

## The Development of a KIM Behavioural Framework to support Knowledge Transfer in the Defence Sector - a Case Study Approach

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**Abstract** - A framework is presented for investigating and understanding human behaviour connected with Knowledge and Information Management (KIM), developed from case studies in Defence Sector organizations. The research showed that particular areas of sensitivity leading to resistance to change when KIM systems are introduced include the lack of usability of KIM IT systems, the length of time required to learn how to use them, their perceived lack of reliability and the users' consequent lack of trust in them. These issues lead to the widespread use of 'work arounds' to cope with the demands of the job without using the KIM systems as designed. The framework's purpose is to indicate how organizations can best approach and implement required KIM changes, taking these issues into account.

**Key words** - Absorptive capacity, behavioural change, knowledge management, managing change, public sector management

### I. INTRODUCTION

#### A. Background

It is axiomatic that knowledge sharing has many benefits for organisations and individuals alike. Many support the view that knowledge sharing is a key contributor to organizational success and is the major process in knowledge management (KM) [1]–[3]. However, knowledge sharing can be perceived as difficult mainly due to the complex interactions between organisations and individuals which are affected by human factors as well technical imperatives [4]. Furthermore, the successful management of change it is argued here, plays a major part in the success or failure of maintaining the synergy between the individual and the organisation within the KIM milieu. Given that the study of human factors in relation to KM is relatively new, and in particular, there are few studies or organisational procedures that provide practitioners on how to support knowledge sharing [4]–[6], this study is prescient.

This research also builds on previous studies examining the KM problems and technology adoption difficulties drawn from experts' practices embedded in their work context [7], [8]. This is associated with what [9] termed, the 'dynamic of KM' involving knowledge *creation, capture and transfer* in organisations. It further develops on the work of, for example, [10]–[13], which

addressed questions about the dissemination of knowledge, locating knowledge holders and exploiting existing knowledge. Two pertinent issues arise from these studies. Firstly, little consideration is given to knowledge attributes when analysing KM problems [12]. Secondly, and more pertinently for this research, although previous studies have examined mainly how knowledge barriers can be mitigated to achieve better technology acceptance they are generally insensitive to exploring how work contexts may affect KM problems [10], [14]. This research was planned to circumvent previous research which appears to treat knowledge barriers as universal; and acknowledges that different expert groups may adopt different types of knowledge within different contexts [15]–[17]. Knowledge in such contexts may reside in physical processes, social communities and industrial settings [18], [19]. Finally, this research provides a heuristic framework to support how organisations can best approach and implement required KIM changes in the future.

### II. KIM IN THE DEFENCE SECTOR

The management of information and knowledge in the defence sector stands at an interesting juncture. Key dilemmas facing the defence sector are on one hand, identifying and effectively using the increasing potential of technical interoperability; on the other hand, the need for new management practices juxtaposed with the escalating global challenge to security to counteract the rise of emerging threats [9]. As a consequence, governments are increasingly identifying their digital infrastructure as a strategic national asset that also needs to be better protected. The Authors argue that such threats to the defence sector challenge existing paradigms for managing information and knowledge and suggests a more radical approach to gaining knowledge superiority is prescient to 'remain agile in the fast-moving, technologically advanced wider defence and security sector. Further, that if the defence sector acknowledges information and knowledge as a strategic asset it needs to be more aware of the advantages of knowledge management (KM) and place it at the centre of the strategic management approach. Furthermore, challenges within the defence sector over the last 10 years to the

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management and use of information has created considerable change, amplified by the steadily increasing opportunities to use even more powerful IT systems. But what of the human component – the necessary body of people who have to understand and operate these advancing systems? As changes multiply the need to manage change more effectively becomes even more important. It is axiomatic that sense-making, problem solving and decision making are more complex and more vital in military situations than ever before. New technologies have resulted in increasingly dynamic, unpredictable and complex operations that require people to filter and analyse information from multiple sources. Concomitantly, know-how, expertise and interoperability are equally important key factors in a defence sector organisation's ability to create knowledge superiority. Command and control is taking on new dimensions and the role of military personnel is evolving some would suggest, into *knowledge workers* [6], [20]. For, as it can be argued, as organisations gain access to even more advanced technology the impetus behind successful global organisations (including those in the defence sector) to maintain competitive advantage is moving more towards the development of knowledgeable employees (and multi-level and multi-cultural relationships).

It was therefore judged that the (wider) Defence Sector was a key area for research into human behaviour connected with KM.

### B. Information and Knowledge Management

The role of KM in defence highlights the difference between information management (IM) and KM which it is argued here, needs to be addressed [21]. Girard [22] argues that the distinction between IM and KM must be made as many people believe that they are synonymous. IM can be seen as the recording of explicit knowledge whilst many believe that KM is much more than recording of information and involves the '*dynamic of KM*' concerning the creation, capture and transfer of knowledge [9]. Therefore, any discussion of KM raises the question of definition. Rumizen [23, p35] defines KM as:

*'...The systematic processes by which knowledge needed for an organization to succeed are created, captured, shared and leveraged.'*

Whilst Collison and Parcell [24, p24] suggest that KM: "*is about capturing, creating, distilling, sharing and using know-how.*"

Further, Frappaolo [25, p75] also supports the distinction between the two terms arguing that whilst both IM and KM are important that the distinction must be clearly understood:

*"...the primary repository for knowledge is people's heads (at least until we agree that machines have*

*intelligence). Electronic and paper-based "knowledge repositories," then are merely intermediate storage points for information en route between people's heads."*

This difference highlights the important distinction between '*explicit and implicit (tacit)*' knowledge respectively [26]. Harnessing both explicit and tacit knowledge is an increasing and necessary challenge to support organisational knowledge creation for it is suggested that when explicit and tacit knowledge interact innovation occurs [27], [28]. It is suggested that one of the fundamental aims of utilizing KM is to understand the importance of tacit knowledge and have the skills and tools to convert tacit knowledge into explicit knowledge [29].

KM can also be seen to be rooted in practice, action and social relationships with an important interplay between the individual and collective levels in an organisation [30], [31]. More specifically from a defence perspective, [22, p63], defines Defence Knowledge Management as: "*...the creation and sharing of knowledge within Defence.*"

Many commentators argue that KM is a key asset in organisations and when utilised successfully is a major contributor to organisational success [2], [32], [33]. Furthermore that a sound framework, well thought out policies and the managed implementation of KM produces a valuable source for competitive advantage. This view is supported by many defence analysts, particularly from the US [34], Australia [35] and Canada [22] who are strong advocates of KM and support the view that it is a fundamental tool in the modern business and battle spaces (and by association, it could be argued, the *cyber space*).

## III. THE RESEARCH PROJECT

This qualitative research was part of larger project into KM and behavioural change to support human capability in Defence. It was sponsored by a large public sector organisation in the UK aimed at considering Science and Technology (S&T) knowledge and information management (KIM) throughout Defence.

### A. Methodology

The study was carried out over a period of five months between December 2012 and April 2013 using data collected from a series of workshops in three separate organizational elements. The output provided a re-usable KIM Behaviours Framework that indicated how best to approach/implement KIM changes required. This supported the development of KIM Implementation and Change activities by providing heuristic guidance around principle areas of sensitivity and appropriate implementation approaches, including a step-by-step guide to using the framework.

There were three semi-structured workshops (one for each organization), each consisting of 12 sessions lasting between 60 and 90 minutes per session. Overall there were 57 participants. The dates and timings for the sessions were determined by the availability of participants, and each workshop took place over a number of days. Participants were a representative sample agreed with the relevant department and for each session were from a narrow band of grades (to minimize the possibility of the exertion of power distance).

A semi-structured interview framework was used identifying questions which were presented verbally by the facilitator at each session, but the participants were not discouraged from ranging beyond this list of questions. The research team involved members from a private sector defence company, a consulting firm and a leading UK university.

### B. Findings

This section brings together several themes that emerged from the workshops, which have been used to inform the building of the framework. It was possible to identify principal areas of sensitivity with respect to KIM that were shared between the three organizations and to consider what might be a range of appropriate implementation approaches for future KIM. It was also possible to identify patterns of probable responses to KIM as an issue, to change in KIM, and to the use of KIM systems.

1) *Knowledge' and 'Information:* Although the research team had decided to collapse the terms 'Knowledge Management' and 'Information Management' into the single expression 'KIM', in order to understand how the participants framed the differences between the terms, the first item discussed in all the workshops was the difference, if any, between 'knowledge' and 'information'. A strong theme emerged that, for those involved from all three organizations, there was a significant difference between the two terms. The overwhelming majority felt that 'information' was something that could be stored and retrieved in physical or electronic form, whereas 'knowledge' had a human component and resided in the minds of people rather than in other storage systems. Additionally, the workshops

showed that the KIM behaviours in all three establishments were affected to a considerable extent by factors such as organizational culture, the background and previous experience of the users, the unofficial responses to officially defined KIM processes, and the experience of working within the organizational structure. It was concluded that KIM in the context of the project went far beyond the technical systems (hardware and software) acquired to provide KIM. There is therefore a substantial human component in the resulting framework.

2) *Principal Areas of Sensitivity:* The most notable themes that came out of the combined workshops concerned:

- the time required to be spent on KIM;
- the lack of usability of the KIM IT systems;
- their perceived lack of reliability and the consequent lack of trust in them;
- and the widespread use of '*work arounds*' to manage the demands of the job without using the KIM IT systems in the way they were designed to be used.

Added to this, there was a running theme of using personal contacts to get advice on how to deal with, or circumnavigate, particular issues with the overall KIM system and in carrying out KIM. These themes were apparent in the data from the workshops in all three organisations, although the way the effects were worked out in practice were not the same in all three.

There was also some evidence from the workshops that the structure of the organisation is an area of potential sensitivity. 'Structure' in this sense combines rank, grade and grouping systems and lines of authority and responsibility. There is no ideal design, but in principle the more that those with authority are seen to embrace the KIM system, to interact with the KIM system operators and users, and to know its advantages and difficulties, the more likely it is that those at the lower organisational level will feel inclined to embrace it.

It was clear that the organisational cultures of each of the three organisations were different, including their perceived goals and measures of success, and, as might be expected, each of the different cultures had a profound effect on the way the organization's members behaved. While this factor cannot yield particular areas of general sensitivity, the common point is that the culture itself is an area of sensitivity that needs to be understood. Any interventions that run smoothly with existing cultural norms are therefore more likely to be adopted easily by the members of the organisation than counter-cultural interventions.

3) *Appropriate Implementation Approaches:* Given that the cultures of the three organisations were different,

it would be unwise to attempt to apply a single implementation approach across the board for KIM. However, the areas of sensitivity identified above do imply some general guidelines that apply to all three establishments and therefore may comprise advantageous ingredients in KIM implementation approaches for the future. These are:

- *System Design:* A high priority for any new system it could be argued, would be intuitive usability, combining ease of use with speed in use, reliability, and effective communications. ‘System’ in this sense comprises the overall KIM design, including processes, people and technology. In this respect it would be advantageous if the use of the software in particular resembled systems that the organisational members use at home (including, for example, such features as ‘drag and drop’ and an easy and comprehensive search facility).
- *Training:* Both initial training for users to become confident in the use of the system, and continuation training to combat skill obsolescence should be provided. In the provision of training, best practice should be followed, where the characteristics of the users should be determined by a target audience description and their detailed needs for training should be established by a training needs analysis. In parallel with the training, it would be advantageous to publish a flow-chart of the overarching KIM system (including human points of contact) so people can locate what they are being taught within that system. It is also recommended that feedback is invited from KIM users on the training that is provided so that it can be adapted for their needs. In particular, buying (or producing) an IT training package and telling the staff to self-train without inviting any feedback on the package has the appearance of a training solution, but can be generally ineffective.
- *Time:* The users’ time should be treated as a significant factor in planning the implementation or upgrading of KIM systems. Many of the ‘work arounds’ described by the workshop participants had the sole purpose of saving their time by not using the KIM tools properly. Similarly, the online training packages available were underused because individuals felt they consumed time to little effect.
- *Information Storage:* As part of the system design, priority should be given to providing easy and reliable document storage, sharing and retrieval facilities.
- *Understanding the Culture of the Organisation:* Because culture is hard to change in the short term, any implementation should be designed to fit with the existing culture. Where implementation and culture are out of step, failure is likely. A working knowledge

of the culture of the organisation is therefore needed. This is best provided through a social science based study before implementation is attempted.

4) Probable Responses - Part of the required output of WP4 was the identification of probable cultural and behavioural responses to KIM, KIM change and KIM systems.

- *Responses to KIM:* There was very little said in the workshops about KIM per se. There appeared to be an acceptance that it is necessary to manage knowledge and information, and the participants spent time and ingenuity in enhancing their KIM abilities – particularly in building personal networks. It seems probable that this positive attitude to KIM will remain the case given the very large amount of information that is available and the accepted need to access it to do a professional job.
- *Responses to KIM Change:* In all three organisations there had been recent changes in KIM IT systems. One organisation has recently adopted their Share Point system, whilst the other two organisations were at a comparatively early stage of using an IT system. Members of all three organisations were highly critical of their system and spent time and effort inventing and employing ‘work arounds’ to avoid using it as designed. These hostile attitudes largely arose, according to the workshop participants, from the areas of sensitivity outlined above. Overall, the users saw these KIM IT systems as adding an extra burden to an already difficult job to no benefit to themselves. These reactions may simply be the working out of conservative, change-resistant attitudes, but it seems more likely that they represent a response to specific unfamiliar and difficult tools. This work therefore indicates that a probable response to KIM change is for people in all three organisations to embrace it more or less enthusiastically in proportion to its usability and lack of demands on their time.
- *Responses to KIM Systems:* Once again, the data from the research indicated that hostile attitudes towards current KIM IT systems are probably linked to the particular systems in use and are not necessarily applicable to KIM systems in general. It is interesting to note that personal networks were an important element in KIM practice (both in using the IT systems and in collecting information and passing it on), and appeared to reflect a cultural penchant for face to face working rather than working through electronic means. This indicates a probable need in future KIM systems, at least in the Defence Sector, to include the establishment of human as well as electronic and IT networks.



5) *The KIM Behaviours Framework*: The practical output from this research included a re-usable KIM Behaviours Framework that indicates how best to approach and implement KIM changes required in particular contexts. It builds on the areas of sensitivity and the appropriate implementation approaches described above, taking account of the probable responses.

The framework comprises:

- A diagram (Figure 1) which depicts the various influences on behaviour related to KIM in a generic organisation.
- A sequence of processes for investigating the issues depicted in the diagram.

The diagram at Figure 1 represents the influences acting on KIM behaviour:

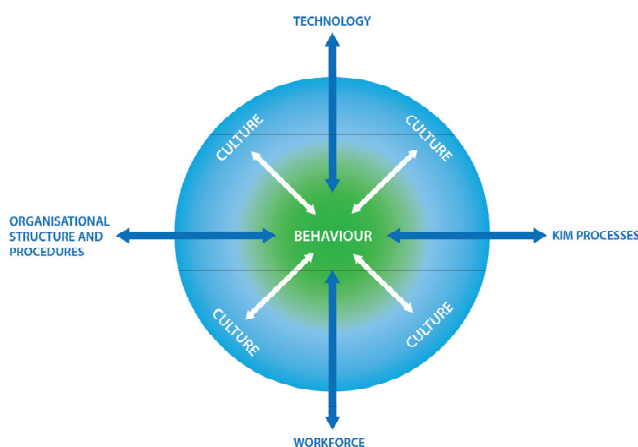


Figure 1: Influences on KIM Behaviour

The constituents of the diagram are:

- *'Behaviour'*, which is what, the members of the organisation actually do in the area of KIM. It occurs in large measure as a result of the other factors captured in the diagram. In most cases, it is behaviour that senior management wish to influence to improve KIM in their organisation.
- *'Technology'*, comprising the hardware and software which the members of the organisation are given to use to carry out KIM.
- *'KIM processes'*, a term representing the KIM procedures that are mandated by the organisation, the formal training of its members in KIM, and the informal activities that the members of the organisation carry out to manage knowledge and information.
- *'The workforce'*, comprising the people in the organisation, the range of their overall abilities, skills and competences in KM, and their previous

experience in the area. In the framework, with respect to KIM the workforce can be divided between the 'KIM decision makers' and the 'KIM users'. This distinction differentiates between those who have influence over the choice of KIM systems (processes, procedures and technology) and the others who operate those systems but have no part in designing or choosing them. Within the framework, when the word 'members' is used it describes a wider population within the organisation that includes KIM users and KIM decision makers but may also include those who are not directly involved in KIM.

- *'The organisational structure and procedures'*, referring to the way the organisation is formally constructed (hierarchies, for example, departments, lines of responsibility, and management structures), and the system for mandating the formally expected actions of the members (what people are expected to do). Such a system would include, for instance, standing instructions and other codes of practice, performance reviews, disciplinary structures and rewards and sanctions, all of which are likely to have a direct or indirect influence on the carrying out of KIM. It would also include HR practices that affect the management of S&T knowledge and information (such as succession planning and promotion), leadership structures, lines of responsibility and the existence or status of 'Knowledge Officers' with special responsibility for KIM.
- *'Culture'*, encompassing all learned behaviour (formal and informal) shared by members of the organisation, in the context of that organisation. This is expressed in the attitudes, expectations and assumptions of everyday life and can be summed up as 'what seems "normal" and "appropriate"'. The reason why culture is placed between 'behaviour' and the other elements in Figure 1 is that all of these elements are filtered by the organisational culture before they influence behaviour. The boundary between culture and behaviour is blurred because they are intimately linked and impinge directly on each other. Culture is therefore a very powerful force on behaviour and it is one that is often a target for change. However, it has been discovered through often-repeated experience that culture is extremely difficult to change in the short term. Interventions are more likely to be successful if they concentrate on the aspects on the outer edge of Figure 1 that are potentially under more direct management control, taking care that they do not confront existing formal and informal cultural norms within the organisation. In essence, different behaviours can be stimulated (within the same culture) by different forms of technology, processes, organisational structure and procedures, and

different ways of selecting, employing and treating the workforce.

The arrows on the diagram in Figure 1 are double-headed because the influence of these various elements on behaviour is not necessarily one way. Not only are behaviour and culture closely linked for instance, but the behaviour of the organizational members towards the technology may influence its development or replacement, while the technology itself may cause changes in behaviour.

With this model as a basis, a process was developed to identify issues and generate appropriate interventions. This process can best be visualised as a cycle of structured and informed investigation and opinion-sharing within the organization. It combines analysis of the current situation, including the organizational culture, developing culturally sensitive interventions in collaboration with the workforce and monitoring them in practice, leading to fresh analysis of the modified situation. It is important that this investigation should be carried out by teams representative of the workforce, containing KIM system decision makers, KIM users, and senior and middle managers.

To inform this process a structured series of questions were developed to provide the systematic element for the investigation.

#### IV. CONCLUSION

The research presented in this paper identifies a KM Behaviours Framework model showing factors affecting KIM-related behaviour, and providing a basis for identifying and generating appropriate interventions through a systematic cyclical process. It is argued this supports the development of KM implementation and change activities by providing heuristic guidance around principle areas of sensitivity and appropriate implementation approaches. The process of applying this framework is intended for use by teams, rather than for individual use. It is argued, the team should contain KIM decision makers, KIM users, and senior and middle managers. The application of the framework is intended to provoke thought, reflection and discussion as much as to elucidate facts and thus to increase the team's understanding of, and insight into, the situation.

The framework can be applied in a range of situations. Its application in a large organization is a non-trivial task and requires the selection of appropriate team members, and the allocation of time and other resources to the team's work. However, the process can be flexible enough to be carried out in more selective contexts (provided that there is still an appropriate mix of experience among the team members) to produce useful insights. In all cases it will only be viable if it is backed by the senior management with the allocation of time and personnel needed. The resultant cost should be weighed against any perceived waste of investment and resources in inefficient use of current systems.

This article presents a re-usable and generic KIM behaviours framework. This framework provides a tool to give guidance on identifying and understanding principal areas of sensitivity and, consequently, on how to approach and implement any changes to improve the increasingly complex situations public sector departments will undoubtedly face in the future.

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