Chapter Five: A theoretical framework of creative knowledge work (3748 words)

Introduction

This chapter presents the final stages in the development of a distinct theoretical framework to investigate creative knowledge work and workers, drawing on the previous three theoretical chapters and an inter-disciplinary and relational approach.

Knowledge work themes

Three major themes relating to knowledge work were identified in Chapter Three. The first related to an individualist manner of working where workers applied their cognitive abilities and creative personalities in the areas of science, technology or culture industries to invent or discover new possibilities e.g. a medium, product or service. The second theme noted that workers through the application of their education and training (possibly post qualification and related to an understanding of abstracted data generated by information technology systems), and work experiences, determined what was the best option available to them to improve work processes. The third theme was concerned with the need for collaboration by creative workers and investigated organizational settings where knowledge work occurred. Collaborative creative work, it was noted, involved both highly educated and skilled participants with a variety of different skills and attributes, who collaborated as a team and shared and used their collective knowledge to create innovative products and/or services.

Creativity themes

In the previous chapter, two prominent themes emerged: a) workers and their skills, abilities and attributes involved in creative knowledge work, and b) the types and degrees of enculturation. The first theme related to workers who use their skills and talents in varying degrees in a collaborative work context and this was accentuated by the relationship between genetic heritage and socio-cultural environments. The second theme identified was "enculturation" (Gardner, 1993, p. xx), two main approaches were distilled: a) a supportive ICET environment was critical particularly where artefacts (e.g. software programmes) had a crucial role to play in supporting the creation of innovative goods/services, and b) positive life conditions/experiences such as a supportive home and work environments as well as a facilitative academic work contexts (e.g. with accessibility to current social knowledge) as enabling creative work to be produced and acknowledged.

Connections between the themes

The themes from the Chapter Three on knowledge work and Chapter Four on creativity are discussed below to emphasize the connections in terms of similarities and differences between writers. These connections will lead on to the development of a conceptual framework of creative knowledge work in this chapter.

The first connection refers to supportive environments that facilitate the enculturation of workers into established and/or new routines and workplace practices (Gardner, 1993, p. xx-xxi). These supportive environments relate to education, training and work, and life experiences. The key issues that arose from Chapter Three were: the value of

training after highly educated technologists are qualified (Drucker, 1993); the value of re-training to informated workers (Zuboff, 1988); the critical importance of providing a supportive and constructive work environment where tacit knowledge (gleaned from work experiences and perspectives) can be shared to facilitate innovative activities (Nonaka and Takeuchi, 1995); and the significance of providing a supportive home environment to facilitate creative activities (Reich, 2001).

Turning to Chapter Four, the creative activities of knowledge workers reflected the following perspectives, which ranged from: the necessity for a unique combination of intelligences (Gardner, 1993, p. xx-xxi); the identification of supportive life experiences such as "learned cognitive flexibility, motivation and rare event in life", the notion that failing is not a negative but rather a learning experience, conformity was not always necessary, the confidence and courage to pursue ideas/activities was very important, as was the self-belief that one could alter one's attitude to life (Csikszentmihalyi's, 1988, p. 330). In addition, workers required a supportive working digital environment, which was created through assistance from their fellow collaborators in the creation of innovations goods/services (von Hippel, 2006).

The new perspectives that emerged from writers discussed in Chapter Four, included: the interaction of supportive life conditions/socio-cultural environments together with genetic heritage so that creative knowledge work can be carried out (Gardner, 1993; Csikszentmihalyi, 1988); the importance of a supportive ICET environment (e.g. where artefacts such as software programmes play an important role) in the innovation of products and services (von Hippel, 2006).

The other identifiable connection between the themes of knowledge work and creativity related to workers' application of their cognitive skills, talents and personalities, which are used individually (Chapter Three, Drucker, 1999; Zuboff, 1988; Reich, 2001 and in Chapter Four, Gardner, 1999; von Hippel, 2006) or collaboratively (Chapter Three, Nonaka and Takeuchi, 1995 and in Chapter Four, Csikszentmihalyi, 1988; Sternberg et al., 2004; von Hippel, 2006).

The individuals who applied their cognitive abilities in their work activities differed in styles: the technologists used theoretical knowledge to implement their work with the assistance of technologies (Drucker, 1999); the informated workers applied past work experiences and utilized abstract IT data (Zuboff, 1988) to determine cognitively the best available process option for product development/improvement; and the creative workers used their creative personalities to identify and solve problems in specific media contexts to create innovative products (Reich, 2001). Whilst some creative workers applied their cognitive abilities to ask new questions and seek novelty in the manufacture and development of new ideas/products (Gardner, 1999), other used their cognitive abilities towards the innovation of new products in a digital media platform (e.g. on the Internet) (von Hippel, 2006). Chapter Four distinguished new perspectives on creativity in the context of cognitive abilities. The first included the posing of new questions and the seeking of novelty (Gardner, 1999, p. 45) through a combination of the workers' "genetic inheritance and life conditions" which occurs via socialization, or "enculturation" (Gardner, 1993, p. xx-xxi). The other perspective related to users/consumers and producers who worked collaboratively towards a new product mediated by advanced technologies (von Hippel, 2006).

In the context of collaborative style of working, which generally occurs in commercial and digital environments, the different aspects include: collaborating during social activities (such as drinking outings), cultural work settings (as in the case of Japanese business organizations) (Nonaka and Takeuchi, 1995); and the combination of a three-dimensional framework of individuals, domain and field carry out collaborative work, which can be external to the business organization (Csikszentmihalyi, 1988). In addition, there are leaders who operate in business organizations by persuading, convincing and motivating workers to execute their vision for the improvement of the financial prospects of their employer companies (Sternberg et al., 2004) and those workers who collaborate via digital media as on the Internet (von Hippel, 2006). In terms of new perspectives from Chapter Four on creativity in relation to knowledge work, these include: collaborative work covering different settings outside the corporate environment and interactions with experts in their fields (Csikszentmihalyi, 1988); and workers collaborating on a digital dimension where geographical or organizational locations are irrelevant (von Hippel, 2006).

From the psychologists' points of view, the individual style of working (Gardner, 1999) and the collaborative style of working (Csikszentmihalyi, 1988) focus on the relationship between genetic heritage and socio-cultural environments. This nature and nurture debate may be perceived differently where the mind is merely as a 'toolkit' and culture "shapes the mind" (Bruner, 1996). This expansive notion of 'culture' may be linked to the discussion of 'context' in relation to knowledge work (in Chapter Three) to invoke the differing social conditions. This expanded relational link is discussed with reference to the definition of "context" (Chaiklin and Lave, 1996) in relation to the primary argument of this study. It was argued that "context" involved sociological forces around temporal dimensions for instance work conditions, media types, qualifications, and life experiences. This was connected to a sense of movement between contexts in relation to creative knowledge work (Cole, 1996). The above notions of context may also be applied to the definition of knowledge where relevant knowledge is applied to specific work contexts or where knowledge is re-contextualized to fit the specificity of the work.

In investigating the connections from the themes from Chapter Three on knowledge work and Chapter Four on descriptions of creativity and knowledge work, terms such as 'individual' and 'collaborative' styles of work, and 'contexts' were used to describe the similarities and differences in the research of different scholars. These concepts are viewed in relation to each other and the implications of this in relation to the principle question under consideration in this study will be discussed in Chapter Ten. The above provides a foundation towards the overall development of the theoretical framework utilized in this research. The framework is examined in the next section with an illustration in Figure 1. A summary is provided in the third section.

A theoretical framework of creative knowledge work

This section presents a fully developed theoretical framework, drawn from the investigations described in previous chapters. Accordingly, the first part of this section, describes the framework as a two dimensional matrix (Figure 1, see below), which features the boundaries of the framework. The horizontal dimension focuses on working styles: which include both individually or collaboratively styles of applying

knowledge creatively by individuals who utilize their previous experience, relevant skills, abilities, and attributes. The vertical dimension is dependent on context, which can be single or multi-contexts. Context has a more dynamic meaning, for the purposes of this investigation, and it includes sociological forces around the nature of working carried out by people such as: temporal dimension, work conditions within and outside an organizational structure; a medium such as a discipline, area, specialism, or sector; using technology; and (academic and non-academic) qualifications and other life experiences that are required for knowledge work. A single context approach refers to people working in one context as described above. A multi-contexts approach may refer to working in or with more than one contexts i.e. multi-contexts and/or cross over of more than one contexts i.e. inter-contexts.

It may be pointed out that the dimensions are fluid and dynamic and indeed any location on a dimension such as working style is merely estimation along that spectrum. Located in each of the quadrants of the framework are: a) work approaches (from Chapter Three) and b) descriptions of creativity in relation to work (from Chapter Four). The next part explains each of the quadrants in the framework.

<FIGURE 1. HERE>

Description of the quadrants
The first quadrant from the top left hand corner (Figure 1) indicates an individual working in a single context. The relevant work approaches associated with this quadrant

are an 'informated worker'. The informated worker applies intellective skills and draws on job experiences both previous and current, discipline-related knowledge and a level of understanding of the abstracted data generated by the information technology system of the company. A combination of these together with training is required for the informated worker to make quality decisions with regard to the most appropriate process option.

Another type of knowledge worker: the 'technologist' applies scientific-based knowledge, or theoretical knowledge to knowledge work such as a surgeon who applies theoretical knowledge to study the requirements and operational activities before the operation and then uses hand-operated skills to perform precise and repetitive actions at different speeds to complete tasks. Technologies used before and during the operation assist the surgeon. The acquisition of discipline-based knowledge (in the disciplines of science and technology) and hand-operated skills continue after the acquisition of professional qualifications.

Another group of workers: the 'creative workers' (e.g. 'geeks' and 'shrinks') are those who apply knowledge creatively and have distinct personalities, which facilitate their production of new goods. The former group of workers chooses to explore and develop new possibilities in a medium whereas the latter group anticipates consumers' wants and desires. The geeks' emphasis is on the product while the shrinks' emphasis is on the would-be-customer/user/consumer. The skills required of creative workers include asking, identifying, solving and brokering problems either in a particular medium (by the geeks) or with a particular group of people (by the shrinks).

Central to these creative knowledge workers is that they work in a medium (a single context) like IT software in a capacity as a software developer. In order to work creatively, they require different forms of knowledge, which they access through a high level of formal education to degree level (explicit knowledge) and a high level of informal education (tacit knowledge). The knowledge required by these creative knowledge workers is re-contextualized whether through their past experiences and/or advanced technologies in order to meet the specificity of the job. These creative knowledge workers require a combination of supportive and facilitative environments, which are provided by their families, access to learning at work, interactions with work colleagues and keen awareness of popular culture.

With regard to the creative descriptions of knowledge work that are associated with the first quadrant, there are two. The first relates to a person's realized potential in the form of seven types of intelligences. These multiple intelligences are realized by the 'socialization' process of domain and field where the outcome is given due recognition by experts through features such as advertising. An individual's creative act is viewed in terms of skills and abilities as a result of asking new questions and by solving problems and fashioning products in a single context, like a sector, which is accepted by experts. Examples of these workers may be the geeks and shrinks. Another example may be the informated worker. The choices made by this worker regarding the most efficient processing options available can be said to be innovative.

There is another example of the creative descriptions - opportunities for innovation - in this quadrant with the backdrop of increased access to and cheaper options of technologies such as laptops and Internet facilities. This approach is mediated using

technological artefacts in two ways: by finding ways, democratically, to elaborate and extend knowledge, and by combining and creating new products. Indeed, a user may innovate for commercial consumption if he/she finds that there is no product or service in the market place that performs according to his/her needs. This opportunity of innovation process marries with the roles of an informated worker, though arguably the two approaches are clearly not identical. While an informated worker uses abstracted data from IT systems and past job experiences in a supportive work environment to decide the best possible operational option, an 'innovative user' applies technology and existing know-how to create innovative products to fill a missing niche in the market.

The second quadrant relates to collaborative working in a single context. The approaches of knowledge work associated with this quadrant are those by 'operators and specialists' of the 'knowledge-creating crew', who are highly educated and skilled workers at the front line of a business organization. They accumulate, generate and update their knowledge. 'Operators' use their technical manuals as well as cognitive skills to provide feedback on determined issues in the workplace. A 'specialist worker' applies explicit knowledge such as codified technical and scientific knowledge and discusses the innovation with people within and outside the company with the aim of solving a common problem.

There are two descriptions of creativity in relation to knowledge work in this quadrant. The first views the creative phenomenon as an interaction between three systems of field (i.e. people who could affect the domain), domain (i.e. a discipline) and individual. The emphasis is on the importance of the 'symbol system of the culture' where a creative act (a change or variation to existing knowledge) is carried out using symbols in a specific domain or discipline. Here the domain is assumed to have the necessary knowledge for a person to understand and apply. The inclusion of symbols may be connected with the aesthetic sensibilities and branding as means of adding value to a product. The creative process must also be acknowledged by the relevant experts in the discipline. This form of interaction requires collaborative actions by the person engaged in or performing the creative act.

Knowledge workers who are involved in the innovative act include 'specialists and operators' who are part of a 'knowledge-creating crew' that has a defined vision to innovate a product.

Like in the previous quadrant, the description of creativity in relation to knowledge work operates against the backdrop of increased access to and more affordable options of technologies e.g. laptops and Internet facilities. Instead of working independently, the user innovator collaborates with like-minded users to find ways, democratically, to elaborate and extend know-how/knowledge, and by combining and coming up with new products/services.

As indicated in the first quadrant, there is a degree of fluidity between the quadrants. One possible example of such fluidity may be in the form of a geek who exchanges technical knowledge with similar users via the Internet to try and come up with an improved piece of equipment for a hobby.

The third quadrant relates to collaborative working in multi-contexts. This quadrant sees the work approaches by two members of the knowledge-creating crew: 'engineers

and officers'. An engineer would interface with the officer, who as leader provides a vision for a project or for the business organization, and also works with others such as operators and specialists. The engineer has to deal in multi-contexts of knowledge including the different organizational levels in order to convert a vision into reality. The essential skills and abilities include management and coordination of a project to bring about desired outcomes in keeping with the vision. The engineer needs to be highly trained and educated to a high level both academically and professionally together and also needs to be engaged in continuous professional training.

An officer not only has to provide a vision but should also possess skills of persuasion and understand how to use the knowledge and abilities of the team members. He/she needs to be able to rally and motivate them to be part of his/her vision and has the ability to pick the appropriate project leader. Furthermore, he/she requires the tact and diplomacy to be able to interact with others to gain their confidence and respect in order to actualize his/her vision. For an officer or leader, collaboration is an important aspect as well as understanding more than one context of knowledge and interacting in such a way that informs his/her vision. The officer also needs a high level of formal and informal education and training and an empathy with the current work culture in order that he/she can understand and relate to people from differing areas of the organization. He/she should also be able to relate to the external culture and differing contexts such as specialist areas and popular culture to ensure the sustainability of his/her vision.

There are three descriptions of creativity in terms of knowledge work in this quadrant. The essential difference in this quadrant is the multi-contexts dimension. In the case of a social system of field, domain and individual, a creative person like an engineer (from the knowledge-creating crew) may be working collaboratively in more than one context. In the case a leader (such as an officer), he/she may envision a project, which traverses several contexts such as mobile phone manufacturing, communication technologies (such as phone, e-mail, radio and visual screen) and services (such as online gaming, and apps). In the case of a group of innovative users, they might create a new piece of equipment for outdoor activities in the canyons, which would consequently incorporate knowledge from several sports like mountain climbing, abseiling and swimming. Again, as indicated in the second quadrant, the fluidity of other approaches of knowledge work and descriptions of creativity in relation to knowledge work, which may not readily be associated with this quadrant, can occur. A possible example may be a geek (creative worker) who collaborates with other 'innovative users' to produce a new piece of sporting equipment for canyoning.

The final quadrant in figure 1 relates to individual working in multi-contexts. The work approaches utilized here may be those suggested by 'technologists' or 'geeks' and 'shrinks' as discussed in the first quadrant. A technologist such as a rehabilitation technician may be involved in multiple contexts such digital simulation of human movement. A geek creative worker for instance may be involved in creating a product such as a tablet computer (e.g. iPad), which requires knowledge of multiple contexts relating to hardware (e.g. connectivity, screen and input and storage), and software (e.g. audio-visual media). A shrink on the other hand may be involved in ascertaining the needs and wants of people, such as travel information across more than one context such as digital and non-digital media, and travel-related information in areas of geography, leisure, entertainment, travel, accommodation and politics.

There are two related creative descriptions in this final quadrant: multiple intelligences and closer creative workings between producers and users. The first creative description includes individuals (using their multiple intelligences) who work primarily on their own to create a new product, using their creative skills and talents (and 'encultured' by societal factors), which expand over multiple platforms or contexts. An example of this description may be a shrink working on her/his own and uses her/his intelligences and skills to come up with an idea for a product. An example of such a product is an iPhone, which combines facilities such as phoning, e-mailing, web browsing, searching and displaying of maps and apps availability. Alongside these capabilities, the product has technologies relating to multi-touch interface and software[1].

Summary

This chapter explained the development of the theoretical framework of this research. It was informed by the various approaches to knowledge work (from Chapter Three) and the creative descriptions (from Chapter Four). The framework has two dimensions namely: individual and collaborative styles of working, and these operate and are applicable in both single and multi-contexts. Each of the quadrants in the framework was explained in relation to the appropriate approaches of knowledge work and descriptions of creativity in relation to knowledge work.

So far, a generic approach of creative knowledge work based on the theoretical chapters has been investigated. However, this investigation, through the use of empirical data, will offer evidence and discuss in the empirical chapters of six to nine and the final chapter the micro level of creative knowledge application. In particular, the intra- and inter-sectoral creative knowledge work and creative knowledge application, which impact on working cultures/practices, will be investigated.

This study offers an innovative and more nuanced understanding of creative knowledge work and by so doing, answers the research questions on the ways knowledge work are understood by key actors in different sectors and the necessary contexts for creative knowledge work.

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[1] iPhone (2007) Apple website. [Online]. Available at: http://www.apple.com/uk/iphone// [Last accessed 19th September 2007].