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Relations between Communities of Practice and Innovation Processes

The paper makes an empirical and theoretical contribution to the innovation literature by both examining case study evidence from a number of technological innovation projects, and reflecting on the relationship between innovation processes and communities of practice. It is concluded that this relationship is not unidirectional. Not only did the communities of practice influence the innovation processes, for example through shaping important knowledge sharing processes, but the innovations also impinged on organizational communities of practice in important ways. The paper also proposes ways in which the analytical utility of the community of practice concept can be improved, for example by taking greater account of potential negative effects that communities of practice can have for innovation processes.

1. Introduction

The "communities of practice" concept to analyze the implementation of IT based process innovations in a number of case studies, and suggests that it has the ability to provide fresh insights into the dynamics of innovation processes. The socio-technical perspective conceptualizes the implementation of technological innovations as involving the blending and synthesis of new knowledge and artefacts with existing organizational practices, artefacts and knowledge (Clark & Staunton, 1989; Mc Loughlin, 1999). Thus if, as the communities of practice literature suggests, organizational communities of practice both shape the structure of the organizational knowledge base, and represent important reservoirs of organizational knowledge, they have the potential to play an important role in the implementation of technological innovations.

The relationship had two primary objectives, to empirically and theoretically examine the links between innovation processes and communities of practice. The empirical objective is addressed through utilizing case study evidence from a number of companies. The data used is drawn from longitudinal, qualitative studies of comparable innovations in seven case study companies. While the companies examined are from a range of countries, and sectors of activity, the focal innovation in each organization was similar: all the case companies researched were attempting to implement IT based, multi-site, cross-functional management information systems.

The theoretical objective is achieved by reflecting on what the empirical data presented says about the way innovation processes and communities of practice are linked, and the general way that the community of practice concept requires to be modified and reconceptualised to make it a more useful analytical tool. This is important, as while the terminology of "communities of practice" has been become widely used, it still remains a relatively poorly developed concept. Issues which arguably require to be more effectively addressed include: taking greater account of the difficulties involved in sharing knowledge between different communities of practice; and more fully taking account of the potential negative aspects of communities of practice. Such analyses are required as too much contemporary writing on communities of practice focuses narrowly on their benefits and advantages.

2. Theorization on communities of practice and innovation processes

The communities of practice concept is based on two central premises: the activity based nature of knowledge/knowing, and the group based character of organizational activity. The development of an activity based view of knowing in organizations, what Cook and Brown refer to as an "*epistemology of practice*" (1999), has been developed to overcome what are regarded as the limitations of traditionally static, objectified views of knowledge. While traditional, static views of knowledge are based on a dichotomy between thinking and doing, in stark contrast, the activity based perspective suggests that this represents a false separation. Thus thinking and doing are fused in knowledgeable activity, the development and use of embodied knowledge in undertaking specific activities/tasks. Secondly, these organizational activities are typically social/ communal activities. Barnes (1977, p. 2) provides a concise summary of this idea in the following quote,

D. Hislop

> *"knowledge is not produced by passively perceiving*
> *individuals, but by interacting social groups engaged in*
> *particular activities. And it is evaluated communally*
> *and not by isolated, individual judgments."*

Fox (2000, p. 854), and Contu and Willmott (2000, p. 272) reinforce this when they define communities of practice, as, respectively, a group of people involved in a shared practice, and a community which reproduces its knowledeability through common, collective practice. Thus activity is embedded in the particular social-occupational-functional groups that people work within. Knowing and working are therefore, ultimately social processes involving an ongoing interaction among individuals working within the same context, or addressing similar issues. For example, DeFillippi and Arthur, in a study of film production showed that for apprentice technicians processes of learning by watching were crucial. Also, Brown and Duguid (1991), drawing heavily on Orr's (1990) study of photocopy repair engineers, also showed how knowing was an ongoing, development process, based in engaging with day to day, practical tasks.

Based on such insights Baumard defines a community of practice as a, "*community of practitioners within which situational learning develops*", which results in the community developing, "*a system of relationships between people, activities and the world*" (1999, pp. 209–210). Communities of practice thus typically possess three primary characteristics. Firstly, participants in a community possess a stock of common, shared knowledge. Secondly, communities typically also develop shared values and attitudes. Finally, and equally importantly, participants/members of communities also possess a sense of collective/group identity (Brown & Duguid, 2001). The relationship between communities of practice, and the implementation of innovations is potentially of great interest for a number of reasons. Firstly, the communities of practice which exist in organizations are likely to influence the implementation process. The socio-technical perspective considers the implementation of technological innovations as involving the mutual adaptation of the technological system being implemented, and the organizational context within which they are being introduced. From this perspective the integration of knowledge represents a key element of these processes, typically involving the customization of "new" knowledge and artefacts and their integration with existing organizational structures, practices and knowledge (which will themselves require some level of customization). Thus, if communities of practice both shape the distribution of knowledge in organizations, and are important reservoirs of knowledge, the specific character of an organizations communities of practice may significantly influence the dynamics of technological implementation processes. Dougherty (2001), for example, suggests that one of the defining characteristics of successful innovating organizations is their effective cultivation, use and support for organizational communities of practice.

Another reason for examining the relationship between innovation processes and communities of practice is that the relationship between them is likely to be two way, and not simply unidirectional. Thus not only will an organization's communities of

practice influence the nature of innovation processes, but the changes being implemented may also have implications for the communities. Lave and Wenger (1991, pp. 113–117) suggest that there is likely to be tensions and contradictions within any community of practice between continuity and change, i.e. between the sharing and utilization of existing practices / knowledge, and the evolution, development and ongoing modification of these practices. The implementation of technological innovations such as those examined thus represent a potential discontinuity impinging upon the practices, knowledge and norms of existing communities of practice.

Finally, the community of practice concept can also supplement and enrich our understanding of the dynamics of innovation processes through providing a new analytical concept with which to more fully understand behavior during the implementation of innovations. Thus, for example, while issues such as the dynamics of inter-functional and business unit relations are well developed in the mainstream innovation literature, the community of practice concept provides a potentially useful extra dimension with which to characterize and explain these dynamics.

3. Organizational context: organization-wide innovations, fragmented knowledge, and multiple communities of practice

The character of the organizations and innovations which are examined, outlining their cross functional, multi-site character, and concludes by outlining the range and types of community of practice which are affected by, and involved in the change projects examined. The data presented is from seven detailed longitudinal case studies, all of which were implementing similar, standardized, cross functional, multi-site information management systems. Each company was visited at least twice (typically there were 3– 4 visits per company), with visits occurring over a time period of between one year and 18 months. The focus of the research was on the progress and dynamics of the implementation projects described, with the longitudinal nature of the research allowing each implementation project to be followed over a number of stages. The source of data in each of the companies was semi-structured interviews with a range of project, and general management representatives.

Table 1 lists the general characteristics of the case companies, the innovations examined, and the number of sites involved in the changes.

Table 1. Organization and innovation characteristics.

Company	Company Details	Innovation Type	International Project	Number of Sites Involved in Innovation Project
UK-Cast	UK base International specialist castings and injection mouldings	ERP System (Enterprise Resource Planning)	Yes	12
UK-Pharm	Specialist, international pharmaceuticals corporation	ERP System	Yes	4
UK-Pen-Gem	UK Pension and life assurance company	Sales Automation Tool	No	60
UK-Pen-Swin	UK Pension and life assurance company	Telephone Service Centre	No	10+
France-Connect	French. mechanical connectors	ERP System	No	6
Neth-Bank	Dutch based, international bank	Intrane	Yes	100+
Swed-Truck	Swedish based, international fork lift truck company	ERP System	Yes	11 divisions (20+ sites)

4. Conclusion

One issue, worth briefly commenting on is the organizational context to the focal innovations. In all seven companies, the stated managerial objectives from their innovation projects were extremely similar and were concerned with the closely inter-related objectives of improving co-ordination levels (between sites, functions, business units), and/or developing greater levels of standardization.

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