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KNOWLEDGE MANAGEMENT IN MILITARY ORGANISATIONS

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INTRODUCTION

Knowledge Management (KM) is a field of management that has gained huge traction in the last decade even though the developed economies and their progressive large corporate organisations have been using this technique for much longer. IBM (International Business Machines) Corporation has defined it as, “Knowledge management is the process of identifying, organizing, storing and disseminating information within an organization.”

It is essential for organisations to equip their personnel with the knowledge that abounds not only within but also in the environment, outside of the organisation. Like inventory, knowledge has become an essential cog that should be available at the right time and in the right format. KM has been recognised as a strategic tool for agility and innovativeness; both attributes are deeply desired by a complex and diverse organisation like the military.

BACKGROUND

In the late 1970s and early 1980s, the saying “Information is Boss” was heard in classrooms teaching management principles. This was the era

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when the Management Information System (MIS) was considered the last word for top echelons of large organisations. For a layman, it implied that getting the latest information about the environment, and the changes it was undergoing, to the top management, was a priority of the lower and mid-management. It was another matter that sifting voluminous information as it made its way up, led to the inclusion of 'noise' as well as the exclusion of a few vital pieces. Finally, the information reaching up from all the verticals led to an overload. Rarely could the top management carry out its analysis and use it for strategic purposes unless it employed smart data and number 'crunchers'.

All this changed with the introduction of computers in which the information/data could not only be smartly aligned but analysed and presented by persons having good knowledge of specific software tools even though they may have had almost nil practical exposure to the business processes that were being analysed and presented. The top management saw and heard, in a very concise and convincing manner, the (software) expert's opinion about the information gathered by the lower and mid-management executives. This was not necessarily the 'voice' of the experts in different verticals at the mid and lower management levels. The management of large organisations soon realised that there was a need for recoding accurately the implementation milestones, rationales, lessons learnt, and the steps taken by the managers to reach a particular result, which could be referred to by all the stakeholders even in the other verticals, at any time, especially in the absence of the concerned persons. This marked the beginning of KM where identification and collation of all available information was the first step.

DEVELOPMENT OF KM

As the organisations and their environments continued to grow complex, KM had to evolve commensurately. From merely collation of information,

it grew into a tool that helped in analysis of situations in fields as diverse as Research and Development (R&D)¹ to manufacturing.² Information that was available explicitly was the low hanging fruit and, thus, the first one to be captured. This was meant to smoothen the access to processes already in vogue. It consisted of documented maintenance and system manuals, Human Resources (HR) system flows and similar specifics of different verticals that were already available albeit in different and difficult to access formats. Standardised and homogenous formats helped the personnel understand the systems easily and faster, and, above all, they came to rely on the information for their day-to-day taskings as referencing was available at a click of button.

Although the easier access and referencing of routine information did improve the productivity, it helped little in the analysis of complex situations as the rationale of following a particular path was never documented. Hence, KM at the nascent stage, did not find many strategic takers as the knowledge pool did not help in fast answers to most complex problems faced by personnel at different echelons.

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1. <https://www.nasa.gov/content/knowledge-management-km-resources>. Accessed on January 12, 2023.
 2. <https://www.slideshare.net/HarshTamakuwala/knowledge-management-and-talent-management-at-toyota>. Accessed on January 12, 2023.

solving models available in the knowledge base of the organisation. This has now resulted in KM emerging as a vertical in the software industry with many advanced applications.³ This has facilitated codifying the complex knowledge base like the experiences of personnel, leadership tools, creative solutions, and similar non-tangible processes within an organisation. The creative or out-of-the-box thinking shown by personnel at some stage of problem solving could now evolve as a Standard Operating Procedure (SOP) when its usage was seen to be ubiquitous by the management.

EVOLUTION OF KM IMPLEMENTATION

KM has now become an integral part of large organisations that have deployed its tools to better the efficiency of their personnel. The management has realised that knowledge is being created at many stages of operations and recognising what needs to be captured for posterity is a tactical decision. Capturing the right knowledge and then ensuring its easy access, with the right context and in the desired format, is the next stage of implementing KM. Capturing knowledge did project a dilemma for the management as people are normally reluctant to document the same. However, with the right amount of motivation and a few organisational changes, this can be made a routine activity of the organisation.

The stages described above are purely reactive to the needs of the organisation, for improving its productivity. These can be described as tactical tools as their effect is not disruptive in nature; the **explicit knowledge** created within the organisation is being put to good use by posterity in the same organisation. However, it was realised that KM is potentially a tool for top management to take strategic decisions if the **knowhow (implicit knowledge)** that exists within the minds of its personnel, especially the mid-management, can be brought to the platform where knowledge capturing is being done. This form of knowledge sharing is an uphill task and requires a culture change.

3. <https://helpjuice.com/blog/knowledge-management-software>. Accessed on January 31, 2023.

Toyota was a pioneer in knowledge sharing from its conception, with mentorship and on job training/apprenticeship being widely used to pass on **tacit or experiential** knowledge. However, as the footprint of the organisation expanded, much more was required to be done on this front. Consider the following practices in Toyota:

- When Fujio Cho was president, Toyota put into writing the founders' wisdom that had until then been passed down orally. Senior executives evaluated sayings and anecdotes and identified two core values as the pillars of The Toyota Way 2001: continuous improvement (*kaizen*) and respect for people.⁴
- It was realised in Toyota that employees who retired comprised a pool of knowledge that the company was losing. The company started the practice of hiring such senior employees who met certain skill-set criteria for a period of three years, to work as mentors in their specific skills/roles.⁵

Problem solving and rationales for many strategic decisions can be, thus, captured in this way, and they can serve as a ready reckoner for the employees when confronted by a parallel situation. It is clear from the above that inculcation and following the practices of a large gamut of knowledge capturing and sharing require the correct organisational culture, which will actively encourage knowledge warriors by recognising their efforts in ways that motivate others to come forward to do the same.

KM IN MILITARY: IMPEDIMENTS AND USAGE

Military organisations are a contradiction in management terms. The application of motivational and reward management theories in the military do not exactly follow the corporate culture. In instances where, on the one hand, a corporate will have to motivate the personnel to react,

4. <https://hbr.org/2008/06/the-contradictions-that-drive-toyotas-success>. Accessed on February 2, 2023.

5. <https://www.toyota-industries.com/csr/reports/items/41-45.pdf>. Accessed on February 2, 2023.

As the complexities of war-fighting increase, the flow of information and availability of lessons learnt in the past, at a click of button, would be the dire need.

the military discipline, on the other hand, would ensure complete and utter dedication. However, the military's requirement of quality is equal to, or even higher than, that of a normal corporate organisation, as for the former, it is normally a question of life and death. Thus, the principles of implementing knowledge-based processes of quality and productivity in all aspects of the highly techno-intensive military would have to surpass the best corporate practices. The need of KM in the military is now more than ever, as advantage against one's adversary is now more dependent on the right knowledge at the right time. The tools of situational awareness are being incorporated in every aspect of military operations. As the complexities of war-fighting increase, the flow of information and availability of lessons learnt in the past, at a click of button, would be the dire need.

In this context, military organisations should have been the first to come up with knowledge management principles, and their adoption. Herein again, the contradictions are visible. Maintaining any database of knowledge, howsoever desirable, has its downside in the secrecy-prone military organisations. So, while explicit knowledge of systems' servicing schedules and such preventive maintenance schedules have been well documented and archived since long, it is only now that nascent steps have been taken to maintain a knowledge-based inventory and maintenance databases in formats that permit easy cross-referencing and analysis. The usage of these explicit knowledge datasets is increasing every day and as the military footprint increases, in both geographical and operational complexity terms, this basic KM tool has become an integral part of military operations.

The capture and application of explicit knowledge tools is just the tip of KM, and the military is still quite far from capturing the existing implicit and experiential knowledge that can prove to be a game-changer in future operations. There are a few verticals within the military wherein even tacit

knowledge capturing had been started way back as its requirement was urgently felt. An excellent example of documentation and usage of tacit knowledge is the recording of every aspect of aviation system trials at the systems testing establishment of the IAF. The lessons learnt from the trials are also documented by the testing personnel. The knowledge so captured is referred to, and relied upon, at every stage of system exploitation in the Service. Even then, there are limitations; the software tools to systematically link such knowledge repositories so that searches can access multiple reports simultaneously like a search engine would dramatically help the knowledge seeker within the establishment or even outside. These limitations are pointers to the culture of documentation within the military, and, to an extent, with providing ease of access to knowhow to each echelon, considering the military way of working.

As a practice, capturing, archiving, sharing, and providing access to tacit knowledge is traditionally limited in the military.

The impediment to capturing the tacit knowledge is more to do with the documentation culture that is in vogue in most militaries, and, to some extent, in corporate organisation too. Mid and senior echelons with lots of experiential or tacit knowledge do not follow a regimented culture that requires them to document their knowledge, leading to loss of a huge amount of knowhow. Even when the knowledge is captured, it is not reviewed before archiving and, at a later stage, gaps are noticed. As a practice, capturing, archiving, sharing, and providing access to tacit knowledge is traditionally limited in the military. Individual barriers to sharing of knowledge viz. motivation/reward by the organisation, perception of losing one's position of eminence and a general lack of awareness to document tacit knowledge are similar in both corporate and military organisations. However, the situation gets complicated in the military with its deep hierarchical structure, that does not provide a conducive environment for regimented knowledge sharing. As an example, till a few years back, one of the Services followed a standard process of writing of a yearly Service paper by all officers till the mid-tier level. It did not have a lot of buy-in and most went about it in a mechanical

manner, hardly documenting their own tacit knowledge, relying mostly on the information available in the environment. It was obvious that the system did not follow any basic tenets of KM. Instead of being upgraded, it was slowly replaced by a system that required only the junior officers to write a yearly paper on variety of subjects, a few of them being those that they may have never been exposed to in their brief Service career. As a feedback tool to the senior echelons or as a new idea generation process, it is quite a useful system but the process never leads to capturing the tacit knowledge or even the implicit knowledge that is available in the military.

USE OF KM IN THE MILITARY

Consider an example on how the KM process can help in a versatile manner. The use of pneumatically inflatable bags to recover an accidented aircraft is well known in the IAF. These bags are provided with the allied paraphernalia in all major airfields. These have been used on different occasions when accidented aircraft had to be recovered inside or sometimes outside the airfield. Their usage is known to almost all personnel who deal with air operations, but mostly in theory. The practical aspects of their deployment, in a manner that is most conducive to the recovery of an aircraft without further damage, is known only to the few who have had to actually deploy them under trying circumstances and they learnt the nuances from their own experience—probably, a one-time affair.

Since the deployment experiences have never been documented or filmed, this cannot be explained or shown even during the in-service flight safety courses that are being conducted by the IAF. While such tacit knowledge exists with the senior echelons in many aspects of military operations, a well-structured process to capture the same does not.

Various facets where KM can be useful in the military are: use and disposal of (air) ordnance in a variety of environments, actual missile launches (as different from annual training exercises), various types of station security improvisations carried out by stations in different terrains,

and quality assurance enhancements carried out in all aspects of aviation/military equipment production and the rationale for the same, etc. This list is by no means exhaustive and KM tools can be deployed across different verticals on a need basis.

KM deployment is a success, as already mentioned earlier, for systems trials at the testing establishment. It is also successfully deployed for system audits that are conducted by the IAF even if the potential for its scaling-up is tremendous in both these fields. A comparison of the two successful deployments mentioned above will show the way to further improving the KM process within the Service and pave the way on its deployment in other verticals.

TYPICAL KM SYSTEM DEPLOYMENT IN THE MILITARY

Military organisations all over the world have a top-driven approach.⁶ Therefore, for KM to be deployed in the military, the top echelons would need to be totally onboard. While they can start the process of capturing the knowledge by defining the broad SOPs for its storage and creation, sharing knowledge by individuals who see it as a competitive edge, would take a lot of overt cajoling by way of changes in HR policies. This would be driven through a culture change, which can only be driven by the top management in any organisation. The bureaucratic thought process may also need to be overcome through culture change as 'security of information' may provide an overarching theme to deny sharing of knowledge in any military organisation. It would need to be appreciated by all concerned that this knowledge is being shared within a closed loop of the organisational personnel, following the same security precedence as for any official correspondence. If warranted, knowledge hierarchy can be laid down for allowing access to specific types of knowledge but in a manner that allows the knowledge seeker to know that more specific data is available but

6. A Nagendra and S Moappakkam, "Knowledge Management Enablers and Barriers in the Army: An Interpretive Structural Modeling Approach", *Indian Journal of Science and Technology*, vol 9, 45, December 2016.

would require a higher class of clearance. This aspect is explained through an example of knowledge of fuzes later in this section.

A typical KM deployment within the military will have to be based on a robust software backbone. This aspect is not being specifically dealt with here as laying down the qualitative requirements of such a process would need a detailed involvement of a wide cross-section of users. Suffice to say that whichever system is chosen, even while keeping in mind the integrity of the knowledge stored therein, compartmentalisation would need to be avoided at all costs. The flexibility in knowledge transfer should not get lost due to a cumbersome process that inhibits both knowledge sharing and accessing. A good KM system would need to pass the sifting process by the mentors in the field to package it in a more relevant and accessible form. By the latter, it is meant storing it in a manner so as to be easily cross-referenced with similar/ related knowledge pools; and vertically and laterally integrated to explicit and implicit knowledge bases that may be picked up across different professional verticals.

An example of cross-referencing is given below, which will illustrate how the same can work in a seamless manner for a user.

Consider the need of the user to understand the type of fuze that is used in an Air-to-Ground Missile (AGM) with respect to its characteristics, delays, types of targets it can be used against, etc. While accessing the information, the knowledge could be stored under AGMs or fuzes but should be accessible from either of the heads. Now, while accessing the information, the user wishes to do a comparison of fuzes that are used in non-guided air ordnance, to see their suitability from a different perspective, for a particular target. This information could also be under the fuzes section or under the air-dropped bombs head. The cross-referencing can, thus, be worked around the common field of fuzes. This would be an apt example of lateral referencing.

If the use of these types of fuzes against different targets during training or in actual operations is documented and referenced by the mentors, along with the explicit knowledge of fuzes (with their settings, etc), this would be the acme of KM. The integrity of knowledge can be maintained by putting

levels of clearances for accessing the referenced knowledge, depending on the type of knowledge that is being sourced. The cross-referencing link in this case must be provided and should be visible to each user so that they are aware that such knowledge is captured and available and only a clearance needs to be obtained to access it. This type of referencing would be an apt example of vertical integration of knowledge.

A lot of implicit knowledge is available in the reports that are rendered after a military engagement exercise, gunnery meets, actual operations, training deployment, special military courses, etc. These reports are sometimes available in the soft copy with the unit that was involved and their controlling formations. Very rarely are such reports made available in a networked system of KM so that other controlling formations or units can access these while planning their own similar deployments at a later date.

Similarly, the explicit knowledge of processes that are used to check and clear different servicing tools/consumables in a particular equipment fleet or machinery is normally not available to operators of another fleet; this is a classic example of knowledge-based silos. Almost all military leaders have seen and experienced these silos during their engagement period. With a lot of persuasion and formation of specific study groups, this knowledge is captured, compared, and standardised. The standardised list of material now becomes available for all the fleets and that becomes the new norm. After this stage, during the normal passage of time, if new servicing materials are introduced in different fleets by the Original Equipment Manufacturer (OEM)/operator, the knowledge of their standardisation process is not captured in the erstwhile shared formats as there is no regimented process to do the same. Therein starts the formation of knowledge silos all over again.

The examples given above are meant to illustrate how KM systems can be deployed to ensure that both explicit as well as implicit knowledge is captured across different professional streams of the military. Capturing of knowledge from a diverse set of sources and its integration in a military organisation can only be started by an equally diverse set of professionals, dealing with all aspects of military operations. Thus, the first focus would

Loss of knowledge due to the retirement of senior military officers at the age of 57 or 58 in the Indian military is a senior handicap faced by the organisation. There have been many experiments in the past to retain some semblance of their knowledge. None of these was quite successful due to the extremely rank-conscious structure and thought process of the military.

structure of the military, the senior echelons are under tremendous pressure to plan and review execution. The planning process is obviously based on implicit knowledge gained by the seniors. Capturing this process while a race against the clock is being faced by the concerned individual would be a non-starter. Devising methods that can capture this knowledge vested with seniors who retire at an early age, may be undertaken, to emulate the good practices of world corporate management leaders like Toyota. Loss of knowledge due to the retirement of senior military officers at the age of 57 or 58 in the Indian military is a senior handicap faced by the organisation. There have been many experiments in the past to retain some semblance of their knowledge. None of these was quite successful due to the extremely rank-conscious structure and thought process of the military.

For KM, the roles of such seniors need to be so defined so as to ensure that this remains a single point focus of these re-deployed personnel. They can start the knowledge capturing process from their own experience. Honing

be to select the personnel who will kick-off the process. However, once the KM process is started, its maintenance and availability can be undertaken by a much leaner team of professionals. The focus at this stage would also include the process of capturing and making available the system to the knowledge seekers. The evolution and improvement of the KM system will only come as more and more users, from varied streams, have a buy-in. At this stage, technology would play a big role to ensure the connect between the knowledge producer and the knowledge-seeker.

KM in the military would face its biggest challenge: to capture the implicit knowledge of the seniors. In the highly pyramidal

of the knowledge base can be undertaken by the in-service seniors (to the extent possible) as well as the newer lot of retirees every year. Obviously, the chosen seniors retiring from service would remain engaged with the military for a short duration of a year or so, to undertake this activity specifically. There are many such good practices that can be copied even from other militaries that have invested in the KM process.

The scope of KM in smaller military organisations seems to be limited to mostly the training/educational establishments.

KM PRACTICES IN OTHER MILITARIES

The KM organisation is prevalent in most military R&D organisations⁷ as well as in the civil R&D labs too. However, its strategic impact is well appreciated in the military organisations of the developed countries like the US.⁸ Militaries like the Slovakian military had also started the practice of implementation of KM, realising the impact of cross-functional knowledge sharing.⁹ The scope of KM in smaller military organisations seems to be limited to mostly the training/educational establishments.

The principles of implementing the KM system in the military organisations remain the same as described earlier. These principles are:

- A technical backbone based on a robust communication network and software that can pick up the data/information from a diverse set of applications (maintenance, logistics, operations, and HR networks, etc may use different software applications) is the first requirement.
- Processes to capture, store and share knowledge must be specified as on SOPs.
- Finally, the HR ecosystem must be evolved to facilitate all facets of KM.

7. "Indonesian Case Study of KM in Defense R&D", <https://ieeexplore.ieee.org/document/9274601>. Accessed on March 18, 2023.

8. <https://ieeexplore.ieee.org/document/9274601> and [https://www.army.mil/standto/archive/2016/01/20/#:~:text=What%20is%20it%3F,effective%20mission%20command%20\(MC\)](https://www.army.mil/standto/archive/2016/01/20/#:~:text=What%20is%20it%3F,effective%20mission%20command%20(MC)). Accessed on March 20, 2023.

9. http://www.jodrm.eu/issues/volume6_issue2/07_petrufova_vol6_issue2.pdf. Accessed on March 20, 2023.

An important aspect that emerges from studying the KM implementation in military organisations, is the seriousness attached to the evolution of the processes. It has been realised that today's tacit knowledge would be tomorrow's implicit knowledge. The SOPs must be commensurately evolved to keep pace with these developments. As an example, the creative process of an action in any field, today, once documented and implemented a few times by many others, would become a normal procedure in due course. Its hierarchical treatment in the KM would, thus, need commensurate change too, with regards to:

- ease of access;
- subject under which categorised;
- relationship with other SOPs;
- and placement of linkages to show related knowledge extensions available.

It has also been observed from the available literature on the subject that almost no military has laid down the specifics of types of data and knowledge that cross-functional professionals have access to, within the organisation. It can be assumed that this subject is strategic in nature and, thus, not provided in the public domain.

CONTOURS OF KM ORGANISATION IN THE MILITARY

Devising a KM organisation is a challenge in any organisation. The primary reason for this is the need to link the cross-functionalities in a seamless manner. To explain this in the context of the military, a hypothetical scenario is given here. Planning an operational airborne mission package requires:

- Availability of aircraft from every designated base.
- Availability of specific role equipment for the mission involved.
- Intelligence Surveillance and Reconnaissance (ISR) of the target.
- Target-to-ordnance matching and rationale for the same.
- Availability of specific ordnance in the required numbers with all designated fuzing components at the launching base.

- Availability of trained recovery teams at diversionary bases.
- Availability of specific ground equipment at diversionary bases too.
- Designating and common briefing of all personnel involved in the mission.

There are many more activities that go to launch a mission against a target. As evident from above, the abovementioned activities are subsets of operations, maintenance, logistics, and to a smaller extent, the HR function. All these aspects would have both, the explicit as well as the tacit knowledge, attached to them. Capturing the linkages when a knowledge seeker wants to access the same about similar missions will involve getting the respective inputs from all those involved, from planning to execution of the mission. In the realm of today's warfare, quite a lot of this knowledge would be in the domain of information operations. Documenting this aspect would also require specialists who can articulate the actual inputs provided for the mission through information operations.¹⁰

In the context of the aforementioned, the KM organisation should be composed of a lean team of mid to senior level functionaries from all domains. They will have to come together regularly, to identify and then capture, knowledge. This will also involve Information Technology (IT) professionals, who will also have to be part of the KM organisation. The KM organisation would operate under the principal KM manager. The whole organisation should rightly be placed under the training department as a large part of this knowledge would have to be disseminated at different levels of seniority, during various in-service courses conducted by the military. From the vantage position wherein the training department has visibility of all courses being conducted and their curriculum/ syllabi, introduction of changes in the Service courses by observing the knowledge available in the network, would be an easier and desirable task.

10. For more on information operations, the reader may refer to RAND papers on the subject, <https://www.rand.org/topics/information-operations.html>. Accessed on March 23, 2023.

CONCLUSION

KM has been recognised as a management tool in the corporate world, which provides strategic advantage to the organisation. It has since become a force multiplier in the field of research and development and academics. However, the competitive advantages associated with KM are far too many, thus, making it essential for all complex and growing organisations, irrespective of their field of operation. It is now well appreciated that knowledge goes beyond mere data and information, albeit assimilation and sharing of the latter is how KM started out in almost all organisations.

Knowledge can be distinctly classified into two categories: explicit and implicit. Explicit knowledge is all about data and information that is already documented as the system's response to inputs. On the other hand, implicit knowledge is knowhow of the system and is mostly experiential in nature. As the system or procedures are put into use, they may need some modifications to be optimised or creative human thought processes may find their alternate use. This happens due to the user having gained implicit knowledge of the system or procedures. Capturing of the explicit knowledge requires modification of organisational SOPs while for capturing the implicit knowledge, changes in the organisational culture are essential. The implicit knowledge, once captured, becomes standard protocol i.e., explicit knowledge, thus, the boundaries of the two types are permeable and always changing.

Capturing and sharing of knowledge on a continuous basis require software solution and a network with nodes spread across many professional domains. The technical inputs aside, KM implementation requires a dedicated team of professionals drawn from contributory domains. Getting the benefit of existing organisational knowledge to every knowledge seeker at the right time and ensuring that the knowledge is being updated continuously, requires the involvement of the KM team, incentivisation to the knowledge contributor and an organisational culture that cajoles the recording of each aspect of knowledge being created in the organisation.

The Indian military establishment is quite large and knowledge availability to every user can provide a huge competitive advantage as reinventing the wheel can be avoided, thus, optimising resources. HR imperatives of a comparatively younger retirement age also lead to loss of vast banks of implicit knowledge in the military. Capturing these as well as the knowledge available with experienced, senior echelons will require a top-driven approach as such a knowledge base is not available right now. The operational advantages of implementing KM in right earnest are too many to seriously overcome the barriers that exist in its implementation. Quite a few of such operational advantages have been explained in this paper, with examples. In a few instances like flight and systems testing, KM has been implemented albeit in a nascent stage. The military already has the technical infrastructure and the prowess for implementation of KM throughout its operations. Therefore, it is just a question of having the vision that can provide the advantages of its implementation as is already prevalent in a few modern militaries.

