Application of Knowledge Flow Theory to Personnel Management

A case study

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Introduction to Knowledge Flow Theory

One of the primary responsibilities of leaders in the Marine Corps is personnel management. My journey to develop the required personnel management skills and tools led me to pursue an understanding of organizational architecture and the flow of information within those organizations. I became frustrated with the effect the frictions in the information flows had on my ability to lead and train my Marines. This recently led me to discover a dissertation written at the Naval Postgraduate School by Dr. Paul Shigley discussing knowledge friction as a part of Knowledge Flow Theory (KFT).[1] KFT is a field of study searching to understand how information moves and is used among individuals and organizations. In the literature review portion of the dissertation, Dr. Shigley summarized much of the previous research in the understanding of knowledge flow. Several studies are acutely apropos such as the definition of common nomenclature described by Nonaka and the representation of the relationship between knowledge lifecycle, explicitness, and reach described by Nissen.

The table from Nonaka explains the basic nomenclature of KFT regarding the transformations between tacit and explicit knowledge.[2]

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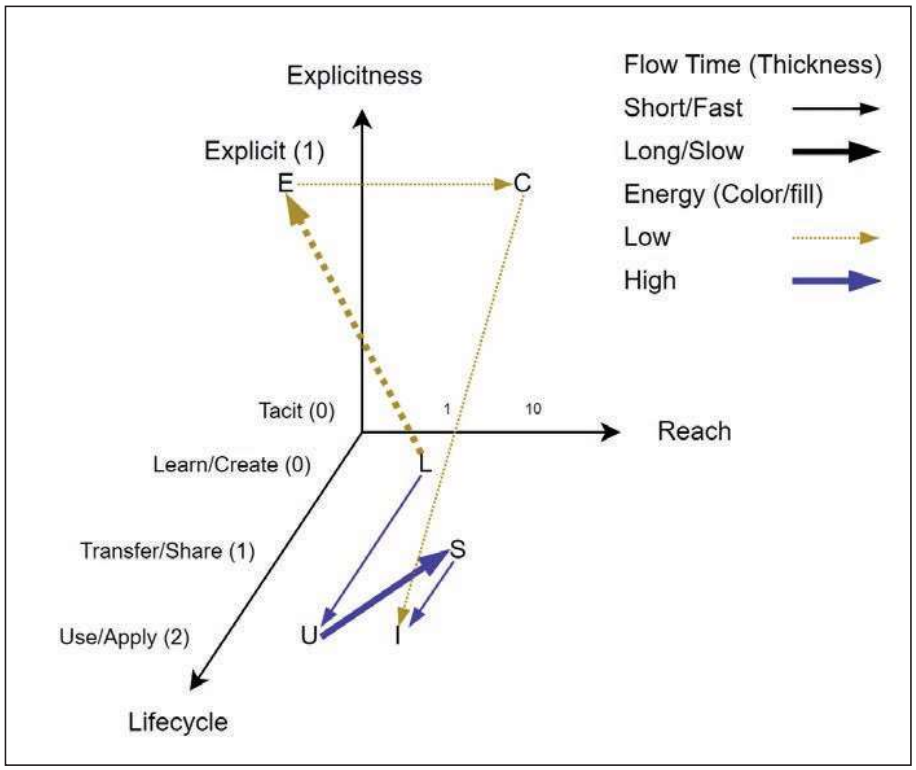
One of the primary responsibilities of leaders in the Marine Corps is personnel management.

The graph (on following page) is adapted from Nissen and demonstrates the paths of knowledge flow and the associated knowledge work (KW).[3] To get from learning information to the organization internalizing the knowledge for use there are two main paths the knowledge can flow in. The path requiring the most KW is $\overrightarrow{\text{LUSI}}$, which is to learn the knowledge (point L), use the knowledge (point U) to gain a deep understanding of the knowledge, and socialize the knowledge (point S) that can then be internalized (point I) and utilized by the organization. The path of least KW is $\overrightarrow{\text{LECI}}$, which is to externalize the learned knowledge (point E) and communicate the knowledge (point C), which can then be internalized.

From \ To	Tacit Knowledge	Explicit Knowledge
Tacit Knowledge	Socialization	Externalization
Explicit Knowledge	Internalization	Combination

Table 1. Modes of knowledge conversion. *(Table provided by author.)*



Paths of knowledge flow and the associated knowledge work. *(Graph provided by author.)*

As observed in the graph, there is an investment in externalizing tacit knowledge to overcome the knowledge friction associated with a transformation but ultimately a greater flow rate once the information is in the explicit state.

Requirement of Externalizing

For knowledge to be transferred beyond a group that is in physical and temporal proximity, it is required to externalize or write out knowledge. This externalization takes effort and time to initially capture, but the rate of transmission is high as the information needs only to be emailed or a link shared. Once the information is received, each group can determine if that information is relevant and whether to internalize that information to use.

Common examples for most Marines are turnover binders and Marine Corps orders. The former is to transmit knowledge effectively between individuals such that information is not lost due to human memory limitations. The latter is to transmit knowledge across a large audience that is physically and temporally disparate rapidly and with clarity.

There is also the case of information that does not need to be converted to tacit knowledge, such as readiness statistics. Readiness statistics like annual training completion snapshots and medical readiness reports do not require internalization. These statistics simply represent actions taken and actions required (e.g., getting a dental exam) to which there is no understanding or learning required. This set of information, which makes up much of staff briefs, can be left as explicit knowledge. The explicit knowledge then only needs to be combined and formatted appropriately. This combining and formatting can require significant effort if not done systematically.

KFT as a Part of an Organization

Every leader is aware that there are many information requirements both up and down the hierarchy either as tasking instructions or as feedback regarding tasking. The appropriate methods for this flow of knowledge are a hotly contested debate. However, like von Clausewitz's observation of warfare's unchanging nature, so too is the nature of the flow of knowledge unchanging.

The book *The Starfish and the Spider* by Brafman and Beckstrom discusses the uses and benefits of centralized and decentralized structures within organizations.[4] The conclusion from the book is that there is no dichotomy, and the best-performing organizations know how to employ centralization and decentralization in a hybrid fashion.

In the case of reporting on readiness and other required tasks, the optimal solution is to decouple the centralization of knowledge flow such that all members of the defined groups are feeding their workflows by their chosen application in a manner that decouples the data aggregation and visualization (i.e., reporting). Decoupling is an engineering principle meaning to reduce interdependencies to reduce unintended effects rippling through a system.

Case Study

From time spent as a part of platoon and company staff, I have sought methods to reduce the administrative burdens on myself and others as administrative tasks take time away from the "real job." I have found that taking the initiative to set up a system to externalize the information requirements and ensuring the cooperation of the required groups is the key.

The first step to devising the system was to understand the requirements and the required formats. Decoupling the information requirements and the formats required led to a small set of aggregation locations (i.e., trackers) with formatting handled programmatically. The trackers were designed to be cohesive, which is another engineering principle meaning to design components of a system to have one function to keep the components simple and logical.

The system devised has four company trackers: administrative, annual training, duty, and operations.

The data is collected into Excel workbooks as this often underutilized and widely available tool allows for the easy collection of tabular information and offers methods to perform data analytics and visualization. Utilizing Excel on Microsoft Teams on Marine Corps Enterprise Network non-classified internet protocol router allows for collaboration

with multiple editors simultaneous and no requirement for version control as everyone has the same document and allows for remote access to the trackers (i.e., the use of Office 365 from anywhere).

The administrative workbook is separated into multiple worksheets to make navigation of the information more manageable—a single table on a single worksheet would work if we had a ten-foot-wide monitor. With this information in one workbook on Microsoft Teams, a summary worksheet was developed that creates all the tables and figures required for the various briefs for the various staffs. The summary worksheet has the most up-to-date data and is then merely copied and pasted onto the different PowerPoints for the various briefs. There is a way to make an Excel table link to PowerPoints, but this functionality is not available with the online versions of Microsoft applications that are embedded within Teams—a small trade-off.

The annual training workbook is fed by three exported queries from the Marine Corps Training Integrated Management System with Power Query utilized in the main workbook to perform data visualization allowing for hit lists to be a quick filtering of a column away. In the main workbook, there is a summary worksheet that performs the data analysis and visualization required for company and battalion briefs. The only manual tasks are to perform the queries, save the exported queries, and refresh the main workbook. Then the entire company can be directed to the main workbook and analyze their section's requirements without being bombarded by email chains. The Power Query application is embedded in the Excel application and the performed operations are saved within the Excel file. This allows the file to be shared from a common repository to allow anyone to make updates to the tracker.

The duty and operations (i.e., the company TEEP) tracking workbooks are both manually filled as this information is too complex to be automated. However, both documents provide resolution to the individual level for operations and commitments. This allows the company to quickly determine the available personnel for required tasks, deconflict operational requirements, and provide situational awareness for the entire company.

The method described keeps the data visualization transparent to both the individuals being tracked and the individuals and groups requiring the information. This is a crucial point: decoupling the aggregation and the analytics and visualization of data allows for flexible responses to requirements while minimizing the efforts required to meet those requirements leading to more time spent on the "real work" of being a Marine. Sections collect the information and company staff works to transform that information to meet the requirements that are imposed, without re-querying the sections. As the transformations are performed programmatically, they take less time, are more consistent, and can be performed by anyone in the company.

At this point, it is obvious that gathering this information requires a significant, but not inordinate, initial investment. However, the routine upkeep of this information pays dividends as requirements bombard the company and leadership is unavailable on operations, leave, etc. The designed combination of the externalized information provides decision makers with the required information without the requirement to task their teams to make a separate query for the new information requirement. The routine requirement of KW to ensure the hand full of trackers are up to date has been significantly less than individual queries and re-queries. The analog for this is the first of Newton's Laws of Motion and Inertia.

It is important to note that this case study only highlights the utility and effectiveness at the platoon and company levels. The intent is to spread this methodology to the battalion level to ease the manual administrative requirements of the different sections and companies. This is a bottom-up approach to problem-solving as the battalion commanders I have served under have delegated, rightly so, the fulfillment of the requirements to the company staffs. Being one of the individuals that is closest to the edge of the problem, I am in the position to experiment with and develop solutions that provide the desired results of my commanders.

Lessons Learned and Further Developments

- Decoupling the collecting and aggregating of information and the reporting of information will allow for meeting information requirements more efficiently without negatively impacting effectiveness.
- Organizing trackers cohesively while being broadly encompassing improves usability and user understanding.
- The described method has proven effective at the platoon and company levels to *complement* the standard enterprise systems not to replace them.
- The described method and the evidence for it will be communicated with other sections and companies within my battalion to help to reduce their administrative burdens and further the development of the methods.

Notes

1. Paul Shigley, "Conceptualizing Knowledge Friction," (Dissertation, Naval Postgraduate School, 2021).

2. Ikujiro Nonaka, "A Dynamic Theory of Organizational Knowledge Creation," *Organization Science* 5, No. 1 (1994).

3. Mark E. Nissen, "Working Toward a System for Measuring Dynamic Knowledge," *International Journal of Knowledge Management*, September 2017, https://doi.org/0.4018/IJKM.2017070101.

4. Rod A. Beckstrom, and Ori Brafman, *The Starfish and the Spider: The Unstoppable Power of Leaderless Organizations* (New York: Penguin Group, 2006).