QUANTITY VERSUS QUALITY IN PROJECT BASED LEARNING PRACTICES

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Quantity versus Quality in Project Based Learning Practices

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QUANTITY VERSUS QUALITY IN PROJECT BASED LEARNING PRACTICES

ABSTRACT

In the midst of the turbulence wrought by the global economy, it has become common to see projects as an essential medium for achieving change. However, project based learning practices – as a subset of organizational learning practices- have not kept pace with this development. To explore this concern, we have carried out a study on practices adopted by organizations for learning through projects involving nineteen companies from across Europe and from a range of different industries. We use the concepts of variation, selection and retention in organizational learning to analyze our findings and report the challenges faced by project based organizations in each of the areas highlighted. We conclude that time pressures, centralization and deferral are the key characteristics of learning in project based firms and that these impede project based members in learning from and through projects.

Keywords: Projects, organizational learning, centralization, deferral, time, reflection.

INTRODUCTION

It has become popular to conceive of management in terms of the difficulties of rapid and discontinuous change (Blackler et al 1993; Mc Kenna 1999; Handy 1995; Hastings 1993). This Heraclitean turn in management thinking can be attributed to many factors including the shift of standard production to low wage economies (Reich 1991); the heightened power of buyers and refinement of market segments (Galbraith 1995); and the increasing speed of technological innovations diffuse (Leonard 1997). Flexible organizational structures are advocated and the adoption of project based ways of working is increasingly important (Kanter 1997; Peters 1992; DeFillippi & Arthur 1998; Ayas 1997). The term project covers a multitude of activities from small internal projects to international joint ventures (Turner 1999; Brown & Jones 1998; Lam 1997). Projects are created to achieve internal change, to deliver bespoke products and services to clients, and to undertake new activities on a trial basis as organizations experiment in the face of business change. Organizations from diverse industries adopt projects in order to become change adept, preparing for tomorrow as well as competing for today (Kanter 1997; Turner 1999).

In the context of rapid business change, the role of organizational learning in general, and learning through project teams in particular, has been elevated to new heights (Senge 1990; Fiol & Lyles 1985; Ayas 1997; March 1991). However, previous research reveals that numerous barriers persist in the achievement of project based learning. Amongst those cited are poor project management, internal politics, organizational inertia, expense cutbacks, communication difficulties within and between project teams, and the 'sticky' nature of organizational learning outcomes from projects (Brown & Jones 1998; Lindkvist, Soderlund & Tell 1998; Lam 1997; Ayas 1997; Pinto 1999). For the purposes of this article, we define project teams as teams of people, drawn from within and/or outside the organization to undertake specific projects. When the project ends, the team disbands and members are reabsorbed into the organization and into new projects. If sub-contractors or consultants, the relationship either ends with the ending of the project or results in rehiring for other projects.

Because these findings paint a bleak picture of the prospects for learning through projects, empirical research on project based learning is necessary to illuminate the potential difficulties faced by organizations that undertake projects as a

key organizing mechanism. With this goal in mind, we present a paper on project based learning practices and locate these practices within the broader theoretical field of organizational learning.

Organizational learning has developed significantly as a field of study in the past forty years, and the literature supports the notion that companies must continually learn to face the challenges posed by global business (Van Deusen & Mueller 1999; March 1991; Leonard 1997; Senge 1990). Organizational learning can be distinguished from both individual and population level learning. Individual learning occurs when a person acquires new ideas or skills. Organizational learning occurs when an organization institutionalizes new routines or acquires new information. Finally population level learning occurs when the activities of an entire population change in response to the fact that some firms are thriving and others are not, and because interaction between organizations within the population prompt a systematic change in the population (Miner & Robinson 1994). The institutionalization of new routines and acquisition of new information by organizations can be understood as a process through which organizations understand and manage their experiences. Prominent organization theorists concentrate therefore not on individual learning per se, but on the manner in which systems and structures facilitate individuals in learning and in sharing their learning experiences within an organizational setting (Dixon 1994, Nonaka & Takeuchi 1995).

Adopting this perspective on organizational learning, the environment can be viewed as either supporting or hindering individual learning. Correspondingly, organizations that can be conceived of as learning communities or as communities that impede learning (Seeley Brown & Duguid 1991). From a practical viewpoint, Pedler et al (1991) link individual and organizational learning by describing tools and techniques organizations use to stimulate individual learning in an organizational setting for the benefit of the organization as a whole. Organizational learning should be considered in terms not of individual but of groups (Senge 1990).

Although the term organizational learning continues to generate interest and controversy (Levitt & March 1988; Fiol & Lyles 1985) we conceptualize organizations as systems that learn from experience, over time, and adapt on the basis of that learning (Cyert & March 1963; Miner & Robinson 1994). The experiences of project teams have the potential to become organizational learning when

organizations facilitate the development of insights, knowledge and associations among past actions, their effectiveness, and future actions (Fiol & Lyles 1985).

Unit of analysis and focus of the study. The learning generated by project teams provides opportunities for organizational learning. Through the institutionalization of new routines, information and processes, project teams benefit from the experiences and insights of their colleagues and other project teams (Nonaka & Takuechi 1995). Project teams are an important potential site for organizational learning. In this study the unit of analysis is project processes common to all projects within a company. We examine project processes in nineteen project-based firms used to capture learning from project teams and institutionalize new routines, information or behaviors based on those experiences. We also emphasize between project learning rather than within project learning even though these two are strongly related and processes for increasing within project learning will also lead to sharing of learning between projects, particularly through the assignment of personnel to different project teams over time.

Organization of the paper. Following Miner & Robinson (1994) we view organizational learning of this kind as an evolutionary process where the constant recycling of variation, selection and retention leads to change. We analyze data from nineteen firms in terms of the practices they have in place to promote learning through projects, and this can be analyzed in terms of variation, selection and retention. Important questions include what kinds of practices exist, what balance do these practices promote between variation, selection and retention, and what is the role of broader organizational processes in terms of variation, selection and retention? To address these issues, the paper is organized as follows. In the next section we describe the study we conducted on organizational learning practices in project based firms. We then present the findings from our study on variation, selection and retention practices. We highlight the problems and challenges that project based firms have in each of these three areas of organizational learning and consider whether the data reflects the oft-cited distinction between exploitation and exploration as key forms of learning (March 1991; Clegg 1999). Based on our findings, we draw out characteristics of project based learning practices that we argue act as an impediment to organizational learning. We finally conclude the paper by reflecting on how

project based firms might cope with those impediments to project based learning to create a more reflective, facilitative organizational learning environment.

THE STUDY

We build inductively on 44 interviews with members of nineteen firms in industries such as management consulting, engineering, construction, computer technology, telecommunications and financial services (see Table 1). All of these firms undertake projects as a significant aspect of their day to day work and warrant the description project based firms (Archibald 1993). Our assumption is that project based learning is a significant aspect of organizational learning. We analyze a variety of research materials (interview notes, company documentation, secondary source material from the press, Internet, books and journals) generated by the study from the perspective of organizational learning as change generated through practices to promote variation, selection and retention. Interviewees include line managers, project managers, technical experts, and human resource specialists. Finally, as agreed with participants, the data is reported in a manner that assures confidentiality in terms of specific companies and practices.

Interviews

The main source of data for the study is semi-structured open-ended interviews. The interviews were 'conversational', characterized by openness and flexibility (Lee 1999). Prior to the interviews taking place, we developed a number of themes to be explored in the interviews. These themes were drawn from two theoretical domains: learning and project management. We used the themes as a guide to areas of potential interest, whilst remaining sensitive to emergent issues and avenues explored in conversation with respondents. The unit of analysis for the study is project processes common to all the projects taking place within a company. We therefore generate general data on projects and project learning rather than specific data on individual projects or programs. All respondents are directly involved with projects either as project managers or project resourcers (functional heads providing expertise, people, finance, etc.).

Potential generalisability

We cannot be certain how generalisable these data are to other project-based firms or companies because of our choice of methodology and aims in conducting the study. Our goal is theory development through inductive methods aiming at 'continual reexamination of the data in the light of developing theoretical arguments' (Seale 1999). Moving from learning theory and the (somewhat sparse) theory on project management, we chose our research partners because we suspected they could illuminate aspects of the theoretical framework – variation, selection and retention – as key facets of learning. All the firms were chosen on the basis of the significance of projects to their everyday work. The evolving nature of this research design and the search for cases to expand on and enlighten previous data means replicability may be limited. We paid careful attention to the question of inter-rater reliability in terms of coding the data, finding themes, and assessing prevalence of practices and interpretation of themes. We analyzed the interview notes and field notes separately coming together regularly during the development of the study to compare themes and interpretation of the data. To further ensure consistency in the development of themes and in interpretation of the data, both researchers attended all interviews, decided on what companies to approach next, and whether to return to a specific company for more in-depth interviews.

Sampling

Our sampling strategy was based on theoretical concerns and can be understood using the idea of theoretical sampling (Glaser & Strauss 1967; Lee 1999, Seale 1999). Through a process of hypothesis generation from learning theory and project management theory, we developed themes to be examined in different companies. The experience of each set of interviews helped us to revise and refine the ideas, and decide where to proceed to next, in the study, in terms of who to interview, what questions to ask, what themes to explore, etc. As our understanding of learning in project based firms increased with each phase of the study, we identified new companies and new issues to explore.

Analysis and interpretation

The analysis, interpretation and reporting phases of the study were nested. In the beginning, each new interview brought new analysis, whereby we independently, and

then later together, brought order to the data, organizing it into categories, themes and basic units of description (Patton 1987). During periods of joint analysis, and as a process of moving between the data and theoretical issues we also began to attach meanings and significance to the analysis, explaining descriptive patterns and looking for relationships and linkages among the descriptive dimensions (Patton 1987). As the interviews proceeded, and particularly towards the end of the period the analysis of the data into categories and descriptive units began to be easier, with patterns repeating and trends developing clearly. We interpreted this to mean that we had identified a number of common characteristics in project based learning within the firms studied. A number of broad trends and patterns emerged during the interviews and appeared to effect all the firms. However, to ensure thoroughness in reporting the data, we have also included idiosyncratic stories and accounts of learning practices to show the variation that exists between companies of different size and in different industries.

Theoretical saturation

The decision to stop sampling was reached when we had studied nineteen companies and arrived at a point where the same themes and patterns were dominating the interviews. This suggested we had reached some theoretical saturation point at the level of learning practices common to projects in general in the companies being studied (Glaser & Strauss 1967). The empirical findings are derived from extensive analysis and coding of themes, and interpretation and decisions about what themes affect what companies and what themes affect all companies, albeit to greater and lesser degrees.

Outcomes

We build on the model of variation, selection and retention to illuminate project based processes emerging from our data that influence learning. We then look at barriers to learning and identify *time pressures, centralization* and *deferral* as key features which impede project based learning in these nineteen companies. Although we cannot assign specific levels of these features (i.e. one company has 86% tendency to time pressures, another 45%), we argue that all of the companies we studied exhibit these features in the same general direction. It would seem likely that time pressures,

centralization and deferral undermine learning even though the quantity of learning practices adopted and discussed by firms seems large.

Further work is called for to elaborate on how project based firms can diminish the negative effects of time pressures, centralization of learning and deferral of learning. It would be possible, for example, to carry out in-depth qualitative based case studies in a smaller number of firms chosen for their explicit commitment to reduction of one or all three of these facets of potential learning impediments.

PROJECT BASED LEARNING PRACTICES

Project based firms and 'employability'. In order to survive in today's hyper-competitive environment project based firms need to continually win new projects (Lindkvist, Soderlund & Tell 1998; De Filippi & Arthur 1998; Sveiby 1997; Brown & Jones 1998). The micro-level notion of individual employability is a useful corollary for examining the challenges faced by project based firms. Employees are increasingly being told that instead of expecting lifetime employment they should instead seek to secure lifetime employability (Kanter 1989; Handy 1995). Studies show that success in achieving employability is positively related to a range of work and personal factors (Noe, Steffy & Barber 1988; Noe 1996; Mc Elroy, Morrow & Mullen 1996). Employability is crucial for employees because future contracts are not guaranteed. Likewise, project based organizations should concentrate on being 'employable' at a macro level because the future governance of projects is not guaranteed. Project based firms, like new age employees must acquire the ability to master new skills on an almost continuous basis (Arthur et al 1995). In these organizations the role of learning – organizational learning through projects – is critical.

It is also clear from employability research that the pressures to act and willingness/ability to act are two different issues. For project based firms, pressures to learn vary with factors including the volatility of the product/market domain, the pace of technological change and the orientation of firms to their environment in terms of innovativeness and conservatism (Burns & Stalker 1961; Lawrence & Lorsch 1967; Miles & Snow 1978; Schuler & Jackson 1987). Adaptability in the face of variation in quantity and quality of projects is important in terms of survival and success in project based organizations (Sveiby 1997) even though not all firms react

in the same way. How project based firms in our study respond to that challenge, in terms of learning through projects, is the topic to which we now turn.

Project based learning and organizational priorities. Our findings suggest that both power and organizational 'attention' play a strong role in determining the balance between variation, selection and retention in organizational learning, with the weight falling heavily, in terms of quantity of initiatives, on retention (Clegg 1999, Weick 1993). Although respondents overwhelmingly agree that exploration is a vital aspect of survival in an era of global hyper-competition, they describe initiative after initiative designed to encourage exploitation rather than exploration. To foreshadow our argument somewhat, there are a number of barriers to organizational learning – and particularly exploratory learning- evident from our study. These include lack of time and reflection at the level of the project team, the tendency to centralize learning and the deferral of learning to future points in time and space. We first analyze why this is the case by presenting the practices we found. Later in the article, we discuss the barriers to project based learning that are evident from our study.

Project based learning – variation, selection and retention. We begin each section on learning in project based firms with the example of the Pillsbury Bakeoff (Von Hippel 1982) which illustrates nicely the differences between variation, selection and retention in organizational learning.

Variation

Organizations generate sources of variation in order to provide new candidates for new routines (Miner & Robinson 1994). Variation processes therefore play an important role in exploratory learning, where the goal is to go beyond what is already known, and to promote risk taking, experimentation and innovation. Variation may lead to new products, new processes, or both. The Pillsbury Company generates variation using the 'Pillsbury Bakeoff' as a vehicle for encouraging their customers to come forward with ideas for new recipes. As Von Hippel describes, new ideas can be garnered by treating customers as valuable partners in expanding the organizations capabilities, and learning potential (Von Hippel 1977). Prior to the contest the ideas (recipes) of individual customers (end users) do not reside in the Pillsbury Company and cannot be considered part of their routines. The Pillsbury Company uses the

Bakoeoff as a process for enhancing their organizational learning by securing the new routines (recipes) through an active process of generating variation.

Findings on Variation. Not all firms in our study emphasize variation generation to the same degree. Our data reveals that firms in the EPC (Engineering, Procurement and Construction) industries are more conservative than their counterparts in financial services, management consulting, computer technologies and telecommunications. Although there is increased pressure to innovate and find new ways of meeting the challenges of a competitive environment, the counter pressures on firms in these industries to act conservatively are strong. According to one respondent:

> This industry [engineering and construction] is very conservative. We work within so many safety standards and we do not innovate unless a client specifically asks us to. This is not very often. We have lots of reasons. We blame the client, the public sector, public opinion. Our expertise and culture are not for taking risks.

This sentiment is echoed in many of the interviews taking place within this industry. Inertia results from the role of large clients, in many cases governments (and in particular the defense industry) in shaping organizational behavior. According to respondents, prominent clients often discourage innovation and exploration. In other cases, inertia results from rules that pertain to safety, procedures, technological methods and organizational processes (deriving from the government and clients). Clegg's description of rule-constraining organizational contexts is relevant in explaining this finding:

> Explicitness about rules may restrict organizational practices, in the familiar punitive sense of rule-implementation as a way or preventing people from doing things they might otherwise do….[S]tructure strives to overwhelm novelty rather than to feel the shock of the new (Clegg 1999:261/262).

Variation can of course occur spuriously, but the few cases of deliberate variation generation we have encountered in EPC firms are of stories of radical, groundbreaking and history making change. Put simply, these are rarities. Having said that, there are signs that exploratory learning and the generation of variation, even for firms in highly conservative industries, may not be avoidable forever. This is expressed by one respondent:

> The drive to work at volume has almost killed us. We were working for almost no profit at all. The volume strategy is a totally wrong strategy. It has no chance of success….[our strategy now is to] get closer to the client, get a better understanding, support them and help them find alternatives early in the process, and provide a full service front end, back end, and even with equity support.

This company has undergone a lengthy process of reorganizing and cut its client base from 800 to 200 with serious consequences including the closing down of offices, and laying off of workers. This respondent describe a strategy of developing client intimacy and seeing clients as partners with whom to develop high quality strategies, including innovative strategies in engineering and construction, by learning from the client.

Exploration in organizational learning involves search, risk-taking, experimentation, and an emphasis on variation to develop new routines (Miles 1991). As we have already mentioned some firms – notably those in consulting, computers and financial services, are more risk taking than other firms. One of the most surprising cases to emerge is that of variation generation in a non-EPC firm. In-depth interviews with three members of this organization – the director of process improvement, the director of Human Resources at the Global Group level, and a senior project manager, spent time discussing the process whereby exploratory learning takes place. These descriptions reveal that the process is governed by a wholly organic method described by respondents using the metaphor of 'whiskey blending' and describe the variation generation process in very sensual terms. According to the director of process improvement (also responsible for project management processes), the developer's 'use their noses' to determine when a product is going to work and to join the other products the firms offers. The generation of variation in this organization is described

as a long and often unwieldy process. Information is drawn from organizational members and from market developments in a process that does not conform to project management conventions such as clear milestones, strict deadlines or efficiency criteria. Respondents from this firm report repeated attempts to enforce a stricter methodology on the process. They resist this organic approach to organizational learning but also describe failure to systematize and formalize the process because the 'pot boilers' (variation generators) have acquired political power to command resources through past successes and their personal histories within the company. At the time of the study, the informality of the process is sustained, but only through constantly battling with those who seek to systematize it.

Concerns with the efficiency of innovation processes were raised in other non-EPC firms. In one organization working in the information technology sector a recent change in leadership has led to the enforcement of strict efficiency criteria in the area of innovation. And in a consulting organization respondents – including a director of projects in the industry division, a director of projects in the education and development group, and a senior process manager - describe concern with the enthusiasm for exploration shown by employees but de-coupled from what they refer to as 'real, identified business needs'. At the same time, these respondents also report problems with the generation of innovation. One director states:

> Innovation of new services is a critical problem. To get our companies aligned to develop innovation a real challenge. In the last year, there has been a decline in successful development

Overall, the belief seems to persist that exploratory learning should be controlled in the pursuit of clear pre-defined goals and where it is not, something is amiss. In one computer company, for example the setting up of development projects has in the past worked in a loose way, but that is going to change:

> When a project is developed to enhance something, a process for example, a 'spec' is drawn up and hawked around and then, if it is successful, a development project is developed. Because of this, we have enormous pockets of development groups around the world.

> Now we are trying to get some control over it and reduce it or streamline it. Rationalize it, and the number of locations.

We can explain this emphasis on improving efficiency from a theoretical point of view by looking at the persistent debate within the innovation literature on the value of slack resources in supporting the innovation process. A recent review by Drazin & Schoonhoven (1996) reveals that this is a core theme in the literature and commentators continue to be divided on whether slack resources help innovation (Nohria & Gulati 1996). In the firms we have mentioned, the emphasis on tightening up the innovation process appears to align with beliefs that slack resources are harmful, and to be avoided, even though the theoretical support for this is by no means uncontroversial.

Summary of findings on variation generation. Our study suggests that variation generation is a difficult aspect of organizational learning project based firms. Practices (formal and informal) for promoting variation are few and far between, and exploratory learning is therefore an under developed aspect of organizational learning through projects. We interpret our findings to suggest that the influence of archetypal project based firms –mainly those from engineering and construction- has had a lasting impact on how project management is taught and learned in project based firms. Even the firms we studied that operate in highly uncertain knowledge intensive sectors such pursue project-based learning in a conservative way. Their policies and practices conform to ideals of project based working that emerged with traditional project based industries. These practices and policies privilege conservatism and efficiency over exploratory learning and variation in behaviors, information and routines (Wheelwright & Clark 1992; Morris & Hough 1985).

Selection

Organizational level learning requires selection in which some ideas, information or behaviors generated by variation practices are retained, and others are not (Miner & Robinson 1994). The Pillsbury Bakeoff represents the selection phase of Pillsbury's innovation and learning efforts in tandem with their customers who submit recipes. The winning recipes are 'selected' and the others are not.

Findings on Selection. Our findings reveal that companies select among competing project proposals at the beginning of projects and also at various stages throughout projects. These selection decisions directly impact on project based learning. The acceptance of some proposals over others reflects project priorities. Organizational learning does not appear to be prioritized in project selection. Projects are often selected on the basis of formal written proposals. Respondents describe a common trend towards 'dressing proposals up' for legitimacy, with emphasis on variables with proven managerial importance such as delivery on time, cost and quality as opposed to other variables that project managers believe will emerge as key factors in how projects proceed. The value of writing formal proposals is therefore not merely functional but also operates on another level. Projects are assessed in terms of expected ideals of effective project processes even where the forecasts may not be attainable.

We find procedures for formal selection at the beginning of projects in six firms in our study. These firms all have international company-wide centers for evaluating project bids and project proposals. Following review by these centers of excellence, some proposals are sanctioned to go forward to clients, others are revised, and yet others are terminated. If the proposals are oriented towards internal projects, a group of senior managers drawn mainly from the functional organization review these and select winners from among them. These selection systems mean that all bids/proposals are judged with reference to standards set at the center of the organization. The center determines what bids should go ahead in the context of corporate strategy, and therefore what types of learning (exploitative versus exploratory) are likely to take place.

Many of the firms we studied also build selection into project processes. The vast majority of firms pursue a waterfall (sequential) approach to project process most of the time. They do not pursue a fountain (simultaneous) approach (Lindkvist, et al 1998). The waterfall approach is a traditional approach to managing projects in which a stage-wise (loose-coupled) development process is adopted. Project phases are sequentially ordered and clearly separated with well-defined entry and exit criteria (selection). Selection occurs at the exit/entry junction between one stage of the project and another. Very often these selection points correspond with milestones in the project. In one company, running very large projects of over 10 million pounds, a project board has been established to judge the performance of projects against clear

milestone planning. A number of visual aids are used by the project manager and the project team to communicate progress at each milestone and thus to influence the selection process. As one project manager describes it:

> Milestone tracker charts are used to show the main board directors of our progress….Apart from helping to brief the managers, you can also use these aids to win commitment from the managers. These aids help to bring things to a decision point very quickly……The main board directors also get to feel involved in the process. It all helps to make sure that communication is flowing upwards into the functional structure so that functional members on the MFT [multi-functional team] know what they are doing is important.

It is clear from this quote that it is important to 'sell' the success and progress of the project upward through the functional structure in order to win support and approval for the next stages in the project. Progress must be satisfactory before the next stage of the project commences. The sequential nature of project selection is described by Lindkvist et al (1998: 937) as follows:

> Later stages or downstream activities cannot start until the exit conditions of earlier ones have been fulfilled. When such a decision is taken, the next (functional) unit takes over responsibility, a procedure well illustrated by the often invoked image of 'throwing things over the wall'.

Exit conditions are often predicated on how well a project conforms to the objectives determined at the beginning of the project. The power of competing project groups is another selection issue. Competition for resources, particularly people, can influence selection and de-selection when more than one project is being assessed at an exit point. The movement of personnel from one project to another during stage review can effectively kill a project. From a functionalist perspective, the decision to kill a potentially successful project may seem confusing. However, projects are a political playground in which the preferences of some groups (seen from a product/market

technological perspective) are used to influence de-selection of projects perceived as a threat to powerful groups in the organization.

The determination of selection criteria and well-defined exit/entry conditions is sometimes confounded by unforeseen circumstances. The more the project is characterized by unclear goals and/or methods (Turner & Cochrane 1993), the more difficult it is to pre-determine success criteria at each stage. For such project, a fountain model of project management based on concurrent rather than sequential project processes may be more effective. With such a model the efficacy of clear selection points is reduced (Lindkvist et al 1998). Although the sequential model dominates in the firms we studied, organizational learning may be seriously implicated – in terms of selection practices – if the spread of fountain models takes place.

Retention

By far the greatest 'number' of initiatives pertaining to learning is undertaken in the realm of 'retention' or exploitative learning. March (1991) describes the purpose of exploitation as 'execution of routines already located in the organizational knowledge base'. Clegg (1999) associates exploitative learning with Tayloristic practices including the detailed prescription of tasks, detailed work procedures, and explication and routinization of tasks. Miner & Robinson (1994) discuss the value of retention mechanisms as consistency and the ability of organizations to capture the gains of prior experimentation or variation generation, i.e. prior exploratory learning. Using the example of the Pillsbury bakeoff, retention occurs when the Pillsbury Company, having selected the winning recipes, proceed to refine these in terms of taste, consistency and appearance and mass-produce them. The goal of retaining what has been learned is so that the learning can be leveraged. The value of exploration and experimentation is 'captured', and the new recipes are 'retained' in organizational processes such as training of personnel to make the new recipes and the codifying of the new recipes in manuals and procedures for distribution on a national basis. The new recipes and the processes of making them can even be programmed into baking machines (Nonaka & Takeuchi 1995).

Findings on Retention. Our companies are extremely active in terms of retention practices. We provide below a brief summary of the main practices we have found in our study:

- Lessons learned databases
- Project end reviews
- After Action Reviews
- Corporate level Training Programs
- Competence models with descriptions of competence exemplars at various level
- Learning Resource Centers
- Intranet
- Quality Procedures and Process Documentation
- Client Procedures and standards
- Centers of Excellence in e.g. Bid Management/Y2K/Other programs of corporate significance

Below we group some of these practices and discuss them in terms of clusters aimed at achieving similar learning retention outcomes.

<u>After Action Reviews/ Project End Reviews/Lessons Learned Databases</u>

All of the companies we studied, without exception, have practices in place to try and capture the learning that takes place on projects when projects are completed. The purpose of these practices is to capture the lessons learned on projects, codify them and make them available to other members of the organization. These practices are variously referred to as 'after action reviews', 'project end reviews', while the outcomes are described as, for example, 'lessons learned databases'. When respondents describe how this works in ideal terms, it is clear that project team members should put time aside and sit down together to develop lessons learned from the project. These should then be fed into databases (manual or computer based) that other project managers and team members could access under project title or key words. In this way learning on projects can be 'retained' by the company, and shared by company members.

However, this rarely happens. Project team members frequently do not have the time for meetings, or for sessions to review lessons learned. Often project team members are immediately reassigned to new projects before they have had time for lessons learned sessions or after action reviews. In no single company did respondents express satisfaction with this process, and all claimed that time pressures exert enormous pressure, and reduce the effectiveness of these learning practices.

Procedures/Processes/Manuals

The majority of project based organizations work to project procedures developed by them or by their clients. These procedures contain instructions on how projects are to be completed including safety standards, communication protocols, relationships with sub-contractors, engineering specifications and a range of other issues. The overwhelming trend in recent years is for clients to push responsibility for procedure development and codification back on companies delivering projects. One reason for this trend is that clients have downsized resulting in the outsourcing of design, engineering and quality standard expertise to project based companies. From several descriptions provided by respondents, we present a brief summary of how the process works and then analyze it in terms of organizational learning in general, and retention in particular.

The expectation is that projects proceed along company/client guidelines, laid out in documented form in extremely thick project process manuals or procedures manuals which weigh down the shelves of project offices we visited. If for any reason a project deviates from company procedures, the reason for the deviation should in an ideal scenario be fed back into the process managers (usually a departmental or functional manager e.g. head of engineering, director procurement, etc.). This manager/director should decide if the deviation is really a source of learning and if it is worth capturing that learning and altering the procedures or processes by which the company works. If, for example, there is an innovation in piping during construction of a building, then the project team member (piping engineer) should report the reason to the head of engineering who should ideally record (retain) this information and decide if it represents real learning. This system of retention is dependent on two things. Firstly project team members working on projects (e.g. piping engineers, financial consultants) should inform someone in authority that they have changed the process, and that it seems to have been successful. Secondly the system is dependent

on the process owner examining the 'deviation' and writing it up for explanation and dissemination to others.

The focus is clearly on capturing 'deviations' (retention) and learning is seen as accidental and spurious. Whether or not it is captured and shared at the project team or organizational level is dependent on the willingness of project team members and process owners respectively to report and codify the changes. The amount of good fortune required for project workers to report their localized learning can also be considered in term of the fact that on some projects we have studied the majority of staff are hired locally on short-term contracts. The minority is project members employed by the company imposing these procedures and also the company with most to learn from any learning that might arise.

Centers of Excellence and International Programs

Ten of the companies we studied are international companies with operating divisions in many countries. These organizations all institute international mechanisms for retaining learning and disseminating that learning throughout the company. For the purposes of summarizing, we refer to these mechanisms in two ways. Firstly, there are international centers of excellence in specific project processes (e.g. bid management). Secondly, there are international programs in issues of specific importance to companies at a given time (e.g. Y2K programs). Both of these systems serve to retain learning developed within the organization. These international centers (centralized) offer advice to operating companies and record changes in 'company ways of doing things'. Where local deviations are examined and determined to be successful, the role of the centers of excellence is codify these, provide training, and retain the learning within the company for all relevant members. The programs operate in a similar manner. They determine what operating companies (affected by a particular program or set of activities) should be doing in terms of best practices (e.g. Y2K methods).

IMPEDIMENTS TO PROJECT BASED LEARNING

As is clear from the preceding discussion, different types of practices and broader organizational processes impact on project based learning. In this section we discuss our findings in terms of three key tendencies of project based learning and learning in

project based firms to emerge from the study: time pressures, centralization and deferral. We argue that these tendencies damage organizational learning through projects. Quantity of practices, particularly in the area of retention, does not necessarily mean high quality of practices in promoting learning through projects. Some practices even impede the facilitation of project team embers in sharing their insights and preclude the organization from developing effective feedback mechanisms from which other teams can learn.

Time Pressures. Time pressures are a threat to effective organizational learning through projects. Punishing work schedules are operated by all of project based firms we studied. Although flexibility theorists often concentrate on the proliferation of part-time working, we encounter 'more than fulltime working' in the firms we studied (Atkinson 1984; Pollert 1991). Time is one resource people simply do not have. It was (alarmingly) common throughout the study for respondents to list impressive practices in place to facilitate organizational learning, and then at the very end to state that they do not work, or are not used, because of the time pressures on those people whose learning is the focus of these systems.

Time is a key resource that people must have in order to develop reflective learning practices and operate effective feedback mechanism in project teams. Time pressures reduce the effectiveness of after action reviews, Intranets, databases of all kinds, lessons learned exercises and other efforts to retain what has been learned on projects. Databases suffer because project managers and team members do not update them by continually adding new material drawn from project experiences. Lessons learned databases suffer greatly because not only is their insufficient time to update them, but the lessons people who DO use them derive are often obsolete. Without one single exception, respondents claim that efforts to facilitate organizational learning suffer because of the pressures of time on project managers and their teams.

The time pressures described by respondents arise in large part because project based firms operate in turbulent product market domains where future governance of projects is not guaranteed (DeFillippi & Arthur 1998). Faced with meeting a deadline for a tender, or releasing people to update learning related databases, most of the firms we studied opt for the former. Respondents express awareness of the long-term dangers of time pressures on organizational learning. They voice concerns about what might be called a 'reinvention of the wheel syndrome' in which the same

mistakes seem to be made time and again. For many companies this is a continuous struggle. For some companies, the solution has been to try and downgrade the importance of short-term efforts (bidding on new projects) and upgrade, in a concrete way, the importance of these learning practices and processes. However, this is a constant struggle, and often, it would seem, a losing one.

Respondents from one organization in our study talk about a learning crisis because of the pressure of short-term objectives. The recognize the negative impact of short term client driven pressures on longer term learning objectives and are seeking to ameliorate this by making project managers responsible for the articulation of learning objectives, for individuals and teams, at the beginning of each project. These are consolidated and evaluated on a regular cycle and project managers are appraised according to whether these are met. This system was being implemented for the first cycle (to last five years) at the time of the study and it would require a longitudinal study on a more in-depth level to assess if it has succeeded. However, the development of this system is one of the few practices we have encountered that attempts to surmount the time pressures most companies in the study recognize, but do not effectively tackle.

Respondents talk about the importance of informal networks within their companies, citing them as the most important conduit for transferring learning between individuals and project teams through the company, thus promoting the shift from individual to organizational learning. However these informal networks also require attention, and nurturing, and this requires organizations to slow down sufficiently so that in the longer term, their learning and development processes can be strengthened and their speed (in competitive terms) enhanced. Awareness of the organization feedback and alignment systems such as informal networks and social contacts is required to transfer individual learning to groups and between groups. Thus, overall, time pressures are a basic dilemma of learning in project-based firms and one for which an adequate solution is yet to be found.

Centralization. Centralization is a core feature of project based learning in the firms we studied. Resources to promote learning are controlled by senior members of the hierarchy (department managers, functional heads) and specialized departments (centers of excellence in bid management, design, product engineering, special programs etc.). These centralization tendencies promote retention over

variation and exploitative learning over exploratory learning. The assumption underlying centralization efforts of the kind we have identified in this study is that senior managers are the best placed to authorize what constitutes true and valuable learning. Burns & Stalker (1961) argued in their seminal work on innovation (exploratory learning) that assumptions of 'management omniscience' are misplaced in volatile product, market and technological domains. Such assumptions lead to loss of insight and initiative among members at all levels of the organization, insights that are crucial in conditions of uncertainty.

The learning practices and policies promoted by the organizations we have studied may damage rather than enhance project-based learning. By promoting centralization, these organizations signal that learning is not the responsibility of everyone but the sole province of a few 'enlightened' people in the organization. These 'enlightened' people include managers who maintain databases, experts who capture process improvements across the organization, those with authorization to alter lessons learned archives, etc. When one considers that as much as 80% of personnel on a project can be contract personnel, it is staggering to contemplate the amount of learning lost when a project disbands and these people move on to work for other organizations. Regardless of how senior or expert a person is, it is difficult to converse with people who no longer work within their projects or even their organization.

Deferral. The final feature of project based learning we want to discuss is what we call deferral. Learning in project teams is deferred through project learning practices we have encountered in our study. Deferral is an outcome of project based learning practices that concentrate on learning at the end of projects, or after significant assignments have been completed. The time pressures of project delivery accentuate these tendencies. Learning in a reflective manner throughout projects is damaged by practices that exist to defer learning until projects are completed. The requirement to report to senior departmental and process managers, which we found in many firms, also means that considerable time lapses can occur between the identification by team members of process improvements (variation), the sanctioning of these by those in authority as significant sources of learning (selection) and the

capturing of this learning for externalization and dissemination to other members of the organization (retention).

Quantity versus Quality in project based learning. We perceive these three tendencies - time pressures, centralization and deferral -as threats to project based learning. Centrally mandated learning practices distract attention from the importance of nurturing and facilitating learning at the level of project teams. By permitting the deferral of learning until the end of projects, reflection (on what happened, how, why and what might be improved) is suspended. Our findings resonate with the argument of King & Rowe (1999) that organizational practices to capture the learning of collectives are partially undermined by the simplistic, methodologies used by organizations to record 'learning' of organizational collectives (e.g. project teams). There is evidence from our study of an inability of project based organizations to come to terms with the complexity of interactions of project team members in learning situation. This problem is manifest in attempts to reduce the learning of project teams to simple summaries and poorly maintained databases that few people have the time to use. Projects are transient and based on a unique assemblage of people, clients and tasks in a particular time period. Valuable lessons emerge all the time in a way that is emergent and localized. These lessons are lost because centralized and deferred learning is privileged over the emergent, localized nature of learning in project teams. Without adequate time for reflection on the outcomes of actions, or adequate attention to feedback and alignment mechanisms within project teams, the lessons emerging from the collective actions of project teams are easily lost (Senge 1990; Herriot & Pemberton 1995). They do not become part of organizational memory and learning, i.e. organizational learning. One respondent captures this:

> Learning takes place on projects, through bad as well as good decisions, but it's hard to formalize and the whole process is so new, its all an education at the moment. It's all easily lost. People start new projects and then months later we hear something went badly wrong, and I often think, 'we could have told them that'.

Many of the practices we encounter in our study defer learning to higher entities and future points in time. This exacerbates the problem, already discussed, that

inadequate time is devoted to learning on projects and reflection on outcomes in a manner that harnesses the insights of project team members working on a client problems in the here and now. Insufficient resources are dedicated to helping project teams to consistently view projects as learning opportunities, and to use feedback mechanisms to capture learning experiences and share them within the team and over time with the organization. Given the large numbers of contract staff employed by project based organizations, we suspect that centralization and deferral tendencies are contributing to a constant loss of learning experiences by those who disappears as transitional members when projects are disbanded. At the very least, their experiences and learning are lost in after action reviews and other such centralized/deferred learning practices. Informal networks, even where they exist and operate at the level of the organization, cannot incorporate the learning of members of a project team who are now working for other organizations as contract labor. The assumption that core project team embers and particularly technical experts are the only members of a project team to identify new ways of doing things (variation) or multiple possible ways of doing things (selection opportunities) is a kind of logic better suited to stable periods in terms of product markets and technologies. This logic is counterproductive as a basis for organization learning when hyper competitive conditions prevail in many markets within which our project based firms operate and markets which they themselves describe as changing rapidly and discontinuously.

CONCLUSIONS

There is a world of difference between the quantity of practices organizations have in place to promote learning, and the quality of those practices. We have described the relative balance between practices for promoting variation, selection and retention, and shown that most attention is paid to retention practices. These are the same practices that tend to defer learning to future time periods (project *end* reviews, *after* action reviews) and centralize the outcomes in databases, Intranet, procedure manuals, etc. When time pressures pervasive in project based organizations are considered, we conclude that the quality of efforts to nurture project based learning, within project teams, and ensure the transfer of learning to the broader organizations, are poor. This conclusion will, we suspect, come as no surprise to the organizations participating in this study. It is a dilemma and concern pointed out by a great number of respondents

We believe an increasing number of project based firms are encountering the dual pressures of upgrading their efforts from volume to value production, generating customer intimacy and tailoring their efforts to generating solutions that are genuinely valuable for clients. However, clients and these organizations seem to collude in a game where learning is the main loser. In a buyers market, clients demand speed, flexibility and responsiveness at a more and more intense level. Organizations respond by trying to beat their competitors by being faster and faster with bids, with designs, and with project plans that look impressive on paper but when it comes to implementation, are underpinned by the illogic of wheel reinvention on a large scale. Under these time pressures, project teams deliver and deliver and deliver without reflection. And without reflection, there is scarcely time to discuss, capture or share learning experience that might, in the future, yield genuine value for clients and process and product improvement for project based organizations. Thus, the old adage, less haste more speed seems a relevant message but one falling on deaf ears. This quote from one of our respondents is insightful and captures a very fundamental issue to emerge from our study:

> The pressures of global hyper-competition are ruining the basic social bonds that make it possible to deliver good projects….[we] get moved around so much trying to meet our clients expectations so much so that we lose touch with the people we knew, and can learn from, because there is no time to talk. With all these emails and Intranets there's no time to talk. It worries me, worries me very much.

Time pressures and short-term contingencies continually take precedence. Time for reflection is impossible in an environment when 'more than full time' work weeks are very common; when new projects begin before current projects are fully disbanded; where key personnel are allocated; where the pressures of competition are destroying the social bonds that make trust and learning possible.

Our final analysis is that learning continues to evade project-based firms. There is some evidence that some companies are trying to overcome this (for example, by making learning a priority for project managers and evaluating them on learning outcomes). But the overwhelming trend is for short-term pressures to drive out space for reflecting, conversing, experimenting and team based learning. The plethora of

practices for centralized capturing of learning (manuals, databases, lesson learned databases, international centers of excellence) may indeed detract from the lack of organic learning and satisfy learning enthusiasts with the quantity of initiatives going on. Our respondents are clear: quantity does not equal quality. These same practices are the very practices not being utilized for the same reasons that learning is prohibited on projects: time pressures, a lack of real decentralization and the constant deferral of learning due to the privileging of future retention of emergent, localized learning practices.

Table One: Organizations taking part in the study.

Company Name	*Country*	*Company Type*
Ericsson	Netherlands	Supplier of bespoke intelligent networks to the telecommunications industry, design and installation
STS	Netherlands	Research company developing novel equipment for the computer industry
Pink Elephant	Netherlands	Information systems consultants
ABN Amro IS Division	Netherlands	Internal department delivering information systems solutions to a bank
Arcadis Bouw/Infra	Netherlands	Engineering procurement and construction contractor in the building, railway and infrastructure industries
Ballast Nedam	Netherlands	Engineering procurement and construction contractor in the building and infrastructure industries
Raytheon Engineers and Constructors	Netherlands	Engineering procurement and construction contractor in the oil, gas and petrochemical industry.
Fluor Daniel BV	Netherlands	Engineering procurement and construction contractor in the oil, gas and petrochemical industry.
ABB Lummus Global	Netherlands	Engineering procurement and construction contractor in the oil, gas and petrochemical industry.
ABB	Austria	Engineering procurement and construction contractor in the power generation industry, (combined cycle power station)
ABB	Sweden	ABB Management Consultants Centre of Excellence Projects
ALWO A G	Switzerland	Designer of Precision Tools/Virtual Factory Member

Unisys	Austria	Supplier of computer equipment and bespoke information systems solutions
Unisys	UK	Supplier of computer equipment and bespoke information systems solutions
British Aerospace Defence Systems	UK	Supplier of bespoke electronic systems to the defence and other industries
Reuters	UK	Supplier of business and financial data products
British Telecom	UK	Communications and data network operator
Postal State Data Centre	Norway	Supplier of bespoke information systems solutions to the public sector
University of St Galen	Switzerland	Established the virtual factory, comprising 30 companies from Germany, Austria and Switzerland around Lake Constance.

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