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## Social Network Analysis and High Velocity Learning

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Monterey, California: Naval Postgraduate School

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## **NPS NRP Executive Summary**

The Relationship Between Social Networks, Leadership Team  
Effectiveness and Organizational Imperatives  
Report Date: 10/31/2019 Project Number: NPS-19-N246-A  
Naval Postgraduate School Graduate School of Defense Management



# **NAVAL RESEARCH PROGRAM**

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## **NAVAL POSTGRADUATE SCHOOL**

MONTEREY, CALIFORNIA

## **THE RELATIONSHIP BETWEEN SOCIAL NETWORKS, LEADERSHIP TEAM EFFECTIVENESS AND ORGANIZATIONAL IMPERATIVES**

Executive Summary Type: Final Report  
Period of Performance: 10/01/2018–10/31/2019

### Researchers:

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**EXECUTIVE SUMMARY**

**Project Summary**

This study examined the relationship between an organization's information sharing structure, team processes and its goals of agility, innovation, speed, and effective teamwork. A Learning Center within Navy's Education and Training Command (NETC) volunteered to participate in the study. The Center, which includes headquarters and four subordinate commands, delivers trained professionals to the US Navy and joint services. Their stated mission is to enable optimal performance of their trained graduates across the full spectrum of military operations.

Data collection included interviews, a social network analysis (SNA) survey, and a team diagnostic instrument. The social network survey explored three types of information sharing amongst the leadership team: a) day-to-day operations, b) training improvements, and c) connections with external customers. A fourth network focused on vertical information sharing pertaining to two specific training course executions. Team effectiveness was also assessed for the five commands.

Findings show that this Center's information sharing is largely stove piped, with limited lateral information exchange occurring within individual commands or across the Center. Bottlenecks impede communication, innovation and problem solving, because of a strong reliance on vertical communication problem solving, and a dependence on headquarters (HQ) to integrate across the commands. The team assessment data corroborated the SNA findings. We concluded that while the Center has been an award-winning organization, emerging global threats will create an increasing gap in their ability meet their mission. We suggest that these types of commands use network analysis and high performing teams (HPTs) measures to optimize information flow and team effectiveness.

**Keywords:** *social network analysis, SNA, high performing teams, HPT, organizational design*

**Background**

The US Navy is undergoing a large-scale organizational transformation to address new adversarial threats (i.e. Great Power Competition). To address this challenge, the Navy recognizes the need for a shift in how work gets done. The transformation aims to be more team-based, flexible, and agile, where rapid learning is the norm rather than the exception. These imperatives will require the redefinition of command and control to focus on removing silos, distributing decision making, improving organizational learning and feedback, developing high-performing teams, and enhancing and enabling formal and informal information sharing, both horizontally and vertically.

Social network analysis (SNA) is an analytic tool that can capture how people work together in an organization. SNA can be used to map information exchange in the organization, identify key nodes in the network, detect internal and external boundary spanners, and discover organizational bottlenecks. Likewise, HPTs have become central to organizations as they address competitive forces by ensuring that information and critical feedback loops flow up, down and laterally within an organization. However, the move towards more team-based designs often contradicts the military's long-standing interpretation of hierarchical command and control, whether in operations

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or in the organizational enterprises. A reimagined view of this legacy hierarchical design is described in General McCrystal's recent book, *Team of Teams*.

The study addressed two primary research questions:

- 1) Using social network analysis, how is information flowing vertically and horizontally within and across the organizations?
- 2) Using a high performing team assessment, how effective are the team dynamics in these organizations?

### **Findings and Conclusions**

We conducted 43 interviews across the Center including leadership teams, course instructors, and a limited number of customers. Sixty-seven leadership team members were asked to complete the team assessment and network analysis; response rate was 57% and 49% respectively. Vertical course network analysis was completed by 22/44 instructors and course supervisors, with a 50% response rate. The qualitative data was analyzed, and themes were created.

This quote encapsulated our qualitative interviews and corroborated the quantitative findings: "We do well with what we can control, but it feels like we are sustaining a sinking ship. We need to produce up-to-date training that is relevant, but our facilities and systems are failing, and we can't update training materials when they need it." This observation suggests the importance of re-evaluating the way work gets done.

Network analysis showed that day-to-day connectivity is relatively low across the whole network (network density 3.4%; average # of links to others 6.3, total ties 1160). Likewise, day-to-day connectivity within sites varies from low to moderate: Organization A 24.5% network density; Org B and C 10%; Org D 8.15%, and Org E 7.6%. Average number of links 5.4 for Org A; 4.2 for Org B; 5.0 for Org C; 1.3 for Org D; and 2.2 for Org E.

Additionally, day-to-day communication is more likely to move vertically within sites or across sites than horizontally (homophily measure 0.28). Essentially, when instructors run into problems, they go up the chain. Last, the connection to the deck plate was very sparse, even at lower levels of the organization.

We also found an almost exclusive reliance on HQ to connect the sites to one another. Without HQ as an integrator, there is sparse communication across the sites, and typically only at the highest levels. Such a reliance on individuals at HQ can create bottlenecks (reducing speed of information flow) and disconnects (if individuals fail to pass along relevant information). Most people tend to ask internal personnel whether they are meeting the needs of external customers. Therefore, while a wide variety of levels are engaged, only a small number of individuals are acting as brokers of information regarding external customer needs.

In summary, the network analysis indicates that 1) vertical communication (up/down) is much more common than horizontal coordination communication, 2) a few key roles at HQ are relied upon to share ideas across the Center, and 3) central innovation brokers are not well connected in the day-to-day network.

In conjunction with the network analysis, participants rated the effectiveness of their team dynamics. The team assessment instrument and interviews measured command leadership

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performance against HPT standards for team effectiveness. In general, findings show that team members exchange information within their teams, but they do not adequately “take each other into account” in the work that they do. This finding confirms the silo nature of information sharing found in the network analysis. Of note, the tendency for these teams to operate using a “command and control” style may impede their ability to work as HPTs. That is, team members may not see the need to take each other into account because they see coordinating across the organization divisions, resolving conflicts and making decisions affecting the whole organization as the responsibility of the Commanding Officer and Executive Officer, not the team members themselves.

While this Center has been considered effective based on past measures of success, several barriers exist that will prohibit this organization from realizing the imperatives of agility, innovation, speed, and HPTs, which would then enable the optimal performance required to compete and win rapidly changing military operations.

### **Recommendations for Further Research**

This study was conducted to show the use of social network analysis for organizational design issues within the US Navy. However, further research is needed to assess scalability.

### **Acronyms**

HPT	high performing team
HQ	headquarters
NETC	Navy Education and Training Command
SNA	social network analysis