Faculty Perceptions of Business Communication Skills and Needs of Management Students

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Abstract: It is unanimously agreed that a business communication curriculum plays an important role in preparing students for the workforce in the corporate (Pittenger, Khushwant K. S.; Miller, Mary C. & Allison, Jesse, 2006; Zhao, Jensen J. & Alexander, Melody W., 2004). However, student population in India undertaking a program in business management primarily comprises those for whom English is a second language. In this scenario, it becomes extremely important to analyze how the faculty teaching business management students perceive the course of business communication and students' possession of business communication skills (Plutsche, Susan & Wilson, Barbara A., 1996). In this connection, very little work has been done on the perceptions of faculty teaching business management students in India. What are the areas of business communication curriculum which faculty perceives as important? What are those areas of business communication in which faculty feels students are more competent? Should something be added to the curriculum to make it more effective? This study enters this discussion by presenting a small empirical study of a faculty's perception of the business communication needs of students. A sample of 93 faculty members, teaching with AICTE accredited management institutions in India have expressed their opinion on the said issue by way of questionnaires. The ultimate goal is to reorient the curriculum of business communication according to the findings of the present study.

Keywords: business communication, oral skills, written skills, topics covered, knowledge dissemination, faculty perceptions

1. Introduction

In the past few decades, it has become widely accepted that the ‘lingua franca of international business is English’ (Charles 2007) with communication potential driving dramatic changes in organizations and their environments. In this scenario, business communication i.e. communication used in conducting business (Reinsch, 1996) has assumed a never before significance. B-schools have emerged as hubs catering to communication needs of the emerging business elite in the basic principles of sustainable development. Thus B-schools, which for long operated in separate domains, have inched closer to each other, creating synergies to cater to the demands of the day.

There is consensus among educators and business executives that excellent communication skills are pre-requisites of today’s jobs. Yet, most business communication instructors realize that it is difficult to get students take business education classes seriously- thus culminating into the need of an effective business communication course, which challenges the students. In this scenario, it becomes extremely important to analyze how the faculty teaching business management students perceive the course of business communication per say and students’ possession of business communication skills. In this connection, very little work has been done on the perception of faculty teaching business management students in India. What are the areas of business communication curriculum which faculty perceives as important? What are those areas of business communication in which faculty feel students are more competent? Should something be added to the curriculum to make it more effective? This article enters this discussion by presenting a small empirical study of faculty’s perception of the business communication needs of students.

2. Literature survey

Business schools, always a subject of controversy, are ‘almost regarded as a necessary evil’ (Vinten, 2000). Such integral part of the business world is this ‘necessary evil’ that its purposes appear rarely to be a subject of reflection (Grey, 2002), especially to those who teach them. Yet a need to prioritize the mission objectives of business schools to the benefit of those stakeholders for whom they dedicate most of their energies is undeniable. Two decades back, Porter and McKibbin report (1988) established that business deplored graduates’ lack of soft skills, including managerial skills. More or less same conclusions have been reached to in various studies conducted further (Wardrope, 2002;...
McPherson, 1998. Numerous articles (for example, Buckley, 1989; Thompson & Smith, 1992) suggest that business schools are failing to help students develop needed competencies and skills. These facts confirm the criticism that B-schools are facing regarding failure to groom students with the required skills and competencies essential to the new workplace and yet the efforts to overcome this failure have proved fruitful only to a limited extent.

The content of a business management programme, the nature of its curriculum and how it meets the needs of business life distinguishes a B-school from its competitors (Baruch and Leeming, 1996). This curriculum is crucial to all the stakeholders- the employers, the business school, the faculty and the students. Given the importance of curriculum content to all the stakeholders and given the dramatic changes in the workplace environment, it is essential for business educators to incorporate changes in their curriculum in order to meet the changing workplace demands.

Research on the opinions of business executives (Chandler, 1995; Locker, 1995) and students (McPherson, 1998) reveal that the ability to communicate effectively in business is as ranked one of the top most skills necessary for job success. Chandler, 1995; Plutsky, 1996; Epstein, 1999; Stowers & White, 1999 Cappel, 2002, & many others in their studies based on their surveys on recruiters have repeatedly established that employers require and expect that business management students i.e. their employees will possess good communication skills when they graduate. In 2002, Wardrope conducted a study on the perceptions of department chairs, relating to business communication. According to the department chairs who responded, written communication was ranked the most important among the communication skills, while using correct grammar was ranked the most important in the written communication category. Swanson and Swanson (1990) found that alumni perceive business communication as the most valuable course than any other course required in the core. Likewise, Gustafson, Johnson, and Hovey’s survey (1993) established that alumni believe communication to be the most significant tool for advancement to higher levels of responsibility. Such studies substantiate and confirm to the criticality most business communication educators attach to their subject for success in the workplace. The business communication curriculum must reflect the current trends that are accepted in the business world. This study makes a small attempt towards indicating the areas of this much required change in India.

3. Business communication in India

Criticism about lack of communication skills and concern about the need to improve them are not unique to India as well, a non-native English speaking country. The same is true of countries where English is the native or dominant language, (for example, in Australia and New Zealand (Clout, 1994; White, 1993; Dwyer, 1992) and the (Plutzky, 1996; Willmington, 1989). The problem of poor English communication skills becomes graver in a non-native English speaking country like India. Indian English is a language spoken by the educated class in India. There are 18 official languages in India, and English is often the language of national communication (Gannon, 1994).

Still, since English is a foreign and acquired language for Indians, communication skills in English do not come naturally to Indian students. It then seems only logical that the prime stakeholders of business management education in India, in the light of the international business scenario today, would be a very valid source of information about which communication skills they perceive as important for success and what would their preference be for the business communication course curriculum. Among various stakeholders, business instructors, with their obvious ties to local business, are arguably in the best position of all to determine the types of communication skills necessary to succeed in the workplace and to judge whether students need to improve those skills. These facts prompted this descriptive study in which business faculty members’ perceptions about the business communication curriculum are examined. Stanga and Ladd (1990) noted that despite the importance of communication skills, relatively little is known about the obstacles that students face when attempting to develop their communication abilities. It is time to also acknowledge the troubles business instructors face while dealing with students for whom English is second language and yet, who have to be taught in English since it is the language of business. Hence, business instructors may arguably be in a strong position to opine what should be taught in a business communication curriculum and to what extent should it be taught. This study enters this discussion.

As stated earlier, studies examining employer and student perceptions of student communication skills have been conducted before but the share of faculty opinion in the above stated studies is relatively very small. Plutsky and Wilson (1996) did undertake some work what the faculty teaching
business management students feel about business communication course curriculum but little has been done in India, where the linguistic context, communication challenges and student expertise in English differ. Also, in the fast globalizing Indian corporate sector with increasing presence of MNCs, effective communication skills have assumed an indispensable quality in any successful manager’s skill set.

4. The study

4.1 Objective

The specific purposes of the study are fourfold:

- To determine Indian business management faculty members’ perceptions on the importance of business communication course.
- To determine Indian business management faculty members’ perceptions on the students’ possession of the important topics of business communication course.
- To identify the faculty reasons behind students not exhibiting the required level of interest in business communication classes.
- To analyze what the faculty community of business management institutions feels about the number of semesters this course should be taught as in India, business communication is a course taught in one semester and in few cases, in two semesters.

4.2 Instrumentation & demographic context of the study

The study was conducted on a population of 93 full-time faculty members teaching in various AICTE approved business management institutes of India. These faculty members represent all the departments of business management studies. The study deliberately did not focus specifically on business communication instructors alone as one of the primary objectives of the study was to determine business management faculty members’ perceptions (irrespective of the course they taught) about the importance of business communication course. All the respondents were Indians & ranged between 27 to 63 years. All the respondents had an average experience of 7 years. 64 respondents were males and 34 were female.

The survey instrument was developed in three phases. In the first phase, a few faculty members were informally interviewed to assess their perceptions concerning the course, business communication, which is a compulsory course of 1-2 credits in management schools of India. This course covers almost all the topics of the prevalent business communication textbooks by authors as Bovée and Thill, Ober etc. Why I say ‘almost all the topics’ is because the study involves the perceptions of faculty members from various institutions, hence, some diversion is only natural. From the interview notes, a preliminary survey questionnaire was designed and plans for data analysis were made. In the second phase, a pilot study, using a group of 20 faculty members, was conducted. The results of the pilot study helped to refine the questionnaire and data-analysis techniques. In the third phase, the final version of the survey was administered.

Subsequently, copies of the questionnaire were mailed to faculty members of various management schools. Out of 315 questionnaires circulated, 119 were received, 93 of these were found to be complete for analysis. After receiving the completed questionnaires, responses were analyzed using descriptive statistics. Wherever ratings were asked, a five point Likert scale was used, where 5 represented the most positive response and 1 represented the most negative response.

The Questionnaire had 4 major sections:

- Faculty perceptions about the importance of various components of business communication skills
- Faculty perceptions about the possession of such skills amongst students.
- Faculty perception about reasons behind not taking business communication course seriously
- Faculty perception about the number of semesters in which the course should be offered.
5. Results and discussion

A look at the table 1 shows that the communication skills found to be highly important for management students, as the faculty perceived, were completeness (M= 4.63), clear expression of thoughts and ideas (M= 4.57), and correct pronunciation (M= 4.55), listening skills (M= 4.35), speaking with confidence (M= 4.28) and coherence (M= 4.24). It is important to note here that only those components of business communication course i.e. oral/written skills were included on which all faculty members, irrespective of their areas could respond. Hence, components such as Augmentation, Business Etiquette, Negotiation Skills etc were deliberately omitted. The table also indicates that all the components, in terms of their importance, had a mean value of >3, indicative of the fact that all the specified components are important for a business management student. The table suggests that completeness in communication is considered to be the most important skill for students (M= 4.63), while the students seem to possess it the highest in written skills (M= 3.27), its possession in oral/other skills is at the fourth place (M= 3.30), implying that there are 3 other components in oral/other skills which are better possessed by the students. Interestingly, despite this component being best possessed in written skills, its possession in oral/other skills is still higher. While grammatical correctness was found to be the least important in communication, (M= 3.26), its possession in written skills was towards the higher side, with the 4th best possessed skills amongst students, (M=3.15), though in oral/other skills possession, this was at the lower side comparatively with M= 3.06. Significantly, the faculty uniformly felt that there was no communication skill, the importance of which was lower than its possession with students. This is consistent with previous research (Agarwal, Chitranshi and Cardon, 2009) where possession of all skills was found significantly lower than its usage and importance.

Table 1: Mean of ‘Importance’ and ‘Possession’ of English communication skills among B-school students

<table>
<thead>
<tr>
<th>English Communication Skills</th>
<th>Importance</th>
<th>Oral/other/ others</th>
<th>Written</th>
</tr>
</thead>
<tbody>
<tr>
<td>Clear expression of thoughts and ideas</td>
<td>4.57</td>
<td>3.45</td>
<td>3.15</td>
</tr>
<tr>
<td>Support of statement with examples, facts, and statistics</td>
<td>4.17</td>
<td>3.19</td>
<td>3.13</td>
</tr>
<tr>
<td>Choice of words</td>
<td>3.93</td>
<td>3.22</td>
<td>3.06</td>
</tr>
<tr>
<td>Precision</td>
<td>3.82</td>
<td>2.97</td>
<td>3.07</td>
</tr>
<tr>
<td>Clarity</td>
<td>4.15</td>
<td>3.09</td>
<td>2.92</td>
</tr>
<tr>
<td>Completeness</td>
<td>4.63</td>
<td>3.30</td>
<td>3.27</td>
</tr>
<tr>
<td>Coherence</td>
<td>4.24</td>
<td>3.17</td>
<td>3.12</td>
</tr>
<tr>
<td>Subject-verb agreement</td>
<td>3.72</td>
<td>3.04</td>
<td>3.06</td>
</tr>
<tr>
<td>Use of jargons and verbosity</td>
<td>3.35</td>
<td>3.02</td>
<td>2.90</td>
</tr>
<tr>
<td>Grammatical correctness</td>
<td>3.26</td>
<td>3.06</td>
<td>3.15</td>
</tr>
<tr>
<td>Tenses</td>
<td>3.97</td>
<td>2.92</td>
<td>2.97</td>
</tr>
<tr>
<td>Speaking with confidence</td>
<td>4.28</td>
<td>3.17</td>
<td></td>
</tr>
<tr>
<td>Correct pronunciation</td>
<td>4.55</td>
<td>3.17</td>
<td></td>
</tr>
<tr>
<td>Variation in pitch and tone</td>
<td>4.09</td>
<td>3.18</td>
<td></td>
</tr>
<tr>
<td>Effective use of audio-visuals in presentations</td>
<td>4.05</td>
<td>3.46</td>
<td></td>
</tr>
<tr>
<td>Vocabulary</td>
<td>3.82</td>
<td>2.91</td>
<td>2.62</td>
</tr>
<tr>
<td>Effective organization of material</td>
<td>4.05</td>
<td>3.07</td>
<td>3.18</td>
</tr>
<tr>
<td>Use of appropriate business terminology</td>
<td>4.00</td>
<td>3.04</td>
<td>3.18</td>
</tr>
<tr>
<td>Correct punctuation marks</td>
<td>3.89</td>
<td>3.30</td>
<td>3.20</td>
</tr>
<tr>
<td>Correctness of sentence structure</td>
<td>4.07</td>
<td>3.28</td>
<td>3.20</td>
</tr>
<tr>
<td>Summary of key points at the end</td>
<td>4.00</td>
<td>3.12</td>
<td>3.07</td>
</tr>
<tr>
<td>Non-verbal Skills</td>
<td>4.04</td>
<td>3.24</td>
<td>3.06</td>
</tr>
<tr>
<td>Listening Skills</td>
<td>4.35</td>
<td>3.36</td>
<td>3.14</td>
</tr>
<tr>
<td>Avoidance of Hinglish (oral/other)</td>
<td>3.91</td>
<td>3.00</td>
<td>3.14</td>
</tr>
</tbody>
</table>

The oral/other skills best possessed were- effective use of audio-visuals in presentations (M= 3.46), clear expression of thoughts and ideas (M= 3.45), listening skills (M= 3.36), completeness (M= 3.3), and correct pronunciation marks (M= 3.3). While the component- effective use of audio-visuals in presentations was rated the highest in possession of oral/other skills, its importance was perceived as comparatively lower by the faculty (M= 4.05). However, though there were 10 other skills that faculty considered more important, there appears to be a higher importance of this component than its possession (M= 4.05 compared to M= 3.46 respectively). While the component vocabulary was the lowest possessed in oral as well as written skills (M= 2.91 and 2.62 respectively), its importance was
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also found to be lower than that of most other skills, (M= 3.82). Nevertheless, its perceived importance was determined to be still higher than its possession.

In written possession of skills, completeness (M= 3.27), correct punctuation marks (M= 3.2), correctness of sentence structure (M= 3.2), effective organization of material (M= 3.18) and use of appropriate business terminology (M= 3.18), emerged as significant. This is consistent with previous research. In 1995, in a study conducted at California State University, Northridge, by Susan Plutsky, showed that the faculty in the College of Business Administration and Economics rated English usage, which included grammar and sentence construction as the top-ranked items to include in a business communication course.

When comparing the possession of written skills against their importance, four components, namely, speaking with confidence; correct pronunciation; variation in pitch and tone; and, effective use of audio-visuals in presentations; were not included due to their inapplicability in writing. Completeness in writing, which was observed as the best possessed written skills of students, (M= 3.27), was also identified as the most important communication skill by the instructors, (M= 4.63). However, its importance was still higher than its possession amongst students. This is a reflection of what research has consistently pointed out. In various studies conducted on business educators’ opinion (Zhao and Alexander, 2004; Hiemstra, 2001), students were perceived to have problems with basic writing skills as well as writing concepts and techniques. As a result, they seem to desire a business communication course in which writing is emphasized.

Out of 24 components, on the scale of importance, 15 were rated with a high mean of >4 and none with a mean of < 3; while in the oral/other possession of the same skills, no faculty seems to have highly perceived their possession amongst students as not a single component could reach to the mean value of 4, which is indicative of comparatively poor oral/other possession of the said skills amongst students. The same appears to be true of the possession of written skills, where again no component could reach to the mean value of 4. The lowest mean value amongst the possession of oral/other and written skills was of the component- Vocabulary (M= 2.91, M= 2.62 respectively). The difference in mean values for Vocabulary in oral/other and written skills possessions suggests that comparatively, students use better vocabulary while speaking than they do in writing whereas research has indicated that competency in written communication is the most important (Wardrope and Bayless, 1999; Quible, 1991). Research needs to take into account the reasons behind this.

It can be observed from the table that the highest mean values in terms of possession of oral/other/ other and written skills are M= 3.46 (Effective use of audio-visuals in presentations) and M= 3.27 (Completeness), while in terms of importance, there are 19 components which have a higher mean values than the ones mentioned above. This substantiates the previous research which establishes that the students’ possession of business communication skills is weaker than that of their importance (Clout, 1994; Nelson, Moncada, & Smith, 1996). It also needs to be noted that in comparison between possession of oral/other and written skills, the possession of written skills appears to be weaker amongst students, as observed by the faculty. While in oral/other skills, 21 components have a mean value of > 3 in possession of written skills, only 14 components have a mean value of > 3. There is significant difference between the highest and lowest mean values as well. (Highest Mean in oral/other/other skills= 3.46 whereas highest Mean in written skills= 3.27; Lowest Mean in oral/other/other skills= 2.91 whereas lowest Mean in written skills=2.61) This is consistent with earlier research (Agarwal, 2008; Pittenger, Miller and Allison; 2006) where possession of written skills with students has repeatedly emerged to be weaker than that of oral/other skills. This could be perhaps because, as has been often discussed, business education is not able to effectively develop its students’ writing skills (Pittenger et al, 2006). Another reason, as pointed by Agarwal (2008), in her study on the perception of students regarding the course of business communication, could be that students, though well aware of their weakness in writing skills, are not very enthusiastic of improving in it since they feel it is too time consuming.

The data were further analyzed with the help of linear regression, the results of which are discussed:

Table 2 shows that the model of the predictor variables (Importance of clear expression of thoughts and ideas, Completeness, Coherence, Speaking with confidence, Correct pronunciation, Listening Skills ) shares 13% of the variance of the criterion variable which, in this case, is Oral possession of clear expression of thoughts and ideas. The F value (3.40) is significant. Therefore it can be said that
the predictors have a definite role in predicting the criterion variable. A look at the table further shows that recognizing the importance of clear expression of thoughts and ideas for English communication is found closely associated (.43 significant at .01 level) with oral possession of clear expression of thoughts and ideas.

**Table 2: Model summary and ANOVA table**

<table>
<thead>
<tr>
<th>Model</th>
<th>R</th>
<th>R Square</th>
<th>Adjusted R Square</th>
<th>Std. Error of the Estimate</th>
<th>F</th>
<th>Sig.</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>.424(a)</td>
<td>0.18</td>
<td>0.127</td>
<td>1.058</td>
<td>3.394</td>
<td>.005(a)</td>
</tr>
</tbody>
</table>

a. Predictors: (Constant), Importance of clear expression of thoughts and ideas, Completeness, Coherence, Speaking with confidence, Correct pronunciation, Listening Skills

b. Dependent Variable: Oral Possession of Clear expression of thoughts and ideas

**Coefficients (a)**

<table>
<thead>
<tr>
<th>Model</th>
<th>Unstandardized Coefficients</th>
<th>Standardized Coefficients</th>
<th>t</th>
<th>Sig.</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>B</td>
<td>Std. Error</td>
<td>Beta</td>
<td></td>
</tr>
<tr>
<td>1</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>(Constant)</td>
<td>.916</td>
<td>1.010</td>
<td>.907</td>
</tr>
<tr>
<td></td>
<td>Importance of Clear expression</td>
<td>.609</td>
<td>.153</td>
<td>.426</td>
</tr>
<tr>
<td></td>
<td>Importance of Completeness</td>
<td>-.096</td>
<td>.186</td>
<td>-.061</td>
</tr>
<tr>
<td></td>
<td>Importance of Coherence</td>
<td>.109</td>
<td>.151</td>
<td>.084</td>
</tr>
<tr>
<td></td>
<td>Importance of Speaking with confidence</td>
<td>.035</td>
<td>.143</td>
<td>.025</td>
</tr>
<tr>
<td></td>
<td>Importance of correct pronunciation</td>
<td>-.024</td>
<td>.172</td>
<td>-.015</td>
</tr>
<tr>
<td></td>
<td>Importance of Listening Skills</td>
<td>-.070</td>
<td>.156</td>
<td>-.053</td>
</tr>
</tbody>
</table>

**Table 3: Model summary and ANOVA table**

<table>
<thead>
<tr>
<th>Model</th>
<th>R</th>
<th>R Square</th>
<th>Adjusted R Square</th>
<th>Std. Error of the Estimate</th>
<th>F</th>
<th>Sig.</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>.302(a)</td>
<td>0.091</td>
<td>0.032</td>
<td>1.06</td>
<td>1.55</td>
<td>.004(a)</td>
</tr>
</tbody>
</table>

a. Predictors: (Constant), Importance of clear expression of thoughts and ideas, Completeness, Coherence, Speaking with confidence, Correct pronunciation, Listening Skills

b. Dependent Variable: Oral Possession of Completeness

**Coefficients (a)**

<table>
<thead>
<tr>
<th>Model</th>
<th>Unstandardized Coefficients</th>
<th>Standardized Coefficients</th>
<th>t</th>
<th>Sig.</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>B</td>
<td>Std. Error</td>
<td>Beta</td>
<td></td>
</tr>
<tr>
<td>1</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>(Constant)</td>
<td>1.541</td>
<td>1.012</td>
<td>1.523</td>
</tr>
<tr>
<td></td>
<td>4.1a</td>
<td>.099</td>
<td>.154</td>
<td>.073</td>
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<td></td>
<td>4.6a</td>
<td>.288</td>
<td>.186</td>
<td>.192</td>
</tr>
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<td></td>
<td>4.7a</td>
<td>-.080</td>
<td>.151</td>
<td>-.065</td>
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<td></td>
<td>4.12a</td>
<td>.301</td>
<td>.144</td>
<td>.225</td>
</tr>
<tr>
<td></td>
<td>4.13a</td>
<td>-.040</td>
<td>.173</td>
<td>-.026</td>
</tr>
<tr>
<td></td>
<td>4.23a</td>
<td>-.182</td>
<td>.157</td>
<td>-.145</td>
</tr>
</tbody>
</table>

Table 3 shows that the model of the predictor variables (Importance of clear expression of thoughts and ideas, Completeness, Coherence, Speaking with confidence, Correct pronunciation, Listening Skills) shares 3.2% of the variance of the criterion variable which, in this case, is Oral Possession of completeness. The F value (1.55) is significant. Therefore it can be said that the predictors have a definite role in predicting the criterion variable. A look at the table further shows that recognizing the
importance of speaking with confidence for English communication is found closely associated (.23 significant at .04 level) with oral possession of completeness.

**Table 4: Model summary and ANOVA table**

<table>
<thead>
<tr>
<th>Model</th>
<th>R</th>
<th>R Square</th>
<th>Adjusted R Square</th>
<th>Std. Error of the Estimate</th>
<th>F</th>
<th>Sig.</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>.192(a)</td>
<td>.037</td>
<td>.025</td>
<td>.926</td>
<td>0.595</td>
<td>.734(a)</td>
</tr>
</tbody>
</table>

- a. Predictors: (Constant), Importance of clear expression of thoughts and ideas, Completeness, Coherence, Speaking with confidence, Correct pronunciation, Listening Skills

- b. Dependent Variable: Oral possession of effective use of audio-visuals in presentations

**Coefficients (a)**

<table>
<thead>
<tr>
<th>Model</th>
<th>Unstandardized Coefficients</th>
<th>Standardized Coefficients</th>
<th>t</th>
<th>Sig.</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>B</td>
<td>Std. Error</td>
<td>Beta</td>
<td>B</td>
</tr>
<tr>
<td>1</td>
<td>(Constant)</td>
<td>3.12</td>
<td>.884</td>
<td>3.536</td>
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<tr>
<td>4.1a</td>
<td>-.189</td>
<td>.134</td>
<td>-.164</td>
<td>-1.413</td>
</tr>
<tr>
<td>4.6a</td>
<td>.070</td>
<td>.163</td>
<td>.055</td>
<td>.430</td>
</tr>
<tr>
<td>4.7a</td>
<td>.083</td>
<td>.132</td>
<td>.080</td>
<td>.630</td>
</tr>
<tr>
<td>4.12a</td>
<td>.137</td>
<td>.125</td>
<td>.121</td>
<td>1.095</td>
</tr>
<tr>
<td>4.13a</td>
<td>.107</td>
<td>.151</td>
<td>.082</td>
<td>.711</td>
</tr>
<tr>
<td>4.23a</td>
<td>-.128</td>
<td>.137</td>
<td>-.120</td>
<td>-.937</td>
</tr>
</tbody>
</table>

Table 4 shows that the model of the predictor variables (Importance of clear expression of thoughts and ideas, Completeness, Coherence, Speaking with confidence, Correct pronunciation, Listening Skills) shares very little i.e. 2.5% of the variance of the criterion variable which, in this case, is effective usage of audio-visuals in oral presentations. The F value (.60) is non-significant. Therefore it can not be said with full confidence whether the predictors have a definite role in predicting the criterion variable or not. A look at the table further shows that none of the predictors are found significantly associated with Possession of effective usage of audio-visuals in oral presentations.

**Table 5: Model summary and ANOVA table**

<table>
<thead>
<tr>
<th>Model</th>
<th>R</th>
<th>R Square</th>
<th>Adjusted R Square</th>
<th>Std. Error of the Estimate</th>
<th>F</th>
<th>Sig.</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>.248(a)</td>
<td>.061</td>
<td>0</td>
<td>.913</td>
<td>1.004</td>
<td>.427(a)</td>
</tr>
</tbody>
</table>

- a. Predictors: (Constant), Importance of clear expression of thoughts and ideas, Completeness, Coherence, Speaking with confidence, Correct pronunciation, Listening Skills

- b. Dependent Variable: Oral Possession of correct punctuation marks

**Coefficients (a)**

<table>
<thead>
<tr>
<th>Model</th>
<th>Unstandardized Coefficients</th>
<th>Standardized Coefficients</th>
<th>t</th>
<th>Sig.</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>B</td>
<td>Std. Error</td>
<td>Beta</td>
<td>B</td>
</tr>
<tr>
<td>1</td>
<td>(Constant)</td>
<td>2.130</td>
<td>.872</td>
<td>2.444</td>
</tr>
<tr>
<td>4.1a</td>
<td>.135</td>
<td>.133</td>
<td>.117</td>
<td>1.011</td>
</tr>
<tr>
<td>4.6a</td>
<td>.131</td>
<td>.161</td>
<td>.104</td>
<td>.817</td>
</tr>
<tr>
<td>4.7a</td>
<td>.151</td>
<td>.131</td>
<td>.145</td>
<td>1.150</td>
</tr>
<tr>
<td>4.12a</td>
<td>.063</td>
<td>.124</td>
<td>.056</td>
<td>.509</td>
</tr>
<tr>
<td>4.13a</td>
<td>-.015</td>
<td>.156</td>
<td>-.011</td>
<td>-.096</td>
</tr>
<tr>
<td>4.23a</td>
<td>-.201</td>
<td>.135</td>
<td>-.189</td>
<td>-1.488</td>
</tr>
</tbody>
</table>
Table 5 shows that the model of the predictor variables (Importance of clear expression of thoughts and ideas, Completeness, Coherence, Speaking with confidence, Correct pronunciation, Listening Skills) does not share the variance of the criterion variable which, in this case, is Oral possession of correct punctuation marks in terms of right pauses in speech. The F value (1.00) is non-significant. Therefore it can not be said with confidence whether the predictors have a definite role in predicting the criterion variable or not. A look at the table further shows none of the predictors is found significantly associated with Oral Possession of correct punctuation marks in terms of right pauses in speech.

Table 6: Model summary and ANOVA table

<table>
<thead>
<tr>
<th>Model</th>
<th>R</th>
<th>R Square</th>
<th>Adjusted R Square</th>
<th>Std. Error of the Estimate</th>
<th>F</th>
<th>Sig.</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>.419(a)</td>
<td>0.175</td>
<td>0.042</td>
<td>1.19</td>
<td>1.312</td>
<td>.033(a)</td>
</tr>
</tbody>
</table>

a. Predictors: (Constant), Importance of clear expression of thoughts and ideas, Completeness, Coherence, Speaking with confidence, Correct pronunciation, Listening Skills

b. Dependent Variable: Oral possession of Listening Skills

Table 6 shows that the model of the predictor variables (Importance of clear expression of thoughts and ideas, Completeness, Coherence, Speaking with confidence, Correct pronunciation, Listening Skills) shares 4.2% of the variance of the criterion variable which, in this case, is possession of listening skills. The F value (1.31) is significant. Therefore it can be said that the predictors have a definite role in predicting the criterion variable. A look at the table further shows that recognizing the importance of correct pronunciation for English communication is found associated (.33 significant at .05 level) with possession of listening skills.

Table 7: Model summary and ANOVA

<table>
<thead>
<tr>
<th>Model</th>
<th>R</th>
<th>R Square</th>
<th>Adjusted R Square</th>
<th>Std. Error of the Estimate</th>
<th>F</th>
<th>Sig.</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>.308(a)</td>
<td>0.095</td>
<td>0.037</td>
<td>0.697</td>
<td>1.626</td>
<td>.049(a)</td>
</tr>
</tbody>
</table>

a. Predictors: (Constant), Importance of clear expression of thoughts and ideas, Completeness, Coherence, Speaking with confidence, Correct pronunciation, Listening Skills

b. Dependent Variable: Written Possession of Completeness

Table 6 shows that the model of the predictor variables (Importance of clear expression of thoughts and ideas, Completeness, Coherence, Speaking with confidence, Correct pronunciation, Listening Skills) shares 4.2% of the variance of the criterion variable which, in this case, is possession of listening skills. The F value (1.31) is significant. Therefore it can be said that the predictors have a definite role in predicting the criterion variable. A look at the table further shows that recognizing the importance of correct pronunciation for English communication is found associated (.33 significant at .05 level) with possession of listening skills.
Table 7 shows that the model of the predictor variables (Importance of clear expression of thoughts and ideas, Completeness, Coherence, Speaking with confidence, Correct pronunciation, Listening Skills) shares 3.7% of the variance of the criterion variable which, in this case, is Written Possession of completeness. The F value (1.63) is significant at .05 level. Therefore it can be said that the predictors have a definite role in predicting the criterion variable. A look at the table further shows that recognizing the importance of completeness for English communication and speaking with confidence are found significantly associated (.25 and .21 respectively both significant at .04 level) with written possession of completeness.

Table 8: Model summary and ANOVA table

<table>
<thead>
<tr>
<th>Model</th>
<th>R</th>
<th>R Square</th>
<th>Adjusted R Square</th>
<th>Std. Error of the Estimate</th>
<th>F</th>
<th>Sig.</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>.427(a)</td>
<td>0.182</td>
<td>0.046</td>
<td>1.133</td>
<td>1.339</td>
<td>.042(a)</td>
</tr>
</tbody>
</table>

a. Predictors: (Constant), Importance of clear expression of thoughts and ideas, Completeness, Coherence, Speaking with confidence, Correct pronunciation, Listening Skills

b. Dependent Variable: Written Possession of effective Organization of Material

Table 8 shows that the model of the predictor variables (Importance of clear expression of thoughts and ideas, Completeness, Coherence, Speaking with confidence, Correct pronunciation, Listening Skills) shares 4.6% of the variance of the criterion variable which, in this case, is effective organization of material while writing. The F value (1.34) is significant at the .04 level. Therefore it can be said that the predictors have a definite role in predicting the criterion variable. A look at the table further shows that recognizing the importance of speaking with confidence for English communication is found associated (.34 significant at .02 level) with possession of effective organization of material in writing.

Table 9: Model summary and ANOVA table

<table>
<thead>
<tr>
<th>Model</th>
<th>R</th>
<th>R Square</th>
<th>Adjusted R Square</th>
<th>Std. Error of the Estimate</th>
<th>F</th>
<th>Sig.</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>.498(a)</td>
<td>0.248</td>
<td>0.122</td>
<td>1.155</td>
<td>1.974</td>
<td>.035(a)</td>
</tr>
</tbody>
</table>

a. Predictors: (Constant), Importance of clear expression of thoughts and ideas, Completeness, Coherence, Speaking with confidence, Correct pronunciation, Listening Skills
b. Dependent Variable: Written Possession of Use of Appropriate Business Terminology

<table>
<thead>
<tr>
<th>Model</th>
<th>Unstandardized Coefficients</th>
<th>Standardized Coefficients</th>
<th>t</th>
<th>Sig.</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>B</td>
<td>Std. Error</td>
<td>Beta</td>
<td>B</td>
</tr>
<tr>
<td>1</td>
<td>(Constant)</td>
<td>1.051</td>
<td>1.530</td>
<td>-.687</td>
</tr>
<tr>
<td>4.1a</td>
<td>.120</td>
<td>.248</td>
<td>.095</td>
<td>.483</td>
</tr>
<tr>
<td>4.6a</td>
<td>.575</td>
<td>.314</td>
<td>.328</td>
<td>1.832</td>
</tr>
<tr>
<td>4.7a</td>
<td>.191</td>
<td>.239</td>
<td>.135</td>
<td>.798</td>
</tr>
<tr>
<td>4.12a</td>
<td>.036</td>
<td>.299</td>
<td>.023</td>
<td>.120</td>
</tr>
<tr>
<td>4.13a</td>
<td>.322</td>
<td>.253</td>
<td>.229</td>
<td>1.271</td>
</tr>
<tr>
<td>4.23a</td>
<td>-.301</td>
<td>.235</td>
<td>-.237</td>
<td>1.282</td>
</tr>
</tbody>
</table>

Table 9 shows that the model of the predictor variables (Importance of clear expression of thoughts and ideas, Completeness, Coherence, Speaking with confidence, Correct pronunciation, Listening Skills) shares 1.22% of the variance of the criterion variable which, in this case, is possession of use of appropriate business terminology in writing. The F value (1.97) is significant. Therefore it can be said that the predictors have a definite role in predicting the criterion variable. A look at the table further shows that recognizing the importance of completeness for English communication is found associated (.33 significant at .02 level) with possession of use of appropriate business terminology in writing.

Table 10: Model summary and ANOVA table

<table>
<thead>
<tr>
<th>Model</th>
<th>R</th>
<th>R Square</th>
<th>Adjusted R Square</th>
<th>Std. Error of the Estimate</th>
<th>F</th>
<th>Sig.</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>.442(a)</td>
<td>0.195</td>
<td>0.065</td>
<td>1.218</td>
<td>1.495</td>
<td>.046(a)</td>
</tr>
</tbody>
</table>

a. Predictors: (Constant), Importance of clear expression of thoughts and ideas, Completeness, Coherence, Speaking with confidence, Correct pronunciation, Listening Skills

b. Dependent Variable: Written Possession of correct punctuation marks

<table>
<thead>
<tr>
<th>Model</th>
<th>Unstandardized Coefficients</th>
<th>Standardized Coefficients</th>
<th>t</th>
<th>Sig.</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>B</td>
<td>Std. Error</td>
<td>Beta</td>
<td>B</td>
</tr>
<tr>
<td>1</td>
<td>(Constant)</td>
<td>.528</td>
<td>1.613</td>
<td>.327</td>
</tr>
<tr>
<td>4.1a</td>
<td>.386</td>
<td>.258</td>
<td>.296</td>
<td>1.499</td>
</tr>
<tr>
<td>4.6a</td>
<td>-.218</td>
<td>.330</td>
<td>-.121</td>
<td>-.660</td>
</tr>
<tr>
<td>4.7a</td>
<td>.381</td>
<td>.248</td>
<td>.265</td>
<td>1.535</td>
</tr>
<tr>
<td>4.12a</td>
<td>.070</td>
<td>.315</td>
<td>.043</td>
<td>.221</td>
</tr>
<tr>
<td>4.13a</td>
<td>.114</td>
<td>.250</td>
<td>.081</td>
<td>.455</td>
</tr>
<tr>
<td>4.23a</td>
<td>-.104</td>
<td>.246</td>
<td>-.080</td>
<td>-.424</td>
</tr>
</tbody>
</table>

Table 10 shows that the model of the predictor variables (Importance of clear expression of thoughts and ideas, Completeness, Coherence, Speaking with confidence, Correct pronunciation, Listening Skills) shares 6.5% of the variance of the criterion variable, which in this, case is written possession of correct punctuation marks. The F value (1.50) is significant. Therefore it can be said that the predictors have a definite role in predicting the criterion variable. A look at the table further shows that recognizing the importance of clear expression of thoughts and ideas for English communication is found associated (.30 significant at .05 level) with written possession of correct punctuation marks.
Table 11: Model summary and ANOVA table

<table>
<thead>
<tr>
<th>Model</th>
<th>R</th>
<th>R Square</th>
<th>Adjusted R Square</th>
<th>Std. Error of the Estimate</th>
<th>F</th>
<th>Sig.</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>.259(a)</td>
<td>0.067</td>
<td>0.006</td>
<td>0.958</td>
<td>1.105</td>
<td>.032(a)</td>
</tr>
</tbody>
</table>

a. Predictors: (Constant), Importance of clear expression of thoughts and ideas, Completeness, Coherence, Speaking with confidence, Correct pronunciation, Listening Skills

b. Dependent Variable: Written Possession of correctness of sentence structure

| Coefficients (a) |
|------------------|------------------|------------------|------------------|------------------|
|                  | Model            | Unstandardized Coefficients | Standardized Coefficients | t     | Sig.   |
|                  |                  | B               | Std. Error | Beta   | B     | Std. Error |
| 1 (Constant)     | 1.951            | .918            |            |        | 2.125 | .036        |
| 4.1a             | .166             | .139            | .138       | 1.198  | .234  |
| 4.6a             | -.086            | .169            | -.065      | -.513  | .609  |
| 4.7a             | .029             | .137            | .026       | .209   | .835  |
| 4.12a            | .245             | .130            | .206       | 1.887  | .032  |
| 4.13a            | -.066            | .156            | -.048      | -.420  | .675  |
| 4.23a            | .006             | .142            | .006       | .045   | .964  |

Table 11 shows that the model of the predictor variables (Importance of clear expression of thoughts and ideas, Completeness, Coherence, Speaking with confidence, Correct pronunciation, Listening Skills) shares very little (.6%) of the variance of the criterion variable which in this case is written possession of correctness of sentence structure. The F value (1.11) is significant. Therefore it can be said that the predictors have a definite role in predicting the criterion variable. A look at the table further shows that recognizing the importance of speaking with confidence for English communication is found closely associated (.21 significant at .03 level) with written possession of correctness of sentence structure.

Table 12: Ways of improving English communication skills by B-school students

<table>
<thead>
<tr>
<th>Ways of improving English Communication Skills</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Reading</td>
<td>37.8</td>
</tr>
<tr>
<td>Writing</td>
<td>12.2</td>
</tr>
<tr>
<td>Speaking</td>
<td>45.9</td>
</tr>
<tr>
<td>Listening</td>
<td>4.1</td>
</tr>
</tbody>
</table>

Table 13: Cross tabulation- gender and ways of improving English communication skills by B-school students

<table>
<thead>
<tr>
<th>Gender</th>
<th>Ways to improve English communication skills</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Reading</td>
</tr>
<tr>
<td>Male</td>
<td>21</td>
</tr>
<tr>
<td>Female</td>
<td>16</td>
</tr>
</tbody>
</table>

Table 14: Cross tabulation- age group*Ways of improving English communication skills by B-school students

<table>
<thead>
<tr>
<th>Age</th>
<th>Ways to improve English communication skills</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Reading</td>
</tr>
<tr>
<td>20-30 years</td>
<td>10</td>
</tr>
<tr>
<td>30-40 years</td>
<td>15</td>
</tr>
<tr>
<td>40-50 years</td>
<td>9</td>
</tr>
</tbody>
</table>
Table 15: Cross tabulation- no. of years of experience*Ways of improving English communication skills by B-school students

<table>
<thead>
<tr>
<th>Teaching Experience</th>
<th>Reading</th>
<th>Writing</th>
<th>Speaking</th>
<th>Listening</th>
</tr>
</thead>
<tbody>
<tr>
<td>0-5 years</td>
<td>20</td>
<td>4</td>
<td>15</td>
<td>2</td>
</tr>
<tr>
<td>6-10 years</td>
<td>11</td>
<td>5</td>
<td>18</td>
<td>1</td>
</tr>
<tr>
<td>11-15 years</td>
<td>1</td>
<td>0</td>
<td>1</td>
<td>0</td>
</tr>
<tr>
<td>16 years and above</td>
<td>2</td>
<td>0</td>
<td>1</td>
<td>1</td>
</tr>
</tbody>
</table>

As indicated in Table 12, B-school students, as perceived by the faculty, could best improve their communication skills through speaking (45.9 %) and reading (37.8 %) as per Table 12. Table 13 depicts that out of the 45.9% respondents who felt speaking was the best means to improve, 28 were males and 13 were females. Amongst the other 37.8% who identified reading as the best way to improve the communication skills of students, 21 were males and 16 were females. The fact that practice writing was not determined effective enough for the required improvement is perhaps suggestive of the general belief that writing skills cannot be adequately developed in a business communication class (Pittenger, Miller and Allison; 2006). Table 14 shows that not a single respondent in the age group of 20-30 years felt that listening skills could be a way of improvement in communication skills. While the fact is surprising, is it also suggestive of youth giving little importance to listening skills? A definite pattern can be observed in Table 14. Irrespective to the age, the highest responses have been in the option of reading and speaking which is as expected. Table 15 clearly shows that faculty members with comparatively lesser experience find reading to be more effective than writing and gradually the focus seems to have shifted towards speaking. Interestingly, the cycle takes full circle and as can be seen in Table 15, the senior most faculty members, though very few in number, seem to be again establishing reading as the most effective way of improvement. However, this analysis may be subjective to the number of respondents.

Table 16: Reasons for not taking business communication classes seriously by B-School students

<table>
<thead>
<tr>
<th>Reasons</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fluency in English is a problem</td>
<td>15.2</td>
</tr>
<tr>
<td>It is not the sole reason of their getting a job</td>
<td>16.2</td>
</tr>
<tr>
<td>It takes a lot of time to improve upon it</td>
<td>26.3</td>
</tr>
<tr>
<td>It is more important to concentrate on their specialization</td>
<td>21.2</td>
</tr>
<tr>
<td>The topics included are not of their interest</td>
<td>13.1</td>
</tr>
<tr>
<td>Any other reason</td>
<td>8.1</td>
</tr>
</tbody>
</table>

Table 17: Cross tabulation- age group*Reasons for not taking Business Communication classes seriously by B-School students

<table>
<thead>
<tr>
<th>Age Group</th>
<th>No Fluency in English</th>
<th>Can get a job otherwise also</th>
<th>Takes a lot of time to improve</th>
<th>More important to concentrate on specialization</th>
<th>Topics included are not of interest</th>
<th>Any other reason</th>
</tr>
</thead>
<tbody>
<tr>
<td>30-40 years</td>
<td>5</td>
<td>6</td>
<td>13</td>
<td>11</td>
<td>5</td>
<td>4</td>
</tr>
<tr>
<td>40-50 years</td>
<td>4</td>
<td>4</td>
<td>5</td>
<td>2</td>
<td>4</td>
<td>1</td>
</tr>
<tr>
<td>50 years and above</td>
<td>0</td>
<td>0</td>
<td>2</td>
<td>3</td>
<td>0</td>
<td>0</td>
</tr>
</tbody>
</table>

Table 18: Cross tabulation- no. of years of experience*Reasons for not taking Business Communication classes seriously by B-School students
Table 16 shows that the most important reason of not taking business communication classes as seriously as other classes by B-school students, according to faculty, was found to be that it takes a lot of time to improve upon it (26.3 %) and it is more important for students to concentrate on their specialization (21.2 %). It appears that the instructors generally feel that students today are more inclined towards immediate results; hence, despite their acknowledged weakness in communication skills and their awareness of its importance, students do not tend to accord appropriate seriousness to the course. A few other reasons cited by the faculty were –the tendency of business communication classes becoming English speaking classes in most B-schools, the failure of the course in appropriately challenging the heterogeneous batch of students; the deviation from focus on the part of business communication instructors and students’ assumption that business communication is more of self practice. The reasons do not seem to get affected by the age groups or number of years of experience as is indicated in Tables 17 and 18. It is perhaps suggestive of the fact the faculty has a uniform opinion on the students’ not taking business communication classes seriously. Interestingly when students were asked why they did not take their business communication classes seriously, in another study undertaken by Agarwal (2008), the major reasons emerged as ‘too much course crammed in one credit course’ and ‘only one credit course , that too in the first trimester’. However, the reasons that have emerged as highly significant in the current study were found to be significant in Agarwal’s study also. In a similar study conducted on new management recruits (Agarwal, Chitranshi and Cardon, 2009), concern over specialization was identified as the major reason behind communication classes not being taken seriously, followed by the belief that communication skills would not be the sole reason behind getting a job.

Table 19: Number of semesters over which business communication curriculum should be spread out

<table>
<thead>
<tr>
<th>Number of semesters</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 semester</td>
<td>15.2</td>
</tr>
<tr>
<td>2 semesters</td>
<td>48.5</td>
</tr>
<tr>
<td>3 semesters</td>
<td>10.1</td>
</tr>
<tr>
<td>4 semesters</td>
<td>26.3</td>
</tr>
</tbody>
</table>

Table 20: Cross-tabulation- gender* no. of semesters

<table>
<thead>
<tr>
<th>No. of Semesters</th>
<th>Gender</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Male</td>
</tr>
<tr>
<td>One semester</td>
<td>13</td>
</tr>
<tr>
<td>Two semesters</td>
<td>32</td>
</tr>
<tr>
<td>Three semesters</td>
<td>5</td>
</tr>
<tr>
<td>Four semesters</td>
<td>10</td>
</tr>
</tbody>
</table>

Table 21: Cross-tabulation- age* no. of semesters

<table>
<thead>
<tr>
<th>No. of Semesters</th>
<th>Age</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>One semester</td>
</tr>
<tr>
<td></td>
<td>20-30 years</td>
</tr>
<tr>
<td></td>
<td>30-40 years</td>
</tr>
<tr>
<td></td>
<td>40-50 years</td>
</tr>
<tr>
<td></td>
<td>50 years and above</td>
</tr>
</tbody>
</table>

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Table 22: Cross-tabulation- no. of years of experience * no. of semesters

<table>
<thead>
<tr>
<th>Teaching Experience</th>
<th>No. of Semesters</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>One semester</td>
</tr>
<tr>
<td>0-5 years</td>
<td>5</td>
</tr>
<tr>
<td>6-10 years</td>
<td>8</td>
</tr>
<tr>
<td>11-15 years</td>
<td>0</td>
</tr>
<tr>
<td>16 years and above</td>
<td>0</td>
</tr>
</tbody>
</table>

Business Communication curriculum should be spread out into two semesters (48.5 %) or four semesters (26.3 %) for its better appreciation amongst students (Table 19). Most male faculty members opined that the business communication curriculum, for better understanding and appreciation, should be spread over two semesters while female faculty members felt that it should be spread over two or four semesters (Table 20). Faculty members of all ages have said that the business communication curriculum should be spread over two semesters (Table 21). Faculty members with work experience of 0-10 years especially and all the faculty members unanimously opined that the course of business communication would do more justice if spread over two semesters (Table 22). In the study conducted by Agarwal (2008), students opined that the course should be spread over two to three semesters while newly recruited management graduates (Agarwal, Chitranshi and Cardon, 2009) felt that the course should be taught in three and four trimesters. A significant observation here is that no stake holder wanted the course to run for one semester alone, as it is currently run in most B-schools of India.

Table 23: English communication-skills recruiters look for in MBA students

<table>
<thead>
<tr>
<th>Communication Skills</th>
<th>Average of ranks</th>
</tr>
</thead>
<tbody>
<tr>
<td>Theoretical knowledge</td>
<td>6.45</td>
</tr>
<tr>
<td>Practical application</td>
<td>4.98</td>
</tr>
<tr>
<td>Confidence</td>
<td>3.22</td>
</tr>
<tr>
<td>Clear expression of thoughts and ideas</td>
<td>4.41</td>
</tr>
<tr>
<td>Conviction</td>
<td>6.18</td>
</tr>
<tr>
<td>Choice of words</td>
<td>7.31</td>
</tr>
<tr>
<td>Speaking fluently</td>
<td>5.95</td>
</tr>
<tr>
<td>Proper body language</td>
<td>5.69</td>
</tr>
<tr>
<td>Presentability</td>
<td>5.78</td>
</tr>
<tr>
<td>Right attitude</td>
<td>4.74</td>
</tr>
</tbody>
</table>

Table 23 shows that recruiters, as felt by business management education instructors, look for the following skills in MBA students- confidence (average rank =3.22), where 1 = 1st rank, right attitude (average rank= 4.41), right attitude (average rank = 4.74) and practical application (average rank =4.98). Significantly, choice of words (average rank = 7.31) and theoretical knowledge (average rank = 6.45) have been ranked lowest by the faculty, though these are the areas management schools have a major focus upon. This dichotomy between what the faculty needs is not so important and yet is delivered, needs to be immediately addressed.

6. Conclusion

Overall, there was some dichotomy between the perceived important components of communication skills for students and their possession amongst them. The skills which were considered to be more important were less on the possession scale while the skills which were considered to be comparatively less important by the faculty were high on the possession scale.

Possession of written communication skills was found to be lower than the possession of same components in the oral skills, which is consistent with the previous research (Pittenger, Miller, and Allison, 2006). It can be thus concluded that the students across the globe, in India and abroad, are weak in possession of written skills. This is despite the fact that most of the delivery of the business communication course is pre-dominated by written skills alone. This gap needs to be further addressed through research. Deliberations whether or not written skills can be taught have already begun (Pittenger et al, 2006). Such studies need to be further conducted to analyze and understand this fact and act accordingly. The study also identifies that the business management teaching community feels that the course of business communication should be taught in either two or four semesters as opposed to the course being presently taught in one semester in most B- schools. The
faculty also opined that the business communication classes are not taken very seriously by students, the most important reasons, as felt by faculty were that it takes a lot of time to improve upon it and that it is more important for students to concentrate upon their specialization. A few other very important reasons that emerged were that the business communication classes very often transform into English speaking classes in most B-schools and the course fails in appropriately challenging the heterogeneous batch of students. This appears to be a very significant feedback for the business communication course instructors across B-schools. Research has already started debating whether English usage should or should not be included in a business communication course (Plutsky & Wilson, 1996).

7. Implications of the study

The study would have some far-fetched implications for business communication instructors. The findings could help business communication instructors to identify strengths, weaknesses and opportunities towards a continuous improvement of business communication education. Second, since the respondents are from across Indian business management institutions, the findings would enable the business communication instructors in India to customize their curricula towards improvement, according to the demand.

8. Recommendations

Based on the above conclusions following guidelines are recommended to those who have a business communication course similarly designed and who would wish to revise based on the present study:

- A clear distinction between a business communication course and an English speaking course needs to be maintained. A basic understanding and level of students’ expertise over English needs to be ensured before offering a course on business communication.
- A balance between the delivery of oral and written components of communication skills needs to sustained, thus providing students with equal opportunity to speak and write. The study has revealed that though the course is focused on written skills, students’ possession of written skills is comparatively lower.
- Analyze the need and receptivity of the business communication course and then, as the study suggests, spread the course out to various semesters. The number of semesters this course should be offered depends upon the need of the students. What needs to be more importantly ensured is that it challenges and creates learning opportunities to a heterogeneous batch.
- The course, which is highly contemporary by nature, needs a continual assessment and revision. These revisions should only be made after proper discussion with faculty across the disciplines to ensure that the course meets the needs of the students and simultaneously prepares them for right kind of oral and written communication skills for their future.

References


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Knowledge Sharing in Academic Institutions: a Study of Multimedia University Malaysia

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Abstract: Recent developments have witnessed the emergence of a new economy where knowledge has become a valuable resource and asset. The dynamism of the new economy requires us to not only quickly create knowledge, but also to acquire and apply knowledge quickly. One possible way to do so is to share our knowledge effectively. Knowledge sharing is envisaged as a natural activity of the academic institutions as the number of seminars, conferences and publications by academics is far exceeding any other profession, signifying the eagerness of academics to share knowledge. However, instead of knowledge sharing, “knowledge hoarding” could be more prevalent in academic institutions. This paper examines knowledge sharing behavior among academics in a private university in Malaysia. Factors affecting the willingness to share knowledge, broadly classified as organizational, individual and technology factors, are examined. The overall findings revealed that incentive systems and personal expectation are the two key factors in driving academics to engage in knowledge sharing activity. “Forced” participation is not an effective policy in cultivating sharing behavior among academics.

Keywords: knowledge sharing, knowledge management, higher education institution, sharer model

1. Introduction

It has become a norm to refer today’s economy as a knowledge-based economy. Knowledge is increasingly becoming “the” resource, rather than “a” resource for wealth generation. It is widely recognized that knowledge is the critical asset to individual as well as organization to succeed in the increasingly competitive environment (Syed-Ikhsan and Rowland, 2004; Alavi and Leidner, 1999; Van den Hooff and De Ridder, 2004; Yang, 2007). Thus, how to make use of knowledge in order to create the greatest value is becoming the central concern and debate in the new economy. Many researchers have attempted the issue by identifying the salient features of the knowledge-based economy and formulating various strategies to capture and create a new source of competitive advantage in the new society. However, most studies related to the knowledge-based economy are confined to the structural challenges of the new economy, paying an excessive attention to issues such as knowledge management system, innovation and technological application. Very little investigation has ventured into the study of human behavior in the new economy, for instance, how people perceive the transition from production-based to knowledge-based economy, how ready are they in taking up new challenges, how individual views the sharing of their hard-earned knowledge asset, what motivated or discouraged them to involve in knowledge-based activities, particularly in the production, distribution and application of knowledge.

One distinguished characteristic that has made the new economy unique is that it deals with a unique resource called “knowledge”. Unlike other traditional resources, i.e. land, labor and capital, to a certain extent, once it is distributed and shared, knowledge becomes a public good. The non-exclusivity and non-rivalry nature of public goods make it essential for knowledge creators to strategize their knowledge sharing and hoarding decision. On the one hand, once created, knowledge needs to be distributed quickly and widely because active knowledge is the “gem” while idle knowledge is the “stone”. On the other hand, knowledge is the “power”, holding knowledge is similar to holding the competitive power of the new economy. The dilemma of knowledge sharing and hoarding happened in all organizations. Failure to understand the relationship between the conflicting interests has explained why many organizations failed to develop an efficient mechanism to manage organizational knowledge to achieve their pre-set goals.
The study of knowledge sharing is dominated by those focusing on knowledge sharing activity within the business organizations. Obviously, the ultimate goal of organizational knowledge sharing in these institutions is profit-motivated. However, the issue of knowledge sharing is equally important for a knowledge-based institution, such as a university, where knowledge production, distribution and application are ingrained in the institution. Though there is no direct way to measure the outcome of knowledge sharing in knowledge institutions, the impact of knowledge sharing could be larger than those created by the business organizations. This paper is designed to fill the gap in the literature and to address some of the hidden issues in literature, such as: Can we expect academics to be knowledge sharers by nature? Do they share all the knowledge they possess? What types of knowledge are shared among academics? What are the main concerns in sharing their valuable asset?

This paper explores knowledge sharing practices among academics in a private university in Malaysia, i.e. Multimedia University. Founded in 1997, Multimedia University (MMU) is the first private university established in Malaysia. In this paper, a private university, instead of a public university is chosen for the study because Multimedia University has a clear and explicitly spelt-out promotional criterion. Research productivity and teaching excellence are the two main criteria to be considered. Under this competitive environment, it is interesting to examine the behavior and intensity of knowledge sharing practices among academics and factors that have motivated them to share knowledge with their colleagues. The findings would provide useful insights for policy makers and administrators at academic institutions to plan and implement effective research and knowledge sharing practices among academics.

2. A review of knowledge sharing literature

Generally, sharing knowledge is about communicating knowledge within a group of people. The group may consist of members engaged in a formal institution, for instance, among colleagues in a workplace or informal for example, among friends and the interaction may occur between a minimum of two individuals to a multiple of individuals. The underlying purpose is to utilize available knowledge to improve the group’s performance (Alavi and Leidner, 1999; Salisbury, 2003). In other words, individuals share what they have learned and transferred what they knew to those who have the collective interest and who have found the knowledge useful. The sharing process consists of collecting, organizing and conversing knowledge from one to another (Van den Hooff and De Ridder, 2004). As the sharing process involves more than just collecting data and information, generally, the value of knowledge expanded when it is shared. Therefore, if managed properly, knowledge sharing can greatly improve work-quality and decision-making skills, problem-solving efficiency as well as competency that will benefit the organization at large (Syed-Ikhsan and Rowland, 2004; Yang, 2007).

In a nutshell, there are two non-exclusive ways of knowledge sharing, i.e. closed-network sharing (person-to-person sharing) and open-network sharing (sharing through a central open repository). In the closed sharing model, individual has the freedom to decide the mode of sharing and choose partners to share his or her knowledge. This type of interaction allows more personal touch and more directed sharing is expected. Many factors would explain the success of the sharing activity in this model, including personal relationship and trust. On the other hand, the open-network sharing refers to the sharing of knowledge among members of a group through a knowledge management system, typically a central database system. It involves multiple individuals sharing multiple knowledge assets in the system. Knowledge asset in this form of sharing carries the characteristics of a public good (Müller, Spiliopoulou and Lenz, 2005), thus insufficient voluntary sharing is anticipated. Open-network sharing is widely adopted in organizations to share organizational-knowledge. The following sections will focus on open-network sharing mechanism, as the method applied in this study is associated with the open-network sharing method.

The intensity and effectiveness of knowledge sharing through the open-network largely depends on the friendliness of the IT system created, the incentive system as well as the organizational culture of the institution. Hsu (2006) in an effort to classify the different approaches used in literature to promote knowledge sharing has managed to summarize them into three approaches. The first approach is called “tool-based” which focused on building sophisticated IT system in knowledge sharing. The second approach emphasizes the importance of incentives to facilitate knowledge sharing, is thus called
“incentive-based”. The third approach is the integrative approach which considers not only management values, organizational culture but also processes and structure to encourage knowledge sharing.

More specifically, the passion to share knowledge in an open-network environment is affected by interacted factors socially, economically and technically. In the literature, when it comes to the decision as to whether to share or not to share, monetary incentives and rewards are the key factors cited most frequently (Hendricks, 1999; Hahn and Subrami, 2000; Ruppel and Harrington, 2001; Bartol and Srivastava, 2002; Dignum and Dignum, 2003; Syed-Ikhsan and Rowland, 2004; Riege, 2005). Sharing of knowledge is a costly activity. Thus, unless the perceived benefits exceed the costs of sharing, the sharing process is hard to realize (Chua, 2003). This can be linked to the economic exchange theory as proposed by Gee and Young-Gul (2002). In addition to incentives and rewards, organizational culture and leadership have a significant impact on the intensity of knowledge-sharing too (Ruppel and Harrington, 2001; Chua, 2003; Kim, Suh and Hwang, 2003; Malhotra and Majchrzak, 2004; Lin, 2008, Cheng, 2002; Riege, 2005). Bureaucracy and hierarchical level in an organization (Hendricks, 1999; Syed-Ikhsan and Rowland, 2004; Riege, 2005; Sondergaard, Kerr and Clegg, 2007; Lin, 2008), diversity of knowledge in a sharing team (Malhotra, and Majchrzak, 2004; Mooradian, Renzl, Matzler, 2006), team cohesiveness (Dignum and Dignum, 2003), and the fear that others will use the knowledge learnt to go against them, have also influenced the motivation to share (Ford and Chan, 2003). (Ruppel, and Harrington, 2001; Malhotra, and Majchrzak, 2004; Van den Hooff, and De Ridder, 2004; Mooradian, Renzl, Matzler, 2006; Sondergaard, Kerr and Clegg, 2007; Lin 2008).

Personal factors, like recognition as experts in the relevant fields of study, group identity and self-esteem are important considerations determining the passion to share their knowledge (Hahn and Subrami, 2000; Syed-Ikhsan and Rowland, 2004; Sondergaard, Kerr and Clegg, 2007). However, not all knowledge will be shared. The type and the amount of knowledge shared depend upon the estimation of the value of knowledge to each individual, i.e. the perceived value of knowledge (Ford and Staples, 2005). It also depends on the availability and extent of intellectual property protection for knowledge sharing activities. The fears that one might receive unfair recognition and accreditation, plus the risks of one's intellectual property being stolen, are some of the key reasons that discourage knowledge-sharing activities (Riege, 2005).

Knowledge expands with the extension of social and community interactions (Pan and Leidner, 2003). Knowledge contributors and seekers who share common interest areas will often look for a common community to share their ideas and experiences which can be done via either informal or formal network. These knowledge contributors and seekers are habitually glued together through their personal connections (Ardichvili, Page and Wentling, 2003), and formed what is generally called “communities of practices”. Since the critical success factor of virtual communities of practice is very much depending on perpetual knowledge generation and sharing, cultivating communities of practices could be an effective mechanism to promote the sharing culture.

Technology is an important mediating factor in knowledge sharing. The intervention of information technology (IT) is inevitably important as a tool for a successful knowledge management implementation (Bhatt, 2001; Kim, Suh, and Hwang, 2003). However, ICT functions as a platform for knowledge sharing is by itself insufficient to encourage knowledge sharing as suggested by Hendricks (1999): “The role of ICT for knowledge sharing can only be fully understood if it is related to the motivation for knowledge sharing…” On top of the motivation for knowledge sharing, Brazelton and Gorry (2003) had also exposed the idea that technology alone may not effectively encourage knowledge sharing activities. Kim and Jarvenpaa (2008) had supported the importance of the existing relationship between communicating parties as a formula to shape technological-enabled-knowledge activities.

The above literature reveals different factors influencing the decision for people to involve in knowledge sharing activity. Basically, these factors can be grouped into three sub-groups; namely organizational factors, individual factors and technical factors. Organizational factors are factors not derived from the individual personally. It can be environmental or caused by another individual to stimulate the knowledge sharing attitude. Incentive system, organizational culture and management system are classified as external factors. Individual factors are factors derived from individually-driven considerations. That means that it comes from the person’s internal being. Examples of internal factors are beliefs, perceptions,
expectations, attitudes and feelings. Technical factor relates to the knowledge management technology, such as software and hardware used in the sharing activity.

Knowledge management initiatives were first adopted and proliferated in profit-oriented organizations, thus studies on knowledge management, including knowledge sharing, were concentrated largely on these organizations i.e., “Hewlett Packard, DaimlerChrysler (Davenport and Voelpel, 2001), British Petroleum (Cohen and Prusak, 1996), Chevron, Ford, Xerox, Raytheon, IBM (Ellis, 2001), Siemens (Davenport and Probst, 2002; Voelpel, 2003), Shell (Haimila, 2001), and Caterpillar (Ardichvili et al. 2003)”, Voelpel and Han (2005) and Toyota (Dyer and Nobeoka, 2000). Recently, knowledge management practices have also extended to universities and other knowledge-based institutions, making knowledge sharing in academic institutions a popular debate.

Universities serve as the platform to enable academics to speak of their ideas and insights (Martin and Marion, 2005), besides add substantial value to the information-processing environment (Mphidi and Synman, 2004). One of the common functions of knowledge management used in universities is to serve as the knowledge repositories (Bhatt, 2001; Rowley, 2000). In fact, it has always been a practice in almost all higher educational institutions to store all relevant documents contributed by in-house resources in the knowledge repository or the database. Storing information is not new in universities, but what is new is to share the available knowledge and to allow members to utilize the information generated within the community. In addition, knowledge repository is used as a diagnostic tool to allow universities to map the existing skills and experience with current needs in order to fill any gaps or deficiencies in the institution's knowledge base (Keramati and Azadeh, 2007).

Similar to the application in business organizations, knowledge management can also create a competitive advantage for academic institutions, if utilized appropriately. This is possible since the knowledge created and stored will serve as the repository to benefit scholars and researchers to advance the knowledge cycle and to distinguish the institution in the academic market place (Basu and Sengupta, 2007). Studies conducted in higher educational institutions in Asia have shown that knowledge sharing activities in the academic environment encountered similar barriers as in business environment. For instance, there seems to be a missing culture of sharing in a business school in India, as most activities are individualistic, limited to internal peer group, and interactions with external experts are limited to personal acquaintance (Basu and Sengupta, 2007). Another study conducted in a tertiary education institution in Singapore (Wah, Menkhoff, Loh and Evers, 2007) has shown that rewards and incentives, open-mindedness of the sharer, and the cost-benefit concerns of knowledge hoarding are the strongest predictors of knowledge sharing in comparison to pro-social motives or organizational care. In a study carried out by Abdullah, et.al. (2008) on seven major public universities in Malaysia, it is found that appropriate incentives and rewards should be awarded for sharing, searching and the usage of knowledge management system as a mode of motivation.

3. Research method

Nonaka and Takeuchi (1995) study the creation of knowledge through the integrated SECI process. Their findings indicated that the presence of a “platform”, especially in the form of face-to-face meetings is critical for knowledge sharing to take place and to allow for interaction to happen (Nonaka and Konno, 1998). Kim and Lee (2005) construct a model consists of organizational culture, structure and information technology to examine the knowledge sharing capabilities among employees in public and private sector organizations in South Korea. They find that performance-based reward systems, IT applications focusing on end-users and social networks are key variables affecting knowledge sharing activities.

Based on the theories developed and derived from the literature and modified to suit the study for university academics, the research model designed for the study is presented in Figure 1. Variables included in the model are organizational, individual and technical factors to identify reasons contributing to knowledge sharing behavior. The willingness to share knowledge is used as the dependent variable in the model. Data are collected to address the following hypotheses:
Hypothesis 1: Incentive system has a significant effect on knowledge sharing.

Hypothesis 2: Management system affects knowledge sharing significantly.

Hypothesis 3: Organization culture affects knowledge sharing.

Hypothesis 4: Individual attitude affects knowledge sharing behavior.

Hypothesis 5: Personal expectation affects knowledge sharing.

Hypothesis 6: Technology, as a means of sharing, plays a significant role in knowledge sharing.

In this study, MMU is the selected sample to study the intensity and behavior of knowledge sharing among academics in the knowledge-based institution in Malaysia. MMU is established in Malaysia to support and facilitate the development of information and multimedia technology in the country. It has two campuses located in two cities, namely Melaka and Cyberjaya. Current student population is approximately 20,000 in total.

Originated and modeled after the Siemens ICN ShareNet, MMU has set up its online sharing system called ShareNet to serve as a platform for the university to share knowledge within the community. Online open-network sharing through ShareNet is critical for MMU to tap its knowledge assets and communicate knowledge across the two campuses which are separated physically by a distance of about 150 kilometers. ShareNet was used to link up not only academics, but also non-academics in the university. Intra-community sharing was unlimited. At the same time, contribution to ShareNet was taken seriously by the management. The management has made it compulsory for each university’s employee to contribute

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1 MMU website, accessed online on March 4, 2008 at http://www.mmu.edu.my
to ShareNet and the contribution was counted at the year-end performance evaluation. Though knowledge sharing means more than simply transmitting and receiving knowledge, however, in this study, we attempt to capture the spirit of sharing by examining the commitment to upload and download information to/from the ShareNet system.

Due to some technical reasons, ShareNet was replaced by Knowledge Bank in 2006. This study is conducted to study the effectiveness of knowledge sharing via ShareNet and to identify factors that influence the sharing behavior among academics. It is expected that the result of the study will provide useful information for the university to build a system that would better serve the purpose of knowledge sharing in universities. In this study, online questionnaires were distributed to all academics in the university. The survey was conducted in mid-2006, immediately after the ShareNet was closed down. Only academics were invited to participate in the survey as the purpose of the study is to examine why academics share and/or not share their knowledge. However, not all academics are qualified to answer the questionnaires, only those who have participated in ShareNet before 2006 are allowed to fill in the questionnaires. Thus, a small sample size is expected. At the end of the survey period, a total of 119 responses were collected while only 60 responses have provided the complete answers. Therefore, the analysis and findings are based on the sample of 60 responses.

The questionnaire contains questions to elicit academics behavior as the knowledge contributor. In addition, few questions were also included to grasp respondents’ behavior as knowledge receiver at the same time.

4. Measures for knowledge contributors

Respondents were asked to rate from (1) “strongly disagree” to (5) “strong agree” for each question listed in Section A of the questionnaire. Questions related to incentive system, management system, organizational culture, attitude, personal expectation and IT application are put forth to reveal factors influencing contributors’ behavior in the knowledge-sharing process. A 3-item measure was used to gauge the willingness to share knowledge (KS) among academics in MMU. Questions asked are “Nobody in this organization is interested to share”, “I have uploaded only limited information” and “I have uploaded information that will not be used by others”. The alpha reliability is 0.692.

To measure the impact of the incentive system on knowledge sharing, respondents were asked to rate from (1) to (5) on three questions related to incentive system, i.e. the attractiveness of the incentive system in MMU; the extent of peer inspiration on knowledge sharing and the level of recognition given by MMU for uploading information on intra-organization database. The alpha reliability for this 3-item measure is 0.680. A 3-item measure was used to examine the impacts of the management practice on knowledge sharing. Questions asked were related to management approach, i.e. on the “compulsory” participation policy; on support given by university and on management emphasis on knowledge sharing activity. The alpha reliability is 0.761. For organizational culture, a 3-item measure which includes trust and the atmosphere for communication of ideas and exchanging experience was used to capture the effect of organizational culture on sharing. The alpha reliability in this study is 0.958.

Individual attitude towards knowledge sharing is measured by two items, these include the fears that the idea shared will be criticized by others and the idea may be “stolen” by others. The alpha reliability is 0.741. A 3-item measure was designed to measure personal expectation with regard to knowledge sharing. Positive statements are prepared for this measure, thus a reversed scaling is done prior analysis to ensure the consistency of scaling used in the analysis. Expectation such as being recognized as the expert in the area; as contributor to improve the knowledge repository in MMU and as connector to link other researchers working on same research area are captured in the study. The alpha reliability for this item is 0.751.

A 3-item measure is used to measure the user-friendliness of technology as a means of knowledge sharing. Essential factors include the friendliness of web-design of ShareNet, support given by the Helpdesk to solve technical difficulties and efficiency of the system in uploading. The alpha reliability for this item is 0.820.
Regression analysis is conducted on the knowledge-sharing model as shown in Equation (1):

$$KS_i = \alpha + \beta_1 IS_i + \beta_2 MS_i + \beta_3 OC_i + \beta_4 IA_i + \beta_5 PE_i + \beta_6 IT_i + \mu_i$$  \hspace{1cm} \text{(Equation (1))}

Where
- KS = Knowledge Sharing
- IS = Incentive System
- MS = Management System
- OC = Organizational Culture
- IA = Individual Attitude
- PE = Personal Expectation
- IT = IT Application

5. Findings

Being a young university in the country, MMU has attracted many young academics. The distribution of the sample reflected this feature as 63.8 percent of the respondents in the survey aged between 26 to 35 years old, 62.1 percent of them hold the position as lecturers, 13.8 percent are tutors, 12.1 percent are senior lecturers, 6.9 percent assistant lecturers or specialists, 3.4 percent are associate professors, and 1.7 percent are professors. More than half of the respondents have worked in MMU for more than 5 years. A total of 58.6 percent are male respondents while 41.4 percent are females. All faculties are represented in the survey; 18 respondents are from the management and business faculties; 11 from engineering; 19 from information technology; 8 from creative multimedia, and others from centers such as modern language and diploma centers.

As mentioned above, the participation in the ShareNet matters in the year-end performance evaluation. Contribution to this online sharing system is therefore “involuntary” to some extent. When asked if it is not made compulsory by the management, will they contribute to the ShareNet, 60 percent of the respondents said “No”. However, it is interesting to find out that even though it is an “involuntary” exercise, 51.8 percent of the respondents said they have contributed more than the “required” times, i.e. more than once a year to the ShareNet, while 40 percent of the respondents said they were just fulfilling the minimum requirement to contribute once a year. MMU is unique in the sense that it enforces a system of “compulsory” participation while other universities basically emphasizing on formulating an attractive rewards system to encourage knowledge sharing.

Each staff has the freedom to choose the types of information he or she would like to upload to share within the community. The flexibility is given to enable academic to participate at own capacities. In some cases, staff may only be able to complete an abstract but not full paper to be uploaded. The intention of not restricting the format and type of document is mainly on encouraging more participation. Figure 2 shows the types of information respondents have contributed to the ShareNet. The findings revealed that most of the respondents have a preference to upload the simplest or least informative form of knowledge product to share within the community, i.e. abstract (51.7 percent) and the literature review (30 percent).

From knowledge receivers’ point of view, apparently, ShareNet is not a preferred source of information for academics in MMU. About 26.7 percent of the respondents said they had never downloaded any information from ShareNet, while only 10 percent of the respondents have accessed some information from ShareNet at least once a month, 20 percent once every quarter and 23.3 percent once every six months. In terms of types of information downloaded, full research articles are the most downloaded materials (47 percent) followed by literature review (25 percent) and findings (25 percent); abstract (23 percent); methodology (23 percent) and non-academic article (17 percent).
The unpopularity of ShareNet was attributed to reasons such as lack of confidence on the quality of the information uploaded at ShareNet, technical reasons such as the web design is not user-friendly as well as stronger preference to use other published databases available outside Multimedia University. Figure 3 shows the reasons given for not searching information from ShareNet.

**Figure 2**: Type of information uploaded in the ShareNet
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The unpopularity of ShareNet was attributed to reasons such as lack of confidence on the quality of the information uploaded at ShareNet, technical reasons such as the web design is not user-friendly as well as stronger preference to use other published databases available outside Multimedia University. Figure 3 shows the reasons given for not searching information from ShareNet.

5.1 Findings from regression analysis

Result of multiple regression analysis is presented in Table 1. As indicated in Table 1, incentive system and personal expectation are the two significant factors associated with the passion to share knowledge. The findings suggest that both the external and internal factors are crucial in promoting knowledge sharing activities among academics.

Academics are motivated to share if the incentives and reward mechanisms are encouraging to create a conducive knowledge sharing environment. Both the monetary as well as non-monetary incentives are crucial to generate the passion toward knowledge sharing. Promotion and other monetary rewards are fundamental factors. Besides, although it may not bring immediate monetary payoff or promotion as a return, if the university recognizes the effort of knowledge sharing as significant to the success of the institution, academics will also be motivated to participate in the sharing activities.
In addition, personal expectation and the desire to build a reputation as an expert in the specific area in MMU provides the strong inspiration for academics to upload their valuable knowledge work on the ShareNet. Also, academics will be encouraged to contribute to the ShareNet if they could expect to receive useful knowledge in return and to build a network within the community. Another factor related to the personal expectation is the desire of academics to be portrayed as altruistic in helping others with what they know.

Technical factors, such as the user-unfriendliness of the information system, have often been cited as one of the critical factors that hinder people from participating in the open-network system, like ShareNet. However, in this study, it does not stand up to be a prime reason for academics not to share their knowledge. It could be due to the reason that being a university that stresses on IT and multimedia, academics at MMU do not find it a burden to use IT in their sharing activities, or it could also be a result of the well-designed feature of the ShareNet system that provides an easy way for people to engage in the activity.

The findings suggest that to promote knowledge sharing activity in knowledge-based institutions, it is essential to create an environment which is people-oriented, rather than technological-oriented. While technology plays a crucial role in minimizing the barriers and increases the propensity to share knowledge, knowledge sharing is still a people-process.

**Table 1**: Regression analysis of the knowledge-sharing model

<table>
<thead>
<tr>
<th>Dimensions</th>
<th>Variable</th>
<th>Regression Coefficient</th>
<th>Standard Error</th>
<th>t</th>
</tr>
</thead>
<tbody>
<tr>
<td>External</td>
<td>Incentive system</td>
<td>0.401*</td>
<td>0.159</td>
<td>2.524</td>
</tr>
<tr>
<td></td>
<td>Management system</td>
<td>0.106</td>
<td>0.153</td>
<td>0.695</td>
</tr>
<tr>
<td></td>
<td>Organizational culture</td>
<td>0.063</td>
<td>0.114</td>
<td>0.553</td>
</tr>
<tr>
<td>Internal</td>
<td>Individual attitude</td>
<td>0.125</td>
<td>0.111</td>
<td>1.121</td>
</tr>
<tr>
<td>Dimensions</td>
<td>Variable</td>
<td>Regression Coefficient</td>
<td>Standard Error</td>
<td>t</td>
</tr>
<tr>
<td></td>
<td>Personal expectation</td>
<td>0.348**</td>
<td>0.299</td>
<td>2.908</td>
</tr>
<tr>
<td></td>
<td>Technology</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>IT application</td>
<td>0.007</td>
<td>0.133</td>
<td>0.958</td>
</tr>
<tr>
<td></td>
<td>Constant</td>
<td>-0.062</td>
<td>0.446</td>
<td>-0.140</td>
</tr>
</tbody>
</table>

_R^2_ = 0.563  
_Adjusted R^2_ = 0.503  
_F_ = 9.439***

_N_ = 60

6. Conclusion

This study was conducted to examine knowledge sharing among academics in the knowledge-based institution. Knowledge sharing is vital to the success of knowledge management practices in all organizations, inclusive of universities. Effective knowledge sharing is essential for the organization to benefit from the knowledge its employees have generated. This study reveals that both external and internal factors are equally important to explain academics’ behavior in knowledge sharing. Although it is a policy in MMU that every academic must upload their research output on ShareNet at least once a year, the impact of “stick” strategy is not as significant as the “carrot” strategy. Academic responded to performance-based incentive system rather than the “force” management system. To a certain extent, the findings are consistent with previous studies, which emphasized the importance of providing the “right” incentive system and understanding individual’s expectation towards knowledge-sharing in order to facilitate knowledge sharing behavior.
In managing the valuable knowledge asset, organizations always seek help from technology to build sophisticated database to capture and store knowledge. However, if employees are not willing to share and pass along the knowledge across the organization, the effort of knowledge management will fail. In a nutshell, knowledge sharing is a people-process. More consideration should be given to understand how individuals react to internal as well as external factors in making their decision as to whether to participate in the sharing activities.

References


Organisational Knowledge Base and Knowledge Transfer in the Shipping Industry

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Abstract: Severe shortages of skilled and qualified personnel in the shipping industry have been addressed in different ways. This paper looks into the issue from a new perspective where high mobility in the shipping industry is seen as a vehicle of knowledge flows that can be used for knowledge transfer. This paper argues that while organisations cannot stop personnel leaving, it is possible, however, to retain part of the knowledge that these leaving personnel carry through effective knowledge management practices. This paper introduces organizational knowledge base (OKB) and identifies knowledge flows both at organizational and industrial levels showing that much can be done to effectively utilise knowledge spillovers brought about by high personnel mobility in the shipping industry. The paper then examines the barriers and facilitators of knowledge transfer in the context of the shipping industry. Due to the unique characteristics of the shipping industry such as the absence of genuine employment link between seafarers, and the remoteness of the onboard workplace from the onshore management, conventional knowledge management practices need to be modified to suit the context of the shipping industry. The paper suggests that advanced information and communication technologies, a dedicated knowledge sharing culture, and strong leadership are essential factors in facilitating knowledge transfer in the context of shipping. The implications of the application of knowledge management practices in the shipping industry are two fold: one is the change of perspectives towards the shortage of skilled personnel in the shipping industry which in turn impacts on maritime education and training; the other is the realignment of resources in tackling the problem of skill shortages, that is, a shift from employee retention to knowledge retention. It is expected that such an attempt will shed light on the understanding of skill shortages from a different perspective and provide insight on the tasks that the shipping industry is facing.

Keywords: OKB, human mobility, knowledge management, knowledge flow, knowledge transfer

1. Introduction

The shipping industry has been experiencing severe shortage of skilled and qualified personnel. A comprehensive study conducted by the Baltic and International Maritime Council, in conjunction with the International Shipping Federation shown an imbalance of supply and demand of seafarers (BIMCO 2000; 2005) as a result of on-going outflow of its highly experienced personnel to other shore-based industries and low intakes to refill its skill base. It is projected that by 2010, the shipping industry will be faced with a shortage of 46,000 skilled and qualified personnel worldwide (table 1). The shortage will impact the shipping industry’s ability to sustain ever increasing demand on maritime transport therefore the wellbeing of international trade and world economy will be affected. The skill shortage will also threaten safe shipping practices thereby the marine environment. Due to shipping industry’s unique characteristics, personnel movement across industries has been very high and in most cases, such movement is in one-way direction with the shipping industry constantly losing its expertise to other industries.

Table 1: Supply and demand balances source: BIMCO/ISF 2000; 2005

<table>
<thead>
<tr>
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</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td>Numbers</td>
<td>%</td>
<td>Numbers</td>
<td>%</td>
<td>Numbers</td>
</tr>
<tr>
<td>1995</td>
<td>18000</td>
<td>219000</td>
<td>-18000</td>
<td>-4.22</td>
<td>-16000</td>
<td>-3.81</td>
<td>-33000</td>
</tr>
<tr>
<td>2000</td>
<td>-16000</td>
<td>224000</td>
<td>-4.22</td>
<td>-3.81</td>
<td>-33000</td>
<td>-7.64</td>
<td>-46000</td>
</tr>
<tr>
<td>2005</td>
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<td>230000</td>
<td>-7.64</td>
<td>-7.64</td>
<td>-46000</td>
<td>-10.38</td>
<td>255000</td>
</tr>
<tr>
<td>2010</td>
<td>-46000</td>
<td>255000</td>
<td>-10.38</td>
<td>-10.38</td>
<td>255000</td>
<td>42.29</td>
<td></td>
</tr>
</tbody>
</table>

Conventional teaching from human resource management cannot effectively solve the problem of high turnover in the shipping industry due to, not only high costs involved in retaining leaving personnel, but also the initial motives of leaving being irrelevant to any retention incentives. The battle for retaining expertises and skills has gone for years with little success. It is under this background that this research was initiated as an attempt to address the shortages of seafarers from a new perspective. It is believed that personal knowledge can be retained without having to physically retain the individual who carries that knowledge. Given the fact that personnel mobility is rather high in the shipping industry, it is possible to establish an organisational knowledge base (OKB) (Fei & Grewal 2007) where personal knowledge can be transferred to organisational level and then be used for fast track training and
personal development therefore reducing the time span for getting experienced personnel and enriching their existing knowledge.

This paper starts with introducing OKB and discussing relationship between human mobility and knowledge flows in the shipping industry and its impacts on OKB. Barriers to knowledge transfer in the shipping industry are examined subsequently. This paper finally suggests a knowledge transfer model to be applied in the shipping industry for effective knowledge transfer.

2. Perceived effects of human mobility on the OKB in the shipping industry

2.1 Organisational knowledge base (OKB)

Organisational knowledge base (OKB) refers to the total knowledge resources that an organisation can use as leverage to gain competitive advantage. Drawn from the organisational knowledge matrix of Nonaka and Takeuchi (1995) and Spender (1996), and Cook and Brown’s (1999) four forms of knowledge, the OKB can be illustrated in a matrix (figure 1) which includes both the organisational knowledge (tacit and explicit) that is independent to any individual, as well as personal knowledge (tacit and explicit) that can be possibly integrated into the organisational level. Components in each cell are identified through a review of measurement approaches on knowledge assets including Skandia Navigator (Edvinsson & Malone, 1997), IC-Index (Roos et al, 1997), Intangible Asset Monitor (Sveiby, 1997), Knowledge Asset Map (Marr & Schiuma; 2001; Schiuma & Marr, 2001), and IC Audit Model (Brooking, 1996).

**Figure 1**: Knowledge components in an OKB matrix (source: authors)

Based on the above OKB matrix and its components, the OKB in the shipping industry can be considered as a construct comprising four groups of knowledge as follows:

**Individual explicit knowledge**
- Education: study in maritime or non-maritime education institutions that leads to attainment of formal certificates or degrees. Indicators of the level of personal education include years of school, certificates and/or degrees, including certificates of language fluency.
- Training: training undertaken to fulfil the requirements of STCW or other relevant international Conventions or Codes. Qualifications obtained as the result of training courses can be good indicators for training.

**Individual tacit knowledge**
- Skills/expertise: areas of expertise (nautical or managerial skills), acquired through the combination of education and work experience. Indicators of skills/expertise include certificates of competence and other relevant professional qualifications. In addition, skills or expertise are the result of individual experience and are reflected not only through the acquisition of professional qualifications, but also in the individual’s problem solving capability and innovation ability in the real working world. Therefore, in terms of knowledge components in the OKB, skills/expertise should be...
represented by three elements, that is, professional qualifications, personal problem solving capability, and personal innovation ability.

- **Experience**: generally, length of service in the industry and positions held are good indicators of personal working experience that to a great extent manifest the richness of a personal knowledge. In the shipping industry specifically, work experience in different types of ships, sailing on various ocean routes and exposure to multicultural workplaces, are important indicators of personal knowledge.

- **Attitudes**: work attitudes are considered closely related to individual performance and to the future success of an organisation (Hurst, 1995). In the shipping industry, especially for those who work onboard, work attitudes have great implications to their well-being and have direct effects on safe shipping. Attitudes can be measured through a) overall satisfaction with the current job, b) pride to work for the company, c) alignment of personal and company values, d) commitment to the company (organisational commitment) (Rode & Near, 2005), and e) commitment to the industry (career commitment).

**Organisational explicit knowledge**

- **Technologies and Information Systems**: these can be broadly categorised into three groups: a) knowledge storage and retrieval, which on the one hand assist management in decision-making and, on the other hand, enable employees in self-improvement, database for information sharing, for example, b) systems that provide access to existing knowledge base, such as intranets, EDI, track and tracing systems, and c) communication technologies that facilitate knowledge sharing, such as E-forums, alumni, and online communities of practice (where people having similar interests gather to share experience and discuss their viewpoints).

- **Process Manuals**: these are usually in the form of written instructions or operational procedures. In addition, best practices identified from workplaces are also included in this group in the form of codified knowledge.

- **Intellectual property**: while the inclusion of intellectual property in to organisational knowledge has been in debate, its elements (patents, copyrights, trademarks, registered designs, and brands) are certainly, to a great extent, to do with the knowledge capacity an organisation possesses. Trademarks and brands have a close relationship with organisational image.

**Organisational tacit knowledge**

- **Culture**: organisational culture is considered as a whole component of OKB. An understood and articulated vision and mission statement, a story of a respected captain, can be part of organisational culture.

- **Image**: an organisation’s reputation for social and environmental responsibilities that is known to the public or community in general, and to the industry in particular, for example safety and quality approaches employed by a shipping company.

- **External relationships**, relationships such as shippers, terminals, manning companies, or agreement with alliances.

### 2.2 Mobility and knowledge flows

The movement of personnel is widely recognised as a mechanism for distributing tacit knowledge and skills across space and time (Almeida & Kogut 1999; Cooper 2001; Gruenfeld, Martorana & Fan 2000). As personnel are knowledge carriers (Grant 1996; Polanyi 1962; Von Krogh & Roos 1995), when they move they bring their knowledge into the new workplace. While inflow mobility may bring in new knowledge that the organisation previously did not have (therefore reflecting an increase in its OKB), outflow mobility may be translated into a loss of certain knowledge if the knowledge of the leaving person is not known to the others in the organisation (therefore a decrease in its OKB). As OKB itself is dynamic (Fei & Grewal 2007), the measurement of its sheer size is of little relevance to organisational management. Rather the identification of knowledge flows related to an organisation may help management to initiate best practices to make best use of knowledge flows brought by personnel mobility.

#### 2.2.1 Intra- and inter-firm knowledge flows

In the literature, knowledge flows are identified as both intra- and inter-firm (Eisenhardt & Santos 2002; Winter & Szulanski, 2001), with the organisation as unit of analysis. Intra-firm knowledge flows take
place within an organisation, between management and employees (vertical) or between colleagues (horizontal). Subgroups of knowledge flows may exist within the boundary of the organisation such as teams, groups and projects. Inter-firm knowledge flows include: 1) upstream flows from suppliers (e.g. universities) (Bolton 1994; Hauknes & Ekeland 2002); 2) downstream flows across industry boundaries (Tomlinson 1999) and 3) knowledge flows between other organisations, that is, between organisations in competitive interaction (Almeida, Song & Grant 2002). The only one-way movement direction is from organisation to the domain of retirement. The literature therefore provides a picture of how knowledge flows within and across the boundary of an organization shown in figure 2. The knowledge flows in a two-way direction with firm arrows representing knowledge inflow and dot arrow as outflow.

It is clear that the structure of knowledge flows corresponds to that of human mobility. The difference is, apart from inter-organisational knowledge flows, knowledge also flows horizontally as well as vertically within the organisation. The internal knowledge flows are a vital part of the whole knowledge flow structure in that knowledge retention occurs during this process through knowledge sharing and transfer. This reflects the individual-group-organisational (IGO) learning framework which highlights the importance of learning that resides in the organisation’s systems, structures, procedures and routines (Fiol & Lyles 1985).

2.2.2 Organisation – education institutions
The entire formal education system is believed to be the first measurable step in human’s acquisition of knowledge (Graversen 2003). Knowledge acquired through formal education in most cases, is explicit in nature, which is visible, reproducible and sharable. This knowledge is essential for the human’s ability to absorb and develop new knowledge in the second step of their knowledge acquisition, that is, tacit knowledge. The inflow of graduates to the organisation brings fresh ideas into the workplace. The effects of the inflow on OKB depend on the level of formal education because a) formal education is an indicator of how much explicit knowledge the individuals have acquired and b) formal education is highly correlated with individuals’ ability to acquire tacit knowledge in workplaces.

Figure 2: Intra- and inter- firm knowledge flows (source authors)
The outflow (personnel movement from industry to education institutions) can provide students with access to leading-edge thinking and technology in their field of interest. Industrial representation on university planning raises awareness of the needs of industry resulting in the development of educational programs that are more relevant to the demands of the industry (Bolton 1994). This outflow movement also includes those who will pursue further education or training in order to take higher positions when they come back to the industry or to find a different occupation in another industry. The former can be treated as graduates and the latter shall be considered as across sectoral movement. In terms of its effects on OKB, the organisation has a loss of knowledge when its employees leave for positions in education sector. However, because these employees will diffuse their knowledge to the students through lecturing, which in turn will benefit the industry as whole when these students come into the workplace, the net effect of this movement is hard to determine for a specific organisation. The overall result to the whole industry nevertheless is positive.

Among the inflow movement, included are also those who have been in the education sector for years but will spend time in the industry for research purposes or as an occupation. To simplify the discussion, this group of people will be treated in the industry-education collaboration. Research joint ventures, as one form of industry—education collaboration, have been increasing over time (Caloghirou, Tsakanikas, & Vonortas 2001), reflecting the advantages of knowledge creation and sharing in the process of joint research. The major benefit to the industry from university-industry collaboration is the enhancement of the knowledge base of the firm. This includes the improvement of the firm’s technological and organisational capabilities, exploitation of complementary resources, new knowledge creation and/or acquisition, and acceleration of research.

2.2.3 Organisation—organisation

Movement between organisations in the same industry is sometimes called ‘temporary mobility’ (Langberg & Graversen 2001). Personnel learn from their workplaces and bring their knowledge with them to the new workplace when they move. At the industry level, since personnel remain in the same industry and they learn from each organisation that they work for, mobility increases personal knowledge and has positive effects on the industry. At the organisational level, since mobility is a two-way movement to the organisation its effects on the OKB therefore depend on two facts and a moderator. The first one is if mobility is the result of dysfunctional or functional turnover (Dalton, Todor & Krackhardt 1982). The second is if there is a balance between inflow and outflow in knowledge movement in terms of individual qualifications, experience and skills, that is, personal knowledge. The moderator is related to the knowledge management practices that can be possibly employed to retain personal knowledge. The more effective the practices, the less impact of personnel leave on the OKB.

2.2.4 Organisation—other industry

Research indicates that cross sectoral mobility happens more commonly between industries and R & D institutes or between higher education institutions (Graversen 2003). Other cross industry mobility might be caused by macro-economic or industrial restructure resulting in flows of skills acquired in one part of the economy into another for example, shifts of employment from manufacturing to services in 1980s (Tomlinson 1999). In the shipping industry, China experienced strong inflows of personnel from various other industries in 1980s when the industry was perceived as offering very high salary compared to other industries. Other nations such as the UK however, observed a net loss of experienced personnel to other maritime related industries (Gardner & Pettit 1999). While the effects of inflow cross industry mobility is to great extent, dependant on the relevance of the skills to the receiving industry, the outflow is considered as a loss of knowledge for the industry in general and for the delivering organisation in particular.

2.2.5 Organisation—retirement

Personnel movement from active workforce to domain of retirement is a less explored area. Generally, retiring personnel have rich tacit knowledge that has been accumulated from many years of work experience. This knowledge is hard to articulate and is a valuable asset to the organisation. Research in the gas and oil industry indicates that the aging workforce is posing a severe threat to the whole industry, if significant steps are not taken (Leavitt 2002; Sapient Corporation 2001) to retain the rich knowledge that the aging workforce is carrying. If this knowledge is not known to the other members of the organisation, the retirement of these personnel will surely have a negative impact on the OKB.
2.2.6 Intra-firm

Research indicates that knowledge diffuses more easily within a firm than between firms (Kogut & Zander 1992) and intra-firm knowledge flows tend to be stronger than inter-firm due to stronger interpersonal networks within firm boundaries (Singh 2005) and a high level of cooperation among members (Kogut & Zander, 1996). However, such intra knowledge may be relatively redundant because members of a firm share the interpretations of experience and firm’s collective memory over time (Madsen, Mosakowski & Zaheer, 2003; March 1991). From the perspective of the OKB, intra-firm personnel movements may not contribute directly to the richness of the OKB, such movements nevertheless enhance the ability of the firm to retain knowledge in case of high intra-firm mobility.

2.3 Human mobility in the shipping industry and its effects on the OKB

Overall, human mobility in the shipping industry is rather high. The survey of seafarers conducted during the Rochdale Committee of Inquiry into Shipping showed that 66% of all seafarers switch between companies while 32% remain with the first company they joined (Moreby 1975). Accompanied the high inter-company mobility is the high cross sectoral movement of personnel, which has been termed as ‘wastage’ so called as this personnel movement has been one-way direction therefore a loss to the shipping industry.

Previous research indicated an average time-span of shipping officers’ active seafaring career was seven years (Moreby 1975). Recent reports in China recorded a 60% of attrition of graduates in a period of five years after they joined in the shipping industry (Kong & Ruan 2001). In addition, there has been difficulty in attracting personnel into the industry for various reasons (Dinwoodie 2000; Leggate 2004; Moreby 1975; Sambrasos & Tsiaparikou 2001). The mobility in the shipping industry thus has three distinct characteristics:

- High mobility rate between companies within the industry;
- High and almost one-way direction movement of personnel from the shipping industry to other maritime related industries; and
- Low intake of graduates from maritime education institutions due to the difficulty in attracting candidates studying nautical courses.

Based on the discussion in the earlier section, investigation has been done to establish the structure and characteristics of personnel mobility in the shipping industry and its potential effects on the OKB (figure 3). The categorisation of groups and subgroups in the investigation process follows Graversen’s (2003) definition of mobility while taking the shipping specific characteristics into consideration. This framework is conceptual in nature, however, can be used for empirical test in the late research.

For the shipping industry, the main source of intakes of personnel is graduates from various maritime education institutions (MEI). The long-existing problem associated with this source of inflow movement has been the difficulty faced by these MEIs to attract young people into the shipping industry and the high drop rate of nautical students. A close examination reveals a pyramid shape of numbers of people at different stages of study or career path with a large base and much smaller group of people on the top remaining actively in the industry (Chen, 1998). This obviously affects the overall costs of education and training and the efficiency of the whole system. While movement between organisations within the shipping industry is considered balanced and does not affect the overall skill base of the industry, the movement across industries has been identified as one of the major factors for the shipping industry losing its expertise to other industries due to the fact that such movement is greatly unbalanced and nearly one-way direction. Due to the characteristics of the shipping industry, it is unlikely that such phenomenal movement can be mitigated. In fact any attempt to obstruct such mobility may have a negative impact on the attractiveness of the industry as such mobility has been seen by many as major career path therefore the very reason to join the industry at the first place.
2.4 Human mobility and knowledge transfer

As human mobility is always accompanied by knowledge flows, there are different sources of knowledge flow through the organisation at any given time. The organisation is able to use the inflowing knowledge when the knowledge stays within the organisation. However, high mobility makes personal knowledge temporal to the organisation. If no retention mechanism is in place, these inflows of knowledge will be lost again when personnel leave the organisation. If knowledge flows are properly managed, then the OKB will be enhanced and continuously updated. Figure 4 illustrates the relationship between knowledge flows and the OKB. If proper methods are adopted, part of knowledge that flows into the organisation will be retained even if personnel leave.

Given the prevailing human mobility, the main task for knowledge management is to make the dot arrows in figure 4 solid, that is, to make knowledge transfer effective. Personnel coming from competitors provide the organisation opportunities to learn from others through sharing of their personal knowledge. People from education institutions and other industries often carry fresh ideas into the industry and represent opportunities for the organisation to advance its knowledge base. From the perspective of an industry, human mobility among organisations, between education institutions and the industry, and across industries, might maintain a dynamic balance, that is, the inflow and outflow of personnel to the industry is balanced therefore a balance of inflow and outflow knowledge.

However, personnel retirement certainly represents a sheer loss of knowledge to the industry as a whole if no knowledge retention mechanism is employed. In addition, for an industry where inflow and
Outflow of personnel is unbalanced, especially when outflow outweighs inflow, mobility poses a severe issue for the industry to maintain a competent knowledge base.

Figure 4: Knowledge flows and the OKB (source authors)

This is the case for the shipping industry where attrition of seafarers is high and intake of personnel is difficult. For a particular organisation within the industry, effective knowledge management practices can retain the knowledge carried by mobile personnel, which is interpreted as an increase on OKB. To make the process effective, obstacles of knowledge transfer need to be identified in order for management to employ relevant mechanisms to facilitate the transfer process.

3. Identifying barriers to knowledge transfer in the shipping industry

As previously discussed, there is prevailing human mobility and high attrition of expertise in the shipping industry. The agenda for the industry is therefore to retain the knowledge of leaving personnel so that a dynamic balance of the OKB is maintained. It is also established that knowledge transfer is an effective way of protecting an organisation from knowledge attrition incurred by high mobility. The next two sections will examine the factors affecting knowledge transfer in the context of the shipping industry and to identify effective management practices to reduce the barriers and to facilitate the transfer of knowledge within a shipping organisation.

Literature on knowledge flows and knowledge transfer identifies a number of factors that might affect the process of knowledge transfer. These factors can be grouped into knowledge related (for example Kogut & Zander 1993; Simonin 1999; Winter 1987), context (for example Szulanski 1996; von Hippel 1994), individual (for example Gupta & Govindarajan 2000), relationship (for example Szulanski 1996), and organisation (for example Simonin 1999). Discussion of knowledge transfer barriers in the shipping industry follows the above identified groups of factors.

There are distinct characteristics in the shipping industry, which may affect the transfer of knowledge among individuals in organisations. These include the composition of the workforce in the shipping industry, unique working environment on ships, the management structure of shipping organisations, and highly mobile personnel. These elements have a direct impact on the factors discussed which in turn have implications on the adoption of effective management practices to facilitate knowledge transfer.

3.1 Context

The shipping industry by its nature is international. Personnel in a shipping organisation often come from many different countries and with multicultural backgrounds. In fact, research indicates that two thirds of workforce is working in a multicultural environment (Kahveci & Sampson 2001). Cultural differences can make daily communication difficult and even more difficult for knowledge sharing. In addition, people coming from different cultural backgrounds often speak different languages. Although English has been the working language on ocean-going ships, the ability to communicate in English varies significantly among seafarers. ‘Language filters and organisers information from the physical and cultural realms and transform it into meanings that make up human knowledge and experience’ (Polkinghorne 1988: 158). Research shows that there are tight links between verbal skills and the
acquisition of abstract concepts, conceptual depth, critical analysis, logical argumentation and the articulation of ideas (Orr 1987). Different national languages are reported as a key obstacle for knowledge transfer in MNC context (Almeida & Grant 1998). The complexity of workforce in the forms of different culture backgrounds and languages in the shipping industry is a source of barrier for knowledge transfer.

3.2 Relationship

The working environment on ships has been well documented in literature (for example, Forsyth 1989; Gerstenberger 2002; Glen & McConville 2001; Moreby 1975; Roger 1983). Apart from linguistic and cultural issues, there is little time for personal communication due to clear duty definition and tight daily shifts. Most people carry out their duties alone and have different schedule from others. The staffing policy of reducing the number of personnel on modern ships makes the situation even worse. Furthermore, the physical design of space, machines, and workflow has been given little attention to the impact of the social and organisational requirements for creating an efficient, productive organisation (Whyte 1983). Moreover, every ship is an isolated world (Zhao 2001). A ship at sea is effectively isolated from the rest of the world spatially and socially. Even with the help of modern information technology (Goel 2003; Mazières et al. 2002), their ability to be socially connected is still limited. Therefore the workplace situation decreases the likelihood of these personnel being a part of networks for either social or learning purposes.

3.3 Organization

The management structure of the shipping industry has two distinct features. One is the hierarchy on ships (Lane 1986; Zuboff 1983). The other is the time and spatial difference between onshore management and its vessels. While hierarchy is necessary to get things done in many circumstances, it is of no help in building informal relationships across hierarchical ranks. This makes onboard interaction limited to superficial working relations rather than personal, making detailed interpersonal communication impossible. On the other hand, the spatial distance and time difference from onshore management make interpersonal connection between crew members and staff ashore remote (Gerstenberger 2002). Members of both sides hardly reach to each other in a meaningful way. The reality of this management structure calls for realignment of personnel from all parts in order to facilitate both vertical and horizontal interactions between members and groups of the organisation.

3.4 Individual

Finally, as previously discussed, mobility in the shipping industry is rather high, especially its “wastage”, compared to other industries. This is partly due to the eroding employee loyalty prevalent in modern workplaces (Abassi & Hollman 2000; Kransdorff 1996) and partly due to the uniqueness of occupations in the shipping industry (Moreby 1975). For many, working in the shipping industry is not a lifelong occupation, rather an interlude in their occupational life. The initial motives to choose the industry and later the broken “psychological contract” frequently leads many to drop out (Moreby 1975). In addition, flagging out and the development of financial markets have broken the genuine link between the owner of the ship and crewmembers who work and live on it (Gerstenberger 2002). As a result, commitment for both the organisation and personnel no longer exists.

3.5 Knowledge

The types of knowledge in the shipping industry tend to be distinctively divided. On the one hand skills and expertises are very experiential and are obtained only through observation and real working experiences. On the other hand, however, there are abundant of written instructions, procedures, and manuals to follow under certain circumstances due to the fact that shipping is one of the most regulated industries because of its possible impacts on human lives and marine environment. It is a misperception that safe operations can be carried out solely based on the knowledge of various International Conventions, Codes, or other regulations. While the understanding of rules and procedures for a particular operation can be obtained through articulation of explicit knowledge in forms of Conventions, Codes, Manuals, the manoeuvring of an operation needs far more tacit knowledge which can only be mastered through observation and mentoring.
3.6 Mechanisms

Given the working environment in the shipping industry, knowledge transfer can be facilitated at different stages of a career path or through other related activities. Cadetship/apprenticeship is an important part of the real world learning curve, where candidates start the process of applying what they have learnt from school to the real world situation, a process of knowledge validation and assimilation. Furthermore, job rotation provides participants the opportunity to access to different working environments where different skills are required. Such rotation stimulates learning motivation and promotes knowledge sharing environment. A distinctive feature of working in the shipping industry is the need to upgrade skills required by International Conventions in order to be competent for what they are doing. Therefore, regular training and development is important part of knowledge acquisition. Moreover, networking, especially informal, is important way of sharing knowledge given the multicultural workforce of the industry.

The above discussion can be summarised in table 2, where shipping industry specific characteristics are categorised into six knowledge transfer (KT) related factors, which have been examined previously. These factors are inter-related. Spatial or perceived distance between management and its workforce, and the lack of genuine link between crew members and the shipping company have adverse efforts on trust building, which, in turn, affect the willingness of employees to share their knowledge (Empson 2001; Morris 2001; Scarbrough 1999). The weak employment tie also discourages companies from investing on training and providing other means for their employees to improve personal knowledge. Another barrier of sharing knowledge comes from the low trust between employees as a result of linguistic and cultural differences. In addition, the inactive attitudes of many employees to pursue new knowledge due to temporal nature of occupation in the shipping industry (Moreby 1975) further impede possible knowledge transfer. The characteristics of knowledge require appropriate transfer mechanisms to be employed. The organisation, by dedicating appropriate resources, can reduce these barriers and effectively facilitate the transfer of knowledge among its employees.

Table 2: Six KT-related factors in the shipping industry (source authors)

<table>
<thead>
<tr>
<th>Factors</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Organisation</td>
<td>1. Remoteness of management and workforce; 2. Low organisational commitment.</td>
</tr>
<tr>
<td>Individual</td>
<td>1. Lack of willingness to share and low motivation to learn due to low trust; 2. Low commitment to the organisation; 3. Lack of motivation to learn due to the temporality of the career.</td>
</tr>
<tr>
<td>Knowledge</td>
<td>Highly experiential vs. written rules and instructions.</td>
</tr>
</tbody>
</table>

4. Effective knowledge transfer practices in the shipping industry – a knowledge transfer model

The main aim of employing knowledge management practices in the shipping industry is to retain the knowledge carried by individuals so that the knowledge becomes a part of the OKB even if individuals leave. This can be achieved through effective knowledge transfer practices where knowledge of leaving personnel is shared with those who are still staying with the organisation (as illustrated in figure 4). Drawing on Gupta and Govindarjan (2000) and Almeida and Grant (1998), Abou-Zeid (2002) builds an inter-organisational knowledge transfer model. Figure 5 is an adaptation of this model to capture the knowledge transfer related factors discussed previously. For an organisation in a given industry, the context in which knowledge transfer occurs is decided. The remaining five factors can be grouped into individual-related (individuals and their relationships), organisation-related, and knowledge-related (characteristics of knowledge and relevant transfer mechanisms). For knowledge transfer to be smooth and successful, the organisation needs to address the barriers and creates a supportive climate for transfer. The knowledge transfer enablers or facilitators include technology, culture, leadership, and measurement (O’Dell & Grayson 1998).
4.1 Technology

Technology is one of the infrastructures that an organisation can provide to facilitate the knowledge transfer process. A variety of information systems and technologies supports knowledge management processes such as creation, storage, transfer, and application of knowledge. For example, data mining techniques such as neural networks find new patterns in data and enhance knowledge creation; knowledge repositories store and retrieve knowledge; electronic bulletin boards, discussion forums, knowledge directories, and other knowledge networks enable efficient and accurate transfer of knowledge.

Figure 5: A knowledge transfer model source: adapted from Abou-Zeid (2002: 35)

In Almeida and Grant’s (1998) knowledge transfer mechanisms, four of them are technology related:

- electronic data exchange (for codifiable information with highly standardised format and low ambiguity, efficient for both limited and wide dissemination);
- electronic mail (characterised by versatility with regard to format and information types and increasingly capable of expressing individuality and subtlety);
- groupware (characterised by versatility in its ability to transfer and integrate many types of information and to provide platform for integration of different individuals’ tacit knowledge); and
- Video conferencing (video capability permits richer inter-personal context conducive to joint problem-solving processes).

However, for IT to be effective in knowledge transfer, there requires participants share similar knowledge, background and experience (Zack 1999).

Technology is a helpful tool in facilitating knowledge transfers not the driver, because most tacit knowledge is too complex and too experiential to be captured electronically, and because the incentives for and barriers to sharing are not technical (O’Dell & Grayson 1998). For example, database only complement the personal networks of those seeking answers to problems. Employees of an organisation usually turn first to friends and peers to learn where to find relevant knowledge rather than engaging in an extensive search through an organisation’s database, regardless of how robust the search functionality or how customised the database is (Cross & Baird 2000).

Moreover, the ability of IT in facilitating knowledge transfer is limited by the characteristics of the knowledge being transferred. When mainly tacit knowledge is involved, the face-to-face approach to communicate knowledge should be facilitated, rather than an attempt to store it (Hansen, Nohria & Tierney 1999). In addition, articulation of knowledge runs the risk of losing finer aspects of the knowledge (Boisot, Griffiths & Moles 1997) therefore should be avoided (Grant 1996). However, by stopping diffusing tacit knowledge, an organisation will not be able to reap the benefits of leveraging knowledge (Sanchez 1997). The point is then to balance these two through identifying appropriate approach for relevant knowledge.
In the shipping industry, technology such as EDI has been widely used for a long time and the application of information technology in shore-based administration has no difference from any other industries. However, while readily available onshore, information technology is sometimes a luxury exception on ships. Only a small percentage of modern ships have installed advanced equipment that allows internet access. Even for those who have access to internet on ships, the high cost associated with the usage stops many to use these onboard facilities. Due to the remoteness of onboard workplace, the provision of affordable information technology will to a great extent facilitate communication between crew and onshore management, which in turn strengthens their relationships and nurtures mutual trust, thereby facilitating knowledge transfer. In addition, affordable internet access facilitates the establishment of communities of practice where participants tend to willingly share their experiences and expertises through informal networking. Moreover, the access of information technology is an important means by which explicit knowledge is obtained. It is therefore clear that technology plays an important role in facilitating effective knowledge transfer in a shipping organisation.

4.2 Culture

Technology by itself is insufficient, since people are central to creating and sharing knowledge. Information technology can only help to store and transfer knowledge and does not facilitate creation or sharing of knowledge if an organisation does not have a culture favouring these activities (Davenport & Prusak 1998). Besides, for barriers caused by culture differences, technology cannot overcome all, but can reduce some cultural nuances (Soley & Pandya 2004).

De Long and Fahey (2000) identify four ways in which culture influences the behaviours central to knowledge management. Two of them are related to knowledge transfer and sharing in an organisation. According to De Long and Fahey (2000), culture dictates what knowledge belongs to the organisation and what knowledge remains in control of individuals. The culture of individualism versus collectivism affects the extent to which knowledge can be transferred or shared in an organisation. Where norms and practices that advocate and reinforce the supremacy of individual knowledge, activities of knowledge transfer and sharing are limited. Furthermore, the level of trust that exists between the organisation and its employees greatly influences the amount of knowledge that flows both between individuals and from individuals into the organisation’s databases, best practices archives, and other records. Moreover, perceived status differences among units lead to adoption of defensive measures to protect knowledge assets of individual units, therefore impeding the sharing and transfer of knowledge within the organisation. The ease or difficulty of moving knowledge is a reflection of its social context. Technologies inevitably have an enormous role to play, but they play it only to the extent that they respond to the social context. A great deal of new technology attends primarily to individuals and the explicit information that passes between them. To support the flow of knowledge, within or between communities and organisations, this focus must expand to encompass communities and the full richness of communication (Brown & Duguid 1998). This calls for the building of networks either formal or informal.

Informal human networks provide sources for people to seek knowledge they need. Individuals in these networks develop strong personal relationships over time and trust each other and fee obliged to sharing knowledge with each other (McDermott 1999). While informal relations often occur naturally, they can be fostered through internal social arrangements that promote horizontal communications and interactions among different organisational units (Ghoshal, Korine & Szulanski 1994; Gupta, Govindarajan, & Malhotra 1999; Tsai 2002). Rather than building new networks for knowledge sharing, an organisation can formalise or lightly authorise existing informal networks by giving them a budget, information systems, space, library support, time for network coordinators to manage network affairs, and recognition of their contribution (McDermott & O’Dell 2001).

One of the unique phenomena the shipping industry has is the absence of a genuine link in many shipping organisations between the employer and its employees, for instance, between the shipowner and its seafarers, due to factors such as flagging out and outsourcing of crew management. In organisational culture where commitment and loyalty are non-existent as the result of disconnected employment linkages, knowledge integration hardly happens. This situation can be mitigated through the proper acknowledgement of the contributions made by those outsourced personnel (contracted seafarers for example) at the organisational level. In addition, the allocation of resources by an organisation to encourage personal development is another indicator of organisational commitment to its employees which, when properly organised, can facilitate knowledge transfer. Furthermore, the absence of genuine employment link does not stop informal networking among employees.
Encouragement of such informal networking from the organisation can foster the development of communities of practices therefore increasing the likelihood of knowledge sharing among personnel.

4.3 Leadership

It is clear that apart from organisational culture, organisational leadership plays a vital role in facilitating knowledge transfer through establishing and reinforcing a supportive culture. Tactics include the creation of a mission or a vision statement that endorses and sustains learning and transfer (Leonard 1995; Levinthal & March 1993; Von Krogh 1998), recognition of successful stories, reinforcing and rewarding positive behaviour, showing commitment to learning through action and removing barriers to progress.

In many onboard workplaces, hierarchy is still strongly maintained and respected. In such working environment, a role model from the top level (the captain, for instance) will have a strong influence on the rest of the members. In the same way, a strong commitment of top management to knowledge sharing activities will affect onboard management teams. The consistent leadership of an organisation has much to play in maintaining a healthy organisational knowledge base through facilitating knowledge transfer and sharing activities.

In summary, instead of using only incentive systems to mitigate internal stickiness, scarce resources and managerial attention should be devoted to developing the learning capacities of the organisation (Hamel 1991; Szulanski 1996). The appropriateness of resource deployment, both human and support assets, shapes the learning outcomes (Hamel, Doz & Prahalad 1989; Pucik 1988). Adequate staffing, involvement of high quality personnel and provision of appropriate information processing and communication capabilities, supported by favourable organisational culture, facilitate the process of knowledge transfer. An effective knowledge transfer model then can be drawn from above discussion and expressed as in figure 6 where factors have been grouped into organisational culture, leadership and technology.

![Figure 6: Effective knowledge transfer practices (source authors)](image)

5. Conclusion

The competitiveness and effectiveness of an organisation will ultimately depend on the knowledge assets an organisation possesses. The proposed application of knowledge management concepts and related practices into the shipping industry is expected to be more effective than conventional human resource management practices in terms of managing organisational knowledge assets, where knowledge dissemination and assimilation is more efficient and effective. The implication to the global shipping industry would be a significant reduction of knowledge wastage as the result of outflows of personnel identified in this paper, which in turn will effectively mitigate the problem of severe shortage of qualified personnel in the industry.

The main task for the shipping industry in general and shipping organisations particular, is to maintain a rich knowledge base through proactive knowledge management practices, given the high mobility nature of the workforce in the industry. Practical tools include the application of information technology to facilitate knowledge transfer and leverage of culture and leadership mechanisms to foster an environment of learning and sharing. Once a dynamic knowledge base is established, a shipping organisation can use the knowledge source to train and develop personnel in a more effective and
efficient way. This practice will not only shorten the time span for training and development therefore reducing costs, but also through the process of knowledge integration and transfer, a learning and sharing culture is nourished and appreciated which in turn benefit the organisation as a whole.

High personnel mobility can be harmful to the shipping industry if there is no mechanism in place to retain experiential knowledge. However, mobility could be used as lubricant or a catalyst of knowledge flows within an organisation if related activities are managed in a correct way. The outcome of such activities and management will be an increase of the organisational knowledge base therefore the strengthening of organisational competitiveness and effectiveness. At the industry level, such practices effectively increase the knowledge base of the whole industry from which individual shipping organisations will benefit greatly. It is therefore the responsibility of all organisations in the shipping industry to dedicate their resources to effectively develop and manage their knowledge assets in order to mitigate the problem of skill shortage.

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Leveraging Knowledge Understanding in Documents

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Abstract: In the past years Knowledge Management has dealt with various aspects of knowledge retention, knowledge sharing and knowledge development. It is agreed that knowledge documentation is essential for all these purposes, in order to enable their re-use. Many books and articles have been written on accessibility of documents, revealing an understanding that knowledge that cannot be accessed cannot be re-used. Most effort has been invested in providing the focused list of relevant documents to the user, while less research has been conducted on how to write the documentation so as to ease its reading, understanding and use. This issue seems to be critical as we notice that existing organizational knowledge is far from being fully utilized: for example, regulations and procedures, including the organization's wisdom, are written; however, recurring faults do occur. People tend not to re-read entire or partial documents, even when the knowledge therein is needed. This paper describes a framework for the document's internal design. The research hypothesis claims that internal design, using the proposed enabling technique, eases understanding and usage of documents. It therefore reduces the knowledge loss. The research methodology implemented was a qualitative method; the strategy chosen was instrumental: multiple case study (Stake, 1995). The research sample included both organizations (public sector) and the public (KM readers), the research instruments consisting of documentation, archival records, interviews, direct-observations, participant-observation and physical artifacts. The findings suggest that internal documentation design eases reading, eases understanding and probably eases use. It therefore leverages knowledge understanding in documents, and reduces knowledge loss. The proposed framework may be useful for a large range of organizational documentation needs, from procedures of work, through SOW's, Engineering Specs, white papers and professional doctrines including organizational knowledge. The framework was designed for organizational Knowledge Management needs, but serves for external rich knowledge documentation as well. It has been used since 2007, in more than fifty cases in five different organizations in Israel.

Keywords: knowledge management, documentation, accessibility, regulations, procedures of work.

1. Introduction- the need for accessibility

A wise man once said: in the same way that the starvation that concerned the world at the beginning of the 20th century has shifted to a concern about obesity, the lack of information and data that occupied us in the sixties has been replaced with a concern about information overflow.

Dalkir in “Knowledge Management in theory and practice” (Dalkir, 2005) speaks about how Knowledge Management started out dealing with the information overload challenge: “The early adopters of KM, large consulting companies that realized that their primary product was knowledge and that they needed to inventory their knowledge stock more effectively, exemplified this step. A great many intranets and internal knowledge management systems were implemented through the first KM generation.” (Dalkir, 2005). Dalkir emphasizes the need to enable access to what he calls “information buried in the organization.” However, as Dalkir states, these KM systems turned into “information junkyards.” Enabling accessibility to knowledge and information is not as simple as one would assume.

Information overload is a known challenge, mentioned in many articles, new and old. Davis, Subramhmanian & Westerberg define the information overload as one of the significant issues connected with explicit knowledge: “Information overload is a constant refrain” (Davis, Subramhmanian & Westerberg, 2005). Already in 1982, the first analysts forecast the coming trend: “The information explosion is about to swamp association executives with more data than they can read and digest, but many are overcoming the problem by setting priorities and establishing systems for handling information” (Vickery, 1982).

The amount of time spent reworking or re-creating information because it has not been found or worse, going ahead and making decisions based on incomplete information is increasing at an alarming rate. The IDC study estimates that an organization with 1,000 knowledge workers loses a minimum of $6 million per year in time spent just searching for information. The cost of reworking information because it has not been found cost that organization a further $12 million a year (Dalkir, 2005).
Information overload is almost as challenging as missing information. If the information and knowledge are not reached and used, their existence is useless. Accessibility is required in order to enable focused information usage.

2. How can accessibility be achieved?

There are two levels of obtaining eased access to information and knowledge:

- External information design.
- Internal information design.

External information design deals with obtaining access to the document unit, finding the right document and retrieving it. Internal information design deals with finding and retrieving the relevant information and knowledge within the document. The importance of external information design is well understood. The internal information design, however, has not been investigated thoroughly and its importance is just recently starting to be understood. Below are two examples that emphasize the challenge:

- Because of a failure in one of the advanced machines of a medium sized company in Israel, with six factories, the supplier was invited from Europe to check and fix the problem. When he arrived and checked the problem, he were surprised that the engineers in this factory were unaware that the same problem occurred five months before in another of the same company’s factories, and that his visit to Israel could have been prevented, saving money and time for all. It turned out that the engineer did check the file system and even found the document in which the problem was described. The document was so lengthy and the engineer so busy that he did not reach the location inside the document that would have enabled him to understand that it dealt with the same problem, and to fix it by himself.

- In a large high-tech industry company in Israel several recurring faults were caused by people who were not working according to correct work procedures. People there, as in many other organizations, did not return to check specific issues in the daily routine, since procedures of work were written in a lengthy and not user-friendly manner.

External information design can be handled by several methods, combining in most cases one or more of the following:

- Repository in which the documents are gathered, categorized by attributes and correspondence values.
- Intranet, portal, site or community of practice including documents and other knowledge items.
- Search engine.
- Navigational tree directing the reader to the relevant information.

Dalkir lists the major KM techniques, tools and technologies. Among the knowledge sharing and dissemination phase he includes "Discussion forums, Groupware, Wikis, Workflow management, Intranets, Extranets, Web servers, browsers, Knowledge repositories and Portals" (Dalkir, 2005). All of these are connected to external information design; none with internal information design. Dalkir does include within his artificial intelligence technologies one relevant technique of internal information design: text analysis- summarization.

Three of the well-known, classic books concentrating on knowledge management implementation include: If only we knew what we know, by Carla O'Dell and C. Jackson Grayson, Jr.; Learning to Fly: Practical Knowledge Management from Leading and Learning Organizations by Chris Collison and Geoff Parcell; and Working Knowledge: How Organizations Manage what they Know by Thomas H. Davenport and Laurence Prusak.

These three books, when dealing with documents, refer to solutions based on external information design. O'Dell and Jackson discuss Knowledge-Enabled Intranets, Lotus Notes and structured document repositories, bringing examples from National Semiconductor, Buckman Laboratories, Sequent Computer Systems, Texas Instruments and The World Bank (O'Dell & Grayson, 1998).
Collison & Parcell discuss Networking and Communities of Practice, bringing examples from British Petroleum (BP). When discussing knowledge capture, they do not refer to the internal information design of the knowledge assets built (Collison & Parcell, 2001).

Davenport and Prusak do discuss the need for knowledge codification, whether as part of an artificial intelligence system (which failed since the knowledge was found to be too subtle and complex to be written into the computer), or as part of a database including structured data. Technologies for Knowledge Management include Web-based systems, Lotus Notes and Broad Knowledge repositories including examples from Hewlett-Packard, British Petroleum, Ernst & Young, Anderson Consulting, Price Waterhouse and Coopers & Lybrand (Davenport & Prusak, 1998).

Davenport & Prusak nonetheless emphasize the need for internal information design:

*Codifying knowledge is an essential step in leveraging its value in the organization. Codification gives permanence to knowledge that may otherwise exist only inside an individual's mind. It represents or embeds knowledge in forms that can be shared, stored, combined, and manipulated in a variety of ways. The challenge is to codify knowledge and still leave it distinctive attributes intact, putting in place codification and structures that can change as rapidly and flexibly as the knowledge itself (Davenport & Prusak, 1998).*

Liew, Foo & Chennupati, in their article “A proposed information environment for enhanced integrated access and value adding to electronic documents” offer a basic framework based on document organization and structuring, including four workspaces: an organizer, a viewer, a structured view, and an explorer (enabling tasks). Their model though is limited to very specific needs and specific technology.

### 3. A framework for internal information design

This paper describes a framework of organizing the document, preventing the knowledge loss described and enabling the leverage of knowledge understanding. This enabling technique is designed to serve every document written with the basic technology of a word processor, eliminating the need for any high level unique technology.

### 4. Target

The framework aims for higher utilization of existing information and knowledge in an organization by easing reading understanding and use of knowledge in documents, which represent a major part of the organizational assets.

### 5. Research methodology

The research method chosen in this research was qualitative. The qualitative method was chosen, two-fold:

- "Qualitative research is a means for exploring and understanding the meanings individuals or groups ascribe to a social or human problem" (Creswell, 2009). Knowledge understanding in documents falls in the category of human phenomena.
- The proposed framework for internal documentation design is innovative. Qualitative research enables the understanding of the phenomena, while further researches may take different forms, analyzing and comparing specific aspects of he understanding described in this pioneer research.

The strategy chosen in this research is Case Study. Case Study strategy, as defined by Stake (Stake, 1994), and quoted in Yossefon (Yossefon, 2001) as dealing with observation on the human activities in a specific place and time. Yossefon also quotes Jarry & Jarry (Jarry & Jarry, 1991) as they claimed that the Case Study enables generalization of the specific case. They define Case Study as research of one example of a phenomenon to be investigated, or as a pattern or sample explaining a more broadened phenomenon, which may be used as examination to a broadened argument. Yin is described as the one who has a major contribution in promoting the Case Study as a logical method and preferred strategy, when conditions and research problems enable using it. Yin defines the case study research method as an empirical inquiry that investigates a contemporary phenomenon within its real-life context; when the boundaries between phenomenon and context are not clearly evident; and in which multiple sources of evidence are used (Yin, 2009). The distinctive use of Case Study...
arises in this research, out of the desire to understand a complex social phenomenon. Specifically, it is a multiple case study research.

Yin defines, for case studies, five components of a research design are especially important:

- A study's questions.
- Its propositions.
- Its unit(s) of analysis.
- The logic linking the data to the propositions; and
- The criteria for interpreting the findings.

(Yin, 2009).

- The research question: Organizations invest in Knowledge sharing and knowledge databases; yet knowledge usage is lower than expected. How can a group or organization leverage the individual's knowledge understanding and existing knowledge usage? How can the knowledge be better utilized?

- The research proposition: A well-defined framework, including structural guidelines for organization of a document, will ease reading and understanding of a document and will lead to better knowledge utilization.

- The research unit of analysis: The unit in research is a group; group of interest, representing document readers. The research focused on four organizations, representing various social services professional groups in Israel (all in the public sector of civil services) and one inter-organizational: Internet readers, interested in Knowledge Management issues. This sample represents different people in different contexts, having differentiated skills and habits of documents reading.

- The logic linking data to propositions and the criteria for interpreting the findings: Yin (Yin, 2009) defines six sources of evidence the ones most commonly used doing case study researches: "documentation, archival records, interviews, direct-observations, participant-observation and physical artifacts" (Yin, 2009). All instruments, but archive records, which are not relevant to the case, have been used: documentation, interviews (after people have been exposed to the new format of documents), direct-observations, participant-observation and physical artifacts. The analytic technique used to link the data is explanation building (Yin, 2009).

The research process included three main phases, in each of the case studies: teaching the people writing the documents the enabling-technique; accompanying the process of renewed document writing; and observing the feedback of the users, reading the renewed documents. Observations took place during the phases, and interviews and data collecting (electronic documentation and artifacts-printed books) after.

Even though the groups of interest were not identical (inner organization, professional connected organizations, open public); and even though the type of usage varied (procedures of work, professional white papers and professional documents, marketing professional book reviews), the findings were identical:

- None of the readers sensed the need for explanation before reading using the new format;
- All readers questioned, found the new format easy to read and understand;
- In the four first cases organization based, related managers expected further similar documents to be written using the same framework.

6. Enabling technique concepts

An enabling technique was developed and used to implement the suggested framework and test the research hypothesis. It was designed according to the following guiding concepts:

- Full & Focused: The internal information design must enable eased and complete reading of the document and, at the same time, eased focused reading (for the person who only wants to check an unclear issue in a section inside the document).
Short: The internal design should impart the impression that the user is reading short nuggets of organized knowledge, rather than a lengthy document.

Structured: In order to understand content, the main idea has to be structured.

Visual: Visualization, executed moderately, eases understanding.

Use of basic components, enabling the framework to be implemented via MS word, Adobe PDF writer, or any other word processor.

The concepts were chosen based on the need of enabling first reading and further reading (concept a); on the assumption that people live and work under a perception of no-time and therefore they have to sense the focused information (concepts a, b); on the understanding that there are four styles of learning (Kolb, 1984) while structuring and visualization are part of abstract conceptualization of ideas (concepts c, d); and on the willing to design a solution which requires no particular specified piece of software (concept e).

7. Limitations

The framework described below suits various needs, all concerning important documents that are to be read and re-read by more than one person. It is aimed at solving challenges particularly present in lengthy documents. For documents that do not exceed one or two pages, it may be useless, as people may find the relevant content without using the framework described below.

8. The internal design enabling technique's components

The internal design technique includes two main parts: the document map and information nuggets.

The document map:

The main concept, implemented in the new documents, is a concept of internal information design. Special focus is dedicated to the first page of the document, named “the document map.” The document map has three objectives:

- Assisting the reader in deciding whether s/he has reached the right document.
- Easing the understanding of the document's contents and structure.
- Easing the navigation inside the document, enabling the user to navigate directly to a specific topic discussed in a specific paragraph.

When viewing a group of similar organizational documents, the document map will be built in a uniform structure for each group, using an identical template.

There are two examples of templates See figure 1 with different structures of document maps (each for a specific type of information to be included within):

A document map designed for procedures in a large government ministry in Israel:

Explanations:

- The diagram, demonstrated in the process section, is constructed according to a gallery of shapes, which have the same meaning for all documents of the type. In the diagram above, for example, the red triangle stands for "exceptions" in all relevant procedures.
- Each hyperlink points to an information nugget, described later on in the article.

Document maps can be structured in a variety of ways, depending on the objective of the document group, the target audience and the reading skills of this audience.

A different document map style better suits a project of book summaries, in this case a learning project of a consulting company. For this need, the document map was designed to include three components: a preface describing the book, its author and why the readers should be interested in it; a diagram explaining the structure of the book and its essence; and a concluding paragraph, encouraging the readers to read the full book.

Below is a partial example of the document map of the book *Wisdom of the Crowds*:
"The book Wisdoms of the Crowds has turned to be one of the basic and important books in the world of WEB2.0, and for good reason. The book, written in 2004 by James Surowiecki, deals with a revolutionary idea: In certain situations, the wisdom of the crowd is greater than the wisdom of the expert. Surowiecki, a New-York financial journalist, describes the idea and the circumstances, and presents examples from various content worlds - economy, contracts, politics, transportation, contests and lotteries, urbane life and many others. Nowadays, it is easier to swallow such a revolutionary idea - Wikipedia demonstrates how an encyclopedia written by the crowds can on average be more up to date, richer and in some ways with higher standards.

One of the things I enjoyed most while reading the book was the concept of examples that contradicted the idea, and the recognition of circumstances and situations in which the theory does apply. Few people would not ignore these while describing their ideas and theories.

It was interesting to see how Surowiecki learns from this theory about the way in which the scientific world works and, not less interesting, about the way organizations behave.

<table>
<thead>
<tr>
<th>Procedure number</th>
<th>Date</th>
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<tr>
<td><strong>Objective:</strong></td>
<td></td>
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<tr>
<td><em>(up to three rows)</em></td>
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<tr>
<td><strong>Introduction</strong></td>
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<td><em>(hyperlink)</em></td>
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<tr>
<td><strong>Definitions:</strong></td>
<td></td>
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<td>• Term a</td>
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<td>• Term c</td>
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<td><em>(each term is a hyperlink)</em></td>
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<tr>
<td><strong>Process</strong></td>
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<tr>
<td><em>(Diagram)</em></td>
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<tr>
<td><strong>Possible consequences</strong></td>
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<td><em>(hyperlink)</em></td>
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<td><strong>Important to know</strong></td>
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<td><strong>Appendixes:</strong></td>
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<td>• Appendix a</td>
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<td>• Appendix b</td>
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<td><em>(each appendix is a hyperlink)</em></td>
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</table>

**Figure 1:** Two examples of templates

The following diagram Figure 2 summarizes the concepts described in the book:

In both examples, designed for different needs, we find the map, including text and a visualized diagram, serving the three defined targets:

- Assisting the reader decide whether s/he has reached the right document.
- Easing the understanding of the document's contents and structure.
• Easing the navigation inside the document, enabling the user to navigate directly to a specific topic discussed in a specific paragraph to come.

Figure 2: A summary of the concepts described in the book
Assisting the reader to decide whether s/he has reached the right document is achieved by providing a twofold clear, short and simple definition of content: A literal explanation limited to half a page, in some cases structured and in others not at all; and, a diagram, including all document contents, organized by components, and handed out visually. Kolb (Kolb, 1984), discusses four styles of learning held by each of us on different levels. One of them is abstract conceptualization, which is achieved through the simplified diagram. One glance at its components (generally not exceeding a dozen, but in rare cases, reaching twenty components), and the reader is able to understand whether this is the right document. A Kolb states (Kolb, 1984) that people are different and learn differently. For this reason, both a diagram and a textual literal paragraph are required, enabling each reader to feel comfortable, with the relevant portion. These overlap partly, yet are complementary.

Easing the understanding of the document is obtained by the same rationale: understanding what is included in the document and understanding the scope of the document are achieved by the same content and structure. Furthermore, the relationships between the objects in the diagram assist in better understanding the underlying concepts of the content.

The third target - easing the navigation inside the document - is obtained, as each component of the diagram is a hyperlink navigating the user to a relevant information nugget. Therefore, one can decide to read the full document, and read it continuously, page after page, or one can chose to focus on a specific issue, and navigate to it using the diagram, drilling down (and if requested, drilling back up). The diagram may seem to resemble a table of contents, but the way it is presented, as a visual simplified diagram, increases understanding and navigation capabilities. The diagram is richer in its capabilities of illustration compared to a flat table of contents. The user will find in most cases that it is easier to understand to where specifically, s/he should navigate.

The concept of the document map is simple, yet very powerful. It is easy (from the readers' perspective) to understand when first accessing the document, and it is very to re-read when one is searching for specific information inside the document and requires focused reading and navigation.

Information nuggets:

Information nuggets are paragraphs of text. They are the major part of the document, as they cover most of the document (everything but the first page, serving as the map).
Concepts:

- The information nuggets will represent the diagram's components - one nugget for each component.
- Each information nugget will be limited in size, preferably to a maximum of one page each.
- Each information nugget will be framed (using the word processor capabilities) and will include at its head an icon resembling the icon of the related component in the diagram.
- Each information nugget will be connected via a hyperlink to the diagram. By clicking on any component in the diagram, the word processor will navigate to the related information nugget (this hyperlink capability is a basic capability that exists in all word processors, basic and advanced).
- At the end of each information nugget, a "back" link may be added, enabling quick return to the main diagram.

Winston Churchill, and some say Mark Twain, once wrote a letter apologizing that he was busy, and therefore writing a lengthy letter. It is more difficult to write in a short and simple way, but this way of writing is a necessity when writing a document that has to be read and its information and knowledge used by others.

The information nuggets therefore are brief, and it is recommended that they be written simply enough to be understood best by the reader. If the writer wants to ease understanding and usage s/he must keeps the readers in mind.

Below is an example of an information nugget, illustrating the concepts described above:

### Exceptions

Exceptions that should be handled; exceptions that should be rejected:

- In cases where the high level committee requests further information in order to make a decision, the request, including all appendices, will be returned back to the unit in charge, in order to contact the requesting person and inform him/her regarding the missing information.
- If the clerk in charge of the case has obtained information that a person who is receiving special payments because of his/her physical situation has undergone any changes that can affect payments, s/he should: a) inform his/her managers about the change in order to understand the exact situation, b) return the case files to the high committee, with a detailed report describing the change, enabling a renewed decision about the payments to be issued further.
- ...

![Figure 3: An example of an information nugget](image)

In this example, one partial information nugget was emphasized. This information nugget related to an example of a diagram map, demonstrated in figure 1. The concepts described above are demonstrated via this example:

- The information nugget represents one component - the "exceptions" component.
- The information nugget is limited at size. The example did not include the full content, but the full length of the nugget was less than a page. This information nugget was part of a rewritten procedure of work, and the source content (before rewriting it according to this new technique) was more than double the length.
- The information nugget is framed (using the word processor capabilities). In this case, the technique used included writing the contents of each information nugget in a table with one row and one column. The information nugget includes, at its top, an icon of a reversed red triangle, exactly the same icon of the related component in the diagram. The title of the information nugget is the same as the title of the icon in the diagram map.
- The information nugget is connected via a hyperlink to the diagram. By clicking on the component in the diagram map, the word processor navigates to this related information nugget.
At the end of the information nugget, the "back" link was added, enabling quick return to the main diagram. In this case, it was embedded within an arrow, giving the reader, in addition to the text, a visual hint of the possible operation.

It is further important to state that when guiding the organization members in writing an information nugget, special attention should be dedicated to simplicity of writing. It has been found that people often tend to write in a lengthy manner, using too high a level of taxonomy and grammar. There are cases where this style of writing is justified. Yet for most organizational needs, simplicity will serve better. This includes, among other rules:

- Using positive rather than negative ones.
- Minimizing the use of passive verbs.
- Using words that have only one meaning (non-ambiguous).
- Using taxonomy that is well known and understood to all potential readers of the document; in case of documents used while dealing with customers, the taxonomy should be clear to them as well.
- Using short sentences.

These two main components - dedicating the first page of the document to a document map, with the heart of the document diagram, and building the resulting pages as information nuggets, together comprise a new enabling technique implementing the suggested framework.

9. Framework implementation and research findings

The framework and its enabling technique were implemented in several organizations (four) and in one use, for public published documents. Interviewed people stated that the enabling technique is simple, yet found to be, powerful in easing reading and understanding. It has been found to be very inexpensive to implement for new documents, after a relative short period of training and minimal assistance (thus, this finding differs from organization to organization); assistance is required mainly after initial training for building the diagram map, representing the abstract conceptualization of the contents. In one case, where the framework was used for procedures of work, the issue of re-writing existing procedures using the new technique has risen. The recommendation was to decide depending mainly on level of estimated contribution (if re-written) compared to estimated cost. For procedures of work, for example, the rule-of-thumb demands re-writing procedures of work that were found to be ignored, resulting in more faults, more accidents, or higher losses of money.

In organizations where the framework was implemented, no training or assimilation activity aimed towards the readers of the documents took place. Of course this is true, also for usage in public. The techniques used, were simple and intuitive enough, for the average 21st century reader. This finding includes the diagram map, which resembles any other diagram used in all conventional documents. The decision to always include the diagram map, as part of the first page, is aimed to the writer, not the reader. The same is true for the document map components as whole. The reader, therefore, requires no training on how the document is to be built or what it will include. S/he have only to understand the content based on the guidelines of the enabling technique it was built on.

Framing the rest of the document may seemed less popular in other documents of the case sample organizations, yet was found very easy to follow and understand. The sizing of each information nugget was again, the writer’s rather than the reader’s concern.

In one of the cases where the framework was used, the document was printed in two hundred copies and send out as hard copies (in addition to enabling direct access from a website). This fact did not negate any of the advantages of working with the proposed framework. Even as a booklet it was easy to comprehend since the connections between the map on the first page to the icons in the continuation of the document answered the needs of the reader. Indeed, it was very easy to understand the document’s contents and to attain a better understanding of its main components.

Most surprisingly, however, the navigation was improved as well. Of course, no electronic navigation exists on the hard copy, but the reader was able to easily connect between the icons on the diagram map, and the icons on the top of each continuing page. Thumbing through the booklet, navigation was achieved rather quickly.
Implementing such a framework in organizations resembled a snowball. At the first stages units were suspicious, and do not usually volunteer to join in. The writing of the first few documents, or their re-writing, took effort, energy and attention. However, once these were published, the picture totally changed: the volunteering units requested more, as they received positive feedback on their documents (while the feedback did not always distinguish between content and structure, all is highly appreciated); other units requested to be the next in line.

The challenges, in these cases, were two-fold:

- To prioritize the units and documents in which the technique expert will invest efforts. The first documents are written by the expert, and the training and assimilation usually follow as step two and three.
- To move inside the units from step one, where they get full assistance, to the next steps, where the unit itself has to become active in the writing process and the technique expert can phase out.

When documents were re-written, based on existing documents, it turned out, in most cases, that the re-written documents were shorter than the corresponding source. This can be explained due to:

- Limiting the number of heading paragraphs (represented by information nuggets) to the number of components in the diagram (and guiding the writers to understandable diagram maps).
- Limiting the size of each information nugget to one page (and in extreme situations to two pages).

In organizations in which the framework was implemented, it was found that short and simple writing, according to the structure defined, is surely a learnable skill; after experiencing the method, it even eases the writer’s job. However, no statistics exist yet on the time invested (after first learning of the technique) to write regular documents compared to writing documents using this new framework.

The research hypothesis was verified: The suggested framework implemented via the defined enabling technique eased reading, eased understanding and probably eased use. It therefore leverages knowledge understanding in documents, and reduces knowledge loss.

10. Conclusion

A framework for internal design of a document has been introduced above. This framework is to be used in addition to conventional frameworks of external design, such as using navigational trees and adding categorization (attributes) to documents. The enabling technique described includes two main components: a document map and information nuggets. The framework increases the document’s visual effect (the map’s diagram and the information nuggets borders and top icons). The use of the diagram provides better understanding both because of its conceptualization and because of this visual effect; the use of information nuggets enables understanding and ease of use, both because it is framed content and structure, and because it is focused. The enabling technique is implemented using a word processor only, needing no advanced technology. It has benefits when used electronically (navigating through the hyperlinks of the diagram), but also serves for paper printed documents, easing their understanding and use.

The document map has three main advantages:

- Assisting the reader to decide whether s/he has reached the right document.
- Easing the understanding of the document’s contents and structure.
- Easing the navigation inside the document, enabling the user to navigate directly to a specific topic discussed in a specific paragraph to come.

The information nugget has also three main advantages:

- It is written simply.
- It is limited in size (having a psychologically positive effect on the reader, who can see the size, due to the framing).
- It is accessed easily. This is important especially for focus re-reading of the document.

In organizations where the framework was used, people indicated that these documents were found to be more user-friendly to read, re-read and understand. We believe that the framework can be improved and refined in the future; yet it already imparts, in its current offering, a significant leverage point to documents’ understanding and knowledge re-use.
References

Knowledge Management Model for Information Technology Support Service

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Abstract: User support has been in existence since the inception of computers in business and with their workforce dependent on technology, organizations depend on the quality of information technology (IT) support services to quickly restore and prevent any downtime due to any failure in technology or its use. Standardization of systems, and the speed with which knowledge becomes redundant, means that support personnel technical knowledge is gained and discarded on a continuing basis. This research evaluates how an organization can conceptualize knowledge management (KM) of IT Support in order to maximize user productivity. Grounded Theory approach is used to explore the knowledge management activities and processes present within the Electronic and Information Technology (EIT) group of a multidisciplinary research centre called iThemba Laboratory for Accelerator Based Science (LABS). Firstly, the approach involved participant observation to gather information about the workflow of EIT support forming the first attempt at open coding. Secondly, semi-structured interviews, as well as the use of the Repertory Grid Technique were used to gather multiple perspectives of support personnel. Extant literature was then incorporated to develop the emergent theory. This research found that the knowledge management foundation for IT Support is strategy and culture based on the constructs of commitment and reciprocity. Further, communication and competency were identified as additional enabling conditions. From this, an adapted KM model for IT Support Service is presented. The model agrees with Nonaka and Konno’s ‘ba’ concept within the Socialization-Externalization-Combination-Internalization (SECI) process. Every transition between the quadrants representing ba (knowledge platforms) requires ‘conversion energy’, in agreement with IT Service Management Service Management Functions of Microsoft’s Operations Framework.

Keywords: knowledge management, information technology, support service, repertory grid, grounded theory

1. Introduction

There have been various terms used to describe user support, including helpdesk, technical support, and call centre. According to Bruton (2002: 5), user support is defined as “a specialist function which retains, on behalf of the company’s user population, technical knowledge about IT and the way the company uses it, in order to deliver that knowledge in a focused form to solve specific technical and business problems on both a reactive and proactive basis, such that user productivity is maintained and enhanced, thereby further enabling the user to contribute to the company’s business goals”.

User support has undergone considerable changes with the introduction of newer and more powerful computing technologies. Presently, the Internet threatens to replace traditional support with technologies of e-support. With increased competition, greater access to information provided through these technologies, increased mobility and the globalization of markets, organizations are forced to think and learn faster (Davenport & Prusak, 1998; Gamble & Blackwell, 2001).

Increasing the amount of information available or accessible to an individual through these technologies does not ensure competitive advantage (Gamble & Blackwell, 2001; Davenport & Prusak, 1998). The beginning of the 2000s has seen a focus on knowledge as the new basis of competitive advantage. Knowledge Management comprises a range of practices used by organizations to identify, create, represent, and distribute knowledge (Keyes, 2006). According to Davenport and Prusak (1998), knowledge is a mix of experience, values and contextual information, and expert insight that provides a framework for evaluating and incorporating new experiences and information. In organizations, knowledge is embedded in its routines, processes, practices, and norms (Davenport & Prusak, 1998).

A real cost is incurred due to reduced user productivity when computer system related problems hinder the user from contributing to organizations profits (Bruton, 2002). This can be seen in critical systems such as those used by corporate central office in making rapid decisions about investments in both local and international markets, real time inventory control, safety interlock systems, and call centre.

Reference this paper as:
production systems and so on. Support personnel's technical knowledge is augmented with skills in expressing complex technical terms, methodical approach to solving problems, as well as their network of information sources (Bruton, 2002). All this culminates in an appreciation of the knowledgeable expertise present in support to enable organizational growth.

According to a study carried out by the IDC (2008) on the IT services industry in South Africa, an imminent concern is the increasing difficulty in attracting and retaining qualified human resources. These are normally poached by competitors, and even clients (IDC, 2008). Due to this variety of options available to support-personnel, managers of IT support services need to focus on attracting and retaining such expertise/knowledge, and safe guarding organizational knowledge.

1.1 Aim and objectives

This research will look at the effectiveness of IT support service framework in (managing knowledge processes) codifying implicit knowledge into explicit knowledge to be stored and shared.

The objectives of the research are:

- To explore and describe the workflow of IT support which support knowledge sharing and retention
- To highlight the drivers, as well as obstacles to knowledge transfer and conversion
- To develop a knowledge management model for IT support service

1.2 Research strategy

The research problem to be addressed is essentially qualitative in nature. However, analysis is also supplemented with some quantitative data. Grounded theory approach is used to explore the social processes present within human interactions within an IT Support environment.

Primary sources of data include participant observation, interviews, and supporting sources. The main focus was on the IT Support group within iThemba Laboratory for Accelerator Based Science (LABS) organization. Secondary sources are reviews of extant literature. These include various books, journals, internet, as well as unpublished working papers.

2. Knowledge management

Knowledge Management (KM) has been an established discipline since 1995. The knowledge movement spawned through management’s realization that what an organization and its employees know is central to an organization’s success (Davenport & Prusak, 1998).

2.1 Generations of knowledge management

Currently, there are four accounts of generations of KM:

- One account is proposed by Mark Koenig. His theory views the first stage of KM as a field driven by IT, the Internet, best practices, and knowledge sharing (Firestone & McElroy, 2003). The second stage is seen as KM focusing on human factors, organizational learning, and knowledge creation among tacit and explicit knowledge. The third stage of KM shifts focus to the arrangement and management of content through taxonomy construction and use (Firestone & McElroy, 2003).
- The second account by David Snowden (2002) suggests that we are reaching the end of the second generation where the first generation focused on timely information provision for decision support and business process re-engineering, and the second generation was triggered by the SECI model of Nonaka. He proposes that the third generation is in: context, narrative, and content management; knowledge as both a thing and a flow; sense making using the Cynefin model drawn from the science of complex adaptive systems; and scientific management and theories of chaos and complexity.
- The third account is proposed by McElroy (Firestone & McElroy, 2003) and highlights only two generations of KM. The first focuses on knowledge sharing, “supply-side KM”. The second generation is on knowledge creation, “demand-side KM”. Firestone and McElroy (2003) argue that the other two accounts have many weaknesses and that their own account is through the
perception of change related more to the evolution of knowledge processing than to knowledge management. This third account has received a wider acceptance and various reviews have been carried out (Loan, 2006; Vorakulpipat & Rezgui, 2008; Campos, 2008).

Vorakulpipat and Rezgui (2008) have built on McElroy’s work and propose a third generation KM based on value creation. According to Vorakulpipat and Rezgui (2008), value creation focuses on the organizational and societal impact, highlighting five major factors towards value creation: Human networks; Social capital; Intellectual capital; Technology assets; and Change processes.

2.2 Intellectual capital

The term intellectual capital refers to an organizations investment in knowledge. The term was coined by Thomas A. Stewart (1997). In his book ‘**Intellectual Capital: the New Wealth of Organizations**’, Stewart (1997) describes intellectual capital as intellectual material such as knowledge, information, intellectual property and experience that can be put to use to create wealth. It consists of human capital (knowledge worker), customer capital (knowledge driving decision to buy) and structural capital (company knowledge) (Davenport & Prusak, 1998; Gamble & Blackwell, 2001). Organizational knowledge refers to companywide collective knowledge of its products, services, processes, markets, and customers.

2.3 Community collaboration

Communities of practice, as described by Gamble and Blackwell (2001), are collections of individuals who share a similar work role in a common context bound by informal relationships. According to Wenger (1998), communities of practice are the prime context in which individuals work out common sense, highlighting the social and negotiated character of both the explicit and tacit in one’s life.

Further, Gamble and Blackwell (2001) identify social capital as a characteristic of communities of practice that affect the creation and sharing of knowledge. They define three inter-related dimensions of social capital. The first is the structural dimension which refers to informal networks that allow individuals to identify others with potential resources which they themselves are lacking (Gamble & Blackwell, 2001). The second is the relational dimension which addresses interpersonal dynamics such as trust, shared beliefs, and expectations (Gamble & Blackwell, 2001). Lastly, the cognitive dimension refers to a common context and language to build social capital (Gamble & Blackwell, 2001). Improvements in the performance of a community of practice through building social capital are argued to improve flexibility, agility, and the organization’s ability to respond to problems (Gamble & Blackwell, 2001).

2.4 Information theory

In Polanyi’s (1966) book, ‘**The Tacit Dimension**’, he considers human knowledge in the context that we know more than we can tell. He argues that limitations of communication display a knowledge that we cannot tell (Polanyi, 1966). Hence Polanyi (1966) states that the process of formalizing all knowledge to the exclusion of any tacit knowing is self-defeating.

According to Krippendorff (1986), information theory is more than a statistical tool; it is at the root of social phenomena by providing explanatory structures, theorems of generality, and calculus for information and communication. In 1995, two Japanese academics, Ikujiro Nonaka and Hirotaka Takeuchi, published the book ‘**The Knowledge-Creating Company**’ (Davenport & Prusak 1998). They highlighted the conversion of internalized tacit knowledge into explicit codified knowledge for successful knowledge sharing. They created a model for knowledge conversion, called SECI (Socialization, Externalization, Combination, and Internalization). Later work by Davenport and Prusak focused on information theory (Davenport & Prusak 1998).

2.5 KM practices

Knowledge sharing strategies have focused on formal arrangements such as internships and apprenticeships, communities of practice, documenting processes, expert interviews, knowledge maps and audits, lessons learned debriefing (held during and at the end of projects to share knowledge as project snapshots) and mentoring programmes (Keyes, 2006).
Resources dedicated to KM can be found as part of Information Technology departments. A technocentric view of KM is a focus on technology that enhances knowledge sharing and growth. KM technologies expanded in the mid 1990s and are referred to as knowledge enablers (Davenport & Prusak 1998). Examples include Lotus Notes, expert systems, collaborative software, and Web 2.0 technologies.

2.6 SECI model

Nonaka and Takeuchi (2004) describe a KM cycle as a knowledge spiral that depends on the interaction of tacit knowledge and explicit knowledge, leading to four modes of knowledge conversion – Socialization, Externalization, Combination, and Internalization, referred to as the SECI model (Nonaka & Konno, 1998; Nonaka & Takeuchi, 2004). Socialization involves the sharing of tacit knowledge between individuals, emphasizing capturing knowledge through close physical proximity (Nonaka & Konno, 1998). Externalization involves the conversion of tacit knowledge to explicit knowledge into a comprehensible form understood by others (Nonaka & Konno, 1998). This mode is founded in the semantics and semiotics of communication (Depres & Chauvel, 1999). Combination involves building explicit knowledge into a more complex set of explicit knowledge (Nonaka & Konno, 1998). Internalization involves the conversion of explicit knowledge into tacit knowledge which is actionable (Nonaka & Konno, 1998).

These modes view knowledge as context-specific and depend on a time, space and relationship with others (Nonaka & Toyama, 2004). This context is referred to by the Japanese term ‘ba’, originally proposed by Japanese philosopher Kitaro Nishida (Nonaka & Konno, 1998). The SECI model provides four modes of ba (see figure below) (Nonaka & Konno, 1998).

Originating ba is supported through direct interaction and shared experience (Nonaka & Takeuchi, 2004). Interacting ba helps promote reflection and interaction between individuals (Nonaka & Takeuchi, 2004). Cyber ba, is when externalization transcends the group to be combined (Nonaka & Takeuchi, 2004). Exercising ba is when individuals identify relevant knowledge within organizational knowledge and put this newly acquired knowledge into action (Nonaka & Konno, 1998).

![Figure 1: The four characteristics of ‘ba’ in the KM spiral evolution (Source: Nonaka & Konno, 1998)](image-url)
3. KM and IT support services

The lack of management of technical knowledge in IT support services has substantial costs in making the same mistake twice (or more), and inability in finding what the company knows fast enough in problem solving (Gamble & Blackwell, 2001). To mitigate these costs, IT Service Management (ITSM) looks at managing IT systems centered on the user’s perspective of ITs’ contribution to the business. ITSM as a discipline for managing information technology is a primary enabler of IT Governance objectives. ITSM audit is covered in the standard ISO/IEC 20000.

ITSM is supported by a number of standardized guidelines; an example is the Information Technology Infrastructure Library (ITIL). ITIL describes industry processes and best practices necessary for delivery of service solutions and is a registered trademark of the Office of Government Commerce (OGC) in the United Kingdom (MOF 2008). Microsoft has adopted and adapted ITIL to create the Microsoft Operations Framework (MOF). MOF highlights activities and processes into Service Management Functions (SMFs) which are grouped together in phases mirroring the IT service lifecycle (MOF, 2008). The IT service lifecycle has three ongoing phases and one foundational layer.

![Figure 2: The operate phase within the IT service lifecycle (Taken from TechNet library solution accelerators: Microsoft operation framework 4.0. (MOF, 2008))](image)

Plan Phase – optimize IT service strategy in order to support business goals and objectives

Deliver Phase – IT services developed and deployed effectively ready for operations

Operate Phase – IT services are operated, maintained, and supported in a way that meets business needs and expectations

Manage layer - Operates throughout all other phases, providing principles to ensure a return on IT investment

This paper considers the Operate phase as the main area where IT services are operated and maintained, highlighting the daily ongoing activities of IT support service personnel. Owing to the above, the Operate phase will be viewed through the SECI model to determine how knowledge flows and is diffused in a service environment.

4. Overview of iThemba LABS

iThemba LABS is a multidisciplinary research centre sponsored by the South African National Resource Foundation (NRF). iThemba LABS provides basic and applied research using particle beams, particle radiotherapy for the treatment of cancer, and supply accelerator-produced radioactive isotopes for nuclear medicine and research. The organization has a number of groups, namely
Accelerator, Material Research, Physics, Radiation Biophysics, Medical Radiation, Radionuclide Production, Electronics and Information Technology (EIT), Technical Support Services, and Financial/Administration Group. The organization structure is largely project-based, where individuals and groups work together on defined projects. It has approximately three hundred personnel, with an EIT Support group of roughly thirty five personnel.

EIT support handles the daily provision and maintenance of hardware and software to all other ten internal groups. Support also goes beyond simple reactive activities such as error logging and trouble-shooting to more proactive activities such as development, research, and the identification of new technologies and solutions. All this translates to availability of the particle radiation beam, providing greater return on investment.

Use of iThemba LABS for fieldwork was due to easy access to data, information, as well as people. Further, a number of organizational issues were of concern:

- IT support of new service and technologies, as well as the complexity of services in the nuclear facility born in the 1970s (legacy systems);
- implementation of a request tracker (incident management and knowledgebase) which forms part of the Integrated Management System (IMS) evaluation tools;
- increasing rate of innovation in nuclear research requires replacement of informal knowledge with formal methods;
- the amount of time available to experience and acquire knowledge is diminished as competitive pressures have reduced the size of the workforce;
- a need for succession training and lifelong learning as the personnel are largely older people reaching retirement age, and are the only individuals who hold specific knowledge about the intricacy of certain vital systems

4.1 EIT Support workflow

The support organization has a centralized structure. Both email and telephone calls are all logged to the same place through the use of the ticketing system. This is considered first-line support. If first-line support is unable to resolve the incident, it becomes a ‘problem’ which is referred to second-line support for further diagnosis and action. A list of roles and responsibilities is provided below. In order to log incidents and track their status till resolution, management introduced a ticketing system.

<table>
<thead>
<tr>
<th>Roles</th>
<th>Support Personnel</th>
<th>Head of System Support</th>
<th>EIT Group Head</th>
<th>EIT Quality Representative</th>
</tr>
</thead>
<tbody>
<tr>
<td>Responsibilities</td>
<td>Day to day support (query handling, trouble-shooting)</td>
<td>Drive efficiency and effectiveness of support process</td>
<td>Production and maintenance of major incident communication plan</td>
<td>Customer representative (customer feedback)</td>
</tr>
<tr>
<td></td>
<td>Monitoring status and progress toward resolution</td>
<td>Management and feedback on support operations</td>
<td>Facilitating production and maintenance of major incident restoration plan</td>
<td>Ensure procedures and process in place</td>
</tr>
<tr>
<td></td>
<td>Keep affected users informed about progress</td>
<td>Manage first- and second-line support personnel</td>
<td>Facilitation of management team reviews</td>
<td>Monitoring service quality</td>
</tr>
<tr>
<td></td>
<td>Research and development</td>
<td>Develop and maintain incident management system</td>
<td>Production of major incident progress updates</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Procurement, ordering and invoicing</td>
<td>Sign off on cost centers</td>
<td>Participation in major incident reviews</td>
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</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>EIT Budget</td>
<td></td>
</tr>
</tbody>
</table>

Table 1: Roles and responsibilities
4.2 Ticketing system

A ticketing system is normally used for incident and problem management. It provides a knowledgebase for support personnel to fast track solutions through looking up similar past incidents, and the people involved in resolution of incidents (Best Practical, 2008). Hence, the technology acted as a knowledge enabler. Various software, called Request Trackers, enable a group of individuals to efficiently manage tasks, issues and requests submitted by user communities via its web or email interface (Best Practical, 2008).

When an event or incident is reported, it is given a unique tracking number or ticket and is placed in a queue. Several queues were created: ‘ITSupport’ queue for initial ticket creation; ‘ITPurchases’ queue for procurement; ‘ITHotSeat’ for major errors/issues/bugs; and ‘ITNetwork’ for network incidents. Watchers of the queue receive notification when a trouble ticket is created and/or changed. The duty of monitoring the ‘ITSupport’ queue was on a rotational basis. Responsibility involved creating new tickets from calls received at the helpdesk (for users who preferred to call), moving tickets to different queues, and assigning tickets to owners.

Implementation of the ticketing system adhered to the MOF service monitoring and control management flow (MOF, 2008): Define Request Tracker requirements; Implement service; Continuous monitoring; Control and reporting.

Table 2: Service monitoring and control management activities (adapted from MOF, 2008)

<table>
<thead>
<tr>
<th>Flow Phase</th>
<th>EIT Group Head</th>
<th>System Support Head</th>
<th>Support Personnel</th>
<th>Quality Rep</th>
<th>Activities</th>
</tr>
</thead>
<tbody>
<tr>
<td>Defining Request tracker requirements</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>Define IT service to be monitored; prepare service component health model; review reliability requirements</td>
</tr>
<tr>
<td>Implement Service activities</td>
<td>△</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>Align new IT service to existing processes and functions; align new IT service to existing IT organization; align new IT service to existing SMC tools</td>
</tr>
<tr>
<td>Continuous monitoring activities</td>
<td>△</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>Receive notification; analyze event; resolve or escalate event</td>
</tr>
<tr>
<td>Control and reporting activities</td>
<td>△</td>
<td>○</td>
<td>○</td>
<td>△</td>
<td>Produce reports and statistics; conduct operational health management review; plan and execute service improvement</td>
</tr>
</tbody>
</table>

5. Research method

5.1 Grounded Theory methodology

Grounded theory (GT) is a qualitative research approach that is inductively derived from the study of the phenomenon it represents (Corbin & Strauss, 1990a; Fernandez, 2004). Pioneered through the work of sociologists Glaser and Strauss (Glaser & Strauss, 1967; Corbin & Strauss, 1990a; Fernandez, 2004), it is a form of field research where theoretical explanations of key social processes are derived from or grounded in empirical data (Speziale & Carpenter, 1999; Fernandez, 2004). Hence, one does not begin with a theory, and then prove it; rather one begins with an area of study and allows theory to emerge (Corbin & Strauss, 1990a; Glaser 1992; Speziale & Carpenter, 1999; Fernandez, 2004). Therefore, data collection, analysis, and theory stand in reciprocal relationship with each other (Corbin & Strauss, 1990a).

Glaser and Strauss later separated, each developing their own approaches on how to conduct grounded theory research. This research uses the Glaserian description of the methodology, where
emergence and theoretical sensitivity form the central role in interpretation. The basic principle of open coding, theoretical and selective sampling, and abstraction still remain crucial. Issues of bias and preconceptions are dealt with through grounded theory’s systematic approach that takes into consideration extant theory but is not driven by it (Fernandez, 2004; Glaser & Strauss, 1967).

5.2 Repertory grid
The Repertory Grid interview technique which focuses on human judgment and psychology (Easterby-Smith, Thorpe & Holman, 1996) ties in with the grounded theory approach since grounded theory is renowned for its application to the study of human behavior (Goulding, 2002). The Repertory Grid Technique is derived from personal construct theory originally developed by George Kelly, a clinician, in the 1930s (Fransella, 1977; Easterby-Smith, Thorpe & Holman, 1996; Song & Gale, 2008). The technique was borne through Kelly’s discontent with the then psychological theory and from his engineering background. The technique addresses three main concerns in theory development: observer bias, precision and prediction for the individual, and over-reliance on the expert (Fransella, 1977).

5.3 Research procedure
After the completion of a project to implement a ticketing system for the Electronic and Information Technology (EIT) Support sub-group, a study of its usage and knowledge management activities was conducted. This study was carried out within a three month period. Entry into the field of research is through participant observation whilst serving an internship as a Software Engineer. All participants were made aware of this study, and their involvement was voluntary.

Firstly, information was gathered about the workflow of EIT support from discussions with three support personnel, the head of support, the deputy group head, as well as the group head. From there, the ticketing system was installed, configured and customized according to their workflow. Training on the system was provided through documentation and also one-to-one training of the helpdesk (first line support). This formed preliminary observation and information which formed the first attempt at open coding and the first cycle of theory generation.

Further, semi structured interviews and repertory grid technique interviews were carried out. This, together with data from the ticketing system, formed another cycle. These findings were then swept into the emerging theory, supplemented by extant theory to inform and refine coding. At this point, theoretical concepts were dense enough to present a substantive theory. From this theory, a KM model of a service framework is presented.

5.4 Data collection

5.4.1 Participant observation
The stance is that of participant as observer (Kawulich, 2005). The group was aware of this research activity. Observation provided a way to check for nonverbal expression of feelings, how personnel communicated with one another, and also how much time was spent on activities (for example, problem solving and use of the ticketing system tool).

5.4.2 Interviews
Semi-structured interviews were used to gather multiple perspectives of the support personnel. Selection of interviewees (eight in total) provided full coverage of EIT support function; from technical support, software engineering, electronics-research and development, and electronics-installation and maintenance. The interviewees experience within the organization range from three (3) years to twenty-nine (29) years, giving an average of 11.125 years. Theses interviews were taped. Although the Glaserian approach denounces taping of interviews, taping allowed fewer false conclusions due to researchers own bias or interpretation.

The interviewees also participated in a repertory grid interview. Elements were elicited through the interview discussion on workflow, knowledge sharing and transfer. Constructs were generated through the Triading method (Easterby-Smith, Thorpe & Holman, 1996). The grid technique was based on ratings. In the rating grid, elements were rated on a scale of 1 to 5 defined by two construct poles. The method allows flexibility of response but the resultant matrix is not easy to deal with by
hand and requires a computer programme (Fransella, 1977). Principle component analysis (PA1) programme is required to analyse the matrices (Fransella, 1977). It analyses the total variance of the data (by row and column but not the two together), requiring no assumption of the data (Fransella, 1977). The excel spreadsheet add-in called XLSTAT provided for principle component analysis.

6. Results and analysis

This chapter presents the findings for each data source, then ties them in to form a framework of knowledge management for IT support services. It also shows how extant literature informs the study, and fortifies the theory grounded in the data.

6.1 Participant observation

Observation was carried out for a period of three months, during meetings and whilst the ticketing system was in use. Three major observations stood out during this period. Firstly, there seemed to be a need to discuss and share ideas on how to implement the system, format to record incidents, and how to divide the workload. Despite the ticketing system tool, support personnel still relied on informal and collaborative contact, such as wikis, email lists and mentoring, in discussing problems, issues, and ideas. This emphasizes the importance of the reliance on each other, almost like a community of practice. Each support personnel had a specialization, with only medium overlap with their peers. Hence, each had a role within the community in which they are a member. This reflects activity within the socialization mode.

Secondly, there was joint agreement on experience rather than formal education as being the major contributor to both individual and group knowledge. Strict discipline had to be exercised in documenting incidents and their solution using the ticketing system. Time constraints on the individual were a pressure that prevented or compromised document quality. Lastly, there is a great concern for communication from both senior and junior personnel. Both see the value in effective and efficient communication. Junior personnel complained that normally all information pertaining to the solving of incidents were not provided to them by their supervisors, instead they are only provided with an abbreviated version of the solution. Supervisors, on the other hand, blame poor communication on the receivers’ ability to comprehend all aspects, as well as their own inability to articulate the complete solution.

6.2 Semi-structured interviews

Semi-structured interview questions focused on: troubleshooting methods; how knowledge is typically shared; reasons why this process is followed; reasons for sharing; where knowledge is created; what is considered critical; what are the obstacles/constraints. From these base questions, interviewees were encouraged to talk about their experiences, feelings and thoughts on the topic. Transcription involved putting key words and constructs into categories. Also observed were differences in constructs between senior personnel (within the organization for more than ten years) and junior personnel (ten or less years within the organization). The categories table can be found in Table III.

6.3 Repertory grid

The major themes identified from using covariance principle component analysis were: research; interest; benefits; communication; experience; and resources. These were found to increase together (positive covariance). The various components from individual matrices (interviews) were ranked in order of Eigen value, highest to lowest. From there, the identified three principle components were selected from each matrix (Table IV and Table V). Owing to some overlap in components between the matrices, six themes were found to be of greater significance.

- Research refers to the need to seek a solution to a problem through identifying the root cause.
- Interest in the problem area highlights a need or value in entering the knowledge marketplace, either as a seller or buyer.
- Benefits of sharing include fast tracking the solution, learning new skills, competency, multiple perspectives and solutions, self-improvement, and a give-and-take two-way street regarding sharing.
- Communication was a core construct of both junior and senior personnel. The semantics of language play a huge role in transferring and sharing ones knowledge. As Stewart (1997) wrote in
his book ‘Intellectual Capital’, “Even the smartest people in the world need a mechanism to assemble, package, promote, and distribute the fruits of their thinking”. Effective communication aids smooth knowledge flow.

- Experience gives rise to lessons learned and hence proven methods of tackling an incident.
- Resources are important in converting knowledge from tacit to explicit and vice versa. Resources include, time, funding, infrastructure.

Table 3: Interview categories

<table>
<thead>
<tr>
<th>Category</th>
<th>Junior Personnel</th>
<th>Senior Personnel</th>
</tr>
</thead>
<tbody>
<tr>
<td>Problem solving</td>
<td>External documentation; interesting reference; communities of practice; own experience and knowledge</td>
<td>prior knowledge (depend on oneself) (extends to knowledge of where to find documentation); guidelines; reference from people; teamwork; historical problems; common-sense; elementary; expert in field</td>
</tr>
<tr>
<td>Learning process</td>
<td>Self-help; research due to limited solution provided by people; supervision; individual interested in knowledge</td>
<td>facility problem-faster using teams; programming problem-rely on oneself; logical problem solving steps; no hard fast rule; proven methodology; experience; DIY-self dependence</td>
</tr>
<tr>
<td>Useful/critical knowledge</td>
<td>Through collaboration; procedure; multiple solutions; overlap in expertise</td>
<td>fundamentals; people skills; communication skills; complex system skills; experience; technical background; formal qualification</td>
</tr>
<tr>
<td>Knowledge creating process</td>
<td>During implementation; problem solving (trial and error); research; sharing problems/ideas; supervisor communication; upgrades/changes</td>
<td>formal education; group learning; research; changing tech environment-learning curves; individual/group faults; interest</td>
</tr>
<tr>
<td>Knowledge as action</td>
<td>problems occur; upgrade/improvement system requirements; struggles; through asking; implementation</td>
<td>daily work; formalizing experience through documentation – gain perspective; training; social informal communication; collaboration-alternatives; explanation from different specialists</td>
</tr>
<tr>
<td>Constraints/obstacles</td>
<td>resources (time, workload, infrastructure, funding); lack of documentation; training; management approval; knowledge hoarding</td>
<td>resources; personalities (protective over information, shy, confidence, communication, language); shortage of personnel; funding; lack of documentation; ability to understand competency; job preservation; recipients interest/ability/absorption of knowledge and information</td>
</tr>
<tr>
<td>Sharing</td>
<td>observation; explanation; example; talk; supervisor; presentation; communication; asking advice; problem fault finding; tagging along</td>
<td>verbal; practical example; work alongside; talk sessions; log events (self discipline); wikis (informal documentation)</td>
</tr>
<tr>
<td>Benefits</td>
<td>broaden self knowledge base; faster solution; help others; continuity; two way street; multiple perspectives; more people (resources)</td>
<td>empowerment; learn new skill/tool; reinforce learning; two way street; reduced workload; sustainability; resource usage; quick solution; cannot write everything down-transfer through peers; economic; job satisfaction</td>
</tr>
</tbody>
</table>

Table 4: Repertory grid PCA
Table 4: (Continuation of repertory grid PCA)

<table>
<thead>
<tr>
<th>No.</th>
<th>Theme</th>
<th>Constructs</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Research</td>
<td>5.2; 7.1</td>
</tr>
<tr>
<td>2</td>
<td>Interest</td>
<td>1.1; 1.2; 7.2; 8.2</td>
</tr>
<tr>
<td>3</td>
<td>Benefits</td>
<td>1.3; 2.1; 2.2; 2.3; 3.2; 4.3; 5.3; 8.1; 8.3</td>
</tr>
<tr>
<td>4</td>
<td>Communication</td>
<td>3.1; 3.3; 4.1; 5.1; 6.2; 6.3</td>
</tr>
<tr>
<td>5</td>
<td>Experience</td>
<td>4.2; 5.2; 7.3</td>
</tr>
<tr>
<td>6</td>
<td>Resources</td>
<td>4.1; 5.3; 6.1; 6.3; 7.1; 8.2</td>
</tr>
</tbody>
</table>

6.4 KM Model for IT support service

Results from data collection were then used to form a tentative KM model for the support service framework:

SECI model and EIT support
It was found that every transition between the quadrants representing \textit{ba} (knowledge platforms) requires ‘conversion energy’. This energy can be compared to that needed in changing the state of a material. For example, ice to water, water to vapour, vapour to water, and water back to ice requires the use and conversion of energy. This ‘conversion energy’ is in the form of resources. Resources are both tangible and intangible. Tangible are in the form of funds, tools and infrastructure. Intangible resources include time and quality. The driver was found to be commitment and reciprocity. From the transition between quadrants, it was found that the MOF Operate phase Service Management Functions can be linked to the four \textit{ba} quadrants. The socialization quadrant referring to an overlap of expertise comes into play in problem solving activities carried out by the Customer Service Service Management Function. This requires interaction with not only peers but customers and suppliers’, forming the beginning of the knowledge spiral as problem solving requires physical proximity and joint activities at the actual job site.

Movement to the externalization quadrant involves monitoring and capturing IT health knowledge. This resembles the Service Monitoring and Control Service Management Function which observes IT services to minimize impact of service incidents and events (MOF, 2008). The outcome is improved understanding and quicker, effective responses to service incidents (MOF, 2008). The quadrant also focuses on knowledge enablers required to aid in the capture of experience and knowledge. As the use of the ticketing system showed, service monitoring and control aided faster and efficient service by providing a description of the problem and its solution, persons involved, trends, workload, escalation of incidents, and other incident data.

Transition to the combination quadrant requires research encompassing other knowledge to form a more complex set. This resembles the Problem Management Service Management Function where the main deliverable is effective problem resolution process (MOF, 2008). This is in line with findings which showed an outcome of proven methodology in problem solving.

Finally, transition to the internalization quadrant which looks at the need, value and interest of knowledge resembles the Operations Service Management Function. This is in line with findings of knowledge as action. Knowledge drawn from procedure and methodology needs to be absorbed by personnel. This is restated in the findings where absorptive capacity was argued to be a limitation in proper sharing of knowledge. Addressing the issue of absorptive capacity will require a look at the learning process of the individual (how lessons can be internalized for personal development or training) and bounded rationality, which is beyond the scope of this study.
The main themes highlight two important enabling conditions for knowledge flow. The benefit theme highlights faster problem solving through increasing the competency (self-knowledge base – skills) of personnel which in turn affects the quality of knowledge and transfer. Hence the give and take relationship (reciprocity) effectively enhances competency. The communication theme stresses the importance of conversations and the recipients’ ability to understand which in turn aids in resource (time, funds, infrastructure) bargaining. Presented below is a representation of a KM Model for IT support service. It has been developed from the Kao Corporation Five-phase Model of the Organizational Knowledge-creation Process (Nonaka & Takeuchi, 1995).

Figure 4: KM Model of IT support service (adapted from Nonaka & Takeuchi, 1995)

The enabling condition of intention is through the goals and objectives of EIT support. The support environment is in constant fluctuation due to changes in technologies and solutions, and normally results in self-organizing groups according to the nature of the particular incident. This provides for a certain degree of fluctuation/chaos and autonomy. The other enabling conditions of redundancy and requisite variety are provided through rotational basis of workflow (overlap in expertise) and interaction with the external environment (users and suppliers).

7. Conclusion

Incorporating data collected from the substantive area and aligning with MOF leads to a more general KM model for a service environment. This framework agrees with Nonaka and Konno’s (1998) ‘ba’ concept within the foundations of IT Strategy and Culture. This is based on the constructs of commitment and reciprocity. These constructs reinforce and build on each other. Further, communication and competency were identified as additional enabling conditions.

IT strategy needs to be linked to the overall goals and objectives of the organization (intention) to ensure that resources (tangible and intangible) are directed towards the right projects and people, providing knowledge when it is needed at specific decision points. As pointed out by the findings, knowledge becomes actionable through daily work experience, where the major obstacle is resources (time, funding, and infrastructure).

Improving and implementing strategy involves commitment not only from management, but all IT personnel in realizing both human capital (skills), and structural capital (that which remains after people leave). As observed and presented in the findings, discipline had to be exercised in documenting incidents and their solution using the ticketing system. This discipline is a form of commitment needed to carry out work tasks. As Day (2007) also commented, organizations are made and run through commitments.
This commitment is brought about through communication (Day, 2007). From the findings, communication depends on both the receivers’ ability to comprehend all aspects, as well as the senders own ability to articulate the complete solution. Knowledge workers are able to identify what they know, who knows what, and share their knowledge through conversations with colleagues. Communication was found to be an enabling condition in knowledge creation, providing the mechanism for resource bargaining.

To encourage such productive conversation and interaction, culture plays an important role. This can be seen from the findings where the cultural limitation or obstacles were language, and the concept of ‘knowledge as power’ belief held by older personnel. Freedom to share ideas, and removing the negative association of asking for assistance as a sign of incompetence, promotes an environment ideal for knowledge management. This is largely driven by reciprocity.

Reciprocity reflects two-way interaction, in giving and receiving. This involves measures of trust and common ground, which is reiterated by Davenport & Prusak (1998), and Gamble and Blackwell (2001). At iThemba LABS, a culture of openness and reciprocity comes through trust in the knowledge source or competency of the knowledge owner. Competency of personnel enhances the quality of knowledge and transfer.

Since this study looks at IT Service Operate phase only, further research could look at the other phases forming IT Service Life Cycle to see if knowledge processes can be identified. It would be worthwhile to have an analysis of all phases, since each affects the other in IT service management, forming a wholly KM model for IT service.

Also, it could be argued that the need for improved user productivity through value added by IT Support falls within the third generation of knowledge management (value creation) proposed by Vorakulpipat & Rezgui (2008). Future research can take a closer look at value creation and knowledge management in the context of IT support service.

In addition, the issue of absorptive capacity in the KM spiral will require a look at the learning process of the individual. This includes how lessons can be internalized for personal development or training and bounded rationality in actions and decision making.

References


Situated, Embodied Human Interaction and its Implications for Context Building in Knowledge Mobilisation Design

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Abstract: System design is mostly guided by the computational model of the mind, known as computational cognitivism. This model, traditionally based on Turing’s Universal Machine, looms large behind the bulk of system design even in Intelligence Augmentation (IA) approach to human-computer interaction, although with the seemingly obvious exception of connectionist approaches (e.g. neural networks, swarm intelligence). Other extensive computational models do exist (e.g. Hintikka and Mutanen’s trial-and-error computability model and Peirce’s semiotic model) but they have not yet been implemented in working computer systems. Computational cognitivism pictures the mind as a disembodied, decontextualized calculating machine, operating with logical-syntactic rules and principles. This view has in contemporary times been challenged from the quarters of biology, sociology, anthropology, linguistics, psychology and economics. Perhaps the best comprehensive label for this critical approach is grounded cognition. Grounded cognition conceptualises the mind as a complex process related to and partially constituted by body, environment, other minds and artefacts, thus calling for a corresponding re-evaluation of knowing, understanding, learning, perception, action, interaction and reasoning. The aim of this paper is to tentatively examine whether these insights into natural cognition could inform the system design of mobile systems which support nomadic knowledge workers as well as the man in the street. Computer supported (automated) context building is of special interest here as the human way(s) of being in the world presents a particular challenge to this part of system design.

Keywords: mobile human-computer interaction, situated rationality, embodied rationality, grounded cognition, knowledge mobilisation, context design, abduction

1. Introduction

Throughout history, human cognition has as a rule been conceptualised as grounded in our natural environment, that is, as more or less part of our natural and social environment. Along with the rise of mathematical logic, pioneered by the works of Gottlob Frege, Charles Sanders Peirce, George Boole and Ernst Schröder, human thought was beginning to be seen essentially as a calculus that obeys universal laws, the laws of thought (Pulkkinen 1994). The things related to human cognition which do not fall under the universal laws of thought were regarded as belonging to psychology or sociology. At the turn of the 20th century, logicians spent much time and energy in criticising each other for psychologism. By psychologism was meant confusing how people really think in everyday life with how they ought to think. Psychologism was a serious professional blunder that extremely few logicians were willing to admit to (Kusch 1995). Mathematical logic with its laws of thought prepared the ground for present-day computational cognitivism. When computers entered the scene, it was a natural notion to regard human thought as computation, in analogy to the mechanical calculus performed by computing machines. It was first after computer scientists, led by Herbert Simon, focused their attention to how people reason in real life that also psychologists began anew pay more attention to higher cognitive processes and inner mental representations. Herbert Simon (1947; 1957) has also been a major contemporary influence on how computer scientists and system designers have pictured the human mind, and thereby how they picture thought, knowing and reasoning. In spite of Simon’s decisive influence and contribution to the study of heuristics – inspiring the work of Kahneman and Tversky (see e.g. Kahneman 2003) as well as Gigerenzer and his colleagues – Simon remained true to (or trapped in) the computational cognitivist picture of the mind. Computational cognitivism sees the human mind as similar to the computer, focusing on syntax instead of semantics (meaning). Patterns of human cognition were reduced to algorithms, and these logical-symbolic simulations were on the whole successfully applied in computing systems on a wide range of tasks (Ibañez and Cosmelli 2008; Patokorpi 2008). Computational cognitivism is nowadays criticised from the quarters of a great many natural and social sciences. A central message is that rather than individuals being less rational than predicted by the complete rationality approach and computationalism, these approaches had a misguided conception of rationality to begin with (Hurley 2005). A good collective label for these critical voices is grounded cognition (Barsalou 2008a; see also Ibañez and Cosmelli 2008).
Traditional, supply driven knowledge management is now being challenged by a number of more
dynamic approaches to knowledge, e.g. system-based knowledge transfer model (Parent et al. 2007),
embodied interaction (Dourish 2004), knowledge creation (Nonaka and Takeuchi 1995; Nonaka and
Konno 1998), knowledge building (Bereiter and Scardamalia 1993), various decision support and soft
systems approaches (Silver 1990; 1991; Checkland and Holwell 1998; Hasan 2008) and knowledge
mobilisation (Carlsson 2007; Romero 2008), to name only a few. A common denominator in these
approaches is that knowledge is no more seen so much as a static, supply driven asset but rather as
a dynamic component of situated human interaction within a hybrid environment of technological and
social systems. A host of things over and above inner mental representations is seen to be an
inevitable part of human knowing and learning. Building on previous research – under such labels as
Situated cognition, Embodied interaction, Ecological rationality, and so forth – the paper at hand takes
a look at some of these key elements of human interaction: situation, body, mind, other minds,
environment, everyday reasoning and reality. These elements are, as a rule, poorly taken into
account in system design. Understandably so, one might say. However, new mobile technologies and
advances in computer system ontologies, description languages, logic programming, and so forth,
make efforts to weave computer systems more closely together with natural (everyday) human action
and interaction seem more realistic. It is here uncritically presumed that computers are easier, more
effective, more expedient and more fun to use if made to support our biologically and culturally
conditioned behaviour in the real world.

For the sake of clarity, the subheadings follow the division of key features of human interaction. It
should be clear that a fair and balanced account of the various alternative approaches to cognition is
not on the agenda as there is both a considerable overlap between them and many differences due to
for instance disciplinary differences. In line with the general thrust of these approaches, knowledge is
in this paper understood as a by-product of our social and natural interaction with the world.
Consequently, the above-mentioned key elements of human interaction are believed to form an
integrated whole. Due to a lack of space, no attempt at spelling out what this allegedly integrated
whole looks like will be made here. The main idea is to first bring forward, one by one, aspects of
natural cognition, and then ponder upon whether they could be taken into consideration in context
design for knowledge mobilisation. Knowledge mobilisation is an emergent field which builds on the
new freedoms in users’ everyday life and computer supported situatedness of action and knowledge
enabled by new mobile technologies (Carlsson 2007).

2. Situation: Situated knowing

Situated cognition or rationality aims to convey how individuals act and reason in the real world. The
concept is very easy to understand. Situated knowing seeks to take into account some key elements
that set the stage for human reason under uncertainty in a context in the real world. Situated cognition
involves the following key elements of human cognition. Human cognition takes place/is:

- in real time
- in real-world surroundings
- in interaction with the environment
- connected to goal-oriented action
- embedded in social practices
- emergent

The situated cognition approach restores some elements which the advocates of complete rationality
have – in the name of scientific rigour – eliminated from the study of rational action. In its endeavour
to find universal principles of rationality, the complete rationality approach sought to ignore time and
place as inconsequential to human reason. Situated rationality or cognition recognizes time and place
as important factors in human reason in the real world. For the situated rationality approach, knowing
is an epiphenomenon of goal-oriented action rather than merely an abstract calculation made in the
head. By interactivity is meant that people act in/upon the world and the world acts back. Put less
simplistically, knowing and cognition are in many ways intertwined in complex social practices that
have a history and a cultural background. Once you take away the social practice, the knowledge
related to, or rather embedded in, it becomes virtually meaningless. Usually the social environment is
underlined by the advocates of situated cognition, although the physical or natural one is also
recognized as important. Human interaction includes not just thought in the head but is in many ways
intertwined with perception and interaction with objects, and this interaction can be either symbolic or
non-symbolic, although many advocates of situated knowing stress the natural, unreflective dimension of human cognition. The bulk of human knowing is closely connected to the environment so that some knowledge emerges in a situation, and would not exist without this encounter with the environment, although there are of course ways of abstracting the knowledge from where it emerged (Lave and Wenger 1991; Brown and Duguid 1993; Nonaka and Konno 1998; Nonaka et al. 2000; Dourish 2001; Galea 2008).

3. Body: Embodied knowing

Essential features of the embodied rationality approach, over and above the ones listed also under situated knowing, are:

- embodied knowledge
- cultural differences in meaning making
- reality is complex

Knowledge is embodied in the sense that it is anchored in our body and thereby connected to our way of being in the world and the practices evolved during human biological evolution and cultural development (Lakoff and Johnson 2003; Barsalou 2008b). The ways we are anchored to the world (our life world) are seen as reasonably static and persevering in spite of cultural differences. The natural and social environment around us in turn is constantly changing and complex, forcing us to reuse a number of basic metaphorical interpretation patterns in order to make sense of the world and ourselves.

Ontologies for computerised systems have traditionally been devised in line with objectivist metaphysics. A central requirement for objectivist (Aristotelian or Linnaean) taxonomy is that the categories are unambiguous. Secondly, objectivist categories of a classical taxonomy are based on properties. A thing is made of objective properties. The properties are thus independent of people and how they experience things. If a thing does not have the necessary properties, it will fall outside the category. Empirical studies of human categories in the mind give a very different picture of classification. We categorize things according to prototypes. A prototypical chair has four legs, a seat and a back, but there are also non-prototypical chairs that are identified in relation to prototypical chairs. Thus there are no necessary properties; a chair may for instance not have legs at all. Chairs need to have certain interactional properties instead; we can sit on them, we can touch them, we can rest our body on them, etc. Contrary to an objectivist view on language and thought, advocates of embodied cognition regard concepts as only partly defined or understood in terms of innate properties. Hence ‘love,’ rather than being understood as consisting of a number of properties like warmth, passion and desire, is understood in terms of other fundamental domains of experience: madness, war, and journey. ‘Love’ is thus a structured, multidimensional gestalt deriving from our physical and cultural experience (Lakoff and Johnson 2003).

4. Mind: Nonclassical categories

Lakoff and Johnson (2003) argue that our conceptual system is for the most part metaphorically structured. More complex concepts are partly built on other, more familiar and easily understandable concepts. It is questionable whether there are concepts that we would understand immediately, but there are concepts that are more central to our life world. Spatial concepts like ‘up-down’ and ‘near-far’ are central to our life world, and derive from our bodily experience of the world. As we interact with the world, the fact that we have a body and stand in an upright position, lays the ground for our spatial concepts. According to Lakoff and Johnson, our everyday thinking is fundamentally metaphorical, and can be analysed into a fairly small number of basic metaphors. “He shot the mayor out of desperation” is a metaphorical expression in which desperation is a beholder and the event comes out of the beholder. We have a number of multidimensional, conceptual gestalts like “discussion” – derived from our experience – that structure our perception and thinking. “Discussion is war” is a metaphor where discussion is selectively structured from “war.” In this sort of discussion one has strategies, fires away and wins or loses. The experience of discussing is understood from the experience of war. Metaphorical expressions that are as a rule systematic make us understand more complex experiences out of other fundamental domains of experience, potentially simpler ones. For instance, experiences and behaviour towards food make us understand experiences with thoughts and thinking. Both our immediate concepts (‘up-down,’ ‘objects’) and metaphors (‘happy is up,’ ‘discussion is war’) are based on our interaction with the physical and cultural environment.
Complex concepts seem to be holistic – consisting of components that become understandable through the whole – rather than aggregates of simple parts. The whole is more important than the parts. Accordingly, a given object is rather categorised based on family resemblances (i.e. prototypically) than set theory. Thus prototypical birds are for instance sparrows as they can fly and sing. Ostriches are not prototypical birds because they cannot fly, but birds all the same (Lakoff and Johnson 2003; Lakoff 1987).

- The mind’s categories are based on family resemblances
- Conceptual systems are metaphorically structured

The main point here in relation to taxonomy is that language and meaning are metaphorical. Metaphors, in turn, spring from our practices in the social and physical world. Our practices are therefore constrained by our being in the world which is inescapably a bodily (as well as social) experience. Language and rationality cannot escape these ties to our body and the physical and social world. Non-classical categories with prototypical objects better reflect the reality of mind’s workings as well as the outside reality than classical ones. Lakoff (1987) points out that for instance the former stronghold of classical taxonomies, biological taxonomies, have invariably run into confusion and paradox.

5. Other minds: Collective intelligence

Instead of building on methodological individualism, distributed or collective intelligence focuses on decision making in which a group of players seek to maximize the collective utility of the group. Collectively rational choices cannot be reduced to individual utility maximisation (Colman et al. 2008). The advocates of distributed cognition regard a decision maker or rational agent as inescapably connected to other people because of the social nature of knowledge and reason. They talk about socially distributed cognitive systems in which individual minds (cognitive systems) are fused with other minds; knowledge and cognition are socially distributed processes, involving other people (and artefacts) (see e.g. Engeström 1987; Bereiter and Scardamalia 1993; Lehtinen 2003; Fiske 1992).

- fusion with other minds

Recently this view has got support from neuroscience, according to which man is hardwired to read other minds (Camerer et al. 2004; 2005). However, the idea is not new. In The Phenomenology of Mind (1807/1967), Hegel observes that the servant pays close attention to the inner mental processes of the master, that is, reads his or her mind, whereas the master, by and large, treats the servant as if she or he had no inner thoughts.

6. Artefacts: Distributed intelligence

The cultural-historical school of activity (Vygotsky 1969; Leontyev 1977; Engeström 1987) and other knowledge building (Bereiter and Scardamalia 1993) and creation (Nonaka and Takeuchi 1995) movements conceptualise artefacts as parts of a cultural-historical system consisting of people and tools. Hakkarainen et al. (2004) call it the hybrid mind. The hybrid mind is without a well-defined centre, fused with external tools: “In longstanding deliberate practice and object-oriented activity, artefacts may fuse with the agent’s cognitive system or become a seamless and inseparable aspect of his or her own cognitive system in the same way as in biological functional systems” (Hakkarainen et al. 2004:19). Put differently, knowledge and cognition are socially distributed processes, involving artefacts (and other people).

- fusion with artefacts

Anthropologists Jack Goody (1986) and Clifford Geertz (1983) have analysed the development of man’s socio-historical relation to man-made objects from a cultural viewpoint. A central theme (with variations) in all of the above mentioned writers and schools (including Lehtinen 2003; Magnani 2004) is the dialectic of internalisation and externalisation of practices enabled or supported by artefacts (see e.g. Kaptelinin and Nardi 2006, p. 69).

7. Environment: Ecological rationality

Gerd Gigerenzer’s and his colleagues’ research programme of ecological rationality takes Herbert Simon’s insight about the relation between the mind and the environment – Simon’s famous two blades of the scissors – as its point of departure. However, Gigerenzer’s programme differs fundamentally from both Simon’s and Tversky and Kahneman’s programmes. Gigerenzer’s goal is to find heuristics in the mind that help decision makers to adapt to the environment. The heuristics
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exploit the structure of the environment, thus enabling decision making that requires less time and information than linear optimal strategies. Certain environments make certain heuristics effective. One central aim of the programme is to find a collection of smart behaviours, a so-called adaptive toolbox of decision making mechanisms. The second aim is to find out what structures of the environment make a given heuristic successful. Thirdly, how do people choose between different heuristics (Gigerenzer et al. 2008; Todd and Gigerenzer 2007; Gigerenzer and Goldstein 1996)? The most important single novel element in ecological rationality is the idea of a so-called adaptive toolbox, which could here be phrased as follows:

- Mind has a collection of patterns of smart behaviour

Computational models have an important role in Gigerenzer’s programme: “psychology needs models rather than labels for cognitive processes” (Gigerenzer et al. 2008, p. 236). Instead of trying to find a single general purpose calculus, Gigerenzer’s group examines a host of specific simple heuristics that adapt organisms into certain specific environments. The outcome is a number of computational models of simple heuristics. The most astounding result of their research is that some simple, fast (requiring less time) and frugal (requiring less information) heuristics, in some environments, perform better than optimization for instance by multiple regression or neural networks. Computational or formal models in general, are a means of showing that these simple heuristics really do perform better than other models. Especially in predicting the future, simple heuristics beat optimal, computationally more powerful methods (Gigerenzer 2008; Gigerenzer et al. 2008; Todd and Gigerenzer 2007).

8. Reality in the raw: Fundamental uncertainty

Thanks to Herbert Simon (1947; 1957), even those researchers who find for instance context and social factors important in the study of rational action and decision making usually picture rational choice as a form of problem solving (e.g. Smith 1997; Quinn 1980). A growing number of scholars feel that reducing all rational action to problem solving is too restrictive. Karl Weick (1993; 1995; see also Selart and Patokorpi 2007) argues that often rather than a lack of information the decision maker faces confusion about the question to be tackled. No matter how much we gather information, it will not be enough if there is confusion about the problem (question) itself; as Collingwood (1939) says; questions are logically prior to answers. For instance, let us assume that we have collected all available, relevant information for a building project or a plan for tackling a famine, but when we arrive at the building site or the place where there is a famine, things look different. However much we have gathered information, when on the spot, we may discover that we have set out with a wrong problem, seeking answers to wrong questions. On the spot we need to resort to sensemaking (Weick 1995), and sensemaking is an abductive process) (Patokorpi 2007; Selart and Patokorpi 2007). A problem (question) does not exist ready-made but has to be socially constructed, and this social construction involves sensemaking.

The study of decision making under fundamental uncertainty is an approach or a critical angle that has emerged in economics in reaction to complete rationality and computationalism. It highlights the following aspects of human knowing:

- confusion about the problem
- uncountable solutions
- language and knowledge open to redefinition by social agreement
- reality in flux, open-ended
- fundamental uncertainty

Unlike solutions to games like chess, the solutions to real-life problems typically cannot be enumerated beforehand; they are uncountable. Armand Hatchuel (2001; 2005) gives the examples of going to a movie and planning a party. The former has a countable amount of solutions, depending on what movies there are shown in the local movie theatres, whereas there is no limit to the ways in which people may design a party. The party example underlines the point that knowledge is essentially a social phenomenon, which means that there is always room for sensemaking and negotiation of meaning. Moreover, we change reality by changing our shared ways of seeing it (Selart and Patokorpi 2007). The uncertainty that actors face does not derive from complexity alone but may be fundamental, which means that no amount of structuring the problem or defining the problem area will make it well-structured because the problem (question) is shaped by actors in a changing world (Hatchuel 2001; Checkland and Holwell 1998).
9. Everyday reasoning: Logic in situ

Deduction has traditionally been considered the pinnacle of human thought, reflecting the universal laws of reason. However, the supposed supremacy of deduction is not unequivocally supported by empirical research. Individuals in situ do not universally abide by deductive patterns of thought but frequently resort to what logicians call fallacies, and yet often manage quite nicely. Recently the utility of logic in a specific environment instead of the formal correctness of it has awakened much interest in anthropologists, economists, psychologists and logicians alike (Faiciuc 2008; Smorti 2008). The heuristics movements, too, study the use of logic in specific, real-life or real-life like situations. Individuals in a real-life situation are often (though not always) more interested in how to best cope with this particular situation than in some potential universal truth related to it. For a system designer wedded to an intelligence augmentation approach, this shift of perspective is welcome. Because we nowadays have the means to make users mobile in an unprecedented way, that is, we are on the threshold of ubiquitous computing, it seems natural to turn to solutions that work locally. Grounded cognition redirects our attention to aspects of reasoning which have largely been ignored by classical views. These aspects could be presented as follows:

- Local utility of logic is more important than universal truth
- Forms of reasoning work in tandem
- Perception, action and interaction with objects contain inferential processes

According to Charles Sanders Peirce (1934–63; CP 2.623), there are three fundamental logical forms: induction, deduction and abduction. In everyday thought these three basic forms complement each other. For example, let us assume that I suddenly feel that I am passing out, fainting. Previously when I have felt like this I had trouble with my sense of balance. This is an inductive inference, generalizing from past individual instances. But then I realise that this time there is something different in my feeling of passing out. Previously I have had a feeling of the world around me starting to spin, but now it goes dark before my eyes. This is an abductive inference, focusing on differences and seeking reasons or causes for them. My first thought was that I have trouble with my sense of balance, but now, because of the differences I detected, I have to start looking for another reason. Let us say that I now remember reading in the paper that the feeling of the world turning dark before my eyes is a symptom of heart trouble. Now deduction kicks in. By deduction I conclude that having trouble with my inner ear (affecting my sense of balance) is not something I should be alarmed about but need only to sit down for a moment. In the case of heart trouble I should better consult a doctor. Consequently, wise decisions and sensible action in everyday life frequently require the use of all three basic forms of reasoning combined. What applies for the three basic forms of reasoning, in all likelihood applies for other forms of reasoning, too.

Abduction is operative in perception, action and interaction with objects. The perceptual phenomena studied by Gestalt psychology in which we automatically round up perceptions fall within quasi-automatic, species-specific abduction. An example of a doxastic abductive inference is when we hit the brakes (an action as a conclusion) upon seeing red lights in traffic. The use of auxiliary figures by hand in geometrical analysis is a case of manipulative abduction, indicating that in some cases of human interaction with the environment objects can function as parts of a reasoning process (Magnani 2004; Bertilsson 2004; Eco 1983; Patokorpi 2006a).

10. Closure: Implications for context building

We do not of course always start from scratch when stepping into a situation but sometimes enter with a plan and a firm preconception (right or wrong) of the context. Traditional Human Computer Interaction (HCI) could be seen to build on this assumption of firm preconception of the action by both the user and the designer. Insofar as the situation suits for this approach, as it may suit for instance in well-defined recurring work tasks, not much needs to be said about it here. However, as computation is starting to be everywhere around us, mobility is increasing, and the world is getting more complex, and for a myriad of other reasons, people are less likely to have prespecified plans for action in a great number of situations. Knowledge mobilisation seeks to design exactly for this sort of radical mobility and situatedness in the real world.

In the light of grounded cognition, it seems likely that clearly defined models of context (Winograd 2001) cannot solve the fundamental problems of knowledge mobilisation. Context is something we
make and maintain from one moment to another rather than observe. Thus it is not information but an outcome and concomitant of action. According to Dourish (2004), context is (i) a relation between objects or activities; (ii) its features are defined dynamically and thus cannot be delineated in advance; (iii) an occasioned property of action, and (iv) arises from the activity and thus cannot be divorced from activity or be outside of activity. In brief, what makes a context a context is the nature of the interaction we have in and through the context in question rather than a representation of it.

The aim of ubiquitous computing is to make the digital world (computation) fit our natural ways of coping with the physical environment. Context-aware computing (Abowd and Mynatt 2000), tangible interfaces (Ishii and Ullmer 1997) and digital manipulables (Resnick et al. 2000) seek to bridge the natural everyday world and the digital world by bringing our patterns of natural behaviour to bear on our interaction with computational elements in the environment. The ultimate aim is to make the world into an interface. It means among other things the exploitation of physical objects and physical space in our interface use, making computational elements ready-to-hand and disappear to the background (Weiser 1991; Dourish 2001, 2004; Patokorpi 2006a). Consequently, instead of making models of contexts in advance we could model reality directly. With the help of fuzzy logic, neural networks and abductive logic it should be possible for the user, in and through activity, to create a context step by step in interaction with the system. Context building is in this sense meaning making where meaning (content) is determined by action (i.e. activity, practices) in a hybrid world whose one part is electronic or digital. Fuzzy logic and neural networks are suited for building (rather than representing) the context bottom up from local behaviours. Fuzzy logic and neural network systems do not need a representation or a plan in order to be able to approximate rational action or reach a near-optimal (or optimal) solution. In the same line of argument, some forms of abduction, too, do not need a representation and belong to evolutionary learning, which means that they are patterns of our unconscious biological adaptation to the environment. This is not to say that mental representations, for instance in the form of reasons, have no place in context building. Namely, one problem with the system disappearing into the background, becoming invisible (Weiser 1991), is that the user loses sight of the system’s functions and the effects of his or her own actions to the system and the environment. The user should be to some extent able to read the system’s functions and state as well as have the means to intervene (Silver 1990; Patokorpi 2006a; Patokorpi 2006b; Hasan 2008). Fortunately, some forms of abduction rely on (internal or internalised) mental representations, and it is these forms that can especially be used for securing the user an avenue of direct intervention to context building. It means making the system behave/function in a more predictable way; so that the user will for instance be able to read the signs that point towards causes or reasons behind the functions. Computing systems will, so to speak, have to whistle, whimper, blush, get startled, chuckle, clear their throat, raise their eyebrows, sweat, cry and smile more than they do today.

A context has to be made and negotiated with other people. In the words of Dourish (2004, p. 22), the question of context is “how and why, in the course of their interactions, do people achieve and maintain a mutual understanding of the context for their actions?” However, there have to be some, more stable (default) elements which help anchoring the system’s functions and connecting them with activity. Here are some suggestions. The stable, but not static, features of a context could be connected to levels of action (vegetative, operational, action, activity, coordinated collective action), user roles (Fiske’s 4 social relations), and a setting.

Levels of user behaviour could be: vegetative, operation, action, activity and coordinated collective action. Operation, action and activity levels have been borrowed from the activity theory, and need no explanation here; the levels of activity and action have been applied into the principles of system design for instance by Kari Kuutti (1996). The vegetative or autonomic level requires some clarification. If we think of the operational level as people running on autopilot because the things they do have become virtually automatic, and thus in need of conscious monitoring, then the vegetative level refers to physical (and perhaps in some cases mental) functions that are beyond conscious control. For instance, we have already numerous Information and Communication Technology (ICT) applications in health care, measuring heart beat, blood pressure, and so forth. These streams of data are going to be more and more closely tied to automatic context building in the future. As to the last item on the list above, there probably is use for something like coordinated collective action level, delineated along the lines of either Zeleny (2001) or Hatchuel (2005). The notion of collective activity used by activity theorists is in essence backwards-looking, whereas Zeleny and Hatchuel have a forward oriented, design-based perspective to collective action.
User roles are usually based on expertise (novice, experienced and advanced), authorized access levels and personal identity. An alternative or complementary conceptual framework which maps user roles, at the same time giving room for more dynamic social and human computer interaction, is required. Social relationships can be seen as roles which enable people to make sense of each other’s actions, meanings, emotions and judgments, and thereby coordinate behaviour. According to Alan Fiske (undated), “relationships are patterns of coordination among people; they are not properties of individuals” (p. 1/9). Alan Fiske (1992; undated) has studied social relationships empirically and reduces them into four fundamental models: Communal Sharing, Authority Ranking, Equality Matching, and Market Pricing. Empirical research indicates that violations of relational models are strongly reacted against. Our interaction with the same person or group may vary from one situation to another, but then the model is changed accordingly (Fiske 1992). For instance, we readily give things to our children (Community Sharing) without expecting to profit (which would be Market Pricing) from it or even expecting anything in return. Fiske’s relational models could perhaps be used as a basis for dynamic user classification. The patterns of coordination may involve both people and systems; e.g. commercial versus open source software or systems. The crucial difference is that social relations are not determined by the system alone and that the user is not locked in a certain pattern beforehand. Paying attention to interaction rather than properties, objects and states is in line with a more naturalised and contextualised view on knowledge.

The word setting could be used to refer to those elements surrounding an activity which are relatively stable. These elements can from time to time also become part of the context (e.g. by foregrounding). Setting is akin to Gigerenzer’s structure of the environment. There is a sort of fit between the mind and the environment produced by the evolution (and cultural development) that helps us to survive. One expression of this evolitional fit is quick (fast) and simple (frugal) inferential patterns that we use without any conscious effort. Unfortunately, Gigerenzer’s structure of the environment is relatively narrowly confined to ‘safe’ environments and conceptually connected to a traditional view on information and problem solving. Gigerenzer’s so-called cues hold promise but much more study is required on how humans (and computing systems) read the environment before a working solution can be found.

The computational model does not necessarily have to be of the recursive kind created by Alan Turing. Hintikka and Mutanen (1998) have devised a more extensive, so-called trial-and-error model, which is nonrecursive, and Peirce has devised a semiotic model (Fetzer 1993). Peirce’s model is indeterministic and nonmechanistic, and would thereby seem to tally well with a context building design for knowledge mobilisation based on grounded cognition principles. By the way, this goes for all anchor points suggested above, that is, they seem to be in harmony with a grounded view on cognition presented in this paper.

Predictability is important and it often makes sense to set universal rules and standards in order to ensure that development can be controlled. However, the world does not seem to become less volatile and erratic but more so: Look for instance at the world economy and the climate. The age of dinosaurs seems to be over. Should not we try to regain control locally by designing for easier rewriting of rules by the user in order to meet the ever-changing requirements of time and place?

References


Power, Discursive Practices and the Construction of the “Real”

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Abstract: Starting with a critique of the epistemological and ontological bases of neo-institutionalism, in this article we defend the potential for the application of post-structuralist perspectives to the institutional approach. We contend that this theoretical approach, which incorporates an element, traditionally overlooked in institutional analyses, namely power, has the advantage of contributing to an enhanced comprehension of the dynamics of institutionalization. We apply post-structural perspectives, particularly as presented by Michel Foucault, as well as the pragmatic perspectives represented by the works of William James and Richard Rorty, to explicating underpinnings of the institutional approach. We would stress that the affinity between the post-structural perspective and pragmatism has been acknowledged by other authors, such as Keller (1995), McSwite (1997) and Rorty (1999) himself. Incorporating the element of power into the analysis contributes to an enhanced comprehension of the dynamics of institutionalization. In conclusion, we believe that the area of organizational studies would benefit by a more all-encompassing vision of the processes of institutionalization, which would include power at its core, instead of considering institutions as non-changing variables. Clegg (1989) has provided a framework for such analysis and this paper serves to elaborate what some of its philosophical foundations might be in greater detail. We would stress that it is not possible to find answers if we just search for cause-effect relations, because the explanations found through causal mechanisms constitutes, in itself, a kind of discourse of power, as pointed out by moderns such as Hobbes (1650). Undoubtedly, if we take empirical research into consideration, what we need is, from a historical perspective, understand the way by which the main discourses or narratives constitute, transform and are transformed by our objects of investigation, among which organizations certainly occupy a central place. However, it is necessary to tackle this undertaking with a certain degree of humility, abandoning the search for ultimate causes to more proximate and local narratives, small stories that communicate their own sense of the mechanisms of truth at work. And in these matters, we should be bullied into causality.

Keywords: power, discursive practices, institutionalization, post-structuralism, fields, construction of the “real”

1. Introduction

The new institutionalism is a currently fashionable trend not only in the area of organizational studies, but also in areas such as public administration, sociology and economics, as well as in cultural studies. To a certain extent, this approach is contrary to the basic presuppositions of the rational school, the empiricist epistemology of economicism, as well as structural functionalism (McSwite, 1998). This fact alone may explain part of the positive receptivity to institutionalism in the field of social sciences: being positioned as an alternative to the predominant orthodoxy.

Nonetheless, it is difficult to grasp the paradigmatic presuppositions of the institutional approach, which is characterized by the lack of a coherent account of the bases for human action in organizations. Powell and DiMaggio (1990) acknowledge this failing and stress that, in this sense, the new institutional thinking could benefit from interpretive approaches, such as the social constructivism of Berger and Luckmann, the ethnomethodology of Garfinkel, the phenomenology of Schutz, the cognitivism of Simon, or even the works of Bourdieu and Giddens.

Without these foundations, it is difficult to view the institutional perspective as capable of consolidating the theoretical agenda or of being an alternative for research to the dominant perspectives in the field of organizational studies.

In this paper, we apply post-structural perspectives, particularly as presented by Michel Foucault, as well as the pragmatic perspectives represented by the works of William James and Richard Rorty, to explicating underpinnings of the institutional approach. We would stress that the affinity between the
post-structural perspective and pragmatism has been acknowledged by other authors, such as Keller (1995), McSwite (1997) and Rorty (1999) himself. Moreover, we affirm that the incorporation of “power” into the analysis, contributes to an enhanced comprehension of the dynamics of institutionalization.

2. “Official” perspectives at the basis of the new institutionalism: social constructivism and ethnomethodology

Neo-institutionalists criticize the Parsonian view of the social system as normative order, for focusing on the value aspects and excluding the cognitive, cultural and action oriented aspects. For Parsons (Heritage, 1984), the value system is an important factor that contributes to the understanding of organization and social order. This normative order replicates itself by means of the appropriation of the identity of the individuals involved, turning them into role players who operate on the basis of internalized values which they been socialized into enacting. Action is analyzed as the product of causal processes, which, despite operating in the “mind of the players”, are considered inaccessible and uncontrollable by them.

The main criticism that new institutionalism levels at Parsonian functionalism relates to the lack of a cognitive dimension which, according to the representatives of this approach, may be found in the works of March and Cyert (1963), March and Simon (1958) and Simon (1976). The decision-making process within organizations is seen as a shift from the old to the new institutionalism, from a normative approach to a cognitive approach, from commitment to routine, from motivation to merely playing by the rules (Heritage, 1984; McSwite, 1998; Powell & DiMaggio, 1990).

Other paradigms assume a central role in the new institutional approach, among which social constructivism stands out. The main representatives of this approach are Berger and Luckmann (2001) who are interested in the “genetics” of truth taken as reality (Canales, 1996) and examine the processes of the social construction of reality by contending that the central sociological question is to discover how subjective significances become objective realities.. According to Berger & Luckmann (2001) the relationship between the person – as producer – and the social world – produced by such people – is, and continues to be, a dialectical relationship. In other words, the person (as an actor in a collectivity) and the social world act on one another in a reciprocal manner. The product fights back against the producer. Exteriorization and reification are stages of a continual dialectical process, accompanied by exteriorization, whereby the objective social world is reintroduced into consciousness during the process of socialization. What was “constructed as reality” – constructed by the social intersubjective per se – manifests itself simply as “reality”. What is taken for granted as reality and the fact of superseding it are registered beyond the directly observable or discussable by those involved, who, after instituting it, proceed to live the reality now attributed with full legitimacy. Once reified, socially produced reality needs to be covered with a second cloak of truth. Legitimations – right from the affirmation of the truth of a maxim to full-scale reports which contain symbolic universes (religious, political, etc.), come to represent a “second level” treatise, which qualifies the reality as “fair” or “good” (Canales, 1996).

Consequently, we may note the following process: exteriorization, which sees society as a human product; reification, seeing society as an objective reality, and interiorization, by which the person is seen as a social product (Berger & Luckmann, 2001:87).

According to Canales (1996), knowledge is not only the object of study for social constructivism, defined by Berger & Luckmann (2001) as the sociology of common knowledge, but also for ethnomethodology, defined by Garfinkel (1967) as the method for common knowledge. Ethnomethodology analyses the practical knowledge of everyday life, the folk-methods that generate “the reality” which we consider given and obvious; the formal processes by means of which the ordinary actor “grasps” action in the context within which it is inserted. During the action, the actor takes as given certain knowledge considered as being likewise known and manipulated by the others. This basis of common knowledge – activated in each social situation – as well as its rules and operations, are objects of ethnomethodological research. ‘Ethno’, in view of the fact that we are speaking about knowledge specific to the society of reference of the actor; and ‘methodology’, considering that we are talking about formal procedures of knowledge and argumentation manipulated by the ordinary actor. For Garfinkel (1967), a student of Parsons who came to criticize the master, the social order is constituted as a practical activity during the course of daily interaction and does not derive automatically from shared standards of value and social roles. He rejects the
view that the common judgments of social actors may be treated as irrelevant in the analysis of action and social organization.

“It is the Parsonian disregard for the entire common-sense world in which ordinary actors choose courses of action on the basis of detailed practical considerations and judgments which are intelligible and accountable to others, which ultimately constitutes the central focus and point of departure for Garfinkel’s treatment of the theory of action” (Heritage, 1984:34).

In intersubjective engagements, by means of conversations, participants use tacit knowledge, cognitive typifications that Garfinkel (1967) refers to as “socially-sanctioned-facts-of-life-in-society-that-any-bona-fide-member-of-the-society-knows”. Such conversations are maintained despite the inherent indexicality of language, through the ability that the participants possess for relating talk to some external knowledge that renders it comprehensible (Powell & DiMaggio, 1990:20). Garfinkel (1967) shifted the image of cognition from a rational, quasi-scientific process (in Parsons) to one that operates largely beneath the level of consciousness, a routine and conventional “practical reason” governed by “rules” that are recognized only when they are breached. For him, action is largely scripted and justified, after the fact, by reference to a stock of culturally available legitimating “accounts” (Powell & DiMaggio, 1990).

3. The contributions of post-structural and pragmatic perspectives

It is our opinion that the main difference between the approaches which analyze the processes involved in the construction of reality lie in the basic presuppositions about the objectivity-subjectivity dichotomy, analyzed from a realistic or idealistic perspective. Both Marxist concepts, such as social production and social construction relate to the processes of reification. When analyzed from the standpoint of the notion of fetishism and scientific facts “a complex variety of processes comes into play whereby participants forget that what is “out there” is the product of their own “alienated” work”. It is worth remembering here that both words, namely fact and fetish, share a common etymological origin (adapted from Barthes, in Latour and Woolgar, 1986:259). Berger and Pullberg (1966) was well aware of these similarities, as his article on ‘reification and the critique of consciousness’, attests. However, from the Marxist point of view, the reification process is related to production starting from material and objective conditions (which are “taken for granted” in the capitalist structure) and according to Berger and Luckmann (2001), reification is a subjective process of construction. Such a division reveals an objectivity-subjectivity dichotomy, deeply rooted in our common feelings about the world. In this respect, the contribution of pragmatism is extremely important. Authors like Richard Rorty explicitly propose the end of this dichotomy, as do the French post-structuralists, especially Foucault.

For many people, objectivity is the natural attitude of man vis-à-vis the world. Man is born in a real world. As Morente (1930) argues, for the realist there exist things, the world of things and the I that stands between them. Knowledge reflects the selfsame reality. Truth is defined as the conciliation between the thought and the thing. Such conciliation can be achieved by straightforward formation of concepts. Evolution and the process of realistic thinking involve a continuous correction of concepts. In the essence of this whole process, we always find the same fundamental precept, namely “that things are intelligible: that things are that which have in their very being the essence, which is accessible to thought, because thinking adjusts itself and coincides with them” (Morente, 1930: 134). In other words, realists believe that there exists one, and only one, way the world is in itself (Rorty, 1999a). Realism is not contingent upon ones knowledge.

Such thinking originated with Parmenides and came to fruition with Aristotle and today demarcates realism (for which Bhaskar 1975 remains foundational), which attempts to reproduce faithfully the very articulation of reality.

“(…) spontaneous and natural man is Aristotelian; and if Man is spontaneously and naturally Aristotelian we should not be surprised at the spectacle afforded to us by History, which consists in the fact that, since Aristotle, the Aristotelian metaphysical conception of the world and of life has gradually become increasingly ingrained in both spirit and soul until it has become a belief; a belief that reaches the very essence of intellect, the very essence of the individual soul” (Morente, 1930:135).
Realism is bound to take stock when confronted with the existence of historical facts, which gives rise to a new philosophical position that considers that human thought is radically and essentially conditioned by time and by history (Morente, 1930). It is a philosophical position, known as idealism, which "turns its back on common sense; turns its back on its natural propensity and invites us to conduct an extremely difficult acrobatic exercise, which consists in seeing things as being derived from the self" (Morente, 1930:141). Now is neither the time, nor this essay the place, to give historical explanation of the evolution of this new philosophical thinking. Suffice it to emphasize that the two currents of thought, which originate from different precepts, still engage the thoughts of students and researchers, be they from organizations or not. They have generated countless perspectives, which today still compete for the status of "superiority" in methodological terms.

The structuration theory of Giddens and the habitus construct of Bourdieu both attempt to offer a theoretical synthesis of the objectivity-subjectivity debate (Peci, 2003). Pragmatist authors, however, rather than synthesize the questionable (subjectivism) with the impossible (objectivism) consider that the realism-antirealism debate should be left to one side. A perspective that did not acknowledge this dichotomy would have the advantage of liberating us from the object-subject and appearance-reality problems which have dominated philosophy since Descartes (Rorty, 1999). Additionally, it undercuts other dichotomies: words-acts, knowledge-action, theory-practice, and space-time – these all lose their raison d'etre. Pragmatism emerged mainly in the work of William James, as a philosophical temperament, a theory of truth, a theory of significance, a holistic account of knowledge and a method for the resolution of philosophical disputes. Obviously, all these aspects are closely interrelated. However, as a method, pragmatism attempts mainly to resolve metaphysical disputes, attempting to interpret each concept in terms of its respective practical consequences (James, 1997).

Pragmatism shares a similar view of truth to post-structuralism. For James (1997), truth is a construct – an established truth. No transcendental principle, no absolute truth, no permanent concept or (pre)conception may guide the pragmatic individual, thus establishing an ambitious political program. The pragmatic vision of truth is the truth that is good for us to believe in (James, 1997 and Rorty, 1991). Rorty (1991) emphasizes the ethical preoccupations of pragmatism, expressed in the "us" underlined in the quote from James. He argues that:

"the pragmatist does not have a theory of truth, much less a relativistic one. As a partisan of solidarity, his account of the value of cooperative human inquiry has only an ethical base, not an epistemological or metaphysical one" (Rorty, 1991:24).

But, William James was also a psychologist. He acknowledged that old truths continue to be part of personal beliefs, even when new beliefs are added to our wealth of experience. "The new contents themselves are not true, they simply come and are" (James, 1997:100). The truth of an idea signifies its becoming true, to the extent that this idea helps us to assume a satisfactory relationship with other parts of our experience. An idea is true instrumentally. The truth of ideas signifies their power to "work". Instead of a succession of ideas, James finds a flow, a current, the waters of which merge. The position in the current makes each situation unique.

Rorty (1991) introduces the question of justification to pragmatic discussion. For the pragmatic individual, justification is what substitutes the criterion of truth, which is characteristic of objectivism. Justifications are constructed in relation to their practical advantages and based on experience. Consequently, justifications may also be deconstructed based on the same practical advantages. Rorty seems to share the same point of view of social constructivism, in which "we are just the historical moment that we are, not representatives of something ahistorical" (Rorty, 1991:30). For pragmatism, reality simply signifies the relationship of things with our emotional and active life. Everything which stimulates our interest is real. Being the good pragmatic that he is, Rorty criticizes objectivism in terms of practical consequences: "The best argument that we partisans of solidarity have against the realistic partisans of objectivity is Nietzsche’s argument that the traditional Western metaphysic-epistemological way of firming up our habits isn’t working anymore" (Rorty, 1991:33). He also attempts to show that there are sentiments relative to the desire for subjectivity: fear of death, the attempt to avoid facing contingent fact, and escaping time and chance.

To be pragmatic is to take a stance with relation to life. Rorty (1991) suggests that pragmatism concerns itself with "us", with solidarity. The "us" has two components, namely the I and the other(s),
but it also implies a relationship between these components. We tackle this object mainly as a relationship by means of which the two parts may be (trans)formed.

Although not so often remarked, Foucault’s concept of discourse – a “unit” of knowledge present at a particular period in time – is based on the same ontological presupposition as pragmatism, specifically with respect to the objectivity-subjectivity dichotomy. In The Archeology of Knowledge, Foucault (1972) distances himself from an objectivist and/or subjectivist positioning in discourse. In the study of discursive processes, Foucault (1972:63) proposes “avoiding ‘things’”, suppressing the moment of “things themselves”, as these are absent in the linguistic analysis of significance. In a Foucauldian analysis “words are as deliberately absent as the things themselves” (Foucault, 1972:63-4).

“(...) ‘discourses’, in the form in which they can be heard or read, are not, as one might expect, a mere intersection of things and words: an obscure web of things, and a manifest, visible, coloured chain of words; (...) analysing discourses themselves, one sees the loosening of the embrace, apparently so tight, of words and things, and the emergence of a group of rules proper to discursive practice. (...) A task that consists of not - of no longer treating discourses as groups of signs (signifying elements referring to contents or representations) but as practices that systematically form the objects of which they speak” (Foucault, 1972:64).

Many other examples, which do not acknowledge the objectivity-subjectivity dichotomy, are present in the work of Foucault, demonstrating his affinity with the pragmatism. Nonetheless, for the purposes of this research we will concentrate here on the concept of discourse. Foucault (1972) uses the concept of discourse to refer to relations, which favor the process of the formation of objects. He studies the process of discursive formation, defined on the basis of a set of relations, attempting to show that any object of the discourse in question finds its place, its law of appearance.

“These relations are established between institutions, economic and social processes, behavioural patterns, systems of norms, techniques, types of classification, modes of characterisation; and these relations are not present in the object; it is not they that are deployed when the object is being analyzed; they do not indicate the web, the immanent rationality, that ideal nervure that reappears totally or in part when one conceives of the object in the truth of its concept. They do not define its internal constitution, but what enables it to appear, to juxtapose itself with other objects, to situate itself in relation to them, to define its difference, its irreducibility, and even perhaps its heterogeneity, in short, to be placed in a field of exteriority” (Foucault, 1972:59-60).

Therefore, discursive relations are not inherent in the discourse though neither are they exterior relations, which would limit them or would impose certain forms, or would force them in certain circumstances to say certain things. They are, to a certain extent, the limit of the discourse and characterize the discourse as a practice. The discourse should be considered a practice that systematically forms the objects which are being talked about. The set of rules imminent to a practice define its specific nature. Hence the current use of the concept of discursive practices in research influenced by the Foucauldian perspective is a case of tautology. The word discourse per se already includes the dimension of practice.

To seek for the unity of a discourse is a quest for dispersion of elements, described in its singularity of establishing specific rules according to which objects, enunciations, concepts, and theoretical options were formed. The unity of the discourse lies in this system, which controls and allows its formation. When we speak of a system of formation, this not only includes the juxtaposition, the coexistence or interaction of heterogeneous elements (institutions, techniques, social groups, perceptive organizations, relations between sundry discourses) but also its relationship through discursive practice (Foucault, 1972).

Foucault incorporates the dimension of power in his analysis, basing his work on Nietzsche and using an approach similar to that which pragmatism developed, spoke of the politics of truth. He argued that knowledge was invented, that is that it has no origin.

“knowledge is simply the outcome of the interplay, the encounter, the junction, the struggle, and the compromise between the instincts. Something it’s produced because
the instincts meet, fight one another, and at the end of their battles finally reach a compromise. That something is knowledge” (Foucault, 1994:8).

Just as knowledge is in no way related to nature and is not derived from human nature, it is also not related to the world to be known, has no affinity with this world to be known, or with things. The world does not attempt to imitate man; the world knows no laws. It is here that we find the first rupture between knowledge and things. Thus, if we really want to know what knowledge is and understand its very essence and its production, we should turn to politics rather than to philosophy. We can discover what knowledge is by examining the relations between struggle and power, the way in which people and things hate each other, fight and strive to dominate each other, and exercise power relationships over one another. Since pure knowledge per se does not exist, we should attempt to understand the politics of truth.

Foucault (1972) seeks to differentiate between the concept of discourse and the Marxist concept of ideology. For him, the relations between power and knowledge are inseparable, because within any society exists a “regime of truth” with its particular mechanisms for the production of truth. He describes contemporary societies as having a “political economy’ of truth” characterized by five traits:

- “Truth” is centered on the form of scientific discourse and the institutions which produce it
- It subject to constant economic and political incitement (the demand for truth, as much for economic production as for political power)
- It is the object, under diverse forms, of immense diffusion and consumption (circulating through apparatuses of education and information whose extent is relatively broad in the social body, notwithstanding certain strict limitations)
- It is produced and transmitted under the control, dominant if not exclusive, of a few great political and economic apparatuses (university, army, writing, media)
- It is the issue of a whole political debate and social-confrontation (“ideological” struggles) (Diamond & Quinby, 1988).

The discursive field, wherein the time-space dimension is appraised, is another important concept for Foucault. The field is the space in which discursive happenings are situated. It is in the field that the questions of the human being, consciousness, and the subject, manifest themselves, cross over, become embroiled, and define themselves (Foucault, 1972: 25). Temporality and spatiality become one in the concept of field. The field is time and space, being and becoming, structure and history, formation and (trans)formation.

In this article, we set out to include in the scope of the institutional perspective the idea of the discursive field, instead of the matrix or network, normally present as the locus (considered also in its temporal dimension) and form of movement of the actors in the institutional perspective. It is in discursive fields that the processes of reification and institutionalization occur. The process of discursive formation (trans)forms objects. By relating the processes of institutionalization with discourse, we open up possibilities for the incorporation of a neglected dimension of institutional analysis: the dimension of power. We further argue that by incorporating this dimension, we can take a step forward in comprehending the processes of institutional “selection”, or simply answer the question “Which practices become institutionalized and why these and not others?” This is an important point for understanding the very configuration of an already institutionalized field. Understanding the struggles that took place during the process of formation of a field, based on a historical analysis such as those of Vieira, Carvalho and Silva (2009) can help to identify the main explanatory features of its current configuration. For us, these elements are discursive elements, or discourses, which represent different powers. Our approach is anticipated in Clegg (1989), in the notion of power flowing through those passage points that actors in a field, constantly changing as a result of exogenous contingencies as well as endogenous struggles with meaning and its circuitry, seek to stabilize as their meaning serving their construction of their power.

As in the pragmatic approach, Foucault stresses the role of knowledge as being useful and necessary to the exercise of power, seeing as it is useful in practice and not because it is false – as the Marxist tradition has attempted to prove. For Gordon (1999:xviii), one of the key aspects of Foucault is that he stresses that what is most interesting in the relationship between power and knowledge is not the
detection of false and spurious knowledge – rather that the role of knowledge is valued and effective due to its guaranteed instrumental efficacy. Foucault uses the word savoir to denote knowledge akin to know-how (a way of making a problem tractable or a material safe to handle). This “average” type of knowledge, which cannot be rigorously scientific, requires a considerable degree of ratification within a social group and grants some social benefits.

The idea of the instrumentality of truth, i.e. of knowledge, present in James (1997), is highly similar to the interest of Foucault in the role of knowledge as useful and necessary to the exercise of power, because it is practically serviceable and not because it is false, as the Marxist tradition has attempted to show. However, unlike Foucault, for James the focus of the analysis continues to be the subject. Foucault develops the concept beyond the subject to the level of discourse. Undoubtedly, this notion of practicability, which is present in Foucault, has the advantage of offering another dimension for the analysis of the formation of discursive fields, namely the dimension of power which is, indeed, not explicitly acknowledged in the pragmatic approach either.

For Foucault, power is not capable of promoting and exploring spurious knowledge, though the rational exercise of power tends to make full use of the knowledge capable of maximum instrumental efficacy. Thus, two ideas which were present in the investigations of Foucault were the productivity of power (power relationships are integral to the modern apparatus of social production and related to active programs for the fabricated parts of the collective substance of society itself) and the constitution of subjectivity by means of power relationships (the individual impact of power relationships is not limited to pure repression, but also includes the intention of teaching and molding conduct, and gradually introducing forms of self awareness and identity) (Gordon, 1994).

At this juncture, it is worth tackling the question of the objectivity-subjectivity dichotomy again to stress that the dimension of power is included in the very presuppositions upon which it is founded. Many post-structuralists would agree with the historic narrative of Morente (1930), which seeks to analyze the process of establishing the objectivity-subjectivity dichotomy, but would argue that a process such as this is essentially political (Catlaw, 2002; Keller, 1995; Latour, 1990 and 1999). For Latour (1995, p.15), the isolated, ahistorical, argument and objective existence of the external world was given to fend off the “unruly mob”, which Socrates and others were so quick to invoke to justify the search for a task force of such size as to be able to curtail the power of “ten thousand fools”. Latour (1999) goes further and also considers as a political project the replacement of Transcendental Ego (the mind-in-a-vat) by Society: “(...) it was now the prejudices, categories, and paradigms of a group of people living together that determined the representations of every one of those people” (1999:6).

“Nothing in the world could pass through so many intermediaries and reach the individual mind. People were now locked not only into the prison of their own categories but into that of their social groups as well. Second, this “society” itself was just a series of minds-in-a-vat, many minds and many vats to be sure, but each of them still gazing at an outside world. Some improvement! If prisoners were not longer in isolated cells, they were now confined to the same dormitory, the same collective mentality. Third, the next shift, from Ego to multiple cultures, jeopardized the only good thing about Kant, that is, the universality of the a priori categories, the only bit of ersatz absolute certainty he had been able to retain. Everyone was not locked in the same prison any more; now there were many prisons, incommensurable, unconnected. Not only was the mind disconnected from the world, but each collective mind, each culture was disconnected from the others” (Latour, 1999:15).

The political game which is present in the objectivity-subjectivity dichotomy is also analyzed by Keller (1995). Emphasizing the ideological dimension of the category of the model and based on a psychoanalytical approach, the author attempts to grasp the culturally persistent association between objectivity and masculinity. She shows that this association reflects and contributes to a complex network of cognitive, emotional and sexual development. In order to see how the objectives of science – knowledge and power – are translated in terms of objectification and domination, Keller examines the psycho-dynamic roots that bring these objectives together. “Objectivity, I argue, is the cognitive counterpart of psychological autonomy, and accordingly must be understood as rooted in interpersonal space; the capacity for objectivity develops together with the articulation of self and of gender” (Keller, 1995:71). The relations between objectivity, power and domination are seen from the basis of an interpersonal perspective, even in non-humans.
As we saw earlier, Foucault not only acknowledges this political dimension, which is present in the objectivity-subjectivity dichotomy, but also carefully conjoins the dimension of power to the analysis of discourse. The concept of power is not merely present in Foucauldian analysis. It is by means of the relations of power that the very process of discursive formation is made possible.

4. Reappraisal of some concepts

Starting from the classic perspective of institutionalization, we may reach the mistaken conclusion that everything, at least theoretically, has the potential for institutionalization. Especially when we use the notion of institution as being synonymous with "true entity" (for example, a regulatory entity in the educational field) we may be led to consider the process of institutionalization or institutional change as a conscious and simple process. In fact, only certain practices become institutionalized and the new institutionalism cannot come up with answers for this selective process.

Starting from a pragmatic premise, one would stress that the practices which are institutionalized are practices which "work", which are "good for us". Institutionalization occurs within discursive fields predominant in a given society. By proposing that the institutional processes occur within discursive fields, we are arguing that these are unconsciously serving the productivity of the power relations present in these fields. Practices which are institutionalized are practices which "work", in other words, they are practices which are necessary and useful to the exercise of power. In this work, these discourses (practices) are called practical discourses, in order to highlight the dimension of practicability.

Keller (1995) contributes to the philosophy of the science by merging the pragmatic and the Foucauldian conceptions in the analysis of the formation of new scientific fields. In the study of the formation of the scientific field of genetics in the USA, Keller (1995) developed an interesting theoretical body of knowledge regarding the role of language and dynamics of institutionalization. However, she not only focuses on language (particularly the role of metaphors) but also emphasizes the complex networks of influence and interaction which arise between norms, technical developments and metaphors. The force of the descriptive expressions is derived from the role of metaphors in the construction of similarity and difference, defining "familiar similarities" which form the basis that serves to categorize natural phenomena and motivates the realization of certain experiments or the elaboration of certain technical parameters. Not all metaphors are equally useful or catchy, or even equally practical. The effectiveness of metaphors depends upon the shared social conventions and also upon the authority conventionally granted upon those who use them, namely institutions. The socially effective metaphor of 20 years ago may not continue to be effective today, partly due to the dramatic transformations (as for example, gender) of prevailing discourses.

The effectiveness of scientific metaphors depends not only upon the available social resources but also upon the availability of technical and natural resources. Some metaphors may be cognitively and technologically more productive than others and they may also have different effects. In Keller's approach (1995) the scientific technique not only contributes, but is also produced by discourse. The traffic between metaphors and machines has transforming effects on the terms of social history or scientific techniques themselves. In this context, the human/non-human distinction does not exist (Latour, 1999) and the (trans)formative aspects of the new field depend upon discourse. Scientific objects are constituted and, at the same time, transformed, by discourse.

To sum up, it is possible to reply to the query of Powell & DiMaggio (1999:38) “given that anything that enters into human interaction can become the basis of a shared typification, why are some typifications (the nation, the family, private property) so much more compelling that others (counties, second cousins, the commons)?” A cognitive theory of action cannot cover all the different replies in affective and normative terms. Nonetheless, a theory of discourse may reunite the dimensions discussed in other perspectives, namely the affective, normative, cognitive and political dimensions. The presence of these typifications will depend upon how they are situated in the field of power relations of the discourses.

5. Conclusions

Although the neo-institutional approach is currently in fashion in the area of organizational studies, it presents some shortfalls in terms of possibilities for human action in organizations. Furthermore, the main contribution of this perspective is concentrated more on the analysis of institutions – seeing them as taken for granted – than on the analysis of processes of institutionalization. In this paper, we
argue that the referential basis provided by the post-structuralism of Foucault and the pragmatism of James and Rorty can contribute to strengthening the micro-basis for action of the approach and concomitantly, aid understanding of the processes of institutionalization. All the "official" representatives of institutionalism acknowledge that the processes they research do not arise in a vacuum. On the contrary, by using words such as network of organizations and matrix, they attempt to stress the complexity of processes of institutionalization. However, the problem lies in the basic presuppositions of their perspectives. By arguing that the subject-object dichotomy serves political interests and has severe practical consequences, we assume the pragmatic stance of Rorty and present Foucault's concept of discourse as an alternative for understanding the processes of institutionalization.

It is no accident that the concept of discourse is introduced as an alternative to the official currents of institutionalism. Discourse, for Foucault, overcomes the subject-object dichotomy, because it talks truth into being and thus, we would argue, adds more dynamism to the study of processes of institutionalization, including some often neglected dimensions in institutional analysis, namely normative, cognitive, affective and power dimensions. Discourse is not merely the crossroads between things and words. It does not involve a set of signals; rather it consists of practices, which systematically form the objects of which they speak. Situated beyond things and words, the concept of discourse overcomes the objectivity-subjectivity debate and opens up another space for discussion, which concentrates attention on rules of formation, on relations of power which (trans)form fields. The concept of discourse takes into consideration the complexity of institutionalization processes and contributes in terms of bases for institutional analysis – in this case, without the division based on the micro/macro dichotomy.

The concept of practicability arises as the key to the comprehension of processes of institutionalization. Introduced by American pragmatism, it is also present in the ethnomethodology of Garfinkel. However, we have opted to use this concept in the same way as Foucault uses it, incorporating the dimension of power and arguing that knowledge, in practical terms, is useful and necessary to the exercise of power. In this way, it is possible to take a step forward in understanding the selective aspects of institutionalization and grasp how these processes serve the relations of power present in discursive fields. Practices that become institutionalized in organizations are practices that "work"; in other words, practices which are both necessary and useful to relations of power.

In conclusion, we believe that the area of organizational studies would benefit by a more all-encompassing vision of the processes of institutionalization, which would include power at its core, instead of considering institutions as non-changing variables. Clegg (1989) has provided a framework for such analysis and this paper serves to elaborate what some of its philosophical foundations might be in greater detail. As we have already done in earlier works, we would stress that it is not possible to find answers if we just search for cause-effect relations, because the explanations found through causal mechanisms constitute, in itself, a kind of discourse of power, as pointed out by moderns such as Hobbes (1650). Undoubtedly, if we take empirical research into consideration, what we need is, from a historical perspective, understand the way by which the main discourses or narratives constitute, transform and are transformed by our objects of investigation, among which organizations certainly occupy a central place. However, it is necessary to tackle this undertaking with a certain degree of humility, abandoning the search for ultimate causes to more proximate and local narratives, small stories that communicate their own sense of the mechanisms of truth at work. And in these matters, we should be bullied into causality.

6. References


Pluralism in Knowledge Management: a Review

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Abstract: The purpose of this article is to review the role of simultaneous application of multiple perspectives, or pluralism, in knowledge management, and to describe theoretical frameworks that support pluralism. Pluralism is defined as support for all three of the systems perspectives - hard, soft, and critical - that are implicit in the popular Davenport and Prusak (1998) definition of knowledge. These perspectives are associated with research paradigms (positivist, interpretivist, pluralist) and knowledge perspectives (application, normalization, creation). A case study of coordinating work in a hospital is reviewed to illustrate the role played by pluralistic approaches in knowledge management. A literature search is conducted to find frameworks that support pluralism. The findings are as follow. In the hospital case study the introduction of a patient record system (hard system) was the occasion for changes to both coordination (soft systems) and power relations (critical systems). Facts, norms and feelings are intertwined. While the electronic tool by itself is neutral in the face of power relations, its use in organisations is not. In this case at least, a holistic and pluralistic approach to knowledge management is required. In the search for frameworks to support pluralism, more than 50 frameworks from the general knowledge management literature are identified. Of the eight selected for further study, three are found to be pluralistic. These three - critical systems, scientific discourses, and Habermasian inquiry – share common characteristics. All three recognise that conflict is the precondition to knowledge creation, and that power relations, value commitments, and ethics are central to knowledge management. It is concluded that the knowledge management literature as a whole favours a single systems perspective (hard systems); a single research paradigm (positivism, focusing on objective facts); and a single knowledge management domain (knowledge application). This singular (non-pluralistic) approach produces theories about knowledge that has already emerged. Yet the Davenport and Prusak (1998) definition of knowledge and the hospital case study include two other perspectives – soft systems and critical systems – that focus on the organizational and individual aspects of emergence, respectively. In practice, knowledge management must address the need to simultaneously solve technical problems, resolve interpersonal issues, and dissolve personal conflict. The contribution of the paper is the comparison of knowledge management frameworks on the basis of underlying system perspectives, and the identification, description, and application of some pluralistic frameworks. Each systems perspective constitutes a different discourse on the purposes served by knowledge management, and pluralisms are required to integrate them. Pluralisms constitute both a framework for inquiry in knowledge management and a design theory for collaborative technologies. The review is not exhaustive. It is beyond the scope of this paper to examine the link between the purposes served by knowledge management and the methodology required for development. The paper contributes to the literature that seeks to understand the complexity of knowledge management practice via ‘awareness of the potential and the implications of the different discourses in the study of knowledge and knowledge management.”

Keywords: critical systems, foundational theory, Habermasian inquiry, knowledge management, multiple perspectives, power relations, pluralism, scientific discourses, theoretical frameworks

1. Introduction

“Our objective with this analysis is to raise IS (information systems) researchers’ awareness of the potential and the implications of the different discourses in the study of knowledge and knowledge management.” Schultz and Leidner (2002, p. 213).

Knowledge management is a broad and relatively new field central to understanding the modern service-based, knowledge-intensive economy. Researchers come to knowledge management from different disciplinary backgrounds, to work on a broad range of topics, guided by a variety of images (Morgan, 2006), analogies, and research approaches. A mode of organizing knowledge, ideas, or experience (discourse) is required to reduce the fragmentation and contradictions in knowledge management theory, and in knowledge management practice. In the remainder of this introductory section three perspectives on knowledge management are introduced, the need for their simultaneous application in theory and in practice briefly investigated, and research objectives stated.

1.1 Three perspectives

Operations research provides three system perspectives (hard, soft, and critical) that may be useful in organising concepts associated with three perspectives on knowledge management (application, normalization, and creation). The hard systems perspective treats knowledge as explicit, a representational object. The assumption is that knowledge is standardized and applicable across
social contexts. The hard system perspective typically employs a positivist research paradigm to study the efficient collection, storage and dissemination of objective data (knowledge application). The soft systems perspective treats knowledge as tacit, generated and consumed in social action. The assumption is that knowledge is innovation in a social context. The soft system perspective typically employs an interpretivist research paradigm to study participatory organizational practices and their relationships to mutual expectations or norms (knowledge normalisation). The critical system perspective treats knowledge as a personal creation that is aspirational and contested. The assumption is that knowledge is directly connected to power, and power to knowledge. The critical systems perspective typically employs a pluralist research paradigm to study the coercive use of power (knowledge creation). (Guo and Sheffield, 2008)

1.2 Pluralistic perspectives in theory
A popular working definition of the field is provided by Davenport and Prusak (1998):

“Knowledge is a fluid mix of framed experience, values, contextual information, and expert insights that provides a framework for evaluating and incorporating new experiences and information. It originates and is applied in the minds of knowers. In organizations, it often becomes embedded not only in documents or repositories but also in organizational routines, processes, practices, and norms.” (ibid, p. 5)

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</table>

Figure 1: Discourse in knowledge management

Three perspectives maybe discerned here. Firstly, expertise and documented knowledge is the emerged (“explicit”) knowledge (Zack, 1999) that constitutes the knowledge representations or boundary objects available to members of both local and more global communities. Secondly, it is the aggregate of the action originated by knowers that, over space and time, appear as organizational routines, processes, practices and norms. Thirdly, knowledge that originates in a particular local context through the framed experiences and values of knowers is the emergent (“tacit”) knowledge (Polanyi, 1966) that captures the personal aspect of ‘the way we do things around here.’ These phenomena are underpinned by elements from three knowledge management perspectives: systems perspectives (hard, soft, and critical); research paradigms (positivist, interpretive, and critical pluralist); and knowledge perspectives (knowledge application, knowledge normalization, and knowledge creation). The three clusters constitute a typology of knowledge management theory and practice. These are seen as emphasizing the factual, interpersonal, and personal aspects of knowledge phenomena, respectively. Figure 1 illustrates how this cluster of aligned theoretical concepts may be used to deconstruct the Davenport and Prusak (1998) definition.
1.3 Pluralistic perspectives in practice

Ellingsen (2003) provides a case study of coordinating work in hospitals that illustrates how, in practice, hard, soft and critical systems perspectives are intertwined. In hospitals coordination depends on the integration of oral (soft system) and textural (hard system) knowledge management practices. Oral aspects are important in face-to-face interactions between a patient and a health worker, and between health workers. Textural aspects are important in record keeping and organisational memory. Three vignettes are provided about the case of a single patient who attends a department of rehabilitation over a period of one to two years. Care of the brain-damaged patient relies for success on the professional expertise and coordination of seven types of professionals (physician, nurse, occupational therapist, physiotherapist, speech therapist, psychologist, and social worker). But who will say what these highly educated people know? And how will the knowledge distributed among them be recorded? According to the chief physician “we need a common framework or an ideology; for instance, there is a connection between body impairment and how to manage things in everyday life…This means that everything is interconnected and accordingly must be regarded as a whole.” (ibid, p. 50) An electronic patient record system is to be adopted, but this tool requires explicit prior agreement on a structured format that works for all seven types of health professionals. Contradictions emerge between the formal requirements for the use of the technology, and the heterogeneous nature of the perspectives of different types of health professional. The use of the new, more formal reporting mechanism had the effect of reducing the extent of oral practices, and increasing textural knowledge management practices. As a result, the social relationships among the different kinds of professionals changed, and informal or mutual accommodation took place.

Contradictions also emerged during discussions about the norms that should govern the legitimate joint authorship of the electronic patient record. The use of explicit and uniform requirements for patient records in a heterogeneous professional environment creates tension. Hammering creates sharp distinctions between the hammer, the hammerer, and those being hammered. The use of an electronic tool sharpens distinctions between rules, those who make the rules, and those that must obey the rules. In this case, the physician is making the rules and the members of other health professions are expected to obey. The formality associated with the use of the electronic tool has the effect of intensifying the power imbalances between different types of professionals. The use of the tool becomes the occasion for promoting the professionalism of some specialties and the downgrading of others. Additional accommodations and additional accountability were required. “It implies hard work…The participants had to accept that some of their professional assessments were evaluated in a more critical perspective.” (Ibid, p. 51). Knowledge management practice must resolve competing values and requirements for efficient record keeping, mutually supportive interpersonal relationships, and access to power. While the electronic tool itself is neutral in the face of power relations, its use in organisations is not. In hospitals at least, a holistic and pluralistic approach to knowledge management is required.

1.4 Research objectives

It is clear that the simultaneous application of multiple perspectives, or pluralism, is inherent in the Davenport and Prusak (1998) definition, and in the Ellingsen (2003) case study. What is not clear is the degree to which pluralism is embraced by the general knowledge management literature. The literature favour a hard systems (positivist) approach that prioritizes observation and generalization over action to improve practice in a particular context (Guo and Sheffield, 2008). The current study aims to surface systems perspectives underlyng knowledge management theory, and to select frameworks that embrace pluralism for further study. Non-pluralistic and pluralistic frameworks located in a search of the general knowledge management literature are presented in the next two sections.

2. Frameworks in knowledge management

Because knowledge management is a heterogeneous field researchers engaged in different topics and communities may observe different phenomenon and report different findings. Croadse11, et al. (2003) examines the 76 research papers presented at the Hawaii International Conference on System Sciences (HICSS) during the period 1998–2002. They find that conceptual difficulties are limiting the development of a common vocabulary among members of the KM research community — “Unfortunately, it appears that knowledge is often formed from bonds that are hard to understand from the outside looking in and difficult to explain from the inside looking out.” Guo and Sheffield (2008) analyse 160 knowledge management research articles in ten influential journals for the period 2000–2004. They find that research published in influential journals under the rubric of knowledge
management is characterised by clear statements of research purpose, paradigm and methodology. The authors found no evidence that conceptual difficulties are limiting the development of a common vocabulary among the community of KM researchers who read these ten journals. The confusion surrounding different findings is reduced if research is grounded in theoretical frameworks such as those identified in this and the subsequent section.

2.1 Literature search

The general knowledge management literature is searched for frameworks influential in developing a common vocabulary among members of different knowledge management research communities. Promising frameworks are those that score against three criteria: foundational theory (that is, frameworks that develop and/or review concepts and relationships, taxonomies and perspectives of theoretical importance, and/or of broad application to knowledge management researchers); impact (frameworks frequently cited by knowledge management authors); inquiry (frameworks that develop or review the philosophical assumptions underlying knowledge management research and/or research paradigms). The search process delivered more than 50 frameworks that scored well against a single criterion, including the following:


High impact articles: Hansen, Nohria, and Tierney, 1999 (1000 citations); Nonaka and Konno, 1998 (900 citations); Blackler, 1995 (700 citations); Alavi and Leidner, 2001 (500 citations); Orlikowski, 2002 (300 citations); Earl, 2001 (200 citations).


2.2 Findings

In total approximately 17,000 citations have been made to the high impact books and articles, thus establishing their influence in knowledge management research. Eight frameworks are chosen that, collectively, perform well against all three criteria. Three of these frameworks support pluralism via well-defined systems perspectives, and are investigated in the following section. The remaining five frameworks are briefly described below. An indication is given of the dominant system perspective.

Hierarchy: from data to information to knowledge. (Stenmark, 2002). The theme that objective data is the ultimate source of both socially useful knowledge and personal knowledge is seen as focusing on knowledge as context-independent facts. (Hard systems).

Flow: the knowledge management value-chain. (Shin, 2001). This framework treats knowledge as an organizational resource to which value is added as it moves downstream through the local activities in the value chain. This is a work-flow metaphor that focuses on efficiency and effectiveness in achieving organizational goals. (Hard systems).

Exchange: the knowledge market. (Grover and Davenport, 2001). The exchange and flow frameworks are both oriented to promoting organisational success through efficient knowledge transfer. However, unlike the knowledge management value-chain, the exchange framework attempts to describe individuals’ rational motivations for sharing knowledge with each other. This framework assumes that the very act of sharing knowledge will lead to benefits and so the imperative for the organization is to find means of increasing the efficiency of the market. (Hard systems).

Transformation: knowledge conversion. (Nonaka, 1994). SECI (socialization, externalization, combination, internalization) focuses on the social processes at work in the transformation of explicit to implicit knowledge, and vice versa. Insomuch as the SECI model does not dwell on the technical systems required for the (non-transformative) storage and dissemination of explicit knowledge, nor on the preconditions required to address power relations, it does not fully investigate the role of objective facts and personal values. (Soft systems).
Systems thinking: emergence. (Rubenstein-Montano, et al., 2001). Systems thinking is not well represented in knowledge management research. The single article encountered (Rubenstein-Montano, et al., 2001) interprets knowledge management themes in terms of systems concepts such as people, learning and technology. While a holistic approach is recommended there is no explicit or implicit recognition of any particular underlying knowledge perspective. (A mixture of hard and soft systems).

2.3 Multiple perspectives in knowledge management

Table 1 provides a simple graphical representation that links the eight frameworks to systems perspectives, research paradigms, and knowledge management domains, and classifies them as pluralistic or non-pluralistic.

Table 1: Perspectives and frameworks in knowledge management

<table>
<thead>
<tr>
<th>Knowledge Management Perspectives</th>
<th>Hard systems</th>
<th>Soft systems</th>
<th>Critical systems</th>
</tr>
</thead>
<tbody>
<tr>
<td>Systems perspective</td>
<td>Research paradigm</td>
<td>Positivist, focusing on objective facts</td>
<td>Interpretive, focusing on social norms</td>
</tr>
<tr>
<td>Knowledge management domain</td>
<td>Knowledge application</td>
<td>Knowledge normalization</td>
<td>Knowledge creation</td>
</tr>
</tbody>
</table>

Non-pluralistic knowledge management frameworks

- Hierarchy: Data, information, knowledge (Stenmark, 2002) XXX
- Flow. Value chain (Shin, 2001) XXX
- Exchange. Market (Grover and Davenport, 2001) XXX
- Transformation: SECI (Nonaka, 1994) X XXX X
- Systems thinking (Rubenstein-Montano, et al., 2001) XXX XX X

Pluralistic knowledge management frameworks

- Critical systems (Jackson, 2005) XXX XXX XXX
- Scientific discourses (Schultz and Leidner, 2002) XXX XXX XXX
- Habermasian inquiry (Guo and Sheffield, 2007) XXX XXX XXX

3. Pluralistic frameworks in knowledge management

This section explores the three frameworks that support pluralism. Each framework is anchored in well-defined systems perspectives that differentiate and integrate all three systems perspectives. All three pluralistic frameworks may be useful in analysing “the potential and the implications of the different discourses.” (Schultze and Leidner 2002, p. 213).

3.1 Critical systems: Conflict and power

Jackson (2005) broadens the dialogue between knowledge management and systems thinking to include a variety of theories and methods, and employs the latter to critique knowledge management frameworks. A particular focus is how knowledge management deals with the conditions enabling knowledge creation. (Tackeuchi and Nonaka, 2004). Knowledge creation is seen as a dialectical process in which the deeply held beliefs and (value) commitments of individuals “is dynamically created out of contradictions in a dialectical process” whereby “individuals confront their own most cherished assumptions and a synthesis of different perspectives emerges” (Jackson 2005, p. 190). A social systems approach that champions human agency and employs an interpretivist approach to inquiry is considered a necessary but insufficient move away from more static and mechanistic approaches that focus on objective facts. Knowledge management still needs to confront the conflict, and relations to power, that are inherent in knowledge creation (Marshall and Brady, 2001; Müller-Merbach, 2004; Panagiotidis and Edwards, 2001; Pozzebon and Pinsonneault, 2006). Insomuch as the dialectical process at the heart of organisational learning requires conflict, and involves the
exercise of power, “a critical systems approach, embracing ethical concerns, is essential” (Jackson, 2005, p. 191).

3.2 Scientific discourses

According to Schultze and Leidner (2002), ‘In information systems, most research on knowledge management assumes that knowledge has positive implications for organizations. However, knowledge is a double-edged sword: while too little might result in expensive mistakes, too much might result in unwanted accountability. The purpose of this paper is to highlight the lack of attention paid to the unintended consequences of managing organizational knowledge and thereby to broaden the scope of IS-based knowledge management research.’ (ibid, p. 213). Schultze and Leidner (2002) adopt a framework developed by Deetz (1996) for classifying scientific discourses. Although Deetz’s framework is intended to provide a taxonomy of research for organization science, it can also be used to “make sense of knowledge management research as well as knowledge management itself” (Schultze and Leidner 2002, p. 215). (Figure 2).

The framework consists of two dimensions: the ‘origin of concepts and problems’ dimension and the ‘relation to dominant social discourse’ dimension. The first dimension is concerned with how research concepts and problems are developed. At the local/emergent end of the continuum concepts are developed from a specific situation whereas at the elite/a priori end existing concepts are applied to a specific situation. The second dimension is concerned with the stance of the researcher in relation to the status quo. The consensus end of this continuum seeks to maintain order and equilibrium and regards this as the natural state of social systems. In contrast, the dissensus end is at odds with the dominant social structure and ‘considers struggle, conflict, and tension as the natural state’ (ibid, p. 216).

These two dimensions create four quadrants, each of which is oriented towards a particular scientific discourse: normative, interpretive, critical, and dialogic. The normative discourse is characterised by ‘codification, the normalization of experience, and the search for law-like relationships’ (ibid, p. 17). ‘Normalization’ in the context of scientific discourse emphasizes objective facts. The interpretive discourse assumes reality is socially constructed and seeks consensus on organizational activities from participants’ ‘own frame of reference’ (Collis and Hussey, 2003, p. 53). ‘Normalization’ in the context of communities of practice (Wenger, 1999) revolves around social norms, and hence the interpretive scientific discourse. The objective of critical discourse is to make apparent forms of domination and conflict which implicitly lead to power imbalances between organisation members. Finally, the dialogic discourse recognises that reality is socially constructed yet the multiple narratives and perspectives are disjointed and incoherent. The dialogic discourse differs from the critical discourse ‘in that it considers power and domination as situational and not owned by anything or anyone’ (Schultze and Leidner, 2002, p. 217). Only the dialogic and critical discourses emphasize power relations, and the explicit need for personal commitments and values.

![Figure 2: Deetz's scientific discourses](https://www.ejkm.com/392)
3.3 Habermasian inquiry

Guo and Sheffield (2007) develop a critical pragmatist system of inquiry (Forester, 1993). The system combines elements of pragmatism (Churchman, 1971; Menand, 2001) and Habermas’s Theory of Communicative Action (Habermas 1984, 1987). The focus is on practice, and the use of the system is intended to provide a ‘universally pragmatic framework useful in managing the complexity, and conceptualizing the richness, of knowledge phenomena’. The framework is organized as a three-level integrating structure based on Habermas’s three knowledge interests (technical, practical, and emancipatory) and the rationality associated with each. (Habermas, 1968). The other three design elements (Churchman’s roles, knowledge dynamics, and research paradigms) are positioned according to these three encompassing levels. The resulting framework ‘represents a complex learning system, where there are bidirectional loops between each pair of the three levels of rationality’. (Figure 3).

![Figure 3: The Habermasian inquiring system](image)

Knowledge creation

The relevance of the framework to knowledge management is established through knowledge dynamics associated with the intersecting domains of knowledge creation, knowledge normalization, and knowledge application. A knowledge initiative in one domain ‘always already’ assumes a horizon of possibilities made possible through the existence of the other two domains. Fundamentally, knowledge creation is enacted by individual stakeholders (clients, in terms of Churchman’s roles) through their uniquely personal cognitive processes. These include processes associated with power relations, social justice and ethics (Sheffield and Guo, 2007) that serve Habermas’s emancipatory knowledge interest. Critical pluralism is seen as an appropriate paradigm for studying the conflict that each stakeholder experiences among competing guiding images, beliefs, values, aspirations, and commitments. (Mingers, 2001).

Knowledge normalization

The idea of knowledge normalization is similar to Nonaka’s knowledge spiral, in which knowledge is developed, refined, and amplified from the individual to the organizational level. Knowledge normalization serves Habermas’s practical knowledge interest and Churchman’s organizational decision maker role - clients’ personal knowledge is normalized (socialized) according to the collective values of the decision maker in order to become organizational knowledge. The interpretive paradigm is seen as appropriate for research that investigates the inter-subjective meaning and mutual accommodations central to the normalization process. (Orlikowski, 2002).

Knowledge application
Finally, knowledge application refers to how knowledge - created at the personal level, and normalized at the organizational level - is ultimately utilised in day-to-day operations to achieve organizational results (competitive advantage, organizational capability). By performing against measures such as these, knowledge application ‘realizes’ organizational knowledge, thus serving Habermas’s technical knowledge interest. The positivist paradigm is seen as appropriate in evaluating technical excellence validated by objective truth.

4. Discussion and conclusion

4.1 Discussion

Only the pluralistic frameworks described above capture the richness of the practical example provided by Ellingsen (2003), and the working definition provided by Davenport and Prusak (1998). The alignment between knowledge management perspective (viz, knowledge application, knowledge normalization, knowledge creation), the three pluralistic frameworks, and coordinating work in hospitals is summarised below. (Table 2).

<table>
<thead>
<tr>
<th>Knowledge management domain</th>
<th>Knowledge Application</th>
<th>Knowledge Normalization</th>
<th>Knowledge Creation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Critical Systems (Jackson, 2005)</td>
<td>Static and mechanistic approaches that focus on objective facts</td>
<td>Dialectical process to resolve contradictions</td>
<td>Conflict and relations to power are inherent in knowledge creation</td>
</tr>
<tr>
<td>Scientific Discourses (Schultz and Leidner, 2002)</td>
<td>Normative Discourse</td>
<td>Interpretive Discourse</td>
<td>Critical and Dialogic Discourses</td>
</tr>
<tr>
<td>Habermasian Inquiry (Guo and Sheffield, 2007)</td>
<td>Technical Knowledge Interest</td>
<td>Practical Knowledge Interest</td>
<td>Emancipatory Knowledge Interest</td>
</tr>
<tr>
<td>Coordinating Work in Hospitals (Ellingsen, 2003)</td>
<td>A textural tool is applied in the form of electronic patient record technology</td>
<td>Mutual accommodation of different types of health professionals</td>
<td>While the tool itself is neutral in the face of power relations, its use in organisations is not</td>
</tr>
</tbody>
</table>

Knowledge application

Critical Systems characterises Knowledge Application as comprised of static and mechanistic approaches that focus on objective facts. Knowledge Application is aligned with the Normative Scientific Discourse and the Habermasian Technical Knowledge Interest. In Ellingsen (2003), Knowledge Application consists of the implementation of a textural tool in the form of electronic patient record technology.

Knowledge normalisation

Critical Systems characterises Knowledge Normalisation as a dialectical process to resolve contradictions. Knowledge Normalization is aligned with the Interpretive Scientific Discourse and the Habermasian Practical Knowledge Interest. In Ellingsen (2003), Knowledge Normalization consists of the mutual accommodation of different types of health professionals.

Knowledge creation

Critical Systems characterises Knowledge Creation as inherently involved with conflict and relations to power. Knowledge Creation is aligned with the Critical and Dialogic Scientific Discourses, and with the Habermasian Emancipatory Knowledge Interest. In Ellingsen (2003), Knowledge Creation involves the assertion that while the electronic tool itself is neutral in the face of power relations, its use in organisations is not.

5. Conclusion

The literature search identified more than 50 knowledge management theoretical frameworks, but only three that are pluralistic. It is concluded that the knowledge management literature as a whole favours a single systems perspective (hard systems); a single research paradigm (positivism, focusing on objective facts); and a single knowledge management domain (knowledge application). (Table 1). This singular (non-pluralistic) approach produces theories about knowledge that has
already emerged. Yet the Davenport and Prusak (1998) definition of knowledge includes two other perspectives – soft systems and critical systems – that focus on the organizational and individual aspects of emergence, respectively.

Pluralism was defined as support for all three of the systems perspectives that are implicit in the popular Davenport and Prusak (1998) definition of knowledge. The three pluralistic knowledge management frameworks – critical systems, scientific discourses, and Habermasian inquiry – were found to share common characteristics. All three recognise that conflict is the precondition to knowledge creation, and that power relations, value commitments, and ethics are central to knowledge management. The case on coordination work in hospitals illustrates that, in practice, the simultaneous application of all three systems perspectives is required. (Table 2).

In practice, knowledge management must address the need to simultaneously solve technical problems, resolve interpersonal issues, and dissolve personal conflict. A holistic and pluralistic approach to organizing knowledge, ideas, and experience, is required. The contribution of the paper is the comparison of knowledge management frameworks on the basis of underlying system perspectives, and the identification, description, and application of pluralistic frameworks. These systems perspectives constitute different discourses on the quite different purposes served by knowledge management. They therefore constitute important aspects of design theory for collaborative technologies that address situations in which facts, norms and feelings are intertwined. It is beyond the scope of this paper to examine the link between purpose and methodology. The paper contributes to the literature that seeks to understand the complexity of knowledge management practice via ‘awareness of the potential and the implications of the different discourses in the study of knowledge and knowledge management’.

6. References


