

KNOWLEDGE NEEDS ANALYSIS FOR E-COMMERCE IMPLEMENTATION:

People-centred knowledge management in an automotive case study

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Abstract: A UK car manufacturer case study provides a focus upon the problem of aligning transactional information systems used in e-commerce with the necessary human skills and knowledge to make them work effectively. Conventional systematic approaches to analysing learning needs are identified in the case study, which identifies some shortcomings when these are applied to electronically mediated business processes. A programme of evaluation and review undertaken in the case study is used to propose alternative ways of implementing processes of developing and sharing knowledge and skills as part of the facilitation of networks of knowledge workers working with intra and inter-organisational systems. The paper concludes with a discussion on the implications of these local outcomes alongside some relevant literature in the area of knowledge management systems. This suggests that the cultural context constitutes a significant determinant of initiatives to manage, or at least influence, knowledge based skills in e-commerce applications

1 INTRODUCTION

Social practice acts to develop and apply appropriate knowledge and skills to make e-commerce work as a total socio-technical system in unique business contexts. A knowledge management consultancy case study project with a UK car manufacturer, referred to here as 'Carco', shows how conventional approaches to skills needs analysis (SNA) were found to be deficient for the organisational needs at a time of accelerated adoption of electronic commerce systems throughout the organisation. The paper then describes the progress and outcomes of some facilitated workshops that sought to integrate quality processes as part of an enhanced SNA process. A discussion then focuses on how far contextual factors such as departmental culture appear to determine processes of intellectual capital development through facilitated processes of applied knowledge management.

2 CARCO COMMERCIAL SYSTEMS DIVISION

During the early 1990s the Commercial Systems Division (CSD) of Carco, a UK car maker, supplied information system development expertise in sales, marketing and financial areas developed new business objectives. One was to improve their in-house ability to manage expertise sourced from their Associates, as employees were referred to within Carco. Another was to provide competitive advantage through e-commerce technology. By the mid 1990s much of the e-commerce technical infrastructure was in place. However, one of the most serious issues constraining expansion concerned the matching of personnel with appropriate process knowledge and skills to new e-commerce roles.

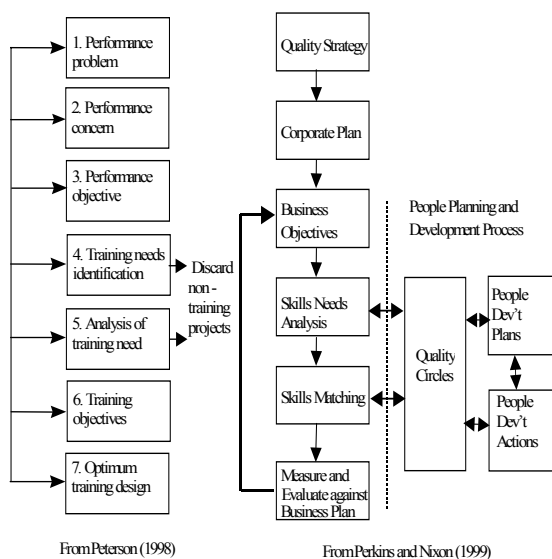


Figure 1: Comparison of two processes of SNA

3 THE SKILL NEEDS ANALYSIS PROJECT

The process for identifying skill shortages at this time was embedded in individual annual performance reviews that all employees undertook with their line manager. A similar model is often used for training analyses. Peterson (1998) explains such a process when she identifies seven key stages in training needs analysis that can be used to represent the contemporary process at Carco. These traditional stages are shown in the left side of figure 1.

Performance concerns at CSD involved the division's ability to deliver information system projects through the use of a range of contractors. Skills classifications at Carco had traditionally been categorised as either 'technical', which included competence in the use of software packages or 'management'. Training needs identification was the process designed to detect and specify training needs at individual and organisational levels. They were analysed on a corporate divisional basis to arrive at an overall view of current divisional skills.

The analysis of training needs was the process of examining these needs to determine how best they might be met. The ultimate purpose was to match the skill deficiencies found in CSD with programmes of development already in existence within Carco. Much of this took place within the normal Personal Profile Development (PPD) used within Carco. Training objectives identified specific skilled performance that should be achieved by the

trainee at the end of the training. According to Peterson, this systematic process of analysis and design leads to the final stage of optimum training design.

The introduction of three critical projects led to a need for a rapid approach to staffing these new technology platforms. The skills analysis process described above was seen to lack sufficient responsiveness in this new context. The hybrid skills identified as necessary for much of the new e-commerce project were to depend upon lateral communications and structured through human and technological networks. As a result a joint project was launched to develop improved means of managing skills. The project was known as New Skill Needs Analysis (NSNA). The deliverables of the project involved the definition of the core skills for each grouping within CSD, the collection of actual skills data for each of the 39 CSD Associates, establishment of skill requirements deriving from business plans and Personal Development Reports (PDR) identification of gap (if any) between skills required by business tasks and actual skills and the recommendations of how to fill these skills gaps.

The right hand diagram in figure 1 shows the process used for the revised SNA. The next sections explain how this process worked.

The quality strategy included empowerment of Associates, seizing business opportunities and bringing about continuous improvement in all aspects of corporate endeavour. The corporate and divisional plans set targets to achieve the overall business strategy. Carco set out to maximise the potential of its human resources and to leverage this human resource with information and communication technologies applied to supply chain management. The NSNA project was to identify skills and knowledge necessary to enable planned projects and to evaluate how far skills currently existed among Associates (Perkins and Nixey 1999). The right hand diagram in figure 1 shows the general process which used four sets of matrices showing the types of skills necessary for critical job roles in e-commerce, the level of competence required for these skills, the level of competence currently in place for a range of skills in a specific role and this competence information presented by the individual in that role (the 'postholder'). This, in turn, was categorised as 'Grade' i.e. the competence level required, 'Post' i.e. the competence required as defined by the postholder and 'Held': the actual level of competence held by the postholder. The measurement of competence levels for identified skills used a scale developed during the workshops. This scale was coded 0 (competence not required) to 3 (expert).

Workshops were set up at this stage to measure and evaluate the skills needs identified against the business plan. It was during workshops at this stage that skills that had previously been taken as well understood were recognised as being in need of much more analysis to be of practical use for effective training or focused recruitment. In considering means by which the emerging skill gaps might be closed, proposals emerging from Associates revolved around the use of short apprenticeships, shadowing and mentoring. Alternative proposals involving the use of external analysts to conduct concentrated studies of practice were met with less enthusiasm by the Associates. As a result of this some expert practitioners in key skill areas launched initiatives involving mentored apprenticeships of Associates for skill development mediated by skill councils, effectively communities of practitioners in identified e-commerce skill areas such as deal negotiation, technical troubleshooting and new business development.

4 DISCUSSION

The project began as a HRM exercise, but it became clear that the practice of conducting business between people connected by technology networks provide a new level of complexity. To address this, the project became much more oriented around skills analysis, intellectual capital development and knowledge management.

Some lessons quickly emerged. There was a heritage for treating skills as either management or technically oriented. The need to deal with skills that blended both of these categories meant that existing language relating to skills became irrelevant and often misleading (Dingley and Perkins 1999). The processes of developing ways to use the technical infrastructure were part of everyday work within the small communities of Associates who were normally members of quality circles (Chourides 2003). This was where authentic practice was recognised and where appropriate skills were developed and passed on to newcomers to the community (Lave and Wenger 1991). The requirement for rapid implementation of the three e-commerce projects at the time imposed urgency. Trial and error became the main way of developing expertise. The original quality circles were used as support groups to guide and protect Associates. This was essentially a mechanism for embedding intellectual assets in to these artefacts of e-commerce, as described by Snowden (2002).

Using Blackler's typology (Blackler 1995) embedded knowledge in this case study was located

in the systematic routines within the structure of the e-commerce platform that comprised application software with the developing practice of a small community of Associates. Embodied knowledge was located in action, 'know-how' and problem solving that depended upon intimate knowledge of the operating situation rather than abstract rules. This was evident in some of the expert e-commerce practitioners. Encultured knowledge was located in the language of shared understanding resulting from people working closely together. It was this area that was most problematic to Carco because the constantly shifting boundary of participants acted to form a wider operating community linked by a technological network. Encoded knowledge involved the transmission of decontextualised data instructions as well as Carco codes of practice and instruction manuals.

In these terms, the NSNA system at Carco provided effective intervention to manage, or at least, influence the development of embedded knowledge to provide greater embodied knowledge to the Associates. The existence of encultured knowledge was recognised and reified in Quality Circles. However there was little use made of it as a mechanism for recognising necessary skill bases. The success of the NSNA project paradoxically was gained by allowing the influence of encoded knowledge – the technical versus managerial divide maintained in all codes of practice – to decline. It was to be replaced by encultured knowledge through the increasing influence of the developing professional community of e-commerce workers, originally through their quality circles. These groups developed into a council that had much greater influence as the determiners of skill, skill gaps and tactics to close them.

Impact assessment in November 2004

Since 1999 Carco has undergone further changes of ownership. This period has seen further increases in competition and increased pressures to innovate in operation and design alongside severely limited access to capital investment. In their annual accounts published in October 2004 Carco declared a loss of £70 million, but pointed out that this was 10% of the loss recorded in 1999 and looked forward to international collaborative projects to close this trading gap in the following year.

During this period the division had been reorganised and restructured, but the cultural movements towards a more distributed approach to skills needs recognition and process knowledge management are recognisable in studies of recurrent practice in Carco's commercial operations.

5 CONCLUSIONS

A single instance of skills management in e-commerce has been used to illustrate some of the dynamics of how organisational context can influence the implementation of what are often seen as primarily technical systems. The principal outcomes are firstly that the categorisation of knowledge types provides an alternative and useful reorientation to traditional ways of thinking about how specific organisation contexts might constrain e-commerce and other technology project development. Secondly, skills are often not generic. In this case they were highly specific to a particular set of operating conditions. In these circumstances a new taxonomy of skills need to be constructed by those who have access to encultured knowledge necessary to socialise and externalise this tacit knowledge (Nonaka et al 2000).

Returning to the point made at the beginning of the paper, this case study illustrates the rapidly changing context of modern business, where e-commerce is employed. Critical success factor in e-commerce involves the people who develop and use it, the knowledge and skills that they can individually bring to these systems and the extent to which they can form communities that cope with needs to change practice. But it is not sufficient to simply agree this as a corporate policy – its implementation needs to be a fundamental and integral part of an e-commerce strategy, and dedicated processes and procedures need to be developed to provide such implementation. The centrality of real-world working practice and associated knowledge in developing communities provides a starting point for what might be called knowledge, or k-Commerce. The approach is more generally supported by work in social practice theory, especially in the area of informal learning (Eraut 2000).

There is considerable research work needed in this area. There is some interesting work taking place in the field of social practice theory, which focuses on the study of work culture through the analysis of professional practice. This provides a reorientation of knowledge as an objective resource into 'knowing' as attribute of doing work. This paper makes a small contribution to this work but more research is needed, applied to specific instances of e-commerce and broader socio-technical practice.

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