

Perceptions of knowledge management amongst officers in the Malaysian Armed Forces

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ABSTRACT

The development of modern warfare is reflected by the rising importance of having knowledge advantage over adversaries. Leadership, sense-making, problem-solving and decision-making are more complex and more demanding in military situations. Command and control is taking on new dimensions, and the role of military personnel is evolving into that of 'knowledge worker'. A study on military officers of the Malaysian Armed Forces (MAF) of perception towards Knowledge Management (KM) applications in the MAF organization was conducted to show the importance of KM innovation in the military environment. The focus of the study is to examine the attitude of military personnel toward the KM key drivers, which include the knowledge creation, processes, applications, and technology. The results of the study indicated that the demographic elements have influenced over the creation of knowledge, and the applications of KM were influenced by the KM processes and technology infrastructural in the MAF. The application of KM in the MAF could be implemented with the right leadership support in line with the learning organization concept towards developing Knowledge Force of the MAF.

Keywords: Military; Knowledge management; Knowledge; Technology; Information.

INTRODUCTION

Today's challenges faced by Malaysian Armed Forces (MAF) has been shifted and identified as more complex in nature. The biggest challenge for the MAF will be the threat of globalization and the advance of Information and Communication Technology (ICT)¹. As a result, the MAF now needs thinking soldiers, people who are innovative and creative to fight digital warfare, which present and future wars will be all about. A balanced and credible force guided by sound operational strategies and concepts, equipped with high-tech weapons and manned by competent professionals will be the direction of MAF in developing its forces.

With regard to the future direction, the MAF is projected to move from threat-based strategy to capability-based approach. This approach is to develop core capabilities in order to meet multi-spectral challenges on several critical goals to focus efforts on protecting critical bases of operations, assuring and conducting effective information operations, providing persistent surveillance, and leveraging ICT. In anticipating future warfare, the MAF future development

¹ In the late 1990s, traditional tools of IT (such as computers) began to rapidly converge with communication technologies, leading to the introduction of the new terminology and yielding products that combined the two (such as mobile telephones with basic computing functions or personal digital assistants with communication capabilities). The term ICT and IT shall be used interchangeably (Yue and Lim 2002).

is envisaged toward Fourth Dimension MAF (4D MAF), which focuses on three features of Joint Force, Information Superiority, and Multi-Dimensional operational capabilities. With regard to this development, the Revolution in Military Affairs² (RMA) has acknowledged an increase in information management (IM) requirements to manage modern warfare.

The modern warfare relies heavily on information from many sources that must be assessed and compiled for immediate use. The "information superiority"³ becomes the determinant of the future war management and requires drastic improvement in IM, assurance, exchanging and sharing of superior knowledge. Information Superiority is a state that is achieved when a competitive advantage is derived from the ability to exploit a superior information position (Alberts, Garstka and Stein, 2000). In order to achieve information superiority, knowledge is seen to be the most important strategic resource for capitalizing the conduct of battle space management. The awareness of managing knowledge effectively could be achieved through the application of Knowledge Management (KM). For most organizations without exception to the military like the MAF, the application of KM is regarded as inevitable. Hence, KM involves the management of knowledge assets, that has to do with the creation of explicit processes that enhance knowledge and learning throughout the organization.

NEED FOR THIS STUDY

The military organizations have a unique context in which KM must be deployed and eventually operate. The transition from an industrial era into an information and knowledge era was significant and the relevance of acquiring and managing information and knowledge is becoming increasingly critical (Muzumdar, 1997). KM was regarded as a strategic approach to achieve defence objectives. Military KM will play a valuable role in leveraging existing knowledge and converting new knowledge into action through the KM cycle (McIntyre, Gauvin, and Waruszynski, 2003). KM strategy is the centre of the military's information revolution, which becomes the enabler for mission operations, knowledge generation, information delivery and technology innovation (Browning, 2002).

The applications of KM strategy in military context is seen extensively applied in the military of major countries, like the United States, Britain, Canada, Australia and several countries within this region like Japan, Korea, and Singapore to name a few. Based on those developments, it is inevitably for MAF to embark on knowledge-based organization through KM strategy.

The situational analysis as a preliminary investigation was done in order to identify several problems that lead to this study. Based on the author's observation, it was obvious that the MAF does not have any prominent KM practices and applications. However, it was found that the existence of knowledge in the MAF organization is available and embedded in the form of doctrines, policies and procedures, operations and training manuals, information systems, work flow and databases. Unfortunately, those elements of KM were presence in silos and not manage in concerted effort. The lack of KM practices and applications in the MAF was perceived as the lack of awareness and understanding and exposure about KM in the organizational context among the MAF personnel. The existence of KM practices in the MAF is

² A robustly networked force shares information by means of a secure infrastructure that enables self-synchronization and, ultimately, more effective military operations.

³ That degree of dominance in the information domain that permits the conduct of operations without effective opposition. The capability to collect, process, and disseminate and uninterrupted flow of information while exploiting or denying an adversary's ability to do the same (The RMAF Air Power Doctrine 2002)

regarded as at infancy stage and would be interesting to examine the perceptions of military personnel about KM in the MAF. This study attempted to explore the relationships and influences between key drivers of KM implementation which is considered important for the innovation of KM practices in the MAF.

STUDY OBJECTIVES

The objectives of this study are as follows:

- a. To identify the perceptions of MAF officers on knowledge creation, KM processes, technology, and KM applications with four factors of demographic elements (type of services, rank, academic background and working experience).
- b. To compare the perceptions amongst MAF officers of knowledge creation, KM processes, technology, and KM applications.
- c. To determine the relationship between technology and KM processes, and KM applications in the MAF.
- d. To determine the availability of KM applications in the MAF.

HYPOTHESES

The following hypotheses were tested:

Hypothesis 1: There is no significant statistical difference in perceptions of knowledge creation, KM processes, technology, and KM applications by the MAF officers among the three services (Army, Navy, and Air Force).

Hypothesis 2: There is no significant statistical difference in perceptions of knowledge creation, KM processes, technology, and KM applications by the MAF officers based on their rank.

Hypothesis 3: There is no significant statistical difference in perceptions of knowledge creation, KM processes, technology, and KM applications by the MAF officers based on their academic background.

Hypothesis 4: There is no significant statistical difference in perceptions of knowledge creation, KM processes, technology, and KM applications by the MAF officers based on their level of working experience.

Hypothesis 5: There is no significant statistical relationship between technology and knowledge creation, and KM processes.

LITERATURE REVIEW

Knowledge has been identified as the ultimate competitive advantage for the modern firms and therefore should be well managed. In relations to managing knowledge within organization, Raja Abdullah (2005) cited that KM deals with both tacit and explicit knowledge in an organization, with regards to knowledge creation, sharing, and how these activities

promote learning and innovation. Knowledge assets within an organization is the capitalization of the members of the organization, collaborative work in terms of sharing and using information which marks the effective use and promotion of knowledge (Milam, 2001). The true process of creating new knowledge, takes place subsequently when the different pieces of knowledge are set in context, organized, linked to one another and compared to the individuals' previous experiences (Gauvin and Lecocq, 2004).

The understanding of the role of knowledge and how it is created is fundamental to the development of a KM model and framework within an organization (Anonymous, 2003; Gold, 2001) and is the pre-requisite for KM innovation. Bartczak (2002) identifies the crucial elements that act as barriers to the KM innovation such as the elements of managerial, resources, and environmental influences in the military. It was also suggested that, to implement KM there must be a continuous leadership guidance, support, reinforcement of KM systems, and technology support (Semmel, 2002). Thus, the study suggested that, the first step to the innovation of KM within military environment was the evaluation of personnel attitudes toward KM, identification of barriers to the implementation of KM strategy, and the education and exposure on KM practices in the organization (Linkage, 2000).

As the transition continues, the evolution of KM has become the current organizational learning theme (Hackney R., et al. 2000), to which the knowing organization is prepared to sustain growth and development in a dynamic environment (Choo, 1998). By identifying salient alternatives, Wiig (1995) suggested methods for dealing with them and conducting activities to achieve the desired results. The KM is then viewed as an increasingly important discipline that promotes the creation, sharing, and leveraging of the organizational knowledge (Fernandez et al. 2004). KM facilitates the creation and use of knowledge for increased innovation and value, could have a profound influence on the organizational excellence. Therefore, knowledge has become the key resource, for a nation's military strength as well as for its economic strength of any organization in the knowledge society (Drucker, 1994).

Definition of Knowledge

Knowledge is regarded as the processed or repackaged information. The terms data, information, and knowledge may be used synonymously. Data is a set of discrete, objective facts about events. In an organizational context, data is most usefully described as structured records of transactions. Structured data include distinct numbers, places, and costs displayed in databases. As organizations interact with their environments, they absorb information, turn it into knowledge, and take action based on it in combination with their experiences, values, and internal rules. They sense and respond. Without knowledge, an organization could not organize itself; it would be unable to maintain itself as a functioning enterprise (Davenport and Prusak, 2000).

Tiwana (2002), defines knowledge as an actionable information in term of its relevance and available in the right place at the right time, in the right context, and in the right way so it becomes the key resource in intelligent decision making, forecasting, design, planning, diagnosis, analysis, evaluation, and intuitive judgment which, was formed in and shared between individual and collective minds. However, Fernandez et al., (2004) distinguished knowledge from data and information in two different ways, which comprises facts, observation, or perceptions which represents raw numbers or assertions, and may therefore be devoid of context, meaning, or intent, and information is just a subset of data that typically involves the manipulation of raw data to obtain a more meaningful indication of trends or patterns in the data. Knowledge is also regarded as at the highest level in a hierarchy with information at the middle level, and data to be at the lowest level. Knowledge could be stored

in a manual or computer-based information system, which receives data as input and produces information as output. Figure 1, depicts how knowledge, data, and information relate to information systems, decisions, and events. It also shows how knowledge helps to convert data into information (Fernandez et al., 2004).

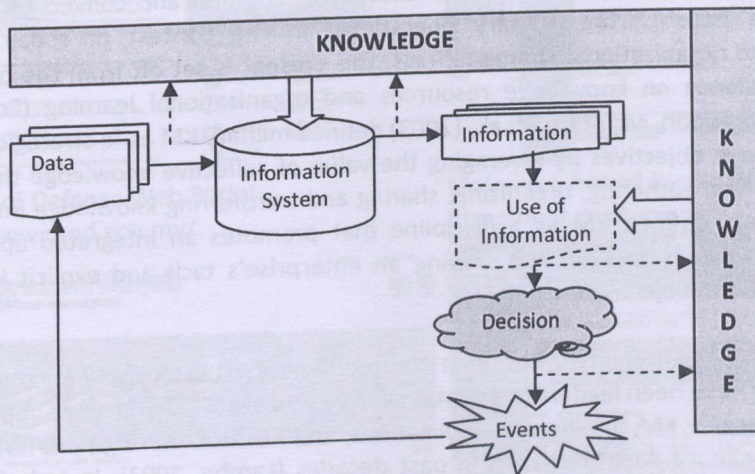


Figure 1: Relation of Data, Information, and Knowledge to Events

Source: Fernandez, Gonzalez, and Sabherwal (2004)

Based on those elaborations about knowledge, knowledge can be categorized into tacit and explicit.

Tacit knowledge is personal, context-specific knowledge that is difficult to formalize, record, or articulate and is stored in the head of people. It consists of various components, such as intuition, experience, ground truth, judgment, values, assumptions, beliefs, and intelligence (Fernandez et al. 2004). According to the Army, tacit knowledge is knowledge that people carry in their minds and is difficult to access and not easily shared. People are often not aware of this knowledge they possess and how valuable it can be to others. It is considered more valuable because it provides context for people, places, ideas, and experiences (AKM, 2008).

Explicit knowledge is that component of knowledge that can be codified and transmitted in a systematic and formal language, documents, databases, webs, e-mails, charts, etc (Fernandez et al., 2004). Similarly, the Army defines explicit knowledge as the knowledge that has been or can be articulated, codified, and stored in certain media. It can be readily transmitted to others. The most common forms of explicit knowledge are manuals, and documents, or other digital media (AKM, 2008).

KM Definitions

In a practical sense, Wiig (1993) elaborated KM as a set of distinct and well defined approaches and processes to find and manage positive and negative critical knowledge functions in different kinds of operations, identify new products or strategies, augment human resource management, and other highly targeted objectives. While Young (2008) defined KM as the discipline of enabling individuals, teams and entire organizations to collectively and systematically capture, store, create, share and apply knowledge, to better achieve their objectives. However, Kidwell, Vander, and Johnson, (2000) holding a different view state that KM is to make the right knowledge available to the right people at the right time. In simple

perception, Barth (2002), perceived KM as the combination of cultural and technological processes of an organisation.

KM in Military

KM application within military environment requires knowledge processes that are robust and reliable within operational contexts and the knowledge creation and conversion processes must match the pace of the military operations. In the context of today's military modernization and organizational change efforts, the present is set off from the past by the current heavy reliance on knowledge resources and organizational learning (Proctor and Gubler, 1998). Thereupon, McIntyre et. al., (2003) defined military KM as "a strategic approach to achieving defense objectives by leveraging the value of collective knowledge through the processes of creating, gathering, organizing, sharing and transferring knowledge into action". However, the Army defined KM as a discipline that promotes an integrated approach to identifying, retrieving, evaluating, and sharing an enterprise's tacit and explicit knowledge assets to meet mission objectives.

The development of KM in military has been accepted and used extensively for thousands of years, the military have been leaders in adopting and advancing KM practices as applied in the military "intelligence"⁴. KM, intelligence applications, and decision-making skills have been at the forefront of military doctrine over the past decades (Lambe, 2003). In today's modern military management, for example, the Army of U.S. military has launched their Army Knowledge Online⁵ (AKO), which enables the Army personnel to gain quick online access to important Army information, news, education and training opportunities, as well as knowledge centres and e-mail. The AKO is the Army's integrated enterprise portal for accessing information, conducting business, and managing operations. Integral to Army transformation, AKO crosses the warfighting, business, and intelligence mission areas to support the current and future force (Lord et al., 2010). For an effective KM implementation, the Army had produced the Army Knowledge Management (AKM) as the strategy to transform itself into a network centric, knowledge-based force with KM methods and successfully applied them in its workplace (Santamaria, 2002).

Consistently, the U.S. Air Force has developed the Air Force Knowledge Now⁶ (AFKN) with features include of customizable discussion forums for fostering worldwide communication among staff members, alert notifications to receive e-mail, notification regarding additions and changes to specific documents, forums and calendars, and links administration for providing access to relevant resources and items of interest⁷. Likewise, the Navy Knowledge Online⁸ (NKO), gives sailors instant access to all training and educational information related to their chosen occupational fields. KM portal assists in identifying career paths, milestones, and educational tools and opportunities, which provides greater operational efficiency and eliminates organizational redundancies (Walter 2002).

With regard to the MAF, the web portal which delivers the same functions as projected by the AKO, AFKN, and NKO was developed in order to support the needs of present and future information sharing. The following are examples of MAF and the three services web portal that can be accessed by the MAF personnel as well as the public as shown in Figure 2.

⁴ The product resulting from the collection, processing, integration, analysis, evaluation, and interpretation of available information. Information and knowledge about as adversary obtained through observation, investigation, analysis, or understanding (The RMAF Air Power Doctrine, 2002).

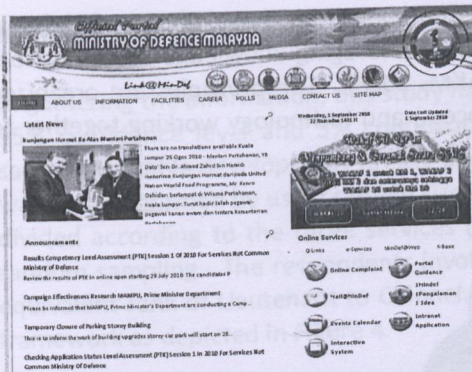
⁵ <http://www.army.mil/ako/>

⁶ <https://afkm.wpafb.af.mil/>

⁷ <http://www.afmc.wpafb.af.mil/HQ-AFMC/PA/index.htm>

⁸ <https://www.nko.navy.mil/portal/splash/index.jsp>

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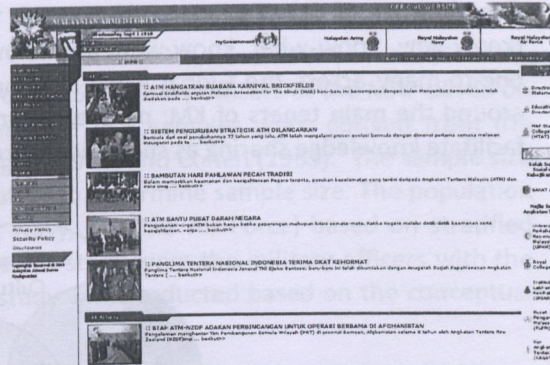
Ministry of Defense Web Portal
<http://www.mod.gov.my/>



The Army Web Portal
<http://army.mod.gov.my/>



The Air Forces Web Portal
<http://www.airforce.gov.my/>



Malaysian Armed Forces Web Portal
<http://maf.mod.gov.my/>



The Navy Web Portal
<http://www.navy.mil.my/>

Figure 2: Example of MAF and Three Services Web Portal

Military KM Principles

Conceptually, the KM in military is about connecting those who know with those who need to know, and leveraging that knowledge across the military organization and to contractors, non-governmental organizations, the other military services and coalition partners. KM goals are to support the shares of intellectual capital with no structural or technical barriers, which values good ideas regardless of their source and collaborates and values collaboration as a means to mission success.

The objective of the principles is to connect those who know with those who need to know (know-why, know-what, know-who, and know-how) by leveraging knowledge transfers from one-to-many across the Global Army Enterprise (AKM, 2008). The principles are organized around the main tenets of KM: people/culture, process, and technology working together to facilitate knowledge sharing as shown in Figure 3.

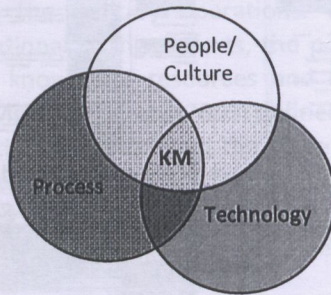


Figure 3: Main tenets of Knowledge Management
Source: Army Knowledge Management Principles, 2008

The AKM Principles could be applied to military organization that will help preserve tacit and explicit knowledge and accelerate learning as units and personnel rotate in and out of organizations. The principles provide authoritative guidance to military Commands and organizations developing or engaging in knowledge management efforts. By adhering to and applying the following principles, the military, as an enterprise, will accelerate individual, team, and organization learning to meet mission objectives (AKM 2008). The three main tenets of AKM principle dimensions are explained as follows:

People/Culture Dimension

- Principle 1 – Train and educate KM leaders, managers, and champions.
- Principle 2 – Reward knowledge sharing and make KM career rewarding.
- Principle 3 – Establish a doctrine of collaboration.
- Principle 4 – Use every interaction whether face-to-face or virtual as an opportunity to acquire and share knowledge.
- Principle 5 – Prevent knowledge loss.

Process Dimension

- Principle 6 – Protect and secure information and knowledge assets.
- Principle 7– Embed knowledge assets (links, podcasts, videos, documents, etc) in standard business processes and provide access to those who need to know.
- Principle 8 – Use standard business rules and processes across the organization.

Technology Dimension

- Principle 9 – Use standardized collaborative tools sets.
- Principle 10 – Use Open Architectures to permit access and searching across boundaries.
- Principle 11 – Use a robust search capability to access contextual knowledge and store content for discovery.
- Principle 12 – Army Knowledge Online (AKO) or Defense Knowledge Online (DKO) is the preferred portal and access point to all Army enterprise knowledge assets.

METHODOLOGY

In gathering the information, this study has selected 368 military officers of the MAF based on 95% confidence level and 5% confidence interval. Total samples were derived from the sample size table developed by Krejcie and Morgan (1970) and Cohen (1969). The sample size was then confirmed by using sample size calculator⁹ to determine sample size. The population divided according to the three services (Army, Navy, and the Air Force) based on stratified random sampling. The respondents involved in this study were the military officers with the equivalent rank of Lieutenant to Colonel. The study was conducted based on the conceptual framework as depicted in Figure 4.

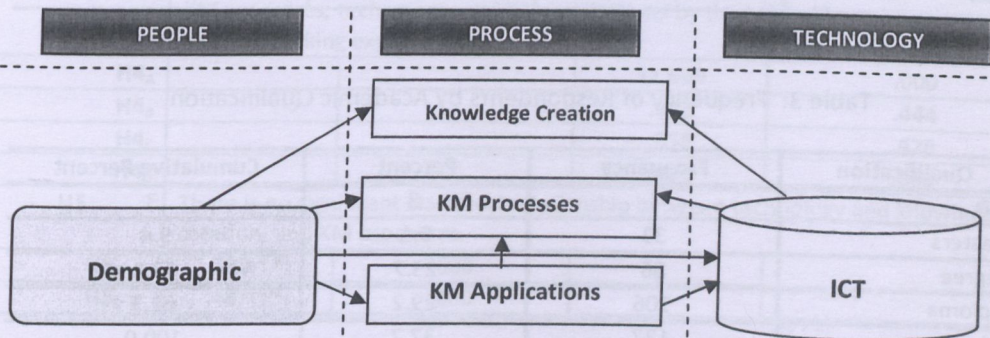


Figure 4: Conceptual framework

The questionnaire was designed in order to assess and investigate the perceptions (attitude) of MAF officers about KM applications in ICT environment. The questionnaire consists of fifty-two (52) items which is divided into Five Parts with five items Likert scale, 1: strongly disagree, 2: disagree, 3: uncertain, 4: agree, and 5: strongly agree). Descriptive statistics are used to describe the results.

FINDINGS AND DISCUSSIONS

Demographic Characteristics

The variables selected to describe the respondent's background were the type of service (Army, Navy, and Air Force), rank (Lieutenant to Colonel equivalent), academic qualification (graduate: Diploma to PhD, and Others: represent highest secondary school achievement), and level of working experience (between <10 years, 10 to 19 years, and >20 years). The results are shown in Table 1, 2, 3 and 4.

Table 1: Frequency of Respondents by Type of Service

Type of Service	Frequency	Percent	Cumulative Percent
Army	218	60.1	60.1
Navy	67	18.5	78.5
Air Force	78	21.5	100.0
Total	363	100.0	

⁹ Sample size calculator available at : <http://www.surveysystem.com/sscalc.htm>

Table 2: Frequency of Respondents by Rank

Rank	Frequency	Percent	Cumulative Percent
Lieutenant	63	17.3	17.3
Captain	144	39.7	57.0
Major	130	35.8	92.8
Lt Colonel	22	6.1	98.9
Colonel	4	1.1	100.0
Total	363	100.0	

Table 3: Frequency of Respondents by Academic Qualification

Qualification	Frequency	Percent	Cumulative Percent
PhD	1	.3	.3
Masters	33	9.1	9.4
Degree	86	23.7	33.1
Diploma	106	29.2	62.3
Others	137	37.7	100.0
Total	363	100.0	

Table 4: Frequency of Respondents by Level of Working Experience

Length of Service (years)	Frequency	Percent	Cumulative Percent
<10	116	32.0	32.0
10 to 19	163	44.9	76.9
>20	84	23.1	100.0
Total	363	100.0	

Hypotheses Testing Results

The summary of the hypothesis test results are presented in Table 5.

Table 5: Summary of Hypotheses Testing Results

Hypothesis	Correlations		ANOVA	
	r	p	F	p
H1	There is no significant statistical difference in perceptions of knowledge creation, KM processes, technology, and KM applications by the MAF officers among the three services (Army, Navy, Air Force).			
H1_A			1.167	.312
H1_B			.559	.572
H1_C			.004	.996
H1_D			.400	.671
H2	There is no significant statistical difference in perceptions of knowledge creation, KM processes, technology, and KM applications by the MAF officers based on their rank.			

H2 _A			4.425	.002
H2 _B			.621	.648
H2 _C			1.772	.134
H2 _D			.849	.495
H3	There is no significant statistical difference in perceptions of knowledge creation, KM processes, technology, and KM applications by the MAF officers based on their academic background.			
H3 _A			5.171	.006
H3 _B			.505	.604
H3 _C			5.555	.004
H3 _D			.866	.422
H4	There is no significant statistical difference in perceptions of knowledge creation, KM processes, technology, and KM applications by the MAF officers based on their level of working experience.			
H4 _A			11.669	.000
H4 _B			.813	.444
H4 _C			.855	.426
H4 _D			.404	.668
H5	There is no significant statistical relationship between technology and knowledge creation, and KM processes.			
H5 _A	.380(**)	.000		
H5 _B	.487(**)	.000		

Hypothesis 1, 2, 3, and 4

Hypothesis 1, 2, 3, and 4 are focused on the associations of people variable as a key driver of KM with the variables of process and technology for KM. As can be noticed in Table 5, the MAF officer's perceptions of the four variables (knowledge creation, KM processes, technology, and KM applications) are not significantly determined by the type of services. The results of ANOVA tests indicate that perception of officers from the three services on knowledge creation are the same. However, based on further examination, the results demonstrate that, there were significant differences in officer's perceptions of knowledge creation which are based on individual rank (H2_A), academic background (H3_A), and working experience (H4_A). Thus, respondent's backgrounds implicate significant influence on the creation of knowledge in the organisation.

Other variable that showed differences in officer's perception is the technology. The perceptions of technology is found to differ among the officers based on their academic background (H3_C). The results indicated that officers who have higher academic qualification demonstrated better perceptions as compared to officers with lower academic qualifications. As shown in Table 5, the results also indicated the generalisability of officer's perception of KM processes, technology, and KM applications did not differ except to knowledge creation.

Hypothesis 5

Hypothesis 5 focuses on the associations between technology driver and the process drivers for KM. The data presented in Table 5, which are the results of correlation test between technology and the three variables of KM, indicates a positive relationship with the knowledge creation (H5_A) and KM processes (H5_B) at $p < .05$. The results of this study showed that technology is an important driver that enables the KM processes and the creation of knowledge.

FINDINGS

Finding 1: The type of services (Army, Navy, and Air Force) has no influence on the knowledge creation, KM processes, KM applications and technology in the MAF organisation. It was also deduced that the perceptions of officers from the three services do not vary significantly.

Finding 2: The rank structure has no influence on the KM processes, KM applications and technology in the MAF organisation. It was also deduced that the perceptions of officers with different level of rank does not vary on the three variables.

Finding 3: There is no significant statistical difference in perceptions of KM processes and KM applications by the officers with different academic background.

Finding 4: The level of working experience has no influence on the perceptions of KM processes, KM applications and technology.

Finding 5: There is a positive relationship between technology and the knowledge creation and KM processes.

RECOMMENDATIONS

For the purpose of strategizing KM initiatives in the MAF, it is highly recommended the MAF to address the requirements that is based on a framework that includes the following:

- a. **Infostructure:** The ICT (computers, software, architecture, security, communications, programs, and facilities) that required supporting the net-centric MAF.
- b. **Intellectual capital:** The individual, team, and enterprise knowledge, systems, services, and strategies that is necessary to improve operations and decision-making.
- c. **Change catalysts:** The policies, resources, management, culture, processes, and education that are required to optimize an adaptive organization and an enterprise net-centric environment.

MAF KM Implementation

The MAF should look into several factors that could encourage the successful implementation of the KM strategies in the MAF (adopted from the AKM 2008), as follows:

- a. The infrastructure must accommodate faster processing capabilities and dissemination of KM requirements;
- b. Enterprise-wide systems must be easily accessible with net-centric processes and services available through a single portal;
- c. The information that leads to knowledge must be well organized and structured through content management, metadata, and data hierarchies;
- d. The ability to generate knowledge requires the transfer and sharing of knowledge across the enterprise using such techniques as collaborative processes, virtual teams, and communities of practice; and
- e. Recruitment, training, and retaining is emphasized to achieve an interdisciplinary workforce (soldiers and civilians) empowered to share knowledge.

CONCLUSIONS

This study sought to examine the current situation of the KM activities in the MAF through the study of officer's perceptions of the knowledge creation, KM processes, KM applications, and technology variables. The results obtained through the statistical analysis could contribute to the feasibility of KM implementation in the MAF organization. The overall respondents' perceptions of KM activities and its principles were examined. One of the greatest benefits of this study is that, it identified the attitudes of the people (MAF officers) towards KM innovation for future strategic solutions in order to be at competitive edge in line with the modernization of the MAF. KM was identified as a new area of management which is incorporated with ICT in managing new knowledge for a superior decision making and problem solving in fields of military operations, tactical needs, and development in the military core competence. Finally, a general conclusion based on the findings obtained indicated that the level of KM availability in the MAF needs greater attention and awareness by the leaderships as well as all level of personnel.

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ABSTRACT

This study aims to investigate the scientific productivity of 20 Malaysian researchers and the visibility and impact of their publications. A total of 2029 publications published in 11 journals were extracted from WoS during 1996-2007 and were then analysed. Results of the study indicated significant differences were found among publications of LIS authors in different years. The results of CiteSpace and CiteNetX clearly showed the falling of the number of LIS citations over the years. The results of LIS citations showed that the number of citations has been decreasing over the years of LIS publications over the entire study period. The number of citations received by each LIS publication was 0.22 on average. More than 66 percent of all LIS publications received the most of all citations i.e. LIS were made by LIS researchers. Bibliometric analysis revealed that LIS publications in their research. Among all institutions, the highest number of publications in LIS in addition, more than 80 percent of LIS papers were published in international journals.

Keywords: Library and Information Science, Research Productivity, CiteSpace, CiteNetX, Information Science, Scientometrics

INTRODUCTION

Evaluating scientific productivity and influence of different authors, journals, institutions, etc. is one of the goals of bibliometric studies. The extent and influence has been assessed through various indicators such as number of publications, h-index, and so on. Evaluation and assessment plays a crucial role in science and policy making about each area of science and policy to identify the areas where the research is that area and its strengths and weaknesses. Very often, we use indicators of bibliometrics. Different studies have investigated the extent and influence of scientific productivity and impact from various studies using various indicators of time. Research by Dorigan and Ghoshal (2007) was an attempt to investigate the extent of LIS during the years of 2000-2004. A sample of 200 Malaysian researchers was selected for this study. The results of this study showed that the highest number of publications were in USA and UK regions. 75% of the total publications were in LIS journals. Very important research is a significant part of the total research. The study also showed that the highest number of publications were in LIS journals. Besides this study, there is still a need for more research in this area.