural properties, and vice-versa. Drawing upon Weick's (1976, 1990, 2000) loosely coupled systems theory, Hendry and Seidl (2003) suggested that episodes are continuously de-coupled, implemented and re-coupled within the organising process. Thus, the structure of organising is continuously renegotiated through the convergence of what is done (praxis) with the way in which similar situations are, or ought to be, solved (practices). Deviations are thus 'points of convergence', episodes, within projects in which solutions are implemented and resolved. Therefore, Weick's framework is also useful for understanding the practice of managing deviations.

Loose coupling of deviations and their management

In accordance with the practice approach, loose coupling among decisions and actions (Cohen, March, & Olsen, 1972; Cyert & March, 1963:235; Lukka, 2007:80), talk and actions (Brunsson, 1989, 2006), permanent and temporary organisations (Christensen & Kreiner, 1991; Dubois & Gadde, 2002) and rules and actions (Snook, 2002) are the result of what someone *does*, that is, a practice carried out by someone in the organisation (Scott & Davis, 2007:94–95). It is important, therefore, to emphasise that coupling is a process (something people *do*), not property (something organisations *have*) (Orton & Weick, 1990:218). Therefore, an understanding of the organising process can be achieved by describing and understanding how practice is created and how episodes of practice tie in to one another (Hendry & Seidl, 2003).

Portraying an organisation as a loosely coupled system is a conceptual framework originally proposed by Weick (1976, 1990, 2000), which focuses upon what were perceived as irregularities in the light of traditional theories (see also Cyert & March, 1963; March & Simon, 1958; Thompson, 1967). Weick's contribution was to explain how loose coupling allowed operations and policy-making to be developed separately in spite of changing environments and directives (see Orton & Weick, 1990, for a comprehensive review). Loose coupling therefore makes it possible to explain how

changes are absorbed and sealed off while business continues as usual. Basically, because many organisations are too complex to be kept together as one tight entity, loose coupling enables organisational growth in terms of size and scope. In terms of managing deviations, loose coupling makes it possible to describe and analyse how the project can continue to exist, and the plan remains valid for other activities despite the necessary changes in practice. In other words, loose coupling reconciles the traditional juxtaposition between innovation (adaptation) and organisation rigidity (stability) (c.f. Brusoni, Prencipe, & Pavitt, 2001:619) and allows practice to be explained and adapted to ambiguous situations (Lukka, 2007:96). Rather than understanding the organisation as either open or closed, the idea is that the organisation is open and closed at the same time (Orton & Weick, 1990:204–205). This image of the organisation is still not fully understood but it has been recognised and accepted for a long time (Scott & Davis, 2007). The practice approach and loosely coupled systems cross-fertilise. Loose coupling enables self-determination, adaptation and innovation processes in sub-systems (deviations) that can be understood by investigating everyday practice (Hendry & Seidl, 2003). The approach provides an understanding of the inertia and resistance to change, which can prevent breakdowns from spreading to the whole system (project) (Weick, 1976:6–7).

There are at two ways to approach loosely coupled systems. One is to investigate how parts of the system are tied to each other and another is to investigate a loosely coupled system as an integrated part of a larger system in which the ties change continuously (Weick, 1979:5). The latter can explain, for example, how a system can persevere over time despite interruptions and changes, which is the primary interest of this paper. There are two sub-groups within which loose coupling in and among projects are examined (Scott & Davis, 2007:95–96). *Structural couplings* focus on projects as sub-systems of larger organisations or networks, while projects are a way through which the strategic core of the firm is loosely coupled to operational projects. When the opportunity to incorporate all activities into a tightly controlled bureaucracy is limited, projects enable the creation of responsive organisational sub-units that are run semi-autonomously with their own identities and are loosely coupled to one another. In other words, projects are an organisational setup (Brusoni & Prencipe, 2001; Dorée & Holmen, 2004; Dubois & Gadde, 2002; Kreiner, 1995) or a response to a hyper-competitive environment (Ravasi & Verona, 2001). *Behavioural couplings*, on the other hand, are related to bounded rationality (Cyert & March, 1963; Glassman, 1973), uncertainty (Weick, 1976, 1979) or hypocrisy (Brunsson, 1989, 2006) in the practitioner's practice repertoire. With regard to practice, and relevant to the present study, Hallett and Ventresca (2006) suggested that loose coupling within an organisation occurs due to micro-activities and that the loose coupling theory would therefore shed light on intra-organisational behaviour (see also Hendry & Seidl, 2003). From a practice approach, which includes an interest in detailed micro-activities rather than organisational structures, *per se*, the current paper is primarily concerned with the behavioural type of couplings. The point is that the behaviours of the practitioners are essential in order to understand the practice of managing deviations (c.f. Hendry & Seidl, 2003). As far as can be ascertained, deviations have not been

investigated from a loosely coupled systems perspective in a project setting. The work that comes closest includes that of Lindkvist, Söderlund, and Tell (1998) and Christensen and Kreiner (1991). Lindkvist et al. studied changing coupling patterns and the possibilities for reflection following different time-based controls, while Christensen and Kreiner examined learning patterns following different coupling logics. Having said that, these two ways mainly follow a traditional top-down process approach rather than a bottom-up micro-organising practice approach. This means that they do not consider the full impact of the activities, but rather interest themselves in the longitudinal development of the project.

By being able to absorb changes, loosely coupled systems have a propensity to show responsiveness among their parts while still maintaining some distinctiveness and separate identity of the parts (Weick, 1976:3). Although Orton and Weick did not define them, the two concepts that are fundamentally important for analysing this propensity are, therefore, distinctiveness and responsiveness (Orton & Weick, 1990:205). The way in which these properties interact determine the relationship between the deviation and the project (Brusoni & Prencipe, 2001:1026). "The concept of loose coupling allows theorists to posit that any system, in any organisational location can act on both a technical level which is closed to outside forces (coupling produces stability), and an institutional level which is open to outside forces (looseness produces flexibility). The image that should emerge from this discussion is the following. If there is neither responsiveness nor distinctiveness, the system is not really a system and it can be defined as a non-coupled system. If there is responsiveness without distinctiveness, the system is tightly coupled. If there is distinctiveness without responsiveness, the system is decoupled. If there is both distinctiveness and responsiveness, the system is loosely coupled." (Orton & Weick, 1990:205).

An event therefore calls for a degree of *distinctiveness* between the event and the organising process; without it management will lack an understanding of the event. Identifying an event requires a degree of *responsiveness* because without it the project manager will not be able to implement appropriate actions (c.f. Weick, 1976:1). Operationally, the ability to absorb deviations and the coupling between the planned project activities and the deviations is determined by the degree of responsiveness and distinctiveness (Orton & Weick, 1990). However, this does not mean that coupling is a static property along a continuum. In line with the argument above, loose coupling allows the "simultaneous existence of rationality and indeterminacy without specialising these two logics in distinct location" (Orton & Weick, 1990:204). The concept is helpful, therefore, for explaining how deviations are a distinct but integrated part of the organising process.

Methodology

The purpose of this paper is to contribute to an in-depth understanding of the nature of deviations and the patterns that follow their management. Loosemore (1998) suggested that case studies could help analyse crises. This paper assumes that the same also applies to deviations, which are the unit of analysis for the study. Orr and Scott

(2008:4) write, "...we explore an intendedly rational, but more cognitively circumscribed, sense-making perspective to consider how institutional exceptions are managed, or mismanaged". The same comment is valid for the approach taken in the present paper. Essentially, this paper has followed the multi-case study protocol suggested by Yin (1994:52–60) and his six-step evidence ladder (pp. 85–103). The use of a multi-case approach has meant sacrificing some empirical depth but, as Eisenhardt and Graebner (2007:29) noted, "*Tables and other visual devices are central to signalling the depth and detail of empirical grounding*". Two tables and one figure are presented below and all the deviations reported on are from the same project. However, because tables alone cannot provide sufficient details of a case, two representative deviations, which are representative in terms of practice patterns, have been chosen to receive extra scrutiny. The study's methodology mainly relied on on-site observations of a project team managing one turnkey diesel power plant project. These observations were similar to the approaches typically utilised and suggested by contemporary practice studies that have been acknowledged for their richness (e.g., Gherardi, 2006; Jarzabkowski, 2003; Orlikowski, 2002). The approach was especially warranted by the fact that deviations are unexpected, which does not allow them to be defined beforehand (Hällgren & Maaninen-Olsson, 2005). In addition, the approach is necessary in order to capture the nature and richness of coupling. Methodologies that are less context-sensitive miss certain nuances and explanatory conditions (Orton & Weick, 1990:219; Weick, 1976:10), which a practice approach interest in detailed processes and day-to-day activities does not (Johnson et al., 2003:3).

Project managers identified the deviations, which were noticed by the authors through observation. Project managers spoke about deviations in terms of something that "was off", "a problem", an "issue", "a change", "a deviation" or "disagreement" and something "had to be done", "fixed" or "attended to". These comments were either made directly or in general conversation. The deviations were then (1) distinguished and separated from other events in the project, and (2) addressed by the project manager or his team in a corrective manner. This paper focuses on events that required corrective action rather than on events that were missed or deliberately neglected. As a result, it investigates the management of loosely coupled deviations rather than what makes certain deviations loosely coupled and others not. The nature of the deviation was identified during investigation into the cause of the deviation.

The data was gathered during 10 weeks of ethnographic research at the corporate office, which included 51 interviews, approximately 5000 e-mails, minutes of meetings, reports and plans. The observations were supported by a field diary (Van Maanen, 1988), while the interviews, most of which were used as background material, were recorded and transcribed (Yin, 1994). The first step was a rough summary of the project, which allowed for a basic understanding of the events and their timeline. Secondly, a data mock-up was sent to the informants, who commented and suggested minor changes to the content, such as the name of certain items of equipment. Thirdly, the mock-up and all observations were coded using the Nvivo 7.0 data management programme. This part of the coding was done "as an interpretation of meaning

by social actors" (Eisenhardt & Graebner, 2007:30) and their practice. A deviation was identified if a project manager referred to it in the manner mentioned above and it was reflected in the practice, for example, if the project manager phoned a subcontractor. The point of departure was then how the concern either stimulated by a clear problem (Cyert & March, 1963:169) or just remotely related to any major organisational problem (Cyert & March, 1963:189) was addressed; relying on responsiveness in the first case and distinctiveness in the latter. Responsiveness is associated with flexibility and trial and error, such as phoning subcontractors and talking to them to get them to take action. Distinctiveness, on the other hand, is associated with explorative behaviour and stabilising the situation, such as phoning a client in order to understand the behaviour. Specifically in the latter case with the contractor, if project managers took decisive action or in the former with the client if they were more reluctant to push for one certain solution. The practice pattern is thus associated with the fundamental parts of loosely coupled systems (Orton & Weick, 1990:205). Fourthly, misunderstandings, such as those regarding equipment names, were further developed with material that had initially been left out. The fifth step was to further categorise and re-analyse the empirical data, which meant that the patterns were coded and emerged from iteration of data processing. By using this approach, 20 deviations were dealt with and coded following either one of the practice patterns, as recognised by the project manager's approach to the problem (see the third step, above). The deviations, briefly described in Tables 1 and 2, were assembled from this information. The project life cycle indicated in Table 1 follows the schedule of the deviation divided by the time taken to complete the project (actual or expected).

Observations

General observations

The company researched for this study is a large, globally active, project-based organisation, one division of which specialises in power plant and power conversion construction. This specific division manages over 120 single projects, which are divided into 30 project teams at a time. The company was chosen for the study because it had global projects and executed the projects in parallel, which were tightly coupled and complex. The division had three main types of projects, ranging from delivery to turnkey projects. This study was particularly interested in a turnkey project that was fully responsible for operations, including ground preparation, design, engineering, procurement, transportation, construction, warranty and, sometimes, also the daily work.

The project's organisation was set up with one project team and a site team. The project team was located at the corporate office in Finland and was responsible for planning, organising, monitoring and control. The site team was located at the construction site, which was geographically distant from the project team, and was responsible for the execution of the project. This study focuses on the project team level.

Each project team was responsible for several projects. Each project would have a site team dedicated to it, while

Table 1 Deviation nature and supporting information.

#	Deviation	Life cycle	Stress on iron triangle	Citation	Supporting information
1	Communication	0–0.8>	Communication problems between site and client and corporate client	"The project engineer is worried about where the project is going as there is no communication" (Diary notation) "[X Euros] over the budget for the steel generation, continue to investigate" (Project manager to engineer)	Three diary notations, ^a two e-mails to site, sales office and client
2	Margin	<0–0.45	Margin deficit due to miscalculations		Two diary notations, one project report
3	Pipe rack stretch	0.1–0.45	Inability of the client to provide the project team with necessary information	"It is impossible to get any straight answers from the client" (Diary notation)	Two diary notations on descriptions by project manager and project engineer
4	Transport damage	0.3–0.6	Critical equipment damaged. Three-month replacement	"I understand that the two MV switchgear cubicles are so badly damaged that we need to supply new ones." (E-mail)	31 diary notations, 25 e-mails, three report meetings (incl. MoM), one subcontractor meeting, six reports, six personal interviews with project manager and engineers
5	Switch yard	0.3–0.7	A client's inability to procure and install a switchyard within its scope	"The customer pipe rack construction pace has increased slightly, but it is evident that it cannot be completed in time!" (Project report to line management)	Ten diary notations, 22 e-mails, five meetings (client, report meeting, incl. six MoM), four reports
6	Pipe rack	0.3–0.7	Client's inability to procure and construct a pipe rack within its scope	"Client was very delayed with the pipe and cable rack. The quality of the works was also very poor." (E-mail from project manager)	Twelve diary notations, 26 e-mails, five meetings (client, report meeting, incl. six MoM), four reports
7	Demobilisation 1	0.45	A subcontractor demobilised personnel due to lack of tasks	"Erik talked to the local representative regarding the demobilisation of the site" (Diary notation)	Five diary notations, one e-mail
8	Logistics	0.45–0.6	Delay in critical equipment	"[The] delay was caused by one part of the chain due to payments not received and that has caused us extra costs" (E-mail from project manager to subcontractor)	Seven diary notations, 20 e-mails, two report meetings (incl. MoM), four reports, one meeting)
9	Extended trip	0.5	A planned trip was extended by three weeks	"The engineers stays for two respectively one week and the project manager for four weeks" (Diary notation)	Two diary notations, one e-mail

Table 1 (Continued)

#	Deviation	Life cycle	Stress on iron triangle	Citation	Supporting information
10	Tanks	0.5–0.8	Delay of subcontractors progress in the construction of tanks	"The works at the site have progressed well, apart from the tank erection work, which started a month later than planned due to internal problems between [subcontractor] and their tank erection and manufacturing subcontractor." (Monthly report)	Two diary notations, one report meeting (incl. MoM)
11	Cash flow	0.5–0.8	Malfunctioning cash flows	"Unofficially, Erik hears that the cash flow has been stopped by the customer to the site" (Diary notation)	Two diary notations
12	Change order 1	0.5	Discovery of missing hatches	"Hatches not in contract" (project report)	One project report
13	Change order 2	0.50	Discovery that unloading protection was missing	"Unloading protection not included in contract" (project report)	One project report
14	Change order attempt	0.6	One of the subcontractors applied for an invalid change order	"The subcontractor had to dig deeper than they thought ... Stop fooling around ..." (Diary notation)	One diary notation
15	Change order 3	0.65	Discovery of missing pipe support system	"Pipe support foundation missing" (Project report)	One project report
16	Change order 4	0.65	Malfunction pipe support that requires adjustments	"Pipe support system missing" (Project report)	One project report
17	Demobilization 2	0.7	Construction subcontractor demobilises its work force	"Bullshit that the demobilized personnel are of no use" (Diary notation)	Two diary notations
18	Tank valves	0.7–0.8	Tank valves found to be undersized	"Information has not travelled between the sites and now some valves are missing" (Diary notation)	One diary notation
19	Control panel	0.8	Minor technical problem	"A control panel that overheats has probably broken during logistics. It needs to be verified with the subcontractor"	One diary notation
20	Installation sync	0.8	Discovery of synchronisation of the power plant outfit	"We have a proposal for you ... I will tell you later on what it will cost you" (Client meeting)	One meeting

^a Diary notations typically include overheard conversations, phone calls, discussions, comments.

the project team, located at the corporate office, had to distribute its efforts among several projects. Each project generally had its own site manager. For turnkey projects, the project team usually included a project manager, one electrical engineer, one mechanical engineer and one civil engineer, in addition to a contract engineer. The project team had a number of in-house services including sales, strategic management, finance and control, human resources, information management, communications, legal services and quality management. The arrangement of having a corporate office project team and a local execution site teams implies that the project teams would have to manage global issues on a local level.

The nature of construction project deviations

Kloppenborg and Opfer (2002) suggested that the project execution phase has not received sufficient attention in the literature. With this in mind, the specific project chosen for the present study was a turnkey project that was in the middle of its execution (0.3–0.8 of the project life cycle). The construction of the buildings was underway and the site team was waiting for equipment to be installed. The project had previously suffered some setbacks when the client had not been able to meet the requirements for preparing the site location. Following standard operating procedures, the project was staffed with a project manager and three project engineers, with junior engineers for each position. The site team, on location in Central America, reported directly to the project team. Of the 20 deviations identified in the project during the observation period, 10 were caused by subcontractors. Five deviations involved the client, four resulted from internal causes and one was technical. Table 1 specifies the nature of the deviation, provides quotes to support the interpretation and other available data (plans, reports, e-mails, diary notations, conversations, meetings (minutes of meetings) and the time interval during which the deviation was topical.

De-coupling, implementing and re-coupling of deviations

In order to understand how episodes of deviations are decoupled, implemented and re-coupled (c.f. Hendry & Seidl, 2003), two essential concepts from the general plan must be considered: responsiveness and distinctiveness (Brusoni & Prencipe, 2001:1026; Orton & Weick, 1990:205). While Orton and Weick did not define either responsiveness or distinctiveness in detail, Cyert and March made a distinction between two different search patterns associated with problem-solving and innovation in organisations. Deviations are a problem for project managers who require innovative solutions. Because of this, the study drew on Cyert and March (1963:169–171, 188–189) and a Projects-as-Practice agenda, which refers to situated “actual activities” (Whittington, 2006:619). From this it is possible to define *responsiveness* as practices associated with resolving a specific event and *distinctiveness* as practices for defining boundaries and thereby developing an identity of the event. Table 2 describes the coding approach. It should be noted, however, that the quotes are only meant as an example (due to space limitations) rather than a comprehensive account. Table 2

classifies deviations into respective practice patterns, while Fig. 1 also incorporates the deviations number.

Following the practice approach and a loosely coupled systems analysis (as combined by Hendry & Seidl, 2003), observations of the issue at hand suggest patterns that are oriented towards action and responsiveness. This was considered preferable to searching for distinctiveness and analysis, on one hand, and a pattern oriented towards analysis and distinctiveness on the other (see Table 1 for the nature of the deviation and Table 2 for practice patterns) (see Brusoni and Prencipe, 2001:1027, for similar use of concepts, maintaining patterns with concept dominance over the other). Fig. 1 presents the identified patterns of remedy. On this basis, discussions and information gathering were underlying themes of the management of every deviation. The next part of the paper, as well as the discussion section elaborates in Fig. 1 and the relationship between the concepts in the figure.

The patterns in Fig. 1 are somewhat idealistic in the sense that the demarcation between when an action is “trial and error” and when it is “assembling options” is sometimes fuzzy. The demarcation should therefore be seen as a tendency and indicative of a break in the logic of actions. Moreover, the deviations were labelled with ‘distinctiveness’ or ‘responsiveness’ simultaneously but with a tendency towards either direction. Both issues are indicated by displaying the continuity of the processes rather than presenting the observations in a matrix. Two deviations were chosen for extra scrutiny, a procedure that reflects previous coding (responsiveness/distinctiveness, see Table 2) and the two following patterns.

Deviation becoming responsive – distinctive: “good enough” practice pattern

When approximately one-third of the project was complete (PLC = 0.3–0.6) and with the construction well underway, a transport damage was discovered (Deviation 4). The site team opened the wooden boxes to discover that crucial equipment (control panels) was damaged; they immediately notified the project manager who received the e-mail late in the evening on a weekend. He replied straight away to ask for more information. The replacement was estimated to take 12 weeks to produce, plus an additional four weeks to transport by boat. The project manager started by arranging the papers he needed to deal with the subcontractor and be given priority for the replacement. This task required the project manager to phone various parts of the organisation, including site and quality services. During the process there were some discussions among team members about how to solve the problem. Once the equipment was labelled a “total loss”, there was a flurry of activity. The project manager talked to the logistics department and arranged to obtain more information. He also tried to contact the insurance company, both by e-mail and by phone. The name of the site was included in the e-mail for information and as a way to let the insurance company know that they needed to give this situation their attention. In the meantime, the project manager heard back from the logistics subcontractor, who promised to investigate and report back once he had more information. The project manager also instructed a junior engineer from a sibling site to go to the site of the damage, take photos and prepare a report for the insurance company. The project manager wrote to the site manager and told him that the engineer was on his way.

Table 2 Patterns of "carefully assessed" and "good enough" practice patterns.

#	Deviation	Practice	Supporting quote
Carefully assessed practice patterns			
1	Communication	Initially identifying the extent and impact of the bad communication. The solution is finally to bounce the majority off the project manager.	"The project engineer has contacted the client so many times about the information but without luck" (Diary notation)
2	Margin	Possible solutions to the margin deficit were discussed with line management and the sales and finance department. In the end a structured budget rearrangement, use of buffers and formal lowering of margin was implemented.	"The reason for the margin deficit needs to be investigated further with the support functions" (Diary notation)
3	Pipe rack stretch	The project manager continually reminded the client about the measurement. The project team finally did the measurement themselves.	"The project manager continuously contacted the client regarding the length of the new stretch" (Diary notation)
5	Switch yard	The project manager continually approached the customer carefully via e-mail and on-site local client representative. Once the switch yard came on the critical path immediately demanded information.	"I heard that you will be [at the project] on Monday. Take [the site manager] with you and go and discuss these issues with [the client]" (E-mail from project manager to sales rep)
6	Pipe rack	The project manager continuously carefully approached the customer by e-mail and on-site local client representative. Once the pipe rack came on the critical path immediately demanded information.	"Regarding the pipe rack, the project manager has asked an incredible amount of times but without any answer" (Diary notation)
7	Demobilisation 1	The project manager received a report about the demobilisation of subcontractor personnel, asked the site manager for clarification and identification of involved personnel. Once a clear picture had been established, the project manager approached the subcontractor through e-mail and site manager.	"The subcontractor has started to demobilise personnel even though they can be used to open boxes. He has given threats about contract cancellation" (Diary notation)
8	Logistics	When the subcontractor did not deliver as promised, the project manager started to investigate the reason for the delay and pinpointed points of failure. Later, once the situation had been clarified, the project manager approached the subcontractor, re-planned activities, filed reports and held a meeting including financial demands on the subcontractor.	"Why did the engines not go in the same convoy that the other engines? As I said earlier I insisted that we receive a minimum of 50 percent of the transportation costs back" (E-mail from the project manager to the subcontractor)
9	Extended trip	Delayed negotiations put demands on extending the timeframe from a few days to three weeks. The project team used the local facilities, decentralised and reorganised tasks.	"During the two weeks I had time to sit by the pool for two hours – with my laptop in my lap" (Project engineer)
10	Tanks	E-mail discussions with the subcontractor on how to handle the situation. The site team also had discussions with the contractor. Finally, the decision was made not to put further formal pressure on the contractor.	"We have chosen not to put further pressure on the subcontractor because that might actually slow them down" (Project manager)
11	Cash flow	Carefully approached the client and site team about missing money. Due to sensitivity in the discussions, careful reminders were sent out and finally some material was bought with other money.	"The project manager talked to the site manager and decided to buy the cables themselves" (Diary notation)

Table 2 (Continued)

#	Deviation	Practice	Supporting quote
17	Demobilisation 2	The project manager received a report stating that the subcontractor was demobilising personnel. The site team requested clarification and then approached the subcontractor and reorganised tasks with the site team and subcontractor to keep them busy, monitored the subcontractor and minuted the demands in meetings.	"Discussions with the subcontractor. This was bullshit, according to the project manager who tells them off and thereby ends the demobilisation" (Diary notation)
Good enough practice patterns			
4	Transport damage	Immediately asked site team for clarification, contacted the subcontractor, line management, insurance company, wrote reports. Having achieved a clear picture of the developments, a formal claim was filed to the insurance company and subcontractor.	"We cannot wait, then we will pay horrendous fines!" (Diary notation – Project manager over the phone to insurance rep.)
12	Change order 1	The subcontractor proposed a change order, which was later accepted and added to the monthly report.	"Hatches not in contract" (Project report)
13	Change order 2	The subcontractor proposed a change order, which was later accepted and added to the monthly report.	"Unloading protection not included in contract" (Project report)
14	Change order attempt	The subcontractor complained about the scope and proposed a change order. This was later refused and brought up for discussion with them with a stern reminder to spend time on relevant issues.	"The project engineers sit down and explain the situation about the subcontractor ... The project manager writes a stern e-mail" (Diary notation)
15	Change order 3	The subcontractor proposed a change order, which was later accepted and added to the monthly report.	"Pipe support foundation missing" (Project report)
16	Change order 4	The subcontractor proposed a change order, which was later accepted and put in the monthly report.	"Pipe support system missing" (Project report)
18	Tank valves	Tank valves were found to be badly installed. A technology expert and site team were brought in. Finally, the construction was modified.	"The solutions are going to be okay but not perfect. There might be a need to do some more welding" (Diary notation)
19	Control panel	Dummy pieces put in place while negotiated exempt from queue with subcontractor. Once ready, the dummy pieces were replaced	"The subcontractor needs to be involved, for solution and replacement" (Diary notation)
20	Installation sync	Discussions with client and technical support. Finally accepted some minor costs to the project in order to keep the client happy	"The coordination could perhaps be achieved by a telephone line. It is not optimal but good enough" (Project meeting)

The phone calls, meetings and e-mail communications soon escalated, as line management, quality and logistics services were informed of the situation. The insurance company also called back and was duly informed. The project manager advised the insurance company that it was not possible to wait for their final decision and that he must order immediately or they would risk severe penalties for any delay. The project manager told the insurance company that he was awaiting information but that it would not arrive any time soon, since the site was located in a time zone 8 h behind and the staff there was just waking up. He promised to forward any information. When the conversation ended, the project manager immediately instructed the responsible engineer to go ahead and order the material. An e-mail followed the verbal instructions and this was copied to his superiors.

"I understand that the two MV switchgear cubicles are so badly damaged that we need to supply new ones. Please act accordingly so as not to lose more time." (E-mail 050119)

This remark signifies a subtle change in attention, as a result of which the deviation solution reached its next phase. Once the solution was identified, it was possible to implement it forcefully by assembling the available options, thereby departing from the initial trial and error procedure. The damaged equipment was used as dummy pieces in order to allow construction to continue. The intention was that it would be removed once the replacement equipment arrived. Over the few days that followed, the project manager received a lot of contradictory information about what had

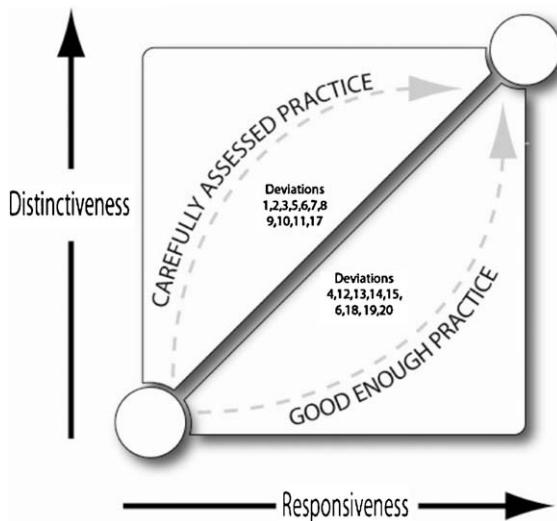


Figure 1 Practice patterns.

happened. Among other things the logistics contractor was trying to deflect the blame to someone else. The project manager learned three days later that the equipment was already damaged when it was shipped.

This caused a month to be lost, time that could have been used for the replacement process. Upon receiving the information, the project manager again informed line management, the site and the project team. He told the person responsible for the insurance that it would be a very interesting case. He also told her that he would request a 50% refund. He later made his demands by telephone to the logistics contractor, who again promised to investigate. As it turned out, the delay was not as severe as anticipated, as there was time slack that picked up most of the time lost in replacement. On the other hand, the organisational strain in terms of resources and time was quite expensive. On 9 February the site was instructed to make a summary of the damage and what action had been taken to remedy the situation. By 22 February a summary was prepared for the upcoming refund discussion with the insurance company.

On 16 March, the project manager and his staff met with the logistics subcontractor. The project manager presented his demands, which the subcontractor felt were too expensive. He argued that it would not have been a problem if the in-house policies had been followed. The project manager responded that it had been impossible to do this due to the time constraints and that the subcontractor was aware of that. A few weeks later the project manager discovered that the reimbursement would be less than he had demanded but he also admitted that he had not expected to receive anything at all.

Deviation becoming distinctive – responsive: “carefully assessed” practice pattern

The pipe rack (Deviation 6) is representative of the carefully assessed practice pattern. An absolute majority of the project's tasks was in the project team's scope of activities but,

importantly, the client needed to complete two tasks (pipe rack and switchyard) in order for the plant to be operational. This pipe rack deviation slowly emerged about one-third of the way into the project and accumulated until the end ($PLC = 0.3–0.8>$). It was not originally on the critical path but it eventually passed its deadline of 15 February. It soon became critical as its construction was essential to the full testing of the plant.

Responding to weak signals, the project manager noticed what would emerge as close to a full-scale catastrophe for the project. On 14 December 2004 he wrote another e-mail to the client.

“Pipe and cable rack (450m) need to be ready according to our schedule 15.02.2005 [sic]. Steam pipes installed (ready insulated) and cables pulled on the rack need to be ready according to our schedule 15.02.2005”

Once the e-mail was received, discussions followed between the project manager and the client, with the aim of identifying the root of the problem. The lack of identification is illustrated by the project manager's concern about progress when the pipe rack was neither officially delayed nor on the critical path. The word from the site manager – underlining that nothing of at least two months' construction had yet begun – did not assuage the concerns of the project manager. Acting on instructions from the project manager, the site manager talked to the local representatives of the client, who promised that the tasks would be completed on time. Approximately one week later, the project manager talked to the local sales office and instructed them to talk to the client's corporate office in order to initiate some action locally. There was no response to the sales office's request. In fact, a response was only forthcoming once the project manager and the organisation's corporate sales support contacted the client's corporate office together. As the situation developed, it became clear that the politics involved limited the project team's manoeuvrability.

The client gave repeated assurances that they would be able to finish the job by the deadline of 15 February. Further promises were made as the deadline approached and, finally, one day after the deadline, the project manager learned that the client had not even contracted a subcontractor. On 16 February 2005 the project manager wrote another e-mail to the client:

“I hope everything is OK with the project. I heard some rumours that the contract between you and the company that will construct the pipe and cable rack have not been signed yet! Could you please give me an update about the situation with the pipe rack ...”

In response, the client stated that the pipe rack had been partly purchased and that it would be completed by 5 April. The project manager responded directly by instructing the site team and the client to have a formal discussion on the subject. What he had in mind was that this situation would require a two-month demobilisation of the construction site. This instruction marks a subtle change from exploring the available options (talking to the client, delaying the project and/or demobilising the project) to starting to assemble the

options (by passing on the demands and the available options – demobilisation or delay).

The meeting was held a few weeks later at the construction site. The main reason for the trip with the entire project team was to negotiate an effective response to the slow progress. At the meeting it became apparent that the site would have to be demobilised for two months. The wait incurred high costs, even though as many other activities as possible were rearranged and finished in the interim. Personnel had to be kept occupied (as they could not be used elsewhere), subcontractors had to be put on hold, financial issues could not be resolved and material had to be guarded. According to the contract, this type of situation would involve reimbursement from the client but the final outcome was quite different. Instead, the costs were absorbed as "good will" costs and the project was finished two months later.

Discussion

This paper has aimed to contribute to an in-depth understanding of the nature of deviations in general and, in particular, the practice of managing deviations. Before understanding the practice of managing deviation, it is necessary to understand what deviations relate to, especially in an environment with global issues and complex execution, which makes deviations an everyday challenge (c.f. Bengtsson & Eriksson, 2002; Evaristo & Van Fenema, 1999; Mahalingham & Levitt, 2004; Orr & Scott, 2008). Most projects have a plan, which, along with the subsidiary project plans, is based on future expectations (Brunsson, 2006). The plan represents operations that, in theory, appear to be tightly coupled (Snook, 2002). From this perspective, loosely coupled activities are viewed as a waste of resources. In reality, however, tight coupling (upholding the plan) is difficult, or sometimes impossible to achieve (Dvir & Lechler, 2004). Unfortunately, there is scant theoretical basis for understanding how projects persevere through the practice of managing deviations (c.f. Cicmil et al., 2006; Hällgren & Wilson, 2007).

Without providing detailed definitions of responsiveness or distinctiveness other than that they involve flexibility, respectively stability, Orton and Weick (1990:205) suggested that these two features were essential for the understanding of loosely coupled activities (and, therefore, how de-coupling and re-coupling are achieved). Drawing upon Cyert and March (1963:169–171, 188–189) and Whittington (2006:619), the current paper has defined responsiveness as practice associated with resolving a specific event and distinctiveness as practice associated with defining boundaries and thereby developing an identity of the event. Accordingly, one of the paper's contributions is the definition of an "as-practice" use. However, the main contributions of this paper are the identification of deviations and their managerial practice, which explain how a project can simultaneously remain open and closed, indeterminate and rational, spontaneous and deliberate (Orton & Weick, 1990:204–205). In other words, how the project can be responsive to deviations and still remain distinctive through the partial isolation of deviations. In this context, 20 specific deviations were observed in one single project during 10

weeks of participant observations, from which two major practice patterns in four categories were identified.

The nature of deviations in construction projects

For the purposes of this study, a deviation is considered as an unexpected event that needs attention from the project team because it interferes with cost, time or scope goals. From a loosely coupled systems perspective (Orton & Weick, 1990; Weick, 1976, 2000), deviations represent a violation of plans that is identified and attended to by management. A change from tight coupling to loose coupling would occur when the conditions for tight coupling disappear for a certain period; in other words, when something unexpected is detected. Therefore, deviations are partly separated from the overall project execution by the attention they receive, which, in terms of loose coupling, provides a deviation distinctiveness. A deviation is also subject to practice aimed at correcting and understanding it, which, in terms of loose coupling, provides responsiveness. The argument in this paper is built on the legacy of Weick (1976), claiming that a response to a deviation must have distinctiveness and responsiveness. Without distinctiveness, management will lack understanding, and the absence of responsiveness will mean that appropriate actions cannot be implemented. This probably accounts for some of the difference in terms of how many deviations were caused by the subcontractor as opposed to those caused by the client. Another explanation of the difference could be that the subcontractor is more involved on a daily basis and, therefore, influences a greater number of activities. Along these lines, practice within projects reveals complex processes of activities, re-assessments, reviews, considerations, negotiations, trial and error, etc., which follow when a situation has been defined as a deviation (c.f. Hällgren & Wilson, 2007; Hwang & Lichenthal, 2000).

Essentially, deviations are episodes of practice that, by necessity, become loosely coupled from the general activities within the project. The deviations move from being neither responsive nor distinctive to loosely coupled via responsiveness or distinctiveness processes (Hendry & Seidl, 2003). As Orton and Weick (1990) argued, these processes mean that no single deviation is immediately fully responsive or fully distinctive. Deviations develop over time and, although both detection and resolution are required to fix the deviation, for the reasons stated above, they are not necessarily addressed concurrently. The data in the present study shows that management action is initially dominated by either responsiveness or distinctiveness, with the other one attended to more later on. This creates two different practice patterns and results in two different processes of deviation management, both of which are built on initial attention to the deviation and the creation of responsiveness and distinctiveness. The result is that the deviation is finally dealt with and discarded from the agenda (see Fig. 1). Unlike process studies on the management of deviations (e.g., Jin & Levitt, 1996; Orr & Scott, 2008), which have made a significant contribution to how deviations are understood and managed over time on a general level, this paper has investigated how deviations are managed in practice. This paper shows how deviations can be managed in more than one way according

to the way that the deviation solving activities are coupled to other planned activities in the project. By doing so the paper contributes to research on both the management of deviations and loosely coupled systems theory.

Good enough practice

The first process, termed "good enough" practice (see Fig. 1) depicts a problem-testing pattern. It is associated with specific problems and the search for a solution is often sought close to the origin of the situation (Cyert & March, 1963:169). In agreement with Cyert and March, therefore, deviations are initially dealt with in terms of trial and error, which implies an initial recognition of the deviation and to the deviation closely held practice associated to responsiveness and flexibility (Orton & Weick, 1990). (See, for example, the acceptance of the change orders (Deviations 12–13, 15–16) but also the rejection of the change order (Deviation 14).) In these cases, solutions were found in the contract and did not create a need for any changes in organisational arrangements. It is a process that promotes one alternative for action at the expense of others and does not include a great deal of consideration or initial careful assessment. (It was noted in the project reports that these deviations had only a minor impact on the project plan.) The target is to create good enough solutions that are believed to work over a short period. (See, for example, the use of dummy pieces in the case of the transport damage (Deviation 4), the control panel that was discussed with a subcontractor while on hold (Deviation 19) or the installation sync in which some unnecessary costs were accepted (Deviation 20).) Driven by the desire to find a solution to a pressing problem, the aspiration of good enough practice is often a solution that takes care of the most basic needs regarding the problem. Good enough practice relates to the idea of finding 'satisficing' solutions to problems (Simon, 1996:30). The trial and error practice is built through iterative cycles of actions that are taken in order to resolve a situation quickly. The situations are briefly defined and poorly understood but still recognised as a deviation. Consequently, the precise identification and stability (distinctiveness) (Orton & Weick, 1990) of the deviation is dominated until an initial sequence of actions has been concluded. For example, once the change orders were accepted in full (or not accepted), dummy pieces were replaced, or costs were absorbed in exchange for some possible goodwill. The practice will, in hindsight, be proved right or wrong. The transport damage deviation, described above, is one such example. The project manager knew that equipment was broken and that he could either repair or replace it; he chose to replace it. He soon found out exactly what had happened, how it had happened and who was responsible. As the information was gathered and the situation unfolded, the parties involved began to assess its full complexity. The situation was dealt with initially by taking immediate action, which was followed by careful analysis. Meetings were called to discuss what had happened, to make demands and so forth, which represented the second part of the process – how the options were assembled into one solution. For good enough practice, therefore, there are few weak signals, which creates more ambiguity and a sense of urgency. The practice is immediate since the lack of dis-

tinctiveness makes for unpredictable consequences. De-coupling is therefore made possible by immediate action that creates responsiveness.

A similar pattern is found in nine out of the 20 investigated deviations. A common first step is trial and error in order to reach a quick solution. The second step is to assemble the options to understand what happened and how well the practice did actually address the deviation.

Carefully assessed practice

The second process is known as "carefully assessed" practice. The first step in this process is to search for options. Following the lead of Cyert and March (1963:189), the observations suggest that certain analyses aim to define the boundaries. At this point, the situation is not yet properly defined. Typical initial actions therefore include investigations (see pipe rack, Deviation 5), negotiations (see switchyard, Deviation 6), and extensive discussions and expert assessments, including investigating possible alternatives for action (see margin and cash flow, Deviations 2 and 11). Contrary to the previous process, efforts are made beforehand to determine which action is right or wrong. This part of the practice would correspond to the deviation becoming distinctive and stable in relation to other activities within the project (Orton & Weick, 1990) and relates to an exploration of the available options. The next step is the structured implementation of a solution practice, often according to a special plan or action item list that comes out of the exploring phase (see, for example, the demobilisation (Deviations 7 and 17)). Similar patterns are found in the handling of communication (Deviation 1), the margin (Deviation 2) and the switchyard and pipe rack (Deviations 5 and 6). In each of these cases the process was to discuss the situation internally, develop a strategy and then implement it forcefully. This part of the overall practice pattern corresponds to the deviation becoming responsive and flexible in relation to other activities in the project (Orton & Weick, 1990) and what is known as structured implementation. The pipe rack is a detailed example of a carefully assessed practice, understood as a practice that, through finding a stable interpretation, may respond with flexibility to the needs of the situation. The client was approached carefully; the contact was preceded by thorough internal discussions about how to approach the client, what could be done about it and various options and their consequences. As soon as the situation was defined and the alternatives unfolded, the project manager took action, pursuing responsiveness in the second stage as they moved towards implementation. The carefully assessed practice is similar to traditional risk management procedures (Gray & Larson, 2008:197–218). Deviations that are either anticipated or for which a plan or mitigation template exists, or for which some early warning signals have been detected, become distinctive more easily and quickly. Therefore, de-coupling becomes possible because of early recognition and distinctiveness.

This process was found in 11 of the 20 observed deviations. A common feature is exploration of the available options as a first step, followed by engaging in structured implementation of the option chosen.

Orchestrating global projects

Deviations can be understood, conceptualised and analysed as part of a process in which they are identified and de-coupled, followed by a practice to create responsiveness and distinctiveness, and then re-coupled once the deviation has been successfully dealt with (Hendry & Seidl, 2003; Orton & Weick, 1990). Consequently, a generally valid conclusion for the understanding of projects and their management is that projects can be best regarded as parallel processes of tight and loose coupling. Tight coupling is built on rational expectations and goal setting, which are apparent during periods when things are going well, that is, according to plan (c.f. Brunsson, 2006). Loose coupling, on the other hand, is a consequence of deviations that inevitably occur as projects are carried out, and are apparent during periods when things are not going according to plan. Therefore, project execution can (1) be depicted more accurately as a combination of periods of tight coupling changing to periods of loose coupling and back again and, as a result (2) be understood as generally characterised by deviations rather than by pre-defined execution of plans. From this it follows that the management of projects becomes the art of isolating deviations from planned activities. This isolation is achieved through either good enough practice or carefully assessed practice.

The exchangeable and dynamic process of loose and tight coupling is natural. Orton and Weick (1990) write that attention should be paid to the condition that tight coupling in one part of the system requires loose coupling somewhere else, in this paper represented by the loose coupling of deviations from the project plan. Adding to this fluidity, deviations come and go in more or less a random pattern and they can occur in parallel (see Table 1 and the overlap of deviations in the project life cycle). A project team may be engaged in the early phase of one deviation while concluding work on another. Deviations may be dependent on each other or follow from each other or they may be totally unrelated. Taken together, the many parallel and sequential deviations are part of the everyday practice of project management and make unexpected events a common part of daily management. The managerial implication of this recognition is that the fluidity of projects is what preserves the project's overall organisation and the capacity to deliver according to goals. Therefore, the expectations manifested in the plan are not an accurate description of what is taking place, even though they may have a valid conception of what is ultimately achieved. Consequently, deviations and the loose coupling among activities they cause actually enable rational project delivery. This is where orchestrating comes into play and shifts the project manager from being a 'planner' to a 'conductor' of processes that are constantly changing.

Conclusions

Contemporary projects that are active in a global environment are challenged on a daily basis, both by the need for situation-specific attention and by a desire for efficiency and standardisation. This paper has investigated how a project team responds to deviations and has identified the general response patterns in terms of practice utilised to mitigate deviations. Literature on projects typically focuses on two

rough approaches — structures or processes — which leaves little understanding of the everyday practice of the project team. By utilising a Projects-as-Practice approach (Blomquist et al., 2010), this paper builds an understanding of projects from everyday activities and how this practice contributes to making deviations that are loosely coupled in relation to the overall project plan (Weick, 1976). The research depends primarily on 10 weeks of observations and 51 interviews with people involved in a certain project in which 20 deviations were identified by the project manager. Because it is a case study on one project, caution should be taken when generalising from the observations in terms of advice about how to deal with individual deviations. Despite this, it is possible to make overall remarks.

The analysis shows that deviations are de-coupled from the project and then re-coupled as a result of dedicated management actions, following either of two identified patterns: carefully assessed practice and good enough practice depending on the nature of the deviation. The findings of this paper are grounded in empirical findings but it also relates to existing theories and research. The identified patterns lie on a conceptual level and provide an understanding of how and why the daily management challenge is different from what is usually assumed in structural and process approaches to projects. The process is more dynamic than what these process and structural approaches assume. The dynamics force both the project itself and the project management task to change constantly. The managerial task changes from running a tightly coupled system to having parts of the system loosely coupled and separately attended to. The global setting, which is complicated by geography, culture, institutional settings and distances, further emphasises such processes and makes them more problematic. Any deviation that occurs will lessen the coupling of the project. Hence, periods of loose coupling can, and in these cases, will be replaced by a period of tight coupling; otherwise, the project in general and the deviation in particular would be a failure. The resulting image is a system that is simultaneously open and closed, indeterminate and rational, spontaneous and deliberate (Orton & Weick, 1990:204–205). The orchestration that is required by the project manager in the global setting describes the dynamic processes that are inherent in the loosely coupled systems framework. This requirement is however not fully developed in the main contributions to the theory. The analysis in this study has added to loosely coupled systems by focusing on the dynamic character of coupling and through a practice-based refinement of the distinctiveness and responsiveness concepts. Thus this has made the loosely coupled systems theory more understandable and relevant from a management perspective in general and a project management point of view in particular.

References

- Ahrens, T., & Chapman, C. S. (2007). Management accounting as practice. *Accounting, Organizations and Society*, 32(1–2), 1–27.
- Alsakini, W., Wikstrom, K., & Kiras, J. (2004). Proactive schedule management of industrial turnkey projects in developing countries. *International Journal of Project Management*, 22(1), 75–85.
- Bengtsson, M., & Eriksson, J. (2002). Project portfolios in their corporate context: Stickiness and leakiness in inter-organization-

- al innovation projects. In K. Sahlin-Andersson & A. Söderholm (Eds.), *Beyond project management—New perspectives on the temporary dilemma*. Malmö: Liber Ekonomi.
- Berggren, C., Järkvik, J., & Söderlund, J. (2008). Lagomizing, organic integration, and systems emergency wards: Innovative practices in managing complex systems development projects. *Project Management Journal*, 39(5), S111–S122.
- Besner, C., & Hobbs, B. (2006). The perceived value and potential contribution of project management practices to project success. *Project Management Journal*, 37(3), 37–48.
- Blomquist, T., Hällgren, M., Nilsson, A., & Söderholm, A. (2010). Project as practice: making project research matter. *Project Management Journal*, 41(1), 5–16.
- Brown, J. S., & Duguid, P. (1991). Organizational learning and communities-of practice: Toward a unified view of working, learning and innovation. *Organization Science*, 2(1), 40–57.
- Brunsson, N. (1989). *The organization of hypocrisy*. Chichester, England: Wiley.
- Brunsson, N. (2006). *Mechanisms of hope: Maintaining the dream of the rational organization*. Copenhagen: Copenhagen business school press.
- Brusoni, S., & Prencipe, A. (2001). Managing knowledge in loosely coupled networks: Exploring the links between product and knowledge dynamics. *Journal of Management Studies*, 38(7), 1019–1035.
- Brusoni, S., Prencipe, A., & Pavitt, K. (2001). Knowledge specialization, organizational coupling, and the boundaries of the firm: Why do firms know more than they make? *Administrative Science Quarterly*, 46(4), 597–621.
- Christensen, S., & Kreiner, C. (1991). *Projektledning, att leda och lära i en ofullkomlig värld*. Lund: Academia Adacta.
- Cicmil, S., & Hodgson, D. (2006). Making projects critical: An introduction. In S. Cicmil & D. Hodgson (Eds.), *Making projects critical*. New York: Palgrave Macmillan.
- Cicmil, S., Williams, T., Thomas, J., & Hodgson, D. (2006). Rethinking project management: Researching the actuality of projects. *International Journal of Project Management*, 24(8), 675.
- Clegg, S., Kornberger, M., & Rhodes, C. (2007). Business ethics as practice. *British Journal of Management*, 18(2), 107–122.
- Cohen, M. D., March, J. G., & Olsen, J. P. (1972). A garbage can model of organizational choice. *Administrative Science Quarterly*, 17(1), 1–25.
- Cunha, M. P., Clegg, S. R., & Kamoche, K. (2006). Surprises in management and organization: Concept, sources and a typology. *British Journal of Management*, 17(4), 317–329.
- Cyert, R. M., & March, J. G. (1963). *A behavioral theory of the firm*. New Jersey: Prentice-Hall Inc.
- De Meyer, A., Loch, C. H., & Pich, M. T. (2002). Managing project uncertainty: From variation to chaos. *MIT Sloan Management Review*, 43(2), 60–67.
- Dorée, A. G., & Holmen, E. (2004). Achieving the unlikely: Innovating in the loosely coupled construction system. *Construction Management & Economics*, 22(8), 827–838.
- Dubois, A., & Gadde, L.-E. (2002). The construction industry as a loosely coupled system: Implications for productivity and innovation. *Construction Management and Economics*, 20(7), 621–632.
- Dvir, D., & Lechler, T. (2004). Plans are nothing, changing plans is everything: The impact of changes on project success. *Research Policy*, 33(1), 1–15.
- Eisenhardt, K. M., & Graebner, M. E. (2007). Theory building from cases: Opportunities and challenges. *The Academy of Management Journal (AMJ)*, 50(1), 25–32.
- Ekstedt, E., Lundin, R. A., Söderholm, A., & Wirdenius, H. (1999). *Neo-industrial organising, renewal by action and knowledge formation in a project-intensive economy*. London: Routledge.
- Evaristo, R., & Van Fenema, P. C. (1999). A typology of project management: Emergence and evolution of new forms. *International Journal of Project Management*, 17(5), 275–281.
- Gherardi, S. (2006). *Organizational knowledge: The texture of workplace learning*. Oxford: Blackwell Publishing.
- Glassman, R. B. (1973). Persistence and loose coupling in living systems. *Behavioral Science*, 18(2), 83–98.
- Gray, C. F., & Larson, E. W. (2008). *Project management: The managerial process*. New York: McGraw-Hill.
- Greve, H. R. (2003). A behavioral theory of R&D expenditures and innovations: Evidence from shipbuilding. *Academy of Management Journal*, 46(6), 685–702.
- Hallett, T., & Ventresca, M. J. (2006). How institutions form: Loose coupling as mechanism in gouldner's patterns of industrial bureaucracy. *American Behavioral Scientist*, 49(7), 908–924.
- Hendry, J., & Seidl, D. (2003). The structure and significance of strategic episodes: Social systems theory and the routine practices of strategic change. *Journal of Management Studies*, 40(1), 175–197.
- Hensgen, T., Desouza, K. C., & Durland, M. (2006). Initial crisis agent-response impact syndrome (ICARIS). *Journal of Contingencies and Crisis Management*, 14(4), 190–198.
- Hirschman, A. O., & Lindblom, C. E. (1962). Economic development, research and development, policy making: Some converging views. *Behavioral science*, 7211–7222.
- Hwang, P., & Lichtenthal, J. D. (2000). Anatomy of organizational crises. *Journal of Contingencies and Crisis Management*, 8(3), 129–140.
- Hällgren, M., & Maaninen-Olsson, E. (2005). Deviations, uncertainty and ambiguity in a project intensive organization. *Project Management Journal*, 36(1), 17–26.
- Hällgren, M., & Maaninen-Olsson, E. (2009). Deviations and the breakdown of project management principles. *International Journal of Managing Projects in Business*, 2(1), 53–69.
- Hällgren, M., & Wilson, T. (2007). Mini muddling: Learning from project plan deviations. *Journal of workplace learning*, 19(2), 92–107.
- Jaafari, A. (2001). Management of risks, uncertainties and opportunities on projects: Time for a fundamental shift. *International Journal of Project Management*, 19(2), 89–101.
- Jarzabkowski, P. (2003). Strategic practices: An activity theory perspective on continuity and change. *Journal of management Studies* 40(1).
- Jarzabkowski, P. (2005). *Strategy as practice*. London: Sage Publishers.
- Jin, Y., & Levitt, R. (1996). The virtual design team: A computational model of project organizations. *Computational & Mathematical Organization Theory*, 2(3), 171–195.
- Johnson, G., Melin, L., & Whittington, R. (2003). Micro strategy and strategizing: Towards an activity-based view. *Journal of Management Studies*, 40(1), 3–22.
- Kloppenborg, T., & Opfer, W. A. (2002). Forty years of project management research: Trends, interpretations, and predictions. In D. P. Slevin, D. I. Cleland, & J. K. Pinto (Eds.), *The frontiers of project management research* (pp. 1–29). Newton Square: Project Management Institute.
- Kreiner, C. (1995). In search of relevance: Project management in drifting environments. *Scandinavian Journal of Management*, 11(4), 335–346.
- Levinthal, D. A., & March, J. G. (1993). The myopia of learning. *Strategic Management Journal*, 14(S2), 95–112.
- Lindkvist, L., Söderlund, J., & Tell, F. (1998). Managing product development projects: On the significance of fountains and deadlines. *Organization Studies*, 19(6), 931.
- Loosemore, M. (1998). Organisational behaviour during a construction crisis. *International Journal of Project Management*, 16(2), 115.
- Love, P. E. D. (2002). Influence of project type and procurement method on rework costs in building construction projects. *Journal of construction engineering and management* 128(1).

- Lukka, K. (2007). Management accounting change and stability: Loosely coupled rules and routines in action. *Management Accounting Research*, 18(1), 76–101.
- Lundin, R. A., & Söderholm, A. (1995). A theory of the temporary organization. *Scandinavian journal of Management*, 11(4), 437–455.
- Mahalingham, A., & Levitt, R. E. (2004). Challenges on global projects: An institutional perspective. *International symposium of the CIB W92 on Procurement Systems*.
- March, J. G., & Simon, H. (1958). *Organizations*. Cambridge: Blackwell Publishers.
- Nicholas, J. M. (2001). *Project management for business and technology*. London: Prentice-Hall.
- Orlikowski, W. J. (2002). Knowing in practice: Enacting a collective capability in distributive organizing. *Organization Science*, 13(3), 249–273.
- Orr, J. E. (1996). *Talking about machines: An ethnography of a modern job*. Cornell University Press.
- Orr, R., & Scott, W. (2008). Institutional exceptions on global projects: A process model. *Journal of International Business Studies*, 39(4), 562–588.
- Orton, D. J., & Weick, K. E. (1990). Loosely coupled systems: A reconceptualization. *Academy of Management Review*, 15(2), 203–223.
- Packendorff, J. (1995). Inquiring into the temporary organization: New directions for project management research. *Scandinavian Journal of Management*, 11(4), 319–333.
- Perrow, C. (1999). *Normal accidents: Living with high risk technologies*. Princeton: Princeton University Press.
- PMI. (2004). *A guide to the project management body of knowledge*. Newton Square: Project Management Institute.
- Ravasi, D., & Verona, G. (2001). Organising the process of knowledge integration: The benefits of structural ambiguity. *Scandinavian Journal of Management*, 17(1), 41–66.
- Schatzki, T. R., Knorr-Cetina, K., & Von Savigny, E. (2001). *The practice turn in contemporary theory*. New York: Routledge.
- Scott, W., & Davis, G. (2007). *Organizations and Organizing: Rational, Natural, and Open Systems Perspectives*. Prentice Hall.
- Shenhar, A. J. (2001). One size does not fit all projects: Exploring classical contingency domains. *Management Science*, 47(3), 394–414.
- Simon, H. (1996). *The sciences of the artificial*. Cambridge, MA: The MIT Press.
- Snook, S. (2002). *Friendly fire: The accidental shootdown of U.S. Black Hawks over northern Iraq*. Princeton: Princeton University Press.
- Standish group. (1995). *The chaos report*. Boston.
- Steffens, W., Martinsuo, M., & Arto, K. (2007). Change decisions in product development projects. *International Journal of Project Management*, 25(7), 702–713.
- Söderholm, A. (2008). Project management of unexpected events. *International Journal of Project Management*, 26(1), 80–86.
- Söderlund, J. (2004). Building theories of project management: Past research, questions for the future. *International Journal of Project Management*, 22(3), 183–191.
- Terwiesch, C., Loch, C. H., & Meyer, A. D. (2002). Exchanging preliminary information in concurrent engineering: Alternative coordination strategies. *Organization Science*, 13(4), 402–419.
- Thompson, J. D. (1967). *Organizations in action*. New York: McGraw-Hill.
- Turner, J. R., & Cochrane, R. A. (1993). Goals-and-methods matrix: Coping with projects with ill defined goals and/or methods of achieving them. *International Journal of Project Management*, 11(2), 93–102.
- Van Maanen, J. (1988). *Tales of the field: On writing ethnography*. Chicago: The University of Chicago Press.
- Weick, K. E. (1976). Educational organizations as loosely coupled systems. *Administrative Science Quarterly*, 21(1), 1–19.
- Weick, K. E. (1979). *The social psychology of organizing*. New York: McGraw-Hill.
- Weick, K. E. (2000). Management of organizational change among loosely coupled elements. In K. E. Weick (Ed.), *Making sense of the organization*. San Francisco: Blackwell Publishing.
- Whittington, R. (1996). Strategy as practice. *Long Range Planning*, 29(5), 731–735.
- Whittington, R. (2006). Completing the practice turn in strategy research. *Organization Studies*, 27(5), 613–634.
- Whittington, R. (2007). Strategy practice and strategy process: Family differences and the sociological eye. *Organization Studies*, 28(10), 1575–1586.
- Yin, R. K. (1994). *Case study research: Design and methods*. Thousand Oaks: Sage Cooperation.