Comparing Knowledge Management between Organisations: Searching for Good Practice

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Abstract
This paper reports ongoing work that is attempting to find out 'what is good practice for knowledge management'. The data we have to analyse this issue is 109 maps of knowledge (on knowledge management) which were built during 18 group workshops with 152 people from 15 different organisations. The maps contain data on the aspirations and action plans which UK managers have to improve knowledge management practices in their organisation. So far we have attempted a number of approaches to analysing this data, both inductive and deductive, but we still feel there is more to be learned from the rich data set we have. The paper presents a flavour of the work we have done, have considered doing, and have resisted doing. The aim of the paper is to stimulate debate on the strengths of our analyses and, more importantly, on amassing views of how it can be further strengthened, and the difficulties and dilemmas which might need to be overcome.

Keywords: knowledge management, facilitation, group decision support, group maps, good practice, knowledge management life cycle

Introduction

One of the things that appears to be widely taken for granted in knowledge management (KM), as in many other fields, is that there is a strand running from research into practice involving the identification and transfer of best practice, or at least good practice. The whole activity of knowledge sharing or transfer is generally seen as one key element of knowledge management (see for example Davenport and Prusak, 1998). Hence it could be argued that one of the activities of managing knowledge in an organisation is to identify good practice and build mechanisms that enable this good practice to be adopted more widely.

It is, however, accepted that knowledge management is highly context-dependent, and that knowledge management preferences and approaches can therefore be highly variable between organisations and over time. Scarbrough et al (1999) termed this *relatively transient*, i.e. changing at different times, even within the same organisation.

Thus the challenge is not so much finding good practice, but identifying what it is about the practice that makes it good, and whether that is potentially transferable from one context to another. For example, good knowledge management practice in one organisation at a given time might be based on the use of an Intranet or the holding of "after action reviews". Yet this level of detail is not sufficient to make it identifiable as *transferable* good practice. There are many examples of organisations with poorly functioning Intranets as testament to this.

To illustrate the difficulty of identifying good practice at anything other than the broadest levels, we consider a recent research project. It involved finding out what good practice staff in UK organisations thought should be in their organisation's knowledge management strategy.

The paper has the following structure. We begin with a discussion of the literature on best practice and one approach which is reported for exploring causal maps. This will lead to a description of the workshop methodology for building maps (the maps which we believe

contain details on best practice). We then review the considered, dismissed and attempted approaches used to analyse the maps. We conclude with an appeal for options for analysing this data set further.

Best practice for knowledge management

It is generally accepted that managing knowledge effectively requires a strategic link. For example, Bartholomew and Adler (1996) have examined the relationship between globalisation and knowledge. Their work applies Bartlett and Ghoshal's (1995) strategic response model. In this, an organisation works its way from a home market through international, multinational and global perspectives, to the emergence of a "transnational" response, in which the organisation attempts to manage and respond at both a local and global level simultaneously.

In addition to this "top down" strategic imperative, KM also requires a "bottom up" willingness to share knowledge and to learn. Forrester (2000) studied the impact of knowledge and learning at the shopfloor level. She found a central distinction between individual and collective knowledge. For example, the dominance of knowledge as an individual preserve within American and Swedish automotive manufacturing organisations contrasts with its role as a collective property in Japanese based organisations. This illustrates different manifestations of a continuum for KM described by Scarbrough (1996). At one extreme is the view that knowledge is something acquired by individuals through learning; at the other, the view of knowledge as a "rational", diffuse and collective phenomenon.

Good practice in KM is, therefore, concerned not only with knowledge creation or acquisition, but also with the internalisation of the knowledge and its eventual application. Those seeking good practice in managing knowledge are not helped by the lack of a generally agreed taxonomy of KM stages and processes. We have discussed this in more detail elsewhere (Edwards, Collier and Shaw, 2003). Several different dimensions of managing knowledge also need to be considered. Among these are content, strategic context, people, value and technology.

Content and strategic context are linked (Holsapple and Joshi, 1999). By strategic context we mean a view of knowledge in terms of the structures, culture, vision and strategy of the organisation. The people dimension will be seen as the most important of all by those who regard knowledge as essentially a property of the knower. However, not only can this be individual or collective, as mentioned above, it can also be short-term, as with what Pasmore (1994) called "temporary concentrations of expertise".

Considering the value dimension, Sena and Shani (1999) identified a range of value adding processes at each stage in KM process. They argue that the effectiveness of different KM strategies requires an understanding of the different resources (financial, material, knowledge and human) available to the organisation. Wiig (1999) reinforces this, arguing that knowledge is a "fundamental factor behind all of the enterprise's activities", whose systematic exploitation depends both on the competitive quality of the knowledge, and on its effective application.

KM practices require support from appropriate information technology, particularly in the storage and dissemination of knowledge. As Davenport and Prusak (1998) point out, the technology must come third in emphasis after the human and organisational issues. Kidd and Edwards (2000) have argued that, while there are many differences between national cultures that are important for KM, reaction to the use of IT support for KM may depend more on the

prevailing *industry* culture. KM initiatives in organisations such as Shell have so far been most successful in more technical domains; see David (1998).

Taken together, we see that the elements going to make up good KM practice, even for potential transfer within an organisation, are wide-ranging, complex and form a fluid mix. We believe that our research approach can surface these elements, but the complexity of the analysis raises problems.

Existing approaches

There are a few documented studies that explore the concepts and links in cognitive or group maps. Some concentrate on exploring the intrinsic properties of the maps adopting a very structural view of the map – for example, the number of concepts, the number of in/out arrows (Eden and Ackermann, 1998a; Henderson et al, 1998). Others focus on the content of the concepts – for example, exploring the range of issues considered (Shaw, 2003).

There are also studies which attempt to understand the depth of a particular issue through mapping. For example, Jenkins and Johnson (1997) perform individual interviews with managers to capture their individual perspectives in cognitive maps. They then analyse the structure of these cognitive maps to understand how this relates to organisational performance. Their analyses include a deductive approach and an inductive approach. With the aim of exploring the inter-connectedness of the interviewee's cognition, the deductive approach calculated: link to node ratio; proportion of clusters indicating fragmented or holistic cognition; chain length of the arguments in the map. The inductive approach aimed to "clarify emergent issues from the elicited maps" (p83) using an iterative approach of "develop[ing] observations on the basis of emergent contrasts between elicited maps". The objective of their inductive approach was to "generate a series of observations or propositions, in order to clarify the potential implications of the elicited maps".

However, Jenkins and Johnson's approach to analysing the maps may need to differ from ours as they focus on the connection between cognition (captured through cognitive maps) and performance. Also, our data differs in terms of it being captured from a group, not individual interviews as in their case. They also report entering the individual interviews with a pre-determined list of core issues from which the participants could select those which were important to them and their organisation. These core issues might have informed their inductive analysis (although they do not report this being the case). We had no such clear pre-determined core list, although we did have a loose structure to the workshop (which, despite being adapted by the participants, could inform the analyses).

Our study aimed to understand the components of knowledge management which contribute to best practice. Therefore the participants have to share, define, develop, negotiate and integrate their perspectives of knowledge management in their organisation into the *group* map. The lack of studies analysing the properties of *group* maps requires us to develop appropriate analytical techniques, based on those used to analyse individual maps.

The workshop methodology for building maps

The workshops were computer-supported allowing participants to share their views with the group by typing them into a computer which is running a brainstorming-type software for cognitive mapping (called Group Explorer). Often this was done in pairs to encourage participants to discuss the issues before typing them in, and begin negotiating the issues with the partner from the outset. The brainstormed views were captured in a database, projected in

map form onto a public screen and used by the group members to stimulate divergent, creative thinking.

A map, as referred to here, is essentially a cognitive map for a group. In our case the maps were built in Decision Explorer (DE) software, purpose built software which can be used with a group when mapping group knowledge. The DE map displays the views that the group members have shared about an issue during an electronic brainstorm (see Figure 1 for an example of a map). The concepts (the shared views) are structured by group members identifying relationships between the concepts. If a relationship exists (e.g. 'conduct after action reviews' is one way to 'evaluate our knowledge management strategy') then this is represented on the map by an arrow between the concepts.

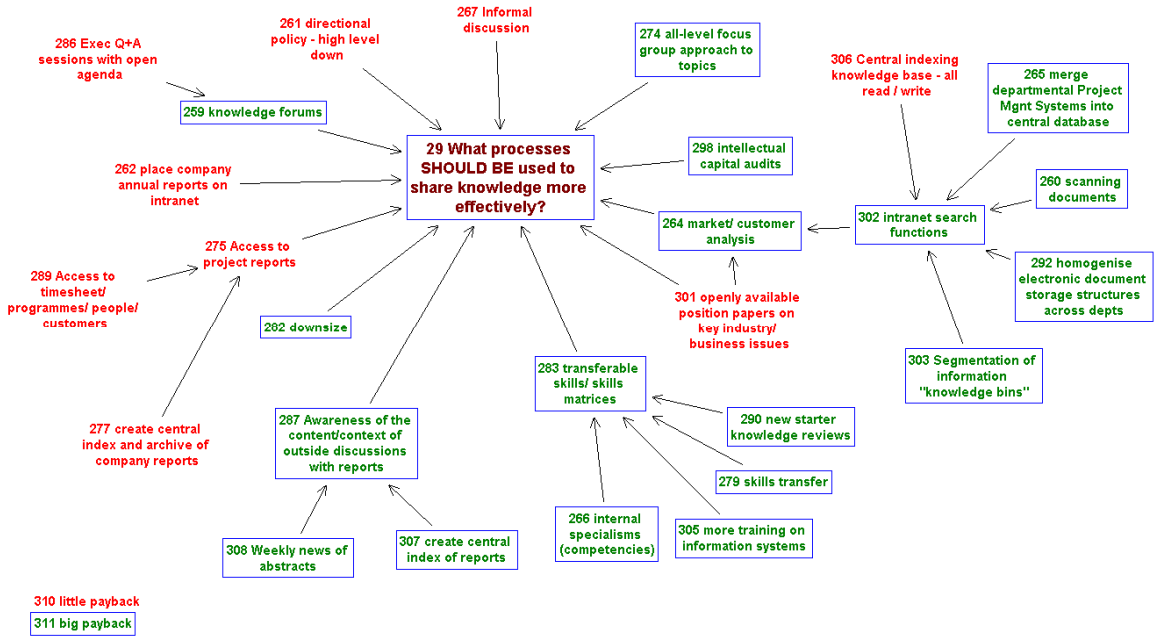

Figure 1: An extract from one of the maps.

The map is used to manage the complexity of the situation. Through graphically illustrating the issues, and the relationships between the issues, the group are sharing, building, expanding, connecting and aligning their multiple, and perhaps competing, perspectives of the situation. This is done in pursuit of generating a shared understanding which accommodates enough of the competing perspectives to have the agreement of all the participants. Through exploring the relationships between the issues, the group members can appreciate the widest range of drivers of change and consequences of action. Essentially through the map the group can identify the actions to be performed to achieve goals as well as the enablers and barriers of those actions. Thus the group can identify important components of their knowledge management strategy.

These maps can be extremely complex, typically containing up to 100 interlinked concepts (the main limitations on the number being projector technology and font size).

For the workshop, the maps serve as an effective tool for the participants to talk around, focus their discussion on and to record what was discussed and agreed. For research, the maps are an accurate record of the issues discussed and provide detailed data which can be analysed post-workshop.

Analysing the maps

Available to us are 109 maps (each including between 30-110 concepts) built by the participants in the group electronic mapping workshops of issues they thought were relevant to their organisation's knowledge management practices. During this project we involved 152 people from 15 different organisations in 18 workshops, providing an incredibly rich data set.

The analysis of the maps aimed to move us towards meeting the project objectives "to identify existing best practice and ascertain the difference between existing and proposed practice". Through analysing these maps our intention is to generate a theoretical model which explores what is transferable good practice for knowledge management.

As described above, the maps are built so as to detail the potential actions to be implemented in pursuit of achieving particular goals, hence it seems reasonable that they could be analysed to identify best practice in this area. Furthermore, they are models built and agreed on by the participants, and which contain actions and goals which staff identified as being good practice for their own organisation's knowledge management strategy. However, analysing the maps is by no means straightforward, as each map has a unique structure and a rich underlying context which makes comparison problematic. It is further complicated by the lack of any proven methods for analysing the *content* of the research data contained in the maps. Analysis also needs to be done in the realisation of the imperfect nature of the structure of the maps as research data. As Shaw et al (*forthcoming*) commented "Real-world strategy workshops are not exhaustive in their attempt to create 'perfect' maps, and so there are often instances where links may appear 'incorrect' or where 'obvious' links are missing.", a finding supported by Jenkins and Johnson (1997). Consequently analyses of the structure of maps must be done whilst being mindful of issues of validity.

This section will review a range of approaches we have used (or considered using) to date for searching the content of the maps for good knowledge management practice. The approaches considered were: visual comparison; counting concepts; third party analyses; NUD*IST type analyses; clustering using the DE algorithms and analysis functions.

Visual comparison – an inductive approach

This approach is akin to the inductive approach which Jenkins and Johnson (1997) report – exploring the emergent issues in the maps. We began an inductive analysis of the maps by visually comparing maps from two organisations. This interrogation aimed to compare (1) the overall structure of the maps, and (2) the clusters of concepts which the participants had built, in terms of content, size, interlinks between concepts. It soon became clear that maps from different organisations – even those in the same industry sector – were themselves wildly different.

We did not attempt to identify where clusters existed by moving concepts into clusters according (purely) to meaning/content of the concept and their links/inter-relationships with other concepts. We have attempted that work before (Shaw, 2001) and found that the shape of the clusters and their boundaries continually changed as more thought was put into the clusters (and as time passed). Shaw was unable to develop robust clusters in which he could

be confident, as concepts could often seem appropriate to include in a number of clusters according to their links.

We did however explore the overall structure of the maps by visual examination, while also being mindful of the imperfect nature of the structure of the maps as research data. Essentially we wanted to see if the participants had been very different in terms of how they structured concepts. However, considering the same facilitator had assisted the group (and that the workshops followed a similar agenda/structure), it is not unsurprising that no major differences between the maps could be found (Shaw, 2003).

In terms of the clusters, we began examining the participant-built clusters which were made during the group workshops. From this we were able to locate similar types of clusters across the maps. Sometimes these clusters were well developed; other times they were sparse. However, from our knowledge of the workshops and the discussion, we also were aware that there was no consistency as to what this meant. Clusters could be sparse because: the group members all knew what was meant and did not need to discuss the issues at length; time pressures of the workshop dictated that the discussion on that issue be kept short, limiting divergence to critical issues which would be captured in the map; the topic was on the periphery of the issue at hand. Furthermore, clusters could be well-developed because: lots of people thought it was important and shared views on it; the facilitator directed the participants to the cluster, consequently having more concepts; it represented an issue on which there was much uncertainty and the participants were trying to understand that complexity by sharing diverse views.

We found that through this method we could not (with confidence and rigour) identify consistencies by visually comparing the maps. This suggested that the maps were even more context dependent than we had realised, and we began to consider a possibility that they could not provide insight into the detail of good practice and its transferability between organisations.

Counting concepts

Counting concepts was done by the researchers building frameworks for analysing the maps and counting the number of concepts which fitted into those categories. Despite the frameworks being informed by the theories of knowledge management and general management (and by our learning from the visual comparison of the maps), we were very concerned, methodologically, about such an approach. This concern centred on forcing the concepts into categories in the frameworks and on the interpretation of the results (for example, for the same reasons as those discussed above, we could not be confident as to what a high count or a low count might indicate).

Frameworks were developed for categorising the concepts from the four sessions. Session 1, which posed the question, ‘What knowledge informs your business?’ required two frameworks. The first, focussed on functional knowledge: strategy; market, including customer information and benchmarking; finance; people; operations including product; technology; other, for example, partners and regulations. The second focussed on the channels or mechanisms for this knowledge: people (knowledge in, rather than about); technology; systems; documents.

Sessions 2 and 3 posed the question, “What processes are we currently/should we be using to harness this knowledge?” The framework for these two sessions focussed on the

oral/written/electronic delivery of the communication and its formality/informality. The framework consisted of: oral, formal; oral, informal; written, formal; written, informal; electronic, formal; electronic, informal; experiential; other.

Session 4 posed the question, "How should we measure the benefits of knowledge management?" The framework focussed on: internal management (including more informed employees); workforce (morale, training etc); financial aspect; quality, and customer interface; KPI; internal and external esteem; time; productivity.

On completing this work we were able to graphically represent the proportion of concepts which fitted into each category (see Figure 2 as an example).

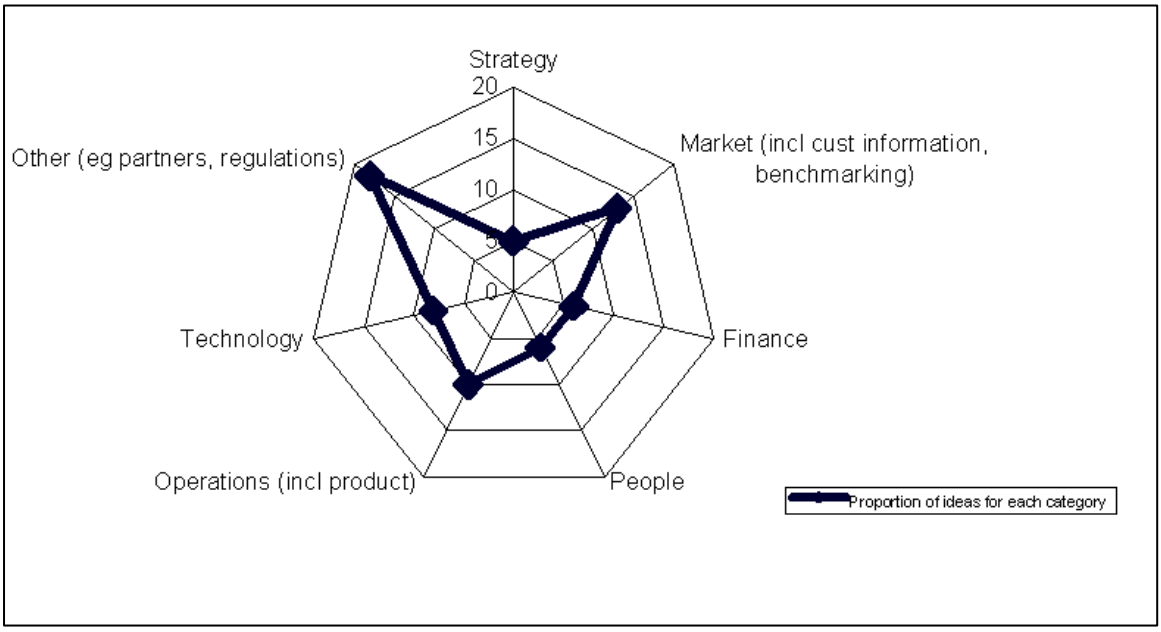

Figure 2: Counting concepts from Session 1, "What knowledge informs your business?"

However the product of this work was unsatisfying as we still recognise that there is so much more insight contained in the maps which can be elicited.

Third party analyses

We asked an "independent" third party to cluster the concepts in the maps. By "independent" we mean a person who was familiar with maps, and with workshops, but who did not attend the workshops and had no prior knowledge of the project. We recognised that this third party did not have the context of the concept/maps in the same way as the researchers did. We did however, provide him with the names of the companies (for background and to make the maps a little more meaningful) and the structure of the workshops (so he could understand what the maps were that he was looking at).

We gave him an open remit – to cluster the concepts – and did not tell him how to do it. He began visually comparing maps and clustering the concepts through emergent clustering based on the content of the concepts (i.e. not using a pre-determined framework) (similar to Jenkins and Johnson, 1997). This was an approach which we had considered and dismissed as being too time consuming for the tight deadline we had.

His emergent clustering meant that each map had a unique set of clusters, making comparison across maps problematic. This work was incredibly time consuming given that a new framework had to be developed for each map. Adding to this time consumption was the need for a day (or so) break between the coding of each map – to prevent the same framework being recalled from the previous map rather than emerging from the content itself.

Due to time and budget constraints this work was not completed. We are however becoming more convinced that an extension to this initial work can provide us with a range of knowledge management strategies, as we will discuss below.

NUD*IST type analyses

In a discussion of NUD*IST and other similar packages (eg QSR NVivo) the developers of the Decision Explorer software, Eden and Ackermann (1998a) comment that they are "inadequately simplistic and misses the most important aspects of exploring cognition" (p 197).

However, the concepts in a DE map can be exported to, and analysed in, NUD*IST and we believe such analysis might return some fruitful results, for two reasons.

First, the maps were built by 152 people and in communicating similar issues each person will use a different language and mode of expression which is appropriate for them in their culture and organisation. This is the same as in any series of interviews or open ended questionnaire returns (for which NUD*IST is ideally suited). It would appear therefore that this analysis is not doomed from the outset.

Second, underpinning each issue will be a context of preference, history and intention which cannot be captured in the concepts but which the researchers will have some appreciation of because they were in the workshop where these were discussed. Comparing the constructs in the maps must be done sensitively and in parallel with the context of the workshop. Hence it might be necessary to perform this analysis in triangulation with a more human interpretation approach where a researcher (who was at the workshop and understands the underlying issues) can see the subtle construction of meaning, context, history and intention which underpins the concepts. It might be that NUD*IST can offer some triangulation of the earlier analyses.

Clustering contributions using DE algorithms

We considered whether the software package in which the maps were built, Decision Explorer, could provide a consistent approach to analysing the structure of the concepts. DE has several analysis functions which enable a researcher to 'slice and dice' a map in many ways - one such function is the clustering algorithm (Eden and Ackermann, 1998a). This approach is more akin to that which Jenkins and Johnson (1997) used in their deductive analysis of their maps.

DE's cluster function identifies those clusters which the map is calculated to contain. The clustering algorithm does this by analysing the similarity of links between contributions and chunking the map into "mutually exclusive topic areas" (Banxia Software, 1997a, Page 53). The analyst can nominate a target size so that each cluster has in it approximately the target number of contributions (Banxia Software, 1997b).

However, the clustering algorithm that DE offers relies wholly on the accuracy of links between concepts. Considering the concerns discussed above over the exhaustive accuracy of links in strategy making group maps (see also Shaw (2001) for more on the accuracy of links in group maps), we do not have good enough data for the analysis functions within DE to make accurate calculations. This is because the maps were built to help the group make a decision on how to improve knowledge management. Therefore the maps contain strategies for good practice in knowledge management, but (for analysis purposes) they do not contain exhaustively linked data to which DE algorithms can be reliably applied.

We do not suggest that all analysis of group maps using the DE algorithms is futile (for example, that performed by, Marchant (1997)). The maps might be built for that purpose and contain more rigorously linked concepts, in fact they might be exhaustively linked. The application these analysis functions are typically used for is to get a general flavour of which concepts have significant impact on the structure of the map – "The analysis of the maps is not intended to be anything other than a guide to exploring the properties of the map" (Eden and Ackermann, 1998b, Page 423), and for that purpose DE's analysis functions might be powerful.

It might be worthwhile experimenting with the DE algorithms, even if it is just to triangulate findings with other approaches.

Future directions for identifying transferable practice

The work detailed above has moved us towards designing an approach for analysing the maps with more thoughtfulness, criticality and rigour. That approach combines emergent clustering with mapping of the resultant clusters in order to identify what the components of a knowledge management strategy are. Relating this to the theory on the topic should enable lessons for best practice to emerge.

To illustrate the proposed process, let us use Session 4 as an example, "How should we measure the benefits of knowledge management?" We can take each Session 4 map from each of the workshops with the 15 organisations. Through emergent clustering of that material we will identify the full range of measures which the groups felt were appropriate for their organisation (let us assume there are 10 measures for each organisation). We will then enter those measures (assuming 150 measures) into Decision Explorer software. They will be entered in such a way that we can identify the measures from the same organisations (i.e. by them all using the same font, which is different to the font from other organisations). We can then cluster those 150 measures into content-related themes.

Through clustering we will identify measures which a number of organisations think are important, which will provide insight to the amount of agreement on the central nature of some of the measures (for example, "income" might be expected to feature in the measures of many organisations). Clustering will also help identify measures which are particular to one or two organisation, maybe organisations in a particular industry. From the clusters we will aim to identify measures which are complementary to each other and which (when measured) can form a coherent attempt to measure an issue. This will lead to super-ordinate measures, and sub-ordinate measures: for example (as illustrated in Figure 3), in order to measure 'the provision of customers service' there is a need to measure 'response time to complaints' and maybe 'satisfaction level of customers'. Furthermore, by measuring the 'satisfaction level of customers' you might also be able to measure aspects of 'the effectiveness of service level agreements'.

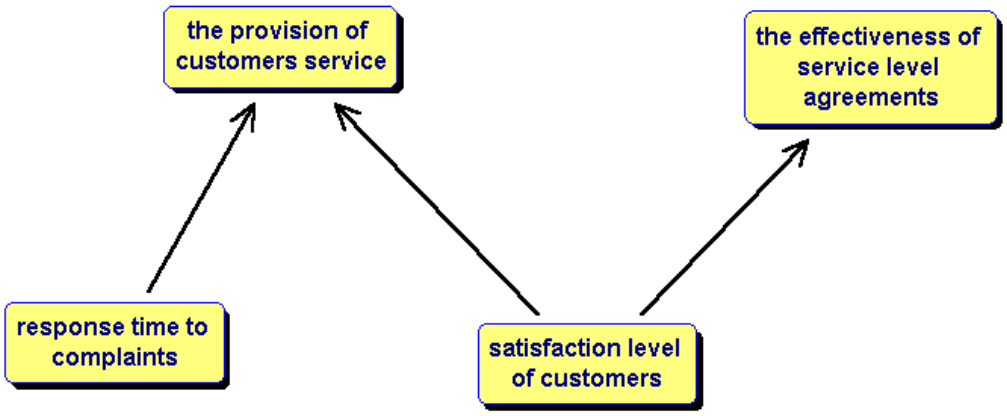

Figure 3: Extract from a hypothetical hierarchy of measures

Through this process we can build a hierarchy of measures, and gain insight into their inter-connectivity. Consequently, if the organisation had limited resources to deploy then (all other things being equal) we might be advised to measure 'satisfaction level of customers' as it will provide insight into both 'the provision of customers service' and 'the effectiveness of service level agreements'.

A similar process can be applied to the maps for Sessions 2 and 3, on "What processes are we currently (or should be) using to harness this knowledge?"

The process can also be carried out for Session 1, 'What knowledge informs your business?' but not with the aim of identifying best practice. Rather, the aim will be to identify what knowledge informs organisations. This work might document a more comprehensive view on this than is currently available.

The process suggested here is one that might identify practices for knowledge management, but it will not identify best practices or even good practices as these are context dependent. It might help us to identify complementary practices which should be deployed simultaneously (or in series) in order to reap maximum benefit. For guidance on best practice we will validate and expand this model in the literature and theory on knowledge management.

Conclusions

We have outlined a programme of work which, so far, has failed to help in identifying good and transferable knowledge management practice. We have made suggestions for future work as we still believe that the maps are able to inform the construction of a theoretical model on good practice in knowledge management. However, we are ever more aware that how the maps are eventually analysed might have considerable influence on the shape of that model. This reinforces the importance of developing rigorous methods for analysing the maps. This work is ongoing, and we hope that conference delegates will be able to contribute to the development of these methods.

Acknowledgement

This research was funded by CIMA, the Chartered Institute of Management Accountants in the UK.

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