Aligning KM Initiatives with Business Strategy

Helen Hasan

School of Economics and Information Systems
University of Wollongong, Wollongong 2522 Australia
Tel: 61 2 42213757, Fax: 61 2 42214474, Email: hasan@uow.edu.au

ABSTRACT

This paper describes a case of knowledge management activity from the strategic view of the organisation. It describes a case involving the evaluation of performance on strategic objectives. An analysis is made from the perspective of an activity system going through cycles of expansive learning. The performance assessment is qualitative rather than quantitative in nature so that results of such holistic assessment can be used creatively to improve performance through innovation and adaptation.

Keywords

Knowledge management, business strategy, alignment activity theory

1.0 INTRODUCTION

Knowledge in organisations can reside at four levels: the individual, the group, the organisation and the inter-organisational domain (McAdam & McCreedy 1999). While it is important to consider knowledge residing at all four levels, in this paper the emphasis will be at the organisational level. The strategic approach to organisational knowledge management will no doubt include the management of knowledge at the levels of individuals and groups within the organisation, as well as knowledge, which crossed the organisational boundary from customers, suppliers and competitors. However, as business strategy is usually driven from the senior organisational executive, this paper will focus on knowledge from a strategic organisational perspective.
In order to study entities such as organisations, which are so varied and complex, the author has chosen to use a framework based on the Cultural-Historical Activity Theory. It is worth reiterating that several research teams have successfully applied an Activity Theory framework to areas such as organisational theory (Blackler 1993), organisational learning (Engestrom 1999), organisational memory (Kuutti & Virkkunen 1995) and organisational sense-making (Hasan 2000). This paper will extend this work into knowledge management and its relationship to business strategy and organisational performance.

The paper will review of the concept of an 'activity system' and relate it to organisational knowledge management highlighting its holistic, contextual, systemic and dynamic nature. This leads to a comparison of Engestrom's cycle of expansive learning with Nonaka's KM cycle (Nonaka & Takeuchi 1995). A case study, involving the application of knowledge management to business strategy in tertiary education, will then be presented and analysed as an activity system exhibiting this expansive learning cycle. It is proposed that this case is an example of a generic knowledge management activity in most organisations, i.e. the evaluation of performance on strategic objectives that are qualitative rather that quantitative in nature and the use of the resulting evaluation to improve performance through innovation and adaptation.

2.0 ACTIVITY THEORY

2.1 Activities

Activity Theory is based on the notion that human activity is a dialectic relationship between subject (person) and object (purpose), where this relationship is mediated by "Instruments", or "Tools", (artifacts, language, ideas, models) and the "Community" (context, environment, culture) which defines the rules and roles within which the subjects act (Figure 1). Individual or group interpretations of the meaning and potential of these mediators stimulate the need for strategic decision making about the form of activity. The perceived "object" of an activity can also be subjective, depending on the point of view, and distinct from its observable outcomes.

According to Kuutti (1996) Activity Theory is a philosophy and cross-disciplinary framework for studying different forms of human practices and offers a set of concepts, structures and terms that are eminently suited to research undertaken within communities of practice. Blackler (1993) eloquently describes his reasons for adopting an Activity Theory approach by stating that it offers a way of synthesising and developing various notions of knowledge, organisations and management and it deals with the messy problems, encountered at the strategic level in organisations, by attributing significance to incoherency and dilemma.

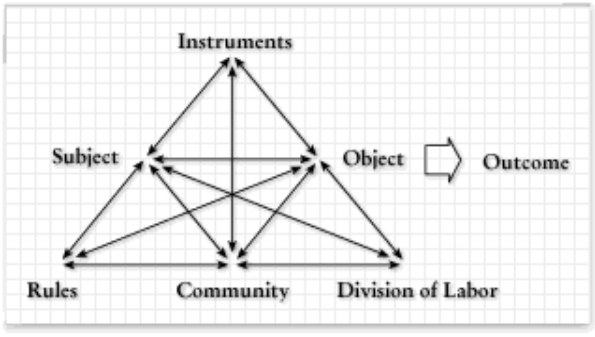


Figure 1 The Components of an Activity (Engeström, 1987)

Leontiev (1981) saw the theory of activity as the foundation of a unified, monolithic psychology that makes possible a consistent, coherent reconstruction of non-reductionist psychological reality. Activity, according to Leontiev, is not a reaction and not a totality of reactions but a system that has structure, its own internal transitions and transformations, its own development. Activity is defined by the dialectic relationship between subject-object, which both mediates, and is mediated by, the tools used and the social context of the work activity. This two-way concept of mediation implies that the capability and availability of tools mediates what is able to be done and the tool, in turn, evolves to hold the historical knowledge of how the communities behaves and is organized. It is through this process that learning occurs, both in the individual and in the society as a whole.

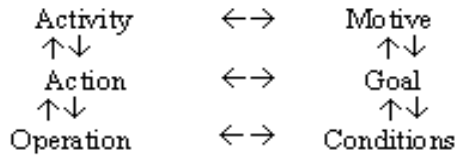


Figure 2 The Hierarchical Structure of Activity (Leontiev 1981)

Leontiev (1981) proposed that "activity" should be the unit of analysis in the study of sustained human endeavour and placed this at the top of the hierarchy shown in Figure 2, associated with purpose and motive over the long term. This is a conceptual level above the level at which most business analysis takes place, i.e. at the level of actions, which are undertaken towards specific and often short-term goals. Under certain conditions, conscious actions can be driven to a lower level of automation, often in computer systems, as they become standardised. For an in depth explanation of this dynamic hierarchy the reader is referred to Leontiev's original treatise (*ibid*) but the following illustration is relevant to this paper.

At the top level, knowledge management may be the core business activity. This is where the organisation is in the business of knowledge, for example institutes of education, training or consulting. However, Activity Theory does not always perceive knowledge management as an end in itself but, more often, as a support for other business activities at all three levels in the Leontiev hierarchy. The second level is where knowledge management is an explicit adjunct to core business activity, with value adding projects such as customer relations management. Activity Theory views these systems as actions towards specific goals but not as core business activities in themselves. The third and lowest level in the Activity Theory hierarchy is that of operations where knowledge management systems are seen as primary tools automating basic organisational knowledge management processes. Data warehouses, document management systems and performance scorecards are examples of these tools.

2.1 Activity Theory and Knowledge Management

The psychological theory of Vygotsky (1978) on which Activity Theory is based, has well-developed notions of internalisation and externalisation, recognising that all human knowledge is socially constructed. The concept of internalisation is described by Vygotsky as the underlying mechanism for the origin of mental processes. Mental processes are derived from external actions through the course of internalisation. It is through this process that learning occurs, both in the individual and in the society as a whole. Internalised concepts then become psychological tools that are manipulation in the Internal Plane of Action (IPA). The IPA is a concept developed within Activity Theory that refers to the human ability to perform manipulation with an internal representation of external objects before starting actions with these objects in reality. IPA is more general than the cognitive concepts of working memory and mental models and is well suited to the analysis of the processes of dealing with the "messy", unstructured problems of communities of practice in the modern work place. Kaptelinin (1996) views computer tools as an extension of the IPA of individuals and provides a platform for the collective IPA of groups of people. Information Technology thus provides the basis for tools that are unique in the history of human activity.

The Activity Theory concepts of internalisation and externalisation are echoed in the knowledge management literature much of which distinguishes tacit from explicit knowledge based on Polanyi's (1966) original concepts. The model describes a dynamic process in which explicit and tacit knowledge in organisations are exchanged and transformed through four modes. Socialisation enables tacit knowledge to be transferred from one individual to another. Combination allows the existing explicit knowledge to be combined into new explicit forms. Externalisation converts tacit knowledge into explicit knowledge in the forms of concepts and models. Internalisation allows individuals to absorb explicit knowledge and broaden their tacit knowledge so that new knowledge could be developed. This has led to the knowledge creation spiral of Nonaka and Takeuchi (1995), shown in Figure 3, which views organisational knowledge creation as a process involving a continual interplay between explicit and tacit dimensions of knowledge.

A similar dynamic is apparent in the activity-based approach of Engestrom (1987) who uses activity as a unit of analysis in his research into developmental work in organisations. In longitudinal case studies in the workplace, he follows the progress of a dominant activity, together with any interacting secondary activities, as an activity system (idealised in Figure 4). Learning occurs from contradictions and tensions within and between the activities and their environment, which Engestrom depicts in the Cycle of Expansive Learning (Figure 5) as the dominant activity evolves into a more advanced form after each cycle.

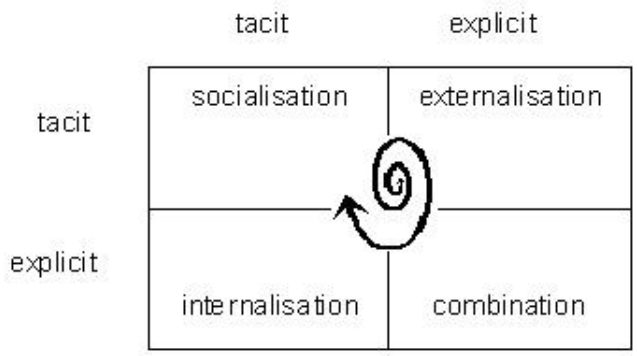
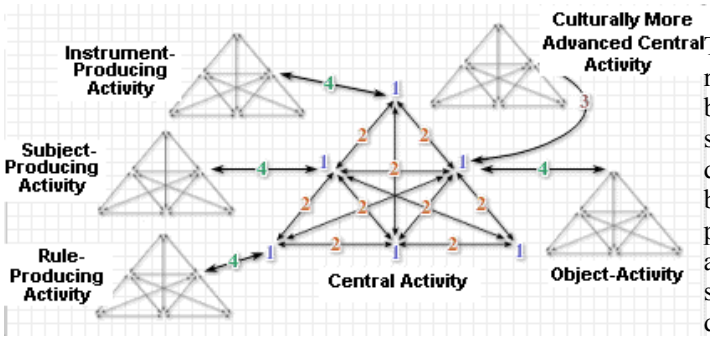


Figure 3 The knowledge creation spiral of Nonaka

Activity systems are constantly working through contradictions within and between their elements. In this sense, an activity system generates a virtual disturbance and thus becomes an innovation-producing machine. There are periods of incremental growth interrupted by discontinuities of growth spurts of knowledge creation and organisational learning.



1: Primary inner contradiction (double nature) within each constituent component of the central activity.
2: Secondary contradictions between the constituents of the central activity.
3: Tertiary contradiction between the object/motive of the dominant form of the central activity and the object/motive of a culturally more advanced form of the central activity.
4: Quaternary contradictions between the central activity and its neighbour activities.

Figure 4: Four levels of contradictions in a network of human activity systems (Engeström, 1999)

2.3 Cycles of Expansive Learning

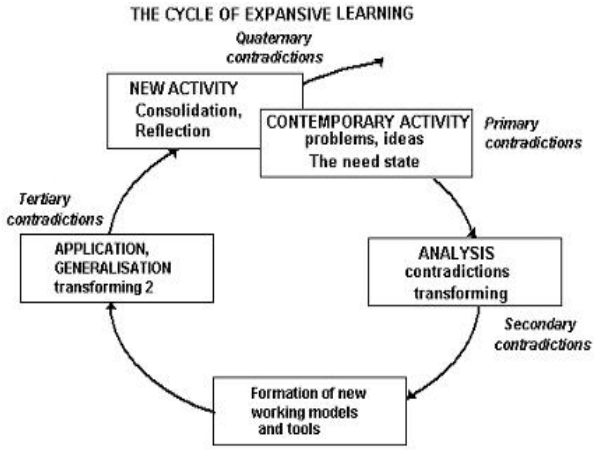


Figure 5 Engestrom's view of a dynamic activity system(Engeström, 1999)

3.0 THE RESEARCH CASE STUDY

3.1 The Research Approach

The research methodology used in the case study was action research, as described by Wood-Harper (1984). The author began as a peripheral participant in the project was subsequently asked to design and develop an appropriate database information system for recording collected data because of her computing expertise. From a research perspective, not being central to the team driving the project afforded the author a measure of objectivity. However, at the same time the direct involvement in the restructuring of the data collection and responsibility for the design of the supporting system provided the author with rich insights into the events as they unfolded. These were recorded by the author and then analysed at the completion of the project. The data analysis was based on the interpretive case study approach of Walsham (1995). The qualitative data was collected and was then interpreted allowing for a rich picture to emerge as the activity system went through four cycles of expansive learning.

3.2 Background to the Case Study

The site of the case study was an Australian university. Among its strategic objectives, the university management had agreed on nine attributes that all graduates should acquire through any course of study at that institution. These attributes included: independent learning, discipline knowledge, communication skills, teamwork, analysis skills, diversity, information literacy, continuous improvement and individual rights. More detailed descriptions of each are documented in the university's strategic plan and shown in Table 1.

In order to demonstrate that this strategic objective was being achieved, senior management believed that it was necessary to audit what was taught and assessed in each subject[1] counting each instance of servicing one of the nine attributes. These counts could then be summed over whole courses. Low counts would reveal which attributes were not addressed in each course taken by students and this *knowledge* would result in appropriate changes to the relevant course curricula.

Table 1 Attributes of a Graduate

A commitment to continued and independent learning, intellectual development, critical analysis and creativity.
Coherent and extensive knowledge in a discipline, appropriate ethical standards and, where appropriate defined professional skills.
Self-confidence combined with oral and written communication skills of a high level.
A capacity for, and understanding of, teamwork.
An ability to logically analyse issues, consider different options and viewpoints and implement decisions.
An appreciation and valuing of cultural and intellectual diversity and ability to function in a multi-cultural or global environment.
A basic understanding of information literacy and specific skills in acquiring, organising and presenting information, particularly through computer-based activity.
A desire to continually seek improved solutions and to initiate, and participate in, organisation and social change.
An acknowledgment and acceptance of individual responsibilities and obligations and of the assertion of the rights of the individual and the community.

In February 2000 is was decided to begin the auditing process by ascertaining the extent to which the nine attributes were taught and assessed in subjects in the undergraduate Commerce degree. The Bachelor of Commerce has the largest enrolment of any course offered by the university and, while there is one generic award, there are 13 single majors and 57 combined majors on offer. A total of 143 individual subjects are involved, each 6 or 8 credit points with at least 144 credit points necessary for completion of the degree. Most students study 8 subjects a year over 2 sessions and finish their course in a minimum of 3 years. There was a very large set of possible combinations of subjects that could be taken by any one student in the course of their study. The knowledge management problem therefore had two parts: one to ascertain and tally the attributes that were addressed in each subject and the other to know the coverage of each attribute over all possible sets of subject combinations. The problem was complicated as subjects and course requirements changed with time.

Over fifty members of the university academic staff have been involved in the project during a period of 15 months. The Sub-Dean of the Faculty of Commerce volunteered to oversee the project to be conducted by an educational consultant from the university's teaching support unit to produce results by the end of the year. The remaining participants, providing the input data, were the subject coordinators who taught the subjects being studied. What follows is a narrative of the data collection and processing tasks of the project as a complex activity system going through cycles of expansive learning.

3.3 The First Cycle

The educational consultant conducting the project, initially relied on studying subject handouts and interviewing subject coordinators to collect information about subjects. Despite the fact that she was well-qualified for this work, and experienced in dealing with academic staff, this was a slow process as it was difficult to find a time to interview each busy subject coordinator and considerable explanation was needed at each interview as to the purpose of the consultant's activity. After only a few of these had been completed the educational consultant left the university and her task was given to a new, inexperienced member of her unit. There was no opportunity for the two consultants to confer before the handover and the Sub-Dean overseeing the project gave only a brief induction to the new consultant, wrongly assuming her to have the same expertise as the former one.

What the new consultant did not lack however was determination and enthusiasm. Through persistent badgering of anyone she could contact, she came to grips with the aims and progress to date of the project. Through this laborious process she had recognised the inadequacy of the approach taken by the former consultant and obtained approval from the Sub-Dean to use a new method to obtain data from the subject coordinators.

This is a simple example of one cycle of expansive learning. A primary contradiction within an activity component (the departure of the consultant) led to secondary contradictions between the subject and the object (the new consultant initially did not know the object or progress of the activity). This could have stalled the project or, as happened, the project was transformed through the internalisation of the project by the consultant through interaction with others. She not only formed an internal understanding of the objective of the project, but could see the shortcomings of its current form and externalised a new form of the activity.

[1] The university uses the word "subject" to refer to each unit of study undertaken by the student (e.g. Microeconomics I).

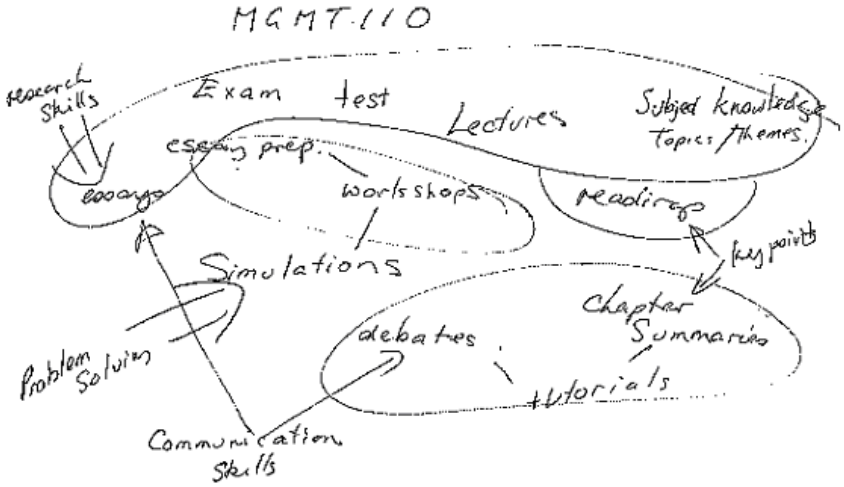


Figure 6 An example of the schema produced at a workshop for one subject.

MGMT110 – Introduction to Management
Autumn 2000

Attributes	Skills	Activities/ assessments
4 8 6 8	• Knowledge of Content – Topics: teamwork/ leadership/ decision-making/ strategy/ business ethics/ and interorganisational relations Themes: diversity/ organisational learning/ reflective practice	Lectures/ readings
2 7 3	• Developed knowledge of topic • Identification of key points • Ability to state main points in concise summary	Chapter summaries for tutorial preparation
3 5	• Oral communication skills • Development of independent critical thought • Developing coherent arguments	Tutorials – debates/ group discussion
3	• Applying theory to practice Problem-solving	Tutorials – simulations
1	Develop knowledge on communication skills	Tutorials – essay preparation
1 2 7 1 3 5	• Encouraged to be indepenedent learner • Development of research skills • Research skills • Critical analysis and synthesis • Written communication The development of logical argument	Essay Lecture/ Study guide/ developmental marking criteria Library workshop Essay 1
1 7 3	• Critical analysis and synthesis • Research skills/ Referencing • Written communication	Essay 2
1 3 5	• Tests knowledge of theory • Tests communication ability • Tests the development of logical argument	Final Exam – essay based

Figure 7 The table drawn up for the same subject as the schema in Figure 6.

3.4 The Second Cycle

The new approach to the project was to divide all the subjects into groups of 6 to 8 and conduct a series of workshops with the subject coordinators of each group. The educational consultant circulated a quantity of explanatory material to those subject coordinators who would take part in the workshops. These workshops were led by the educational consultant who would encourage each coordinator to analyse their own subject and then draw a schematic diagram showing how the subject was organised and what learning was expected from the students. This was then discussed with the other group members for additional insights and adjusted accordingly.

The intended output of these workshops was some form of diagram showing how the subject was run and what each coordinator believed were the skills and knowledge students acquired by participating in the various part of the subject. The educational consultant then planned to extract data from these diagrams, in relation to the nine graduate attributes. At that stage there was no firm idea of how this would be done.
The first workshop involved coordinators that taught and managed core introductory subjects involving very large classes. By all accounts the workshop was most rewarding from the coordinators point of view, as they were able to compare experiences and get useful teaching guidelines from each other. The educational consultant, however, was quite frustrated by how little of the material handed out was read by the academic subject coordinators and how little interest the academics showed in the university's strategic objective concerning the graduate attributes. The educational consultant found that she was unable to get any useful data from the initial workshop.

At each of the next two workshops, the amount of description in the handouts was reduced. With much less lead-in discussion, the subject coordinators were each asked to draw a schematic diagram of how they believed the nine attributes related to the activities that students undertook in their subjects (see an example of the drawing for one subject in Figure 6). The group as a whole then discussed these drawings, and amendments were made. The educational consultant maintained a deliberate policy of not giving the subject coordinators any prescribed format to follow, as it was believed that this would constrain their analysis. However, this approach resulted in diverse, confusing and invariably incomplete schemas that could not be reconciled.

After these workshops, the educational consultant, by a means of expert interpretation, converted each diagram into a first draft of a table. The tables were then sent back to each subject coordinator for comment, although none were volunteered. It was at this stage that I received the table that the educational consultant had produced from the diagram for my own subject. There were two columns in this table with headings of "Activities" and "Skills" consisting of multiple entries in each row. The educational consultant expressed an interest in setting up a database to store the set of tables she had produced and asked me to provide technical advice.

My inspection of the tables for each of the subject processed to that time revealed that they had many different structures. (Figure 7 for example came from the schema of Figure 6). Some of them had three or four columns with various headers, such as "assessment" and "attribute", and all had multiple entries in most cells. While this was meaningful to the educational consultant it was not at all amenable to the formal structure of a database using the normal relational model.

Designing a relational database from the tables produced by the workshops was impossible because of the variety of structures of the tables and the unstructured nature of the information contained in the cells of the tables. My attempts to identify a consistent set of entities and relationships in the tables with the educational consultant resulted only in frustration because the educational consultant's data collection methods did not conform to the needs of the database designers or the type of summarised reports that would be required by management.

A breakthrough came when one of the coordinators explained to the educational consultant that he was more interested in the conduct of his subject, such as preparing lectures, designing assignments and grading tests, than in the graduate attributes that just seemed common sense. He suggested that the next workshop should begin by allowing subject coordinators to discuss the various elements in each of their subjects, instead of starting with descriptions of the graduate attributes from the educational consultant. From the list of activities identified for each subject the consultant could help the subject coordinators list the various skills and attributes that these activities promoted in the students. In retrospect, this now seems an obvious course of action but it was not seen that way at the time. Once the activity-based approach to data collection was agreed upon and instituted, the workshops produced standardised sets of data tables.

During this cycle of expansive learning, contradictions between the activity of the consultant and the activity of the subject coordinators transformed the project into a more structured form. The consultant's starting point was to list the nine graduate attributes and her methods were free-form. The subject coordinators' starting point was to identify their teaching elements and these were much more structured. The tensions between these activities were the stimulus for expansive learning and produced an improved approach to the project, enabling the collected data to be computerised for processing into useful summarised information.

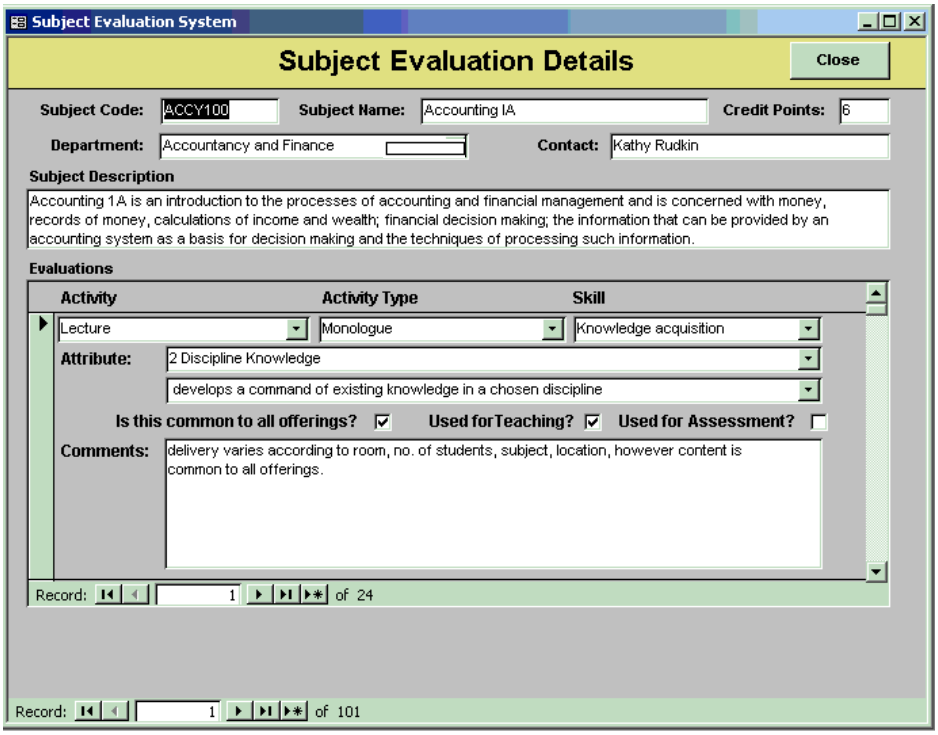


Figure 8 The database screen form for data entry.

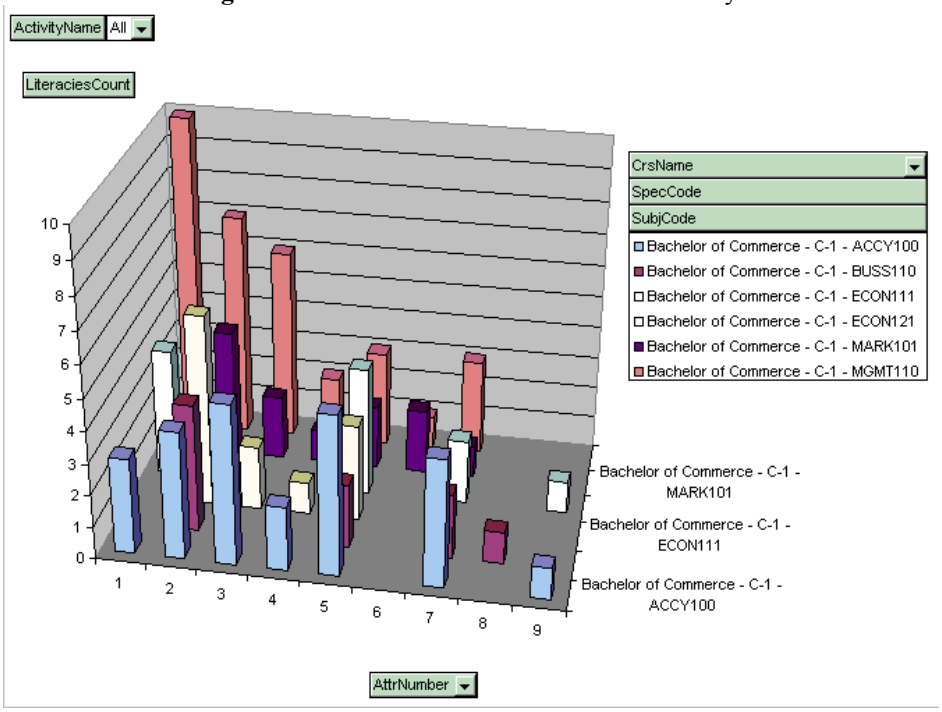


Figure 9 A graph from the database showing missing attributes (numbered 1-9) in core subjects

3.5 The Third Cycle

The construction of a suitable, easy to use database system was not difficult once it had been agreed that the structure had to be based on the relationship between two entities: *graduate attributes* and *subject element activities*. A third entity called "student skills" was also retained as a way of linking attributes and activities in the minds of subject coordinators. These can be seen in the data entry screen, shown in Figure 8.

At this stage of the project the gathering of new data through the workshops was halted while the data, already collected from subject coordinators, was standardised under the new headings and entered into the database. By the time this was completed, interest in the workshops had lapsed, as the end of the year approached. The consultant tried to restart the process but was unable to get suitable meeting times for the subject coordinators. After the Summer end-of-year break, a process of individual interviews was begun. This was facilitated by a new tool, the database set up on a portable computer, and proceeded quickly, collecting a large quantity of data. However, as the new year began, there were many changes taking place that further disrupted the project with new people coordinating subjects, new subjects being introduced and changes to the management team. A few attempts were made by the consultant to collect more data through interviews, but support for the project waned and eventually nothing more was done.

This is an interest path followed by the activity. Initially the introduction of the new tool, the computer system, greatly improved the efficiency of the project, a secondary contradiction. So a cycle of expansive learning began. However triggered by the discontinuity caused by the Summer, end-of-year break, the data gathering activity appeared to collapse.

3.6 The Fourth Cycle

At the time that the data collection activity was declining the activity of producing summarised information for managers began. Extra tables were added to the database to hold information about the patterns of subjects that students took in their courses. The database management system could then automatically generate reports summarising the number of times each of the attributes were addressed in various sets of subjects constituting typical courses of study.

These reports were shown to the Sub-Dean who was overseeing the project and to university managers. The one piece of information that came out of these first reports was that several of the attributes did not appear to be addressed in many of the courses. It seemed then a simple matter of identifying subjects where these missing attributes could be included as part of the subject matter and asking those who coordinated those subjects to include appropriate material. This however was never done as academic staff resisted being told what to teach by university administrative staff.

A discussion with some of the academic staff then began which raised a number of problems with the information coming from the reports. The data in the database simply counted each element in each subject where one of the attributes was identified. A brief mention in one lecture was counted the same as a concentrated assignment over several weeks. Also many attributes, such as "diversity" were harder to equate with specific subject activities but were almost certainly covered by the very nature of the subject and the way it is taught. It was clear that the information contained in the reports was not knowledge, or at least not rich enough for the purpose of either knowing if the strategic objectives were being met and, if not, how they could be.

At this stage I discussed the outcome with the Sub-Dean, asking if the project, as an exercise in knowledge management, had been a failure. Certainly the original objectives had not been met in the way intended. However the Sub-Dean was not so negative about the outcome saying that the conduct of the project had raised considerably the awareness amongst the academic staff of the university's strategic objective of creating graduates with the set of nine attributes. The project had succeeded in doing this where other more direct edicts had failed to get the message across. Indirectly, this would no doubt mean the greater inclusion of more material and activities relating to these attributes in each of the subjects.

4.0 DISCUSSION

This case study in the tertiary education sector has been considered as an exercise in the application of knowledge management to business strategy. The project aimed to collect and process data into explicit knowledge for university management, on how the organisation was meeting a strategic objective: i.e. producing graduates with a full set of the nine attributes. The case has been presented and analysed as an activity system exhibiting four cycles of expansive learning throughout the running of the project.

The question arises as to whether the project was successful in applying knowledge management to business strategy. In other words, was knowledge managed in a way that helped the organisation to achieve its strategic objectives, or at least to know if these had been achieved? The project did succeed in collecting data and producing some information for managers on progress towards this objective, but it is questionable whether any "knowledge" was created or even any "information" produced that was useful or meaningful. If knowledge is defined as "information made actionable" (Introna 1997), the overt outcome of this project was not really knowledge, as it did not lead to direct action by the managers. An extensive database information system was developed and was a useful tool for collecting, and processing, data but the resulting summarised information was not effectively acted upon by managers. This was due to a number of factors: the vague nature of the attributes (qualitative strategic goals), the dynamic, changeable nature of the situation and the culture of universities where academics did not accept that managers tell them what to teach.

When the project was analysed as a cycle activity system, what emerged from this study, was that the project became a vehicle for the growth of tacit knowledge. Indeed effective knowledge management on the business strategy was achieved indirectly as an unintended outcome of the project in two ways. Firstly, the conduct of the workshops and interviews succeeded in creating a much greater awareness of the desired nine graduate attributes among the university teaching staff. This would inevitably increase coverage of these attributes in the course material and thereby produce graduate with the desired attributes, as stated in the strategic objective.

Secondly it alerted management to the inherent difficulties of conducting explicit performance measurement on strategic business objectives. The process of measuring or counting qualitative aspects of business performance is similar to converting tacit to explicit knowledge and often obscures the essence of what is being assessed. Strategic objectives can be complex, qualitative and long term and, as observed in this study, the process of knowledge management might be more valuable than the outcomes. In addition senior managers often have an ulterior motive for performance evaluation in that, as well as wanting to genuinely know how well strategic objectives are being met, they would like a simple set of measures that demonstrate to the world at large (eg shareholders, governments etc) that the organisation is performing well.

A final outcome of this study is the confirmation that Activity Theory provides a framework suitable for the analysis of knowledge management in the strategic areas of business. In this project, the evolution of the approach taken to collecting and summarising performance data was viewed as a dynamic activity system where the project itself became a tool for knowledge management. Initially, the data collection and summarisation processes occurred at Leontiev's level of "actions" (interviews and workshops) and were then automated into "operations" with the development of a database information system. However viewing the project as a whole activity highlighted other issues that were influenced by the community in which it occurred, i.e. the university environment and context. In particular, the explicit nature of the data, in its full context, was internalised as tacit knowledge as an unintended outcome of the project.
It is proposed that this case is typical of many knowledge management initiatives concerning qualitative performance evaluation in organisations. The findings can therefore be generalised to highlight the importance of providing opportunities to increase knowledge, recognising that knowledge creation may be a by-product, rather than the intended outcome, of organised knowledge management activity.

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