Assessing the Impact of KM on Organisational Practice: Applying the MeCTIP Model to UK Organisations

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Abstract: With the emergence of the knowledge intensive industry, where organisations rely on the knowledge of their staff for competitive advantage (Lustri et al., 2007), KM has become key for business success (Mu-jung et al., 2007). KM, once seen as a fad (Ramsey, 1996) is now an integral business function (Zhou and Fink, 2003) in both traditional and internet-based businesses (Borges Tiago et al., 2007) to the extent that KM is now viewed essential for profit (Yang, 2008). Despite the great progress made in KM over the past decade (Omega Editorial, 2009) much confusion exists around the practical implementation of knowledge-orientated programmes, resulting in either an overemphasis on technology to the exclusion of adequate people/quality planning, or, strong people/quality programmes from a knowledge perspective, hindered by inadequate enabling technologies. For example, organisations question how current KM models, frameworks and programmes can be applied across all organisations uniformly? If changes are necessary to the approach adopted by an organisation, what are these changes and are the drivers behind the change approaches largely implementation modifications or are there more fundamental issues to be resolved? Are the most important issues (King, 2007) being addressed? How is KM success defined? (Jennex and Croasdell, 2007) Considering the large investment capital expended by many firms in KM systems (Curley, 1998) and the growing number of companies that see KM as potentially helping them survive and compete, there is a need for more definitive and comprehensive studies in this field for systematic empirical research and in-depth rich case studies. This paper presents results of empirical research undertaken in early 2009 with 588 UK companies. Research purpose is to assess the impact of the MeCTIP model [Moffett, 2000; Moffett et al., 2002, 2003] on UK companies to identify key factors for successful implementation, practice and development of KM. The research employs the 'Benchmarking KM' online survey tool. This paper focuses on research methodology and initial survey results using statistical analysis techniques such as descriptives and factor analysis. Avenues for further research are identified.

Keywords: knowledge management, MeCTIP model, factor analysis

1. Defining KM

There are many definitions of KM but at its essence it entails *'getting the right knowledge to the right people at the right time'* (Davenport and Prusak, 1998). From an organisational view this involves *'the process of critically managing knowledge to meet existing needs, to identify and exploit existing and acquired knowledge assets and to develop new opportunities'* (Quintas et al., 1997). For knowledge to be useful, it must be shared (Borges Tiago et al, 2007) but difficulties arise when knowledge cannot be codified (Dunford, 2000). Explicit knowledge is more easily applied, hence tacit knowledge must be made explicit using techniques such as informal sharing or information systems (Abril, 2007). As knowledge is a fundamental element of all business activities and is therefore not restricted to any particular instrumental change programme in organisations, this project focuses on the development of knowledge based measures to identify potential value to business performance. This paper uncovers key factors to be considered when an organisation aims to implement a KM strategy.

2. Key factors for KM

Much confusion exists around practical implementation of knowledge-orientated programmes. Considering the large investment capital expended by many firms in KM systems (Curley, 1998) and the growing number of companies that view KM as potentially helping them survive and compete, there is need for more definitive and comprehensive studies in this field. Current literature identifies key elements as being crucial for successful KM implementation, namely organisation culture, technical infrastructure and utilisation, strategy and vision, process and people. In addition, KM can either be supported or hindered by macro-environmental, cultural, technical and human intervention (Moffett et al., 2003). Taking this on board a prescriptive, conceptual model of KM is postulated, this model is known as the MeCTIP model (shown in figure 1). The MeCTIP model is formed based on five elements that influence adoption of KM within organisations as outlined below, more detail on the constructs within each of the five categories can be obtained from Moffett et al., (2000; 2002). The name of the model is an acronym of the components of the model, namely,

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Me	Macro Environment
C	Culture
T	Technology
I	Information
P	People

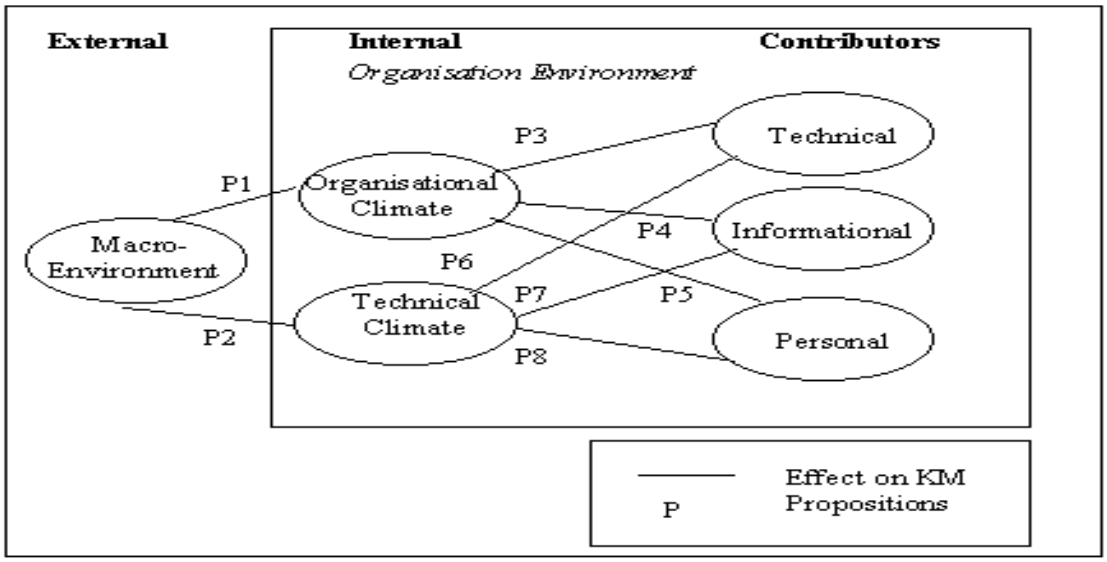

Figure 1: The MeCTIP model

To test the conceptual underpinnings of the MeCTIP model, and the relationships between elements of the model a dual quantitative/qualitative approach has been adopted. An on-line 'Benchmarking KM' survey instrument has been developed, with input from management accounting practitioners (n=10). The tool is available at
http://www.business.ulster.ac.uk/questionnaires/moffett/questionnaire.htm

The 'Benchmarking KM' tool consists of five sections. A number of questions are geared towards general data collection of the respondent companies, such as size, sector, details of respondents while other questions are specific to KM elements, such as Information, ICT and organisation working practices. A five point Likert scale is used to encourage respondents to specify their level of agreement to a statement. All question scales have been tested for reliability using statistical techniques such as Cronbach Alpha, unreliable items have been removed from the statistical interpretations.

To facilitate the online survey a database of UK companies was created. This currently contains 4709 records with complete company contact details, including email addresses. From the database 2000 organisations were selected at random to participate in the study. Following a number of mailing iterations the total number of surveys completed which can be used for statistical analysis is 588, this represents a very acceptable return rate of 29.4%. This figure outlines that almost one third of the sample have elected to complete the survey possibly due to their enthusiasm to develop KM practices within their own organisations. As there were no 'rewards' on offer to encourage completion, for example a prize draw or promise of free consultancy, it can be assumed that no social desirability bias has influenced completion and return of the surveys.

3. Data analysis – descriptive statistics

Data gathered via the survey was analysed using a number of statistical techniques processed through SPSS v11.5. Standard procedures for data entry and cleaning were applied. General descriptive statistics were selected as the appropriate analytical tool for a number of the questions, as presented in this section. Statistical application of this type permits summarisation of complex data to facilitate data interpretation (Rose and Sullivan, 1993).

Figure 2 and 3 display in pictorial format the frequency/percentage distributions of organisations that responded to the survey. These are displayed on the basis of Industrial Sector and Number of Employees respectively.

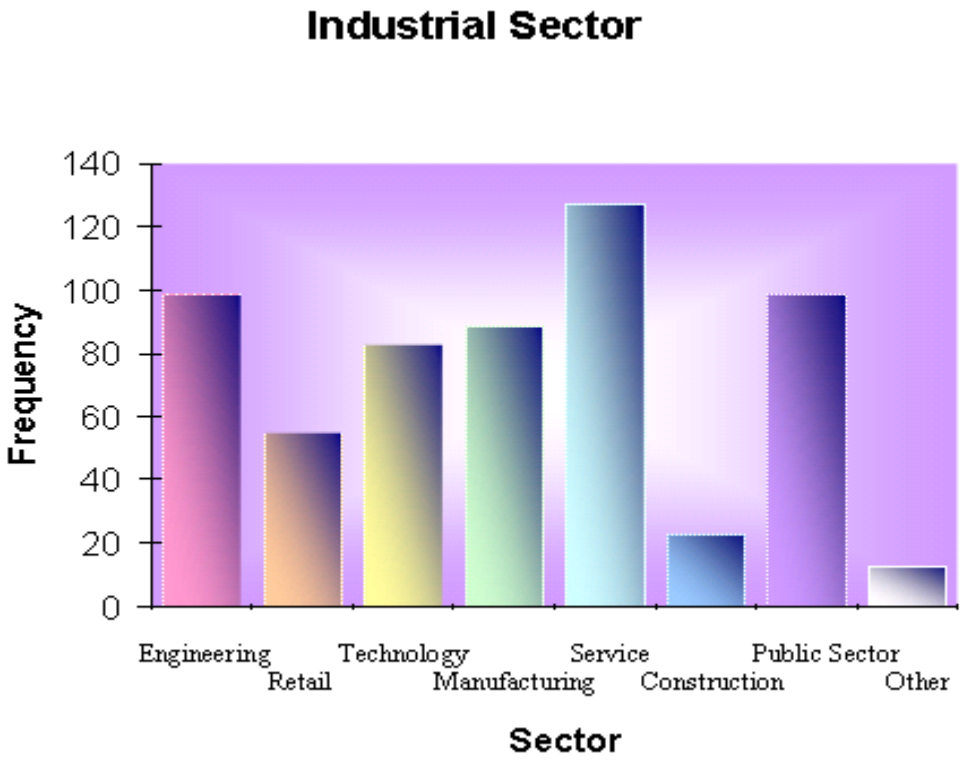

Figure 2: Industrial sector

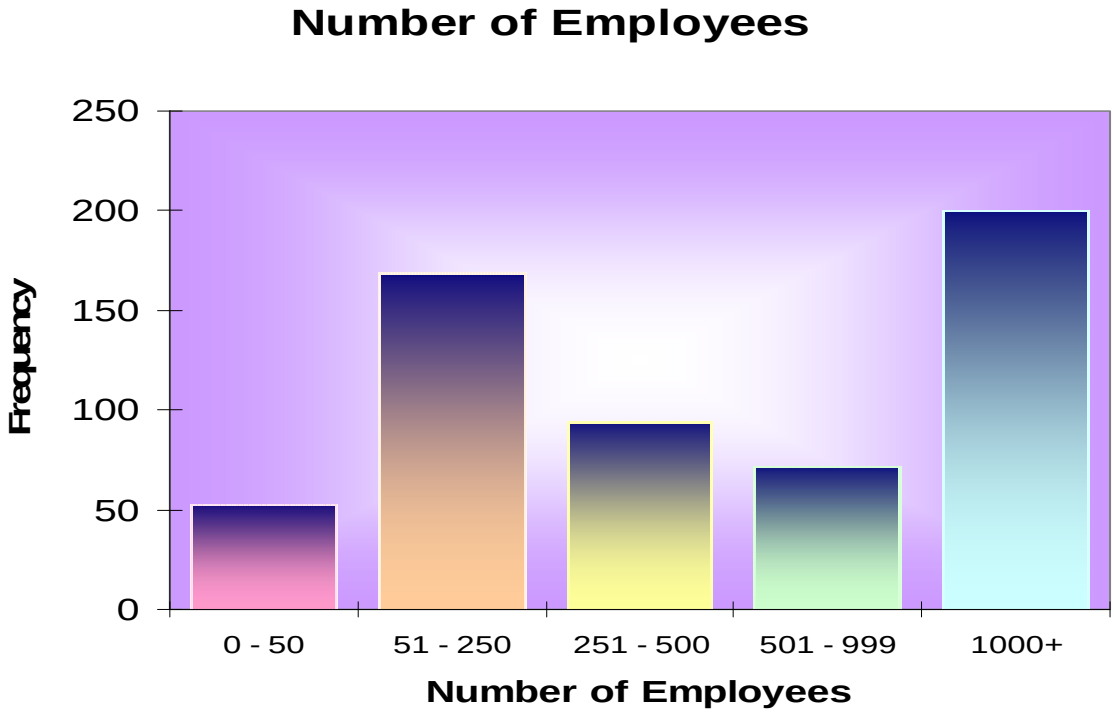

Figure 3: Organisation size based on employee numbers

Respondents belonged to three main industrial sectors, namely Service (n=127, 22%), Engineering (n=99, 17%) and Public Sector (n=99, 17%). The group that contributed least were from Construction (n=23, 4%), this could be attributed to the current downturn in the housing market.

The majority of respondents were from large corporations (n=200, 34%) followed by small-medium sized organisations (n=169, 29%). This indicates that these types of organisations are more focused on incorporating KM. This could be contributed to the effects of socialisation, where smaller organisations (especially in the developing bracket of 51-250 employees) need to focus on face-to-face knowledge share, and globalisation, when larger organisations are operating across geographical boundaries.

Further insight into the organisations was gained by assessing market stage (figure 4). A large percentage of the respondents (n=218, 37%) operated within mature markets. Only 10 organisations (2%) were in the introductory stage, while 120 organisations (20%) were in growth. From these figures one can ascertain that the majority of organisations who responded to the survey are looking to KM as a business improvement initiative and a way to sustain or increase market share. Surprisingly a large number of respondents (n=183, 31%) failed to outline the stage of development their organisation is currently in. Perhaps participants deemed this question unnecessary as KM can be applied to all organisations irrelevant of market position.

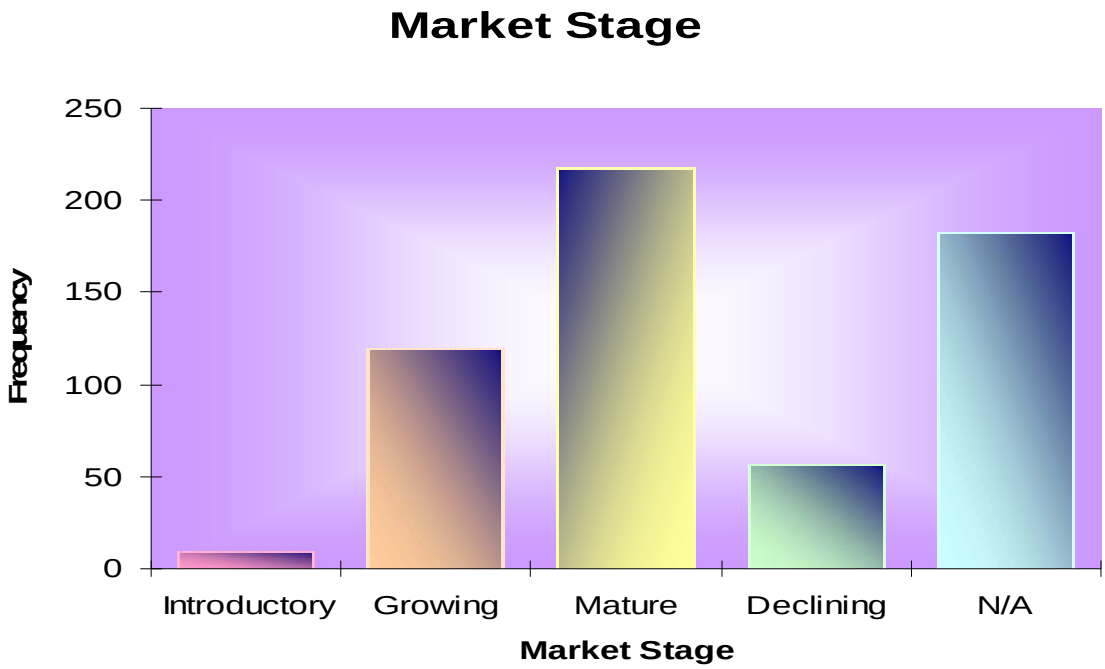

Figure 4: Market analysis

The final frequency tabulation, shown in figure 5, refers to the position in the organisation that the participant, that is the person who completed the survey, holds. The graph shows that 25 respondents (4%) hold Chief Executive Officer (CEO) or Managing Director (MD) positions, while the majority of respondents who identified themselves hold Middle Management posts (n=128, 22%). One reason for these high figures may be that the questionnaire was directed to specific personnel within senior positions. This contact was then requested to either complete the questionnaire or forward it to the person deemed most capable for completion. In many of the cases the person in receipt of the survey, for example the Chief Knowledge Officer may have found themselves to be the most knowledgeable person of the subject in hand. Many (n=272, 46%) who completed the survey failed to provide this information, shown on the graph under the MV (missing value) label. This lack of information would give the impression that people either felt this question was unnecessary, were unhappy to provide job roles or did not feel their role fell under the KM remit and was irrelevant to survey completion.

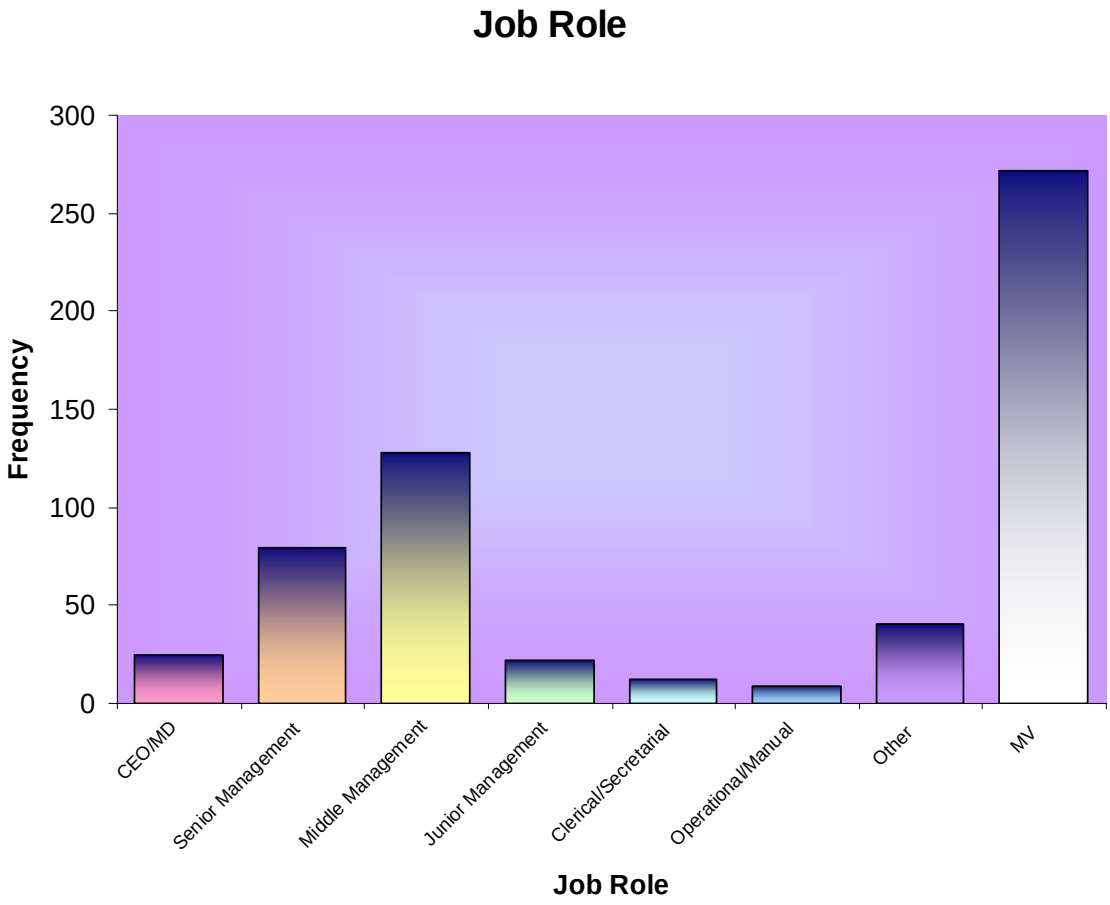

Figure 5: Position of respondent

4. Factor analysis

Factor Analysis (FA) is a statistical technique used to identify a relatively small number of factors that can be used to represent relationships among sets of many interrelated variables (Norusis, 1988). Its primary objective is data reduction and summarisation with a minimum loss of information (Kim and Mueller, 1978; Hair et al, 1987). Steps involved in conducting FA are outlined in figure 6.

Before conducting FA on each of the data categories, the variables were subjected to reliability (Item-to-total correlation and Cronbach Alpha Reliability test) and appropriateness (Barlett's Test of Sphericity and Kaiser-Meyer-Olkin Measure of Sampling Adequacy) testing to ensure quality of measurement (Rose and Sullivan, 1993). Having determined the data scales were suitable for further analysis Principal Components Analysis (PCA) was applied to determine the minimum number of factors that account for maximum data variance (Hair et al., 1987; Tabachnick and Fidell, 1998). In line with PCA, the eigenvalues technique for factor extraction was used. Using this method only those factors with eigenvalues greater than 1.0 are included in the model; these variables signify factors with variance greater than one.

The next step in the process is to calculate factor loadings, presenting the significance of each variable within the factor category. A factor loading value of + or – 0.30 is considered significant, while a factor loading of + or – 0.60 is considered very significant (Hair et al., 1987; Tabachnick and Fidell, 1998). Significance of the loading can also be used to interpret the factor thus enabling descriptions to be awarded pinpointing the underlying nature of the factor.

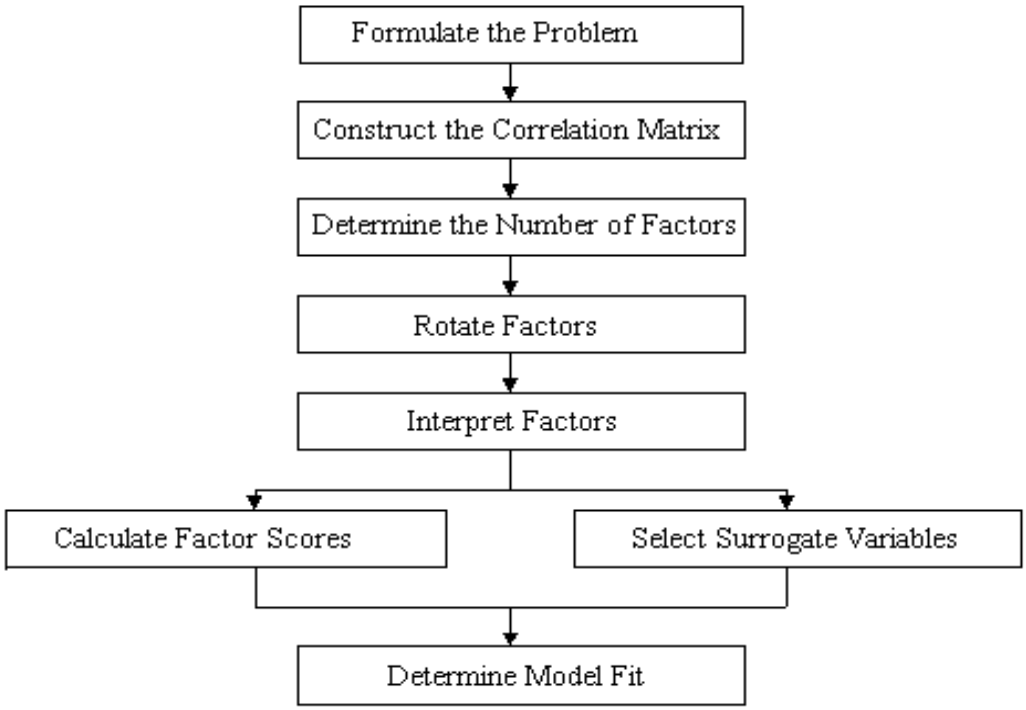

Figure 6: Conducting factor analysis (adapted from Becker and Narnett, 1987)

5. Results and discussion

This section presents the results of FA investigation. An overview of results and discussion of key factors is also included.

Organizational Climate (OC)

Originally 35 constructs were tested for reliability and appropriateness, however four failed to meet the acceptable level of 0.30 and were removed from the data scale. From the resulting 31 variables 20 were above were all above the 0.60 level. Therefore a total of 31 items of the scale meet reliability criteria and are found to be internally consistent, with an alpha of .9498.

To verify the appropriateness of the remaining variables related to organisational climate, both the Kaiser-Meyer-Olkin Measure of Sampling Adequacy and Barlett's Test of Sphericity were utilised (figure 7).

KMO and Bartlett's Test

Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		.947
Bartlett's Test of Sphericity	Approx. Chi-Square	10785.838
	Df	465
	Sig.	.000

Figure 7: Test of appropriateness for OC

Variables for organisational climate display a .947 KMO measure; this is considered a meritorious value, showing that these variables are acceptable for factor analysis. Barlett's test of Sphericity is 10785.838. This is an extremely high value, indicating that the data for organisational climate is indeed suitable for factor analysis. Using PCA, factors were extracted using the eigenvalue technique. Table 1 shows that the first six factors have eigenvalues over 1.0, therefore, all other factors will be ignored. Total variance derived from these six factors is 64.296, representing almost 65% of the total factor.

Table 1: Total variance explained for OC

Component	Initial Eigenvalues		
	Total	% of Variance	Cumulative %
1	12.925	41.693	41.693
2	2.113	6.815	48.509
3	1.541	4.969	53.478
4	1.200	3.870	57.348
5	1.128	3.637	60.986
6	1.026	3.310	64.296
7	.856	2.762	67.058

To be read as: For factor number 1 the eigenvalue is 12.925, explaining 41.693% of the variance

Following the determination that the appropriate number of factors to be extracted is six, the selection of factor loadings took place (Table 2). Loading values confirm that significance criteria of all variables has been met; 29% (n=9) of the factor loadings are rated highly significant (above 0.7). Factor descriptions are included to capture the underlying nature of the factor.

Table 2: Factor loadings – OC

Variables	Factor Loading
Factor 1 – TEAMS	
Problems/errors are openly discussed	.541
Solutions to problems are openly discussed	.573
Team members always clear about team goals	.716
Teams set up to include all necessary experience to deliver solutions	.642
Teams readily collaborate with other teams	.646
Team acknowledges when it lacks experience to reach solution	.642
Each team is open to knowledge/guidance from others	.703
Teams look to see how they can contribute to wider orgn	.690
Each team member knows when goals have been reached	.680
Factor 2 – ADOPTING NEW APPROACHES	
Orgn developed capacity for listening to members	.553
New approaches to capturing customer knowledge adopted/supported	.606
New approaches to capturing employee knowledge adopted/supported	.729
New approaches to sharing knowledge about customers adopted/supported	.765
New approaches to sharing knowledge about employee experiences adopted/supported	.741
Failure is viewed as opportunity for learning	.500
Mgmt team always clear about what it wants	.534
Factor 3 – COLLABORATION	
Orgn uses cross-functional teams	.779
Orgn uses multi-level teams	.737
Teams are clearly valued by orgn	.549
Divisions, departments, units often work on joint projects	.576
Factor 4 – EMPLOYEE WELFARE	
Orgn is apparent to newcomers/outsiders	.514
Orgn takes responsibility for welfare of employees/families	.703
Orgn ensures all employees are inducted promptly	.530
Recruitment/promotion procedures explained/supported	.610
Orgn encourages external contact with other orgns	.521
Factor 5 – INFORMAL PRACTICE	
Creative boosting techniques are encouraged	.504
Physical environment organised to facilitate info flow	.646
Informal meetings held regularly	.762
Factor 6 – ENVIRONMENT	
Risk-taking and experimentation are encouraged	.524
New employees need only few days to fit in	.668
Senior mgmt lead by example	.648

The six factors, derived from the original 31 variables, proved to be relatively easy to interpret, due to strong factor loadings. All of the factors reflect organisational culture, with particular emphasis placed on teamwork and collaborative practices. Organisations that have adopted KM seem to be open environments which foster innovation and are open to implementing new approaches. In addition these organisations respect employee emancipation and welfare, this is also evident by the encouragement of informal interactions and practice. Senior management tend to lead by example which creates an atmosphere in which new employees soon feel settled and ready to participate in flexible work practices.

Technical Climate (TC)

The next section subjected to FA was Technical Climate. To ensure data reliability item-to-total correlation and Cronbach Alpha statistical tests were employed. Four items failed to meet the acceptable level of 0.30 and were removed from the data scale leaving a total of 20 variables, with an alpha of .9183. Half the variables (n=10, 50%) were above the 0.60 level.

To verify the appropriateness of the remaining variables related to TC, both the Kaiser-Meyer-Olkin Measure of Sampling Adequacy and Barlett's Test of Sphericity were utilised (Figure 8).

KMO and Bartlett's Test

Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		.926
Bartlett's Test of Sphericity	Approx. Chi-Square	5749.636
	Df	190
	Sig.	.000

Figure 8: Test of appropriateness for TC

Variables for TC display a .926 KMO measure; this is considered a meritorious value, showing that these variables are acceptable for factor analysis. Barlett's test of Sphericity is 5749.636. This is a reasonable value, indicating that TC variables are suitable for factor analysis. Using PCA, factors were extracted using the eigenvalue technique (Table 3). Four factors have eigenvalues over 1.0, therefore, all other factors will be ignored, total variance from these four factors is 64.562. This figure represents almost 65% of the total factor.

Table 3: Total variance explained for TC

	Initial Eigenvalues		
Component	Total	% of Variance	Cumulative %
1	8.181	40.903	40.903
2	1.469	7.345	48.248
3	1.251	6.254	54.503
4	1.047	5.237	59.740
5	.953	4.763	64.503

To be read as: For factor number 1 the eigenvalue is 8.181, explaining 40.903% of the variance

Table 4 presents the results of the factor loading selection process. Loading values presented in the table confirm that significance criteria for the factor loadings, a quarter of the loadings (n=5, 25%) are rated highly significant (>0.7). Factor descriptions are included to capture the underlying nature of the factor.

Table 4: Factor loadings – TC

Variables	Factor Loading
Factor 1 – COMMUNICATION	
IT and applications developed with clear vision of business needs	.604
IT and applications designed for specific organisational problems	.634
Technology designed to help employees work more efficiently	.688
Technology designed to aid better decision making	.620

Technology is a means of enhancing collaboration	.570
Technology used to minimise geographical/time barriers	.603
SW applications designed to share info only with those who need it	.351
Priority is given to tech that serve as info bridges	.528
ICT permits employees to talk directly to one another	.653
Users of tech systems decide on their content	.630
SW applications designed to recognise/retain info	.443
Factor 2 – INNOVATION	
Senior mgmt leads by example in using tech	.572
SW applications designed to share info across whole orgn	.623
Tech systems are flexible and evolve	.714
Factor 3 – CONNECTIVITY	
ICT permits orgn members to connect directly with customers	.813
ICT permits orgn members to connect directly with suppliers	.770
All employees must contribute to content of tech systems	.628
Factor 4 – ACCESS	
Technology available to all employees	.795
All employees trained to use technologies	.838

The four factors proved to be relatively easy to interpret, due to the strong variable loadings. For successful KM, technology is used to promote communication and collaboration within the organisation. Strong connectivity between users, who are able to access computational systems to support work practice, leads to innovation and knowledge utilisation. These findings are supportive of the literature which states the key role for technology is to enable and support knowledge work (Lank 1997; Davenport and Prusak, 1998). Further information on the role of technology in knowledge-orientated organisations is presented in the next section.

Technology

To support TC findings FA was conducted on the technology data. Again item-to-total correlation and Cronbach Alpha tests were employed to ensure data reliability. Only one item failed to meet the acceptable level of 0.30 and was removed from the data scale leaving a total of 14 variables, with an alpha of .8488. Six items were above the 0.60 level (43%).

To verify the appropriateness of the remaining variables relating to technology, both the Kaiser-Meyer-Olkin Measure of Sampling Adequacy and Barlett's Test of Sphericity were utilised (Figure 9).

KMO and Bartlett's Test

Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		.888
Bartlett's Test of Sphericity	Approx. Chi-Square	9441.866
	Df	91
	Sig.	.000

Figure 9: Test of appropriateness for technology

Variables for technology display a .888 KMO measure, hence these variables are acceptable for FA. Barlett's test of Sphericity is 9441.866. This high value indicates that the dataset is highly suited to further investigation. Using PCA, factors were extracted using the eigenvalue technique (Table 5). The table shows that three factors have eigenvalues over 1.0, therefore, all other factors will be ignored. The total variance derived from these three factors is 84.018. This high figure represents almost 85% of the total factor.

Table 5: Total variance explained for technology

Component	Initial Eigenvalues		
	Total	% of Variance	Cumulative %
1	6.427	45.906	45.906
2	2.836	20.260	66.166
3	2.499	17.852	84.018
4	.682	4.869	88.886

To be read as: For factor number 1 the eigenvalue is 6.427, explaining 45.906% of the variance

Following the determination that the appropriate number of factors to be extracted is three, the selection of factor loadings took place (Table 6). Loading values presented in the table confirm that all factor loadings are at the higher level of above 0.7. Descriptions capture the underlying nature of the factor.

Table 6: Factor loadings – technology

Variables	Factor Loading
Factor 1 – KNOWLEDGE ROLES	
Chief Knowledge Officer	.923
Chief Information Officer	.929
Chief Learning Officer	.951
Community of Practice Co-ordinator	.939
Knowledge Author	.928
Knowledge Broker	.934
Web Master	.930
Factor 2 – TRAINING	
Training provided technology 1	.740
Training provided technology 2	.840
Training provided technology 3	.828
Training provided technology 4	.730
Factor 3 – TRAINING LOCATION	
Internal	.845
In-house	.856
External	.838

Interpreting the factor loadings is relatively easy. Factor one refers to key knowledge roles which exist within organisations for KM implementation, while factors two and three refer to technological training. Factor three shows the location in which training normally occurs while factor 2 outlines that training is usually awarded to four main technologies, namely, Internet, Office Automation Systems, Intranet and Extranet.

Information

Information was the next section subjected to FA. A total of 18 items were included in the final scale with an alpha of .9174, four were removed following reliability tests (<0.30). 10 items were above the 0.60 level (55%). To verify the appropriateness of the remaining variables relating to information, both the Kaiser-Meyer-Olkin Measure of Sampling Adequacy and Barlett's Test of Sphericity were utilised (Figure 10).

KMO and Bartlett's Test

Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		.926
Bartlett's Test of Sphericity	Approx. Chi-Square	5227.896
	Df	153
	Sig.	.000

Figure 10: Test of appropriateness for information

Variables for information display a .926 KMO measure, these variables are acceptable for factor analysis. Barlett's test of Sphericity is 5227.896. This is a high value, indicating that the information dataset is suitable for FA. Using PCA, factors extracted using the eigenvalue technique are shown in Table 7. Total variance from the three selected factors is 58.790, almost 60% of the total factor.

Table 7: Total variance explained for information

	Initial Eigenvalues		
Component	Total	% of Variance	Cumulative %
1	7.656	42.534	42.534
2	1.885	10.473	53.008
3	1.041	5.783	58.790
4	.974	5.411	64.201

To be read as: For factor number 1 the eigenvalue is 7.656, explaining 42.534% of the variance

Selection of factor loadings on the three extracted variables is shown in Table 8. Loading values confirm that significance criteria for the factor loadings of all the variables have been met; 39% (n=7) of the factor loadings are rated highly significant (>0.7). Descriptions capture the underlying nature of the factor.

Table 8: Factor loadings – information

Variables	Factor Loading
Factor 1 - INFORMATION FLOW	
Information flows easily	.732
Structure of organisation aids information flow	.740
Information hoarding is discouraged	.662
Employees are encouraged to own information	.663
Employees determine action steps from information	.786
Information capture crosses functional boundaries	.796
Information reaches decision makers in timely fashion	.448*
Factor 2 – INFORMATION SYSTEMS	
Information from remote sites is quickly incorporated into organisational systems	.464
New information is quickly analysed	.496
Each employee is aware of database contents	.749
Organisation systems tailored to information needs of employees	.690
Organisation maps information repositories	.826
Each employee is able to access relevant information easily	.571
Employees able to locate relevant information from remote locations	.486
Factor 3 – INFORMATION CAPTURE	
Employees gather customer information for product development	.463
Customer information is shared across organisation	.556
Information is rapidly captured and used	.548
Information reaches decision makers in timely fashion	.448*
Employees encouraged to use external information sources	.820

* This variable falls equally into two factors.

A key element for KM implementation and development in organisations is information flow. Davenport and Prusak, (1998) outline that it is crucial that people have access to 'the right information in the right format at the right time'. To ensure that this happens systems must facilitate the capture and dissemination of information throughout the organisation, this information may be obtained from both internal and external sources. One element to be considered in ensuring accurate information systems is that of content management. Responsibility must be taken to ensure that information sources are up-to-date and relevant, preventing databases and other storage mechanisms from becoming static repositories of obsolete data.

People

People was subjected to FA in a similar process as before. Only two items failed to meet the acceptable reliability level of 0.30 leaving a total of 21 variables, with an alpha of .9322. 12 scale items are above the 0.60 level (57%). To verify the appropriateness of the remaining variables relating to information, both the Kaiser-Meyer-Olkin Measure of Sampling Adequacy and Barlett's Test of Sphericity were utilised (Figure 11).

KMO and Bartlett's Test

Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		.935
Bartlett's Test of Sphericity	Approx. Chi-Square	7235.064
	Df	210
	Sig.	.000

Figure 11: Test of appropriateness for people

Variables for people display a .935 KMO measure; a meritorious value, showing that these variables are acceptable for FA. Barlett's test of Sphericity is 7235.064. This high value indicates the people data is suitable for FA. Using PCA, factors extracted using the eigenvalue technique are shown in Table 9. Only two factors have eigenvalues over 1.0, therefore, all others are ignored. Total variance derived from these two factors is 53.925, almost 54% of the total factor.

Table 9: Total variance explained for people

	Initial Eigenvalues		
Component	Total	% of Variance	Cumulative %
1	8.998	42.849	42.849
2	2.326	11.075	53.925
3	.998	4.751	58.675

To be read as: For factor number 1 the eigenvalue is 8.998, explaining 42.849% of the variance

Table 10 presents the results of the factor loading selection process on the two extracted variables. Loading values confirm that significance criteria for all variables have been met; 55% (n=10) of the factor loadings are rated highly significant (>0.7). Descriptions capture the underlying nature of the factor.

Table 10: Factor loadings – people

Variables	Factor Loading
Factor 1 – EMPLOYEE EMANCIPATION	
Employees are able to change their minds without losing face	.481
Employees given time, resources, support to pursue new ideas	.702
Employees from various units frequently volunteer to help each other	.477
Employees share common way of talking/thinking about issues	.479
Employees have freedom to adopt own approaches to workload	.531
Employees able to use skills/capabilities to full	.589
Employees in position to freely express disagreement with senior mgmt	.729
Employees have confidence that orgn is progressing	.611
Employees can influence orgn event/future plans	.816
Employees feel that are surrounded by people who co-operate	.660
Every team member gets something they personally value from membership	.582
Employees know they will receive recognition for achievement	.782
Employees acknowledge access to latest tech	.640
Factor 2 – WORKING PRACTICES	
Employees participate in cross-functional teams	.776
Employees routinely share ideas	.726
Employees routinely share tech tools	.592
Employees within same unit frequently volunteer to help each other	.735

Variables	Factor Loading
Employees believe best results are gained through teamwork	.810
Employees know what teams they are in	.885
Employees know who other team members are	.891
Individuals move easily from team to team	.481

As all variables slotted easily into two factors the interpretations of each are self explanatory. Factor one outlines that employee emancipation is key to successful KM implementation. Knowledge workers need to have flexibility and freedom to conduct their work according to their own intelligence, experience and initiative. Safe in the knowledge that they are supported by technology, information infrastructure and colleagues (teamwork and collaboration are key), knowledge workers will be innovative, creative and forward planning benefitting both themselves and the organisation. This is reflected in factor two, work practices. Bontis and Fitz-enz, (2002) suggest that human elements are regarded as key determinants of both business performance and the management of change. Hence, for successful KM people must feel valued as being central to KM activity within organisations. This view is supported by several other factors such as confidence, freedom, choice, and flexibility.

Key Findings

Key findings are summarised in table 11 below. There were a range of methods employed to test the findings, this gives confidence in the results via research triangulation and confirms that the research methodology is robust.

Table 11: Key findings overview

Element	Key Findings	Method
Macro-Environment (Me)	KM is influenced by organisational factors and in contrast organisations are receptive to influences beyond their boundaries. Changes in the macro-environment tend to affect both organisational climate and the internal technical climate of an organisation. This in turn has a knock on effect for KM adoption and implementation practice. While no direct relationship exists between the macro-environment and KM, statistical results have shown that KM is still affected by macro-environmental factors within an organisational context. The current economic climate is having a big impact on KM adoption.	Literature review Benchmarking KM survey tool Data Analysis – Factor Analysis
Organisation Climate Culture (C)	Organisations adopting KM have environments and cultures which foster innovation and are open to implementing new approaches. Knowledge orientated organisations respect employee emancipation and welfare, encouraging informal interactions and practice. Senior management tend to lead by example which creates an atmosphere in which new employees soon feel settled and ready to participate in flexible work practices	Literature review Benchmarking KM survey tool Data Analysis – Factor Analysis
Technical Climate Technology (T)	Technology is used to promote communication and collaboration within knowledge organisations. Strong connectivity between users, who are able to access computational systems to support work practice, leads to innovation and knowledge utilisation. Organisations excelling in KM have created dedicated knowledge roles, such as Chief Learning Officer, Community of Practice Co-ordinator and Knowledge Broker. Technological tools can be classified into three categories, namely, intelligent tools, support tools and web-based tools. The four most popular tools for knowledge work are the Internet, Office Automation Systems, Intranet and Extranet. Not surprisingly these are the tools on which organisations tend to be focusing training	Literature review Benchmarking KM survey tool Data Analysis – Factor Analysis
Information (I)	To ensure that people have access to *'the right knowledge in the right format at the right time'* systems must exist to facilitate the capture and dissemination of information, obtained from both internal and external sources, throughout the organisation. Responsibility must be taken	Literature review Benchmarking KM survey tool Data Analysis – Factor Analysis

	to ensure that information sources are up-to-date, accurate and relevant, preventing databases and other storage mechanisms from becoming static repositories of obsolete data	
Element	Key Findings	Method
People (P)	Employee emancipation is key to successful KM implementation. Knowledge workers need to have the flexibility and freedom to conduct their work according to their own intelligence, experience and initiative. Safe in the knowledge that they are supported by colleagues (teamwork and collaboration are key), technology and information infrastructure, knowledge workers will be innovative, creative and forward planning for the benefits of both themselves and the organisation. Hence, for successful KM implementation people must feel valued as being central to KM implementation by organizations. This view is supported by several other factors across each sector such as confidence, freedom, choice, and flexibility	Literature review Benchmarking KM survey tool Data Analysis – Factor Analysis

6. Conclusion

This paper presents the results of empirical research undertaken in early 2009 with 588 UK companies, applying the MeCTIP model and 'Benchmarking KM' online survey tool. In particular the paper focused on the research methodology and initial data analysis results. Findings from the research indicate that five key elements must be considered by organisations seeking to implement successful KM programmes. Two of these relate to the infrastructure of the organisation in terms of culture and technical infrastructure (Organisation Climate, Technical Climate) while three relate to process orientated activity for information, technology application and human expertise. The findings from this paper are supportive of current literature.

As this project is part of an ongoing research initiative the results presented in this paper will be further developed. Having identified key factors, tabulation of factor scores can be calculated to ascertain model fit of the data. Structural equation modelling and regression modelling are also planned. Results from the entire data analysis process will enable the creation of a knowledge taxonomy. At least one organisation from each stage of the taxonomy will be identified for further research activity in terms of KM cases. It is anticipated the full set of results will be available in Autumn 2009.

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