

**KEY FACTORS FOR SUCCESSFUL
COLLABORATION WITHIN THE TANK –
AUTOMOTIVE AND ARMAMENTS
COMMAND LIFE CYCLE MANAGEMENT
COMMAND
(TACOM LCMC)**

**SSCF Independent Research Project
(DAU RESEARCH REPORT SSCF-MW 09-#)**



May 2009

**Submitted to Lawrence Technological University in partial fulfillment of the degree of
Master of Science in Global Leadership and Management**

**Submitted to Defense Acquisition University in partial fulfillment of the requirements of
the Senior Service College Fellowship Program**

DISTRIBUTION STATEMENT A. Approved for public release; distribution is unlimited

Report Documentation Page

Form Approved
OMB No. 0704-0188

Public reporting burden for the collection of information is estimated to average 1 hour per response, including the time for reviewing instructions, searching existing data sources, gathering and maintaining the data needed, and completing and reviewing the collection of information. Send comments regarding this burden estimate or any other aspect of this collection of information, including suggestions for reducing this burden, to Washington Headquarters Services, Directorate for Information Operations and Reports, 1215 Jefferson Davis Highway, Suite 1204, Arlington VA 22202-4302. Respondents should be aware that notwithstanding any other provision of law, no person shall be subject to a penalty for failing to comply with a collection of information if it does not display a currently valid OMB control number.

1. REPORT DATE 01 MAY 2009	2. REPORT TYPE N/A	3. DATES COVERED -	
4. TITLE AND SUBTITLE Key Factors For Successful Collaboration Within the Tank-Automotive and Armaments Command Life Cycle Management Command (TACOM LCMC)		5a. CONTRACT NUMBER	
		5b. GRANT NUMBER	
		5c. PROGRAM ELEMENT NUMBER	
6. AUTHOR(S) Jennifer A. Hitchcock		5d. PROJECT NUMBER	
		5e. TASK NUMBER	
		5f. WORK UNIT NUMBER	
7. PERFORMING ORGANIZATION NAME(S) AND ADDRESS(ES) US Army RDECOM-TARDEC 6501 E 11 Mile Rd Warren, MI 48397-5000		8. PERFORMING ORGANIZATION REPORT NUMBER 19894RC	
9. SPONSORING/MONITORING AGENCY NAME(S) AND ADDRESS(ES)		10. SPONSOR/MONITOR'S ACRONYM(S) TACOM/TARDEC	
		11. SPONSOR/MONITOR'S REPORT NUMBER(S) 19894RC	
12. DISTRIBUTION/AVAILABILITY STATEMENT Approved for public release, distribution unlimited			
13. SUPPLEMENTARY NOTES Submitted to Lawrence Technological University in partial fulfillment of the degree of Master of Science in Global Leadership and Management Submitted to Defense Acquisition University in partial fulfillment of the requirements of the Senior Service College Fellowship Program, The original document contains color images.			
14. ABSTRACT			
15. SUBJECT TERMS			
16. SECURITY CLASSIFICATION OF:			17. LIMITATION OF ABSTRACT SAR
a. REPORT unclassified	b. ABSTRACT unclassified	c. THIS PAGE unclassified	
			18. NUMBER OF PAGES 116
			19a. NAME OF RESPONSIBLE PERSON

PAGE
LEFT
BLANK
INTENTIONALLY

**KEY FACTORS FOR SUCCESSFUL
COLLABORATION WITHIN THE TANK –
AUTOMOTIVE AND ARMAMENTS
COMMAND LIFE CYCLE MANAGEMENT
COMMAND (TACOM LCMC)**

**SSCF Independent Research Project
(DAU RESEARCH REPORT SSCF-MW 09-#)**

Jennifer A. Hitchcock

May 2009

**Submitted to Lawrence Technological University in partial fulfillment of the degree of
Master of Science in Global Leadership and Management**

**Submitted to Defense Acquisition University in partial fulfillment of the requirements of
the Senior Service College Fellowship Program**

PAGE
LEFT
BLANK
INTENTIONALLY

Table of Contents

Table of Contents	5
List of Figures.....	6
List of Tables.....	6
Abstract	8
Chapter 1: Introduction	11
Background	12
Separate Commands with Separate Goals	12
Separate Commands with Common Goals: the Formation of the Life Cycle Management Commands	15
Life Cycle Management Commands Today	17
Problem Statement	20
Purpose of the study	21
Significance of the Study	21
Overview of Methodology	24
Objectives and Outcomes	25
Chapter 2: Literature Review	26
Introduction	26
Environment/Culture	27
Goals and Objectives	28
Skills/Competencies/Behaviors	29
Skills/Competencies.....	29
Behaviors	31
Communication	33
Process and Structure	36
Summary	40
Chapter 3: Methods	42
Introduction	42
Data Collection Procedures	42
Interview Data Collection.....	44
Interview Process.....	46
Non-Government Interviews	47
Government Interviews.....	48
Interview Questions	50
Data and Analysis	52
Summary	53
Chapter 4: Analysis and Results	54
Introduction	54
Literature Review Results	56
Interview Data Results aligned to Literature Review Results	61
Overall Summary.....	62
Factor Summary.....	64
Data for Results for all Factors.....	92
Additional Factors.....	94
Summary	95

Chapter 5: Conclusions and Recommendations	97
Introduction	97
Key Factors for Successful Collaboration	97
Similarities and Differences between Military and Industry Factors for Collaboration	99
Common Factors	100
Differences	102
Links and Interdependencies between the Factors	105
Key Factors Summary	107
Opportunities for Further Research	109
Limitations of the Research	110
References	112

List of Figures

Figure 1: Pre-LCMC (Christle, Johnson & Wilson, 2006, p.10)	13
Figure 2: Post - LCMC (Christle et al., 2006, p.11)	16
Figure 3: TACOM LCMC Organization (Reynolds, 2008)	18
Figure 4: Chapter 4 Discussion Outline	55
Figure 5: Combined Military and Industry Responses to Factors	93
Figure 6: Military and Industry Responses to Factors	94
Figure 7: Linkage between Factors	106
Figure 8: Key Linkages between Factors	107

List of Tables

Table 1: List of Interviewees	46
Table 2: Comparison of Factors from Mattessich et al. Study (2001) and Overall Literature Review	56
Table 3: Comparison of Factors from Mattessich et al. Study (2001) and Overall Literature Review	58
Table 4: Overall Interview Response Summary	63
Table 5: Common and Different Factors between Military and Industry	100

PAGE
LEFT
BLANK
INTENTIONALLY

Abstract

The definitions and opinions in the Tank – automotive and Armaments Command Life Cycle Management Command (TACOM LCMC) vary widely on what hinders or facilitates collaboration and how it should be accomplished. Most people agree that during times of urgency and crisis the TACOM LCMC collaborates very effectively. In addition, a few organizations regularly collaborate successfully. But many perceived barriers to collaboration appear to prevent successful collaboration from occurring on a long term basis. Since the LCMC is a collaborative organization and collaboration is important to the LCMC's success, this study was conducted to determine the key factors required for successful collaborations. Specifically this identifies key factors needed for successful long term collaborations within the TACOM LCMC.

A collaborative culture in a business or organization has many benefits. In the United States Army, pockets of collaboration have resulted in leveraging expertise and resources to provide improved capabilities and equipment faster to Soldiers in conflicts around the world. As our pace of operations has increased since 2004, collaborations have helped reduce the time it takes to solve problems, procure and field equipment. This has resulted in providing equipment for Soldiers to perform their missions and a noticeable decrease in lives lost.

Long term collaborations are important not only because of the benefits stated above, but because the Army is undergoing significant changes in the way it does business. The Army is facing a more complex and global operating environment which will require more resources than are available. With the Global War on Terrorism, modernization, increasing requirements and diverse demands, maintaining the status quo is not an option.

This research study was conducted using exploratory research and qualitative analysis to discover the factors that are considered key to successful collaboration. Data was collected from literature and interviews. The interviews were focused on successful collaborations and the interview questions were developed using the appreciative inquiry approach. Interviews were conducted with seven people from three different long term successful collaborations within the TACOM LCMC. Additionally eight interviews were conducted with three different successful industry organizations to provide a perspective beyond the military environment.

Analysis of the data revealed 19 factors that enable successful collaborations and research shows that the appearance of each factor in some amount is needed for successful collaborations. There appear to be commonly agreed upon factors between military and industry collaborations, and factors that are different between the two sectors. There appears to be an important pattern of interdependency between some of the factors. This interdependency implies that *leadership support for the collaboration, the collaborative goals and vision, personal accountability and ownership of the collaboration process, continuous communications and the leaders of the collaboration having collaborative skills and behaviors* are core factors for successful collaborations. Concentrating resources on developing these core factors will begin to build successful collaborations within the TACOM LCMC and allow for the continuous building of all the factors into the culture to create a collaborative culture.

PAGE
LEFT
BLANK
INTENTIONALLY

Chapter 1: Introduction

The Army's Life Cycle Management Command (LCMC) concept has been in operation since 2004. The LCMC construct is built upon the foundation of successful collaboration among its Acquisition, Logistics and Technology (ALT) communities. For the United States Army, Mortensen and Yakovac (2006) stressed actively seeking opportunities to collaborate and work together more effectively to benefit the Army. Collaboration is defined for the purpose of this research as:

a mutually beneficial and well-defined relationship entered into by two or more organizations to achieve common goals. The relationship includes a commitment to mutual relationships and goals; a jointly developed structure and shared responsibility; mutual authority and accountability for success; and sharing of resources and rewards (Mattessich, Murray-Close & Monsey, 2001, p.4).

Within this LCMC construct, there have been many short term collaboration successes. During conversations about collaboration with TACOM LCMC leaders, they stated the Army regularly cooperates to support our Soldiers. During an urgency or crisis situation there are successful short – term collaborations, such as the Mine Resistant Ambush Protected (MRAP) program (personal communications, September 4, 2008). However, long term successful enduring collaborations are unusual. Examples of long term successful collaborations within the TACOM LCMC include the Product Manager Petroleum and Water System (PM PAWS) office (personal communications September 4, 2008) and the Product Manager for Sets, Kits, Outfits and Tools (PM SKOT) office (personal communications, August 16, 2008).

These long term collaborations are important not only because of the benefits of collaboration, but because the Army is undergoing significant changes in the way it does business. The Army is facing a more complex and global operating environment which will require more resources than are available. With the Global War on Terrorism (GWOT),

modernization, increasing requirements and diverse demands, maintaining the status quo is not an option (Army Posture Statement, 2007). The Army Business Transformation will help identify additional resources from cost savings and increased effectiveness (About Army Business Transformation, 2008). Building from the military and industry benefits stated above, long term successful collaborations in the Army will lead to faster, better and cheaper solutions for our Soldiers.

This research will identify and define the key factors required for successful long term collaborations within the TACOM LCMC. These factors will enable the community to have a common understanding and framework for collaboration in order to develop a collaborative culture to best serve the Soldier.

Background

Separate Commands with Separate Goals

Prior to 2004, two organizations supported acquisition and sustainment of major Army systems, the Army Materiel Command (AMC) and Office of the Assistant Secretary of the Army for Acquisition, Logistics and Technology [ASA (ALT)]. AMC's role was to support less than major systems, research and development and general sustainment activities and ASA (ALT)'s role was to support major acquisitions. These commands are depicted in Figure 1.

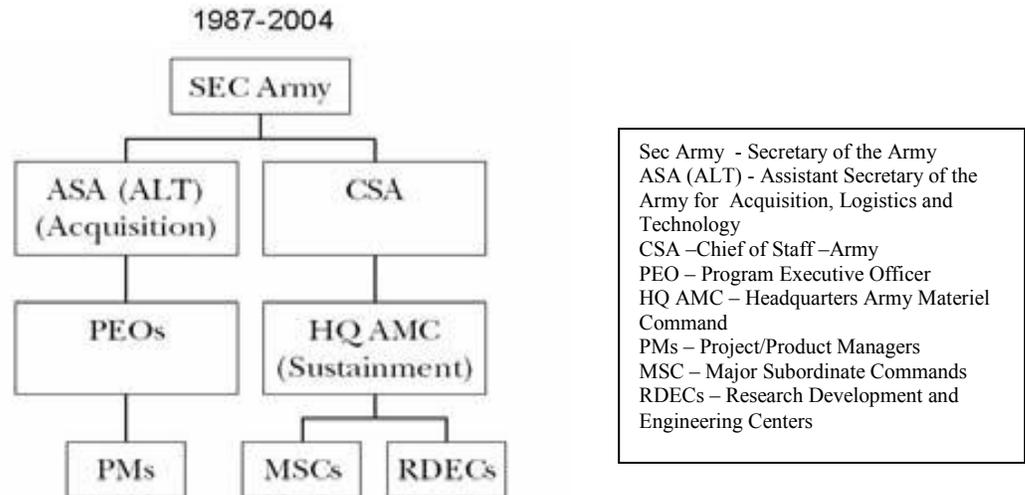


Figure 1: Pre-LCMC (Christle, Johnson & Wilson, 2006, p.10)

This creation of two commands was based on the Packard Commission recommendations and the Goldwater-Nichols Act which took acquisition authority from the service chiefs and gave it to the Service Acquisition Executive (SAE) (Christle et al., 2006). These changes allowed the Program Executive Officers (PEO's) to be dedicated to executive management without any other command responsibilities and ensured that there were no more than two levels of review between a Program Manager (PM) and the Milestone Decision Authority (MDA). The MDA is the designated individual with overall responsibility for a program who approves entry of an acquisition program into the next phase of the acquisition process and is accountable for cost, schedule, and performance reporting to higher authority, including congressional reporting.

In this two command construct both commands were very focused on their own mission and organizational objectives; ASA(ALT) on acquisition and AMC on sustainment.

Each successfully completed their missions but often independently from each other. This often led to issues such as a dual chain of command, conflicting guidance, internal competition and minimal coordination (Christle et al., 2006). In addition, the separation of appropriations, mandated by congress between the two commands, often led to budgeting and execution issues (Flanagan, 2007).

In 1997 Assistant Secretary of the Army for Research, Development and Acquisition [ASA(RDA)], now known as ASA(ALT), declared the program manager to be the life cycle manager. Army Regulation (AR) 70-1 issued in December 2003 defined the Army acquisition policy and officially stated the new responsibility of the PM to manage the total life cycle of the system:

Under Total Life Cycle Systems Management (TLCSM), PMs are responsible and accountable for the life-cycle management of their assigned programs. As such, there is no transition of life cycle management responsibility away from the PM. They will manage assigned programs in a manner consistent with the policies and principles articulated in governing regulations....(Department of the Army, 2003, p.2).

This important regulation change gave total responsibility for system life cycle management to the Program Manager (PM) which meant the PM was responsible for not only the acquisition but also the sustainment of their systems. In addition, this change came without the authority, otherwise known as funding, which was still being allocated to AMC. As an example, PM Abrams received their acquisition funding from ASA(ALT) but were responsible for sustaining systems in the field. This sustainment funding came from AMC to TACOM. Then PM Abrams would have to work with the TACOM sustainment personnel to ensure the systems were being sustained. This significant change in responsibility without authority brought significant challenges in day to day operations (Flanagan, 2007). Then the terrorist attacks on September 11, 2001 happened. By October 2001 the Army was in the War

in Afghanistan and in March 2003 the War in Iraq. The actions in Afghanistan and Iraq significantly increased the pace of operations as the Army needed more systems and those systems engaged in the conflicts needed to be sustained. It was important that the two commands come together to provide one face to the field as articulated by Cannon and Cole:

The driving force behind LCMC creation is the changing demands on the Army. While the Cold War's last few decades were characterized by a certain degree of predictability, the nature of the threat is much more complex, varied and unpredictable today. This has led to a need for the Army and, more specifically, Army acquisition management, to adapt and change to be more responsive in getting products to our Soldiers faster and improving the go-to-war capability of our weapon systems (Cannon & Cole, 2006, p.13)

Separate Commands with Common Goals: the Formation of the Life Cycle Management Commands

The founders of the LCMC concept realized that the Army could not continue to operate with this gap between the Acquisition, Logistics and Technology (ALT) communities. They developed the concept to integrate significant elements of the ALT leadership responsibility and authority to enable a closer relationship between the Army Material Command (AMC) and the PEO's (Kern & Bolton, 2004). On August 2, 2004 a Memorandum of Agreement (MOA) was signed by the Assistant Secretary of the Army for Acquisition, Logistics and Technology ASA(ALT) and the Commander of the U.S. Army Materiel Command (AMC) to formalize the Army's Life Cycle Management Initiative. The initiative had four objectives (Kern & Bolton, 2004, p.1):

- Get products to the Soldier faster
- Make good products even better
- Minimize life cycle cost
- Enhance synergy and effectiveness of the Army Acquisition, Logistics and Technology (ALT) communities

This agreement was important to the future direction of the Army as it was a revolutionary operating concept for how the Army was expected to support the Soldiers in an ever

changing, fast paced, operating environment. The new operational construct of the two organizations is depicted in Figure 2.

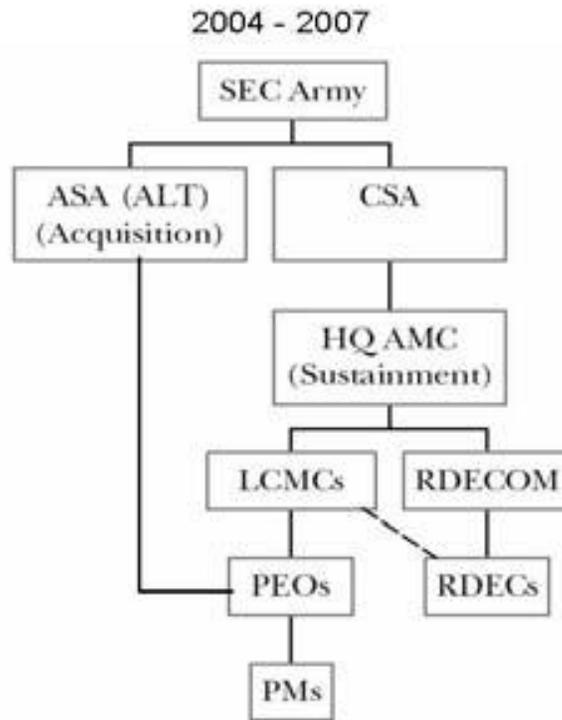


Figure 2: Post - LCMC (Christle et al., 2006, p.11)

The LCMC construct was designed to promote collaboration and cooperation between the two commands at all levels. Four LCMC's were initially formed: TACOM LCMC, Aviation and Missile Command (AMCOM) LCMC, Communications-Electronics Command (CECOM) LCMC and Joint Ammunition LCMC. Each LCMC aligned the AMC Major Subordinate Commands (MSCs) and the PEOs. The Research Development and Engineering Command (RDECOM) Research Development and Engineering Centers (RDECs), the technology piece of ALT, were aligned at a later date. The original MOA called for the Military Deputy (MILDEP) to ASA(ALT) to be dual-hatted as the AMC Deputy Command

General for Acquisition and Technology. It also stated that Program Executive Officers (PEOs) may be dual-hatted as LCMC deputies, the LCMC Commanding General (CG) would now be in the PEO's rating chain, and metrics would be established by the Army Acquisition Executive to evaluate the benefits of this arrangement. There was no mention of any changes in appropriations and the funding allocations remained the same as pre-LCMC. A follow on memorandum was issued in July 2006 with the Subject: "Collaboration Among Organizations is Key to Life Cycle Management Success." This memo discussed the successes to date of the LCMC concept and it also emphasized the need to work together collaboratively and called for unity of command. The following is an excerpt from the memorandum:

We cannot afford to go back to the old ways of doing business. We must go forward and continue to find new and better ways to do business across organizational lines. For example, we must stop duplication and disconnects caused when similar "taskers" are sent to different organizations for action. Therefore, we re-affirm our commitment to LCM and ask each leader at all organizational levels in the acquisition, logistic and technology communities, to identify your counterparts in other organizations, understand their unique perspectives, strengths and needs, actively seek opportunities to collaborate on how to work together more effectively and efficiently for the good of the Army, and view all job functions through an integrated LCM lens to create the best products and services for the Army (Mortensen & Yakovac, 2006, p.1).

Life Cycle Management Commands Today

The Life Cycle Management Commands (LCMCs) today are slightly different than the original concept. There are currently four LCMCs; TACOM LCMC, AMCOM, LCMC, CECOM LCMC and Joint Munitions and Lethality LCMC (JM&L LCMC). For the purposes of this study, the focus will be on the TACOM LCMC in its current state as depicted in Figure 3.

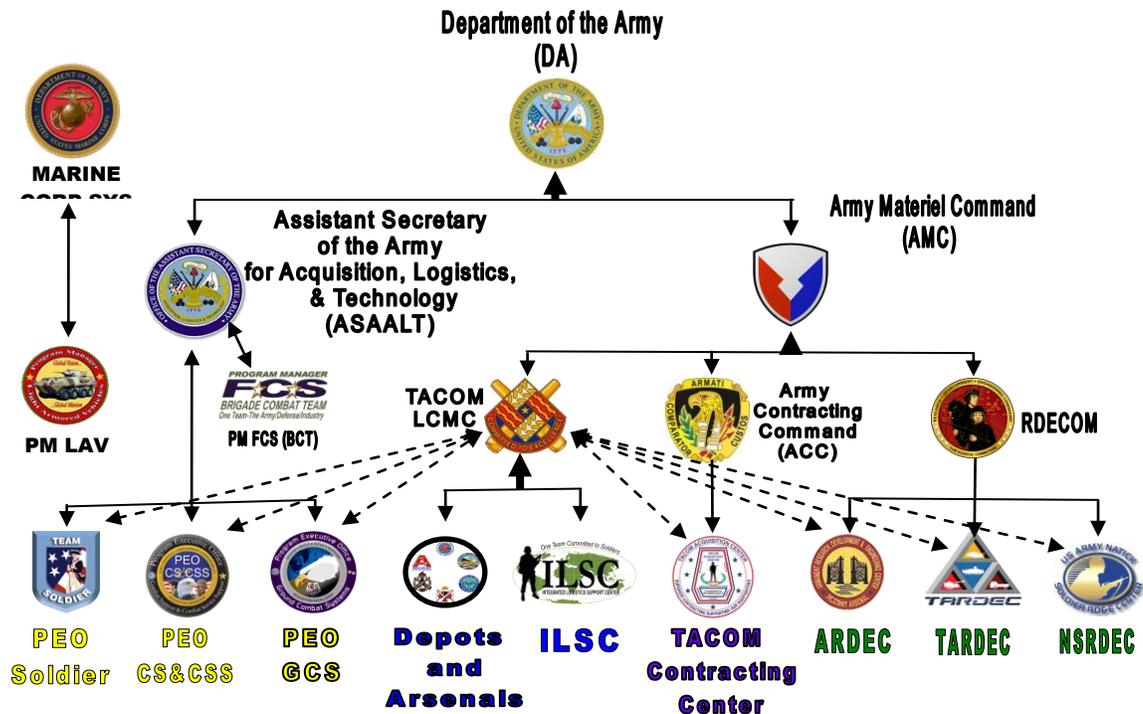


Figure 3: TACOM LCMC Organization (Reynolds, 2008)

The major differences between the original MOA and the TACOM LCMC as it is today is that none of the PEO's in the TACOM LCMC is dual-hatted as the TACOM LCMC deputy nor is the TACOM LCMC Commanding General (CG) part of the PEO's rating chain. —. I was actually the rater [of] PEO's when I came in. That rating of the PEO's went away after a year. Then it was a coalition of the willing" (Talbot, 2008, p. 5).

Today the TACOM LCMC has developed a mission and vision statement, has defined and assigned roles and responsibilities and has developed a strategic plan for the TACOM LCMC community. The TACOM LCMC mission and vision statement are as follows:

TACOM LCMC Vision: Providing our warfighters with overwhelming lethality, survivability, mobility, and sustainment for battlefield dominance, now and in the future.

TACOM LCMC Mission: Develop, acquire, field, and sustain Soldier and ground systems for the warfighter through the integration of effective and timely acquisition, logistics, and cutting-edge technology (Reynolds, 2008, p. 2.2)

In April 2008 the TACOM LCMC Playbook was issued. This playbook was an important step towards outlining the roles, responsibilities, operating principles and rules of engagement within the TACOM LCMC (Reynolds, 2008). Prior to this playbook, many of the associates of the LCMC did not understand the LCMC concept, how it was supposed to operate or their role and responsibilities in the LCMC. They often were only focused on meeting their individual goals and responsibilities (Stephenson, 2007). Talbot says the LCMC is not an organization with the normal hierarchical wiring diagram so the work force does not understand it. The LCMC is a coalition of the willing and the playbook was made up to demonstrate how the LCMC should operate and how people should work together (Talbot, 2008). By instituting this playbook, associates had a clear and concise explanation of the LCMC concept and how they and their organizations played a critical role in its success. This document clearly defined the expectations from LCMC leadership that collaboration is everyone's responsibility.

In personal communications with leaders and associates within the LCMC it appears collaboration at some levels is occurring. However, many sources cite reasons why collaboration is difficult. One reason noted is that separate funding sources between the acquisition, technology and logistic communities drive competition between the entities (Flanagan, 2007). This is emphasized by Talbot who states there is historic animosity between the old small '€' and the PMs arguing who is in charge of stuff and who's going to control the money (Talbot, 2008). The small '€' refers to the TACOM elements that are managed by the TACOM commander and consist of the TACOM Acquisition Center, the Integrated Logistics Center (ILSC) and the Depots and Arsenalns. The LCMC needs to look at how to effectively blend all types of money and provide visibility to all the LCMC partners on

how it is all being spent (Talbot, 2008). Secondly, the LCMC concept is a culture change. Culture can either facilitate or inhibit the success of organizational initiatives like the LCMC's. It is often the cultural issues and differences that create the greatest resistance to change (Pillsbury, 2006). Through education, demographic and personnel shifts over the next few years, it is expected that the LCMC structure and operational concept will become the norm and collaboration will be the accepted mode of operation (Talbot, 2008).

The 2008 TACOM LCMC strategic plan identified strengths and challenges as a life cycle management command. In terms of collaboration, the operational strengths were identified as (Long, 2008, p.10):

- We share a common goal and commitment to warfighters
- We unite around big challenges when they arise
- The Global War on Terrorism (GWOT) has compelled us to be more responsive
- Co-location of our acquisition, logistics, and technology personnel brings improvement in communication, coordination and collaboration
- When we bring people together face-to-face we get great results

In terms of collaboration, the operational challenges as an LCMC were identified as:

- Integration among acquisition, logistics, and technology fund streams
- Synergy between ASA(ALT) and AMC (different views regarding LCMC roles and the supervision and execution of organizational missions)
- Understanding and embracing the life cycle management concept

Problem Statement

The definitions and opinions in the LCMC vary widely on what hinders or facilitates collaboration and how it should be accomplished. Most people agree that during times of urgency and crisis the TACOM LCMC collaborates very effectively. In addition, a few organizations regularly collaborate successfully. But the many barriers to collaboration, including ongoing cultural changes and separate funding allocations appear to prevent successful collaboration from occurring on a daily basis. Since TACOM LCMC is

collaborative organization and collaboration is key to the LCMC being successful, what are the factors required for the collaborations to be successful? Specifically what are the key collaboration factors required for successful long term collaborations within the TACOM LCMC?

Purpose of the study

In May 2008, the TACOM LCMC published its 2008 Strategic Plan with four overarching strategic goals each with their own specific objectives. Goal number four of this strategic plan is:

Foster a climate within the TACOM LCMC in which we mutually arrive at courses of action that are in the best interest of the warfighter. Promote a spirit of collaboration, teaming and customer service throughout the TACOM LCMC (Long, 2008, p.4).

There is a tremendous amount of data in literature on how to achieve successful collaboration. The research will study collaborative successes within TACOM LCMC and industry to determine key factors for successful long term collaboration. This research will identify and define key factors which will enable the community to have a common understanding and framework for collaboration in order to develop a collaborative culture to best serve the Soldier.

Significance of the Study

A collaborative culture in a business or organization has many benefits. As Gray notes, a collaborative culture can produce higher quality results to a problem. When organizations work jointly, rather than independently, they perform a broader, more comprehensive analysis of opportunities and challenges. They often accomplish tasks more efficiently by using and combining their collective resources (Gray, 1989). Successful

collaborations produce ingenious results (personal communications, February 18, 2009) and a better quality product for the customer (personal communications, March 11, 2009).

Collaborations can increase efficiency and reduce individual expenses (Mattessich, et al., 2001). This can lead to an increase in sales and profits and a growth in business (personal communications, February 18, 2009).

Another major benefit of successful collaboration is improved relationships between the partners in the collaboration. They build trust and credibility which results in more effective partnerships and enhanced mutual commitment (Nix, Lusch, Zacharia & Bridges, 2008). Collaboration promotes personal growth and continuous improvement (personal communications, February 23, 2009) by learning from others (personal communications, February 23, 2009) and capitalizing upon the group's diversity (personal communications, February 23, 2009). These benefits allow a company to build a long lasting franchise with an enduring collaborative culture (personal communications, February 18, 2009).

In the U.S. Army, pockets of collaboration have resulted in leveraging expertise and resources to provide improved capabilities and equipment faster to Soldiers in conflicts around the world. As our pace of operations has increased since 2004, collaborations have helped reduce the time it takes to solve problems, perform contracting actions and procure and field equipment (personal communications, March 4, 2009). This has resulted in providing equipment which allows Soldiers to perform their mission and a noticeable decrease in lives lost (personal communications, February 11, 2009). As Dunwoody explains

Our organizations are coordinating their efforts to achieve shared goals as never before. The result is total lifecycle management in its truest sense—built on the full integration of acquisition, research and development, technology, and the materiel we deliver to the battlefield. This new level of collaboration also enables us to provide superior materiel solutions and state-of-the-art technologies and equipment for Soldiers and civilians in theater (Dunwoody, 2009, p.48).

This research is important because collaboration in the military must become a normal and expected mode of operation. Budgets, facilities and personnel resources are all decreasing which means we must bring our organizational resources together to provide our Soldiers with the equipment they need in an efficient and effective manner. In addition, successful collaborations will also drive organizations and people to take ownership and responsibility for meeting the TACOM LCMC vision and goals (Talbot, 2008).

Additionally, because of little or no collaboration, the Army's Research and Development (R&D) community often develops items the acquisition community doesn't need and the acquisition community doesn't have enough resources to meet both urgent and long term needs. For example, the R&D community needs to be driving towards meeting the acquisition community mid and long term needs with their R&D budgets, people and facilities. This will allow the acquisition community to allocate their R&D budget and people to meet their short term urgent problems. As stated by Talbot:

There needs to be an up-front funding for the RDECs (Research, Development and Engineering Centers), but the PMs and LCMC should have a lot more say on the focus of the work it buys. The PMs and LCMCs need to be able to say "these are the technologies or engineering areas that I need you to work on for me right now and these are the skill sets that I need." There ought to be a lot more say, especially on the PM-side of the house, on the RDECOM (Research Development and Engineering Command) RDE centers as far as what you work on (Talbot, 2008, p.30).

At the same time operational resources are decreasing, the pace of Army operations is increasing around the world. This means there is more use of Army equipment, more supplies (fuel, parts, etc) and generally a greater need for resources. The Army's Operations Tempo (OPTEMPO) in Operation Enduring Freedom (OEF)/Operation Iraqi Freedom (OIF) is four times greater than peacetime (Pillsbury, 2006). In addition, the Army's equipment is old and wearing out faster with these increased operations. There is not enough funding in any one

organization to buy new equipment, upgrade it and sustain it effectively through these increased operations. With supplemental appropriations expected to end after 2009, it is crucial that the LCMC collaborate to pull their individual resources together to meet the Soldiers needs on the battlefield and upgrade our current vehicle fleet (Flanagan, 2007). As Hermes and Roddin state:

...there will be a press on resources as we come out of this part of GWOT [Global War on Terrorism] funds, the fighting part, because funding is normally taken away from DOD [Department of Defense], and certainly it will be taken away from the Army. So, how do you maintain the world's best Army when your resources get constrained? There will be a lot of focus on what we're doing in supplying and sustaining the force and that will be driven by how much better we can do our business than we're doing it today. It's a journey that will go on and on (Hermes & Roddin, 2006, p.37).

Overview of Methodology

This study will be conducted using exploratory research to discover the factors that are considered key to successful collaboration. Data will be collected by first searching and reviewing literature. Interviews will then be conducted with successful collaborations within industry and the TACOM LCMC to discover collaboration factors that are enabling these collaborations to be successful. All data collected will be used to help identify key factors required for successful collaborations. The data will then be analyzed to determine the similarities between the literature, industry and LCMC collaborations to define any similarities and differences relative to the TACOM LCMC.

Based on recommendations from LCMC leadership and literature, several industries were identified to have successful collaborations. These are 3M Corporation, General Dynamics Land Systems and SAIC Corporation. Data from these industry organizations will be collected from literature and interviews. Based on recommendations, Project Manager Mine Resistant Ambush Protected (PM MRAP), Product Manager Petroleum and Water

Systems (PM PAWS) and Product Manager Sets, Kits, Outfits and Tools (PM SKOT) are examples of successful collaborative efforts within the TACOM LCMC. Data from these TACOM LCMC organizations will be collected from literature and interviews. Groups will be identified and individuals from those groups will be interviewed based on their knowledge, understanding and experience with collaborative efforts. The interviews will be recorded using a digital voice recorder and transcribed into written documentation.

Objectives and Outcomes

The outcome of this research will be the identification of key factors necessary for long term successful collaborations within the TACOM LCMC organization. The research will evaluate successful collaboration factors in literature and industry and compare with successful collaboration factors in the TACOM LCMC. This will enable identification of any gaps in collaboration factors.

The TACOM LCMC leadership can use these factors and gaps to help determine where resources and plans, including funding, infrastructure, and personnel, may be more effectively applied. The factors can be incorporated into the TACOM LCMC Playbook and training programs can be developed for TACOM LCMC personnel to develop and enhance their collaboration skills and behaviors. These factors can also be used to develop metrics to measure collaboration and be used for personnel performance evaluation factors.

Chapter 2: Literature Review

Introduction

This chapter presents a review of research and literature on key factors that enable successful collaboration. The review is organized into five major categories that appear to emerge from the literature: Environment/Culture, Goals/Objectives, Skills/Competencies/Behaviors, Communications and Process/Structure. Communications was originally grouped with Skills/Competencies/Behaviors; however, it was such an important factor in each of the literature reviews that it seemed to merit its own category.

The guiding research, from which the above categories emerged, was the work of Paul W. Mattessich, Marta Murray-Close and Barbara Monsey of the Wilder Research Center. Their research reviewed over 400 studies on collaboration and identified 20 factors that enable successful collaboration (Mattessich, Murray-Close & Monsey, 2001). Their research stated that the relative importance of one factor over another was not clear. However, what was clear was that each factor, in some amount, should be present to enable successful collaboration. Another important characteristic of their research was their definition of cooperation, coordination and collaboration because their definition of collaboration is the foundation of this research. Also, since the TACOM LCMC regularly cooperates and coordinates and sometimes collaborates it's important to understand the differences in the definitions. Their definitions of cooperation, coordination and collaboration are:

Cooperation is characterized by informal relationships that exist without any commonly defined mission, structure or planning effort. Information is shared as needed and authority is retained by each organization so there is virtually no risk. Resources are separate as are rewards (Mattessich, et al., 2001, p60).

Coordination is characterized by more formal relationships and an understanding of compatible missions. Some planning and division of roles are

required, and communication channels are established. Authority still rests with the individual organizations, but there is some increased risk to all participants. Resources are available to participants and rewards are mutually acknowledged (Mattessich, et al., 2001, p60).

Collaboration is a mutually beneficial and well-defined relationship entered into by two or more organizations to achieve common goals. The relationship includes a commitment to mutual relationships and goals; a jointly developed structure and shared responsibility; mutual authority and accountability for success; and sharing of resources and rewards (Mattessich, et al., 2001, p59).

Environment/Culture

The first prevailing category is Environment/Culture. This category is defined as the physical location and social environment in which a collaborative group exists. The group does not have control over this area but can influence it (Mattessich, Murray-Close & Monsey, 2001). Further defined, the collaborative group has a history of collaboration or cooperation which will allow them to understand the roles and expectations and enable them to trust the process of collaboration (Mattessich, et al., 2001). The trust built in these heritage relationships increases collaboration success and studies show that when 20-40% of the collaborators already know each other they have strong collaboration from the start (Gratton & Erickson, 2007).

The collaborative group is supported by people who control resources and is supported politically and socially (Mattessich, et al., 2001). Gratton et al. (2007) found that the top executives' philosophy will drive a collaborative success by supporting the collaborative relationship and demonstrating that they themselves can collaborate. Successful collaborations operate in a receptive environment that facilitates its work, has realistic goals that satisfy political and social expectations and do not compete or conflict with other endeavors (Kegerise, 1999). Kanter (1994) asserts that a successful collaboration is

institutionalized and is given a formal status, with clear responsibilities and decision processes. It extends beyond the particular people who formed it and it cannot be broken on a whim. Support from leadership in shaping the environment and culture along with those groups that have influence over the collaboration clearly appear to be key to a successful collaboration.

Goals and Objectives

A second category is goals and objectives. This category is defined by the purpose of the collaboration. It includes the reasons the collaboration exists and the results or vision the group is striving to attain. It is driven by a need, crisis or opportunity and has clear attainable goals and objectives (Mattessich, et. al., 2001).

Liedtka (1996) noted that achieving successful collaboration requires partners to locate a common ground on which to build the relationship and Hattori & Lapidus (2004) emphasized the importance of partners having shared goals. Having clear goals that are shared within a group fosters creativity, innovation and enthusiasm and presents clarity to the purpose of the group (Rosen, 2007). Kegerise (1999) noted that successful collaborations develop clear, concrete, achievable goals. The goals should focus on business results which provide a context and the motivation for working together. Members should have a common purpose, sense of membership in a larger endeavor and have a set of shared assumptions (Beyerlein, Freedman, McGee, & Moran, 2003). According to Mattessich et al. (2001), the group should experience small wins along the way to achieving their goals as this will help them maintain motivation and achieve the feeling of accomplishment.

Collaboration success appears to depend upon having a shared vision. Groups should have the same vision, with clearly agreed upon mission, objectives and strategy for the

outcome of the collaboration (Mattessich, et al., 2001). Partners in the collaboration have a clear sense of the organization's strategic direction and the pivotal roles that collaboration plays in achieving it (Liedtka, 1996). Straus (2002) found that as many employees as possible should be involved in developing or reviewing the core strategies, vision, mission, and long-term objectives of the organization so they can understand and own these elements. Kanter (1994) further asserts that by developing the mission, vision and objectives of the collaboration the partners will not only own the goals but understand them and take responsibility for their success. The collaboration is important and fits major strategic objectives of the partners, so they want to make it work. The partners have long-term goals in which the relationship plays a key role. The plan should be aligned around the current state, the future state and the path to get from the current to the future state (Conerly, Kelley & Mitchell, 2008). Vicens (2007) asserts that members should enter a collaboration because of a shared passion.

Skills/Competencies/Behaviors

A third category is skills/competencies and behaviors. This category is defined by the skills, attitudes, opinions and behaviors of the collaborative members (Mattessich, et al., 2001).

Skills/Competencies

The literature suggests that one of the most important skills successful collaborations possess is the members' ability to manage conflict. In fact, in defining which mode to use to resolve conflict, one literature source advocates acting collaboratively to resolve conflict as collaboration emphasizes getting to the real problem, exploring options, meeting interests and building relationships (Management Skills, 2004). During a successful collaboration

members will exchange ideas and viewpoints which often lead to conflict. Expressing candor about ideas is defined as constructive confrontation. This confrontation should take place so others can view different viewpoints in order to develop new ideas and make the end result of the collaboration better (Rosen, 2007). According to Weiss & Hughes (2005) the ability to address and manage conflict from differences in perspective, competencies, access to information and strategic focus will create most of the value from collaboration across organizational boundaries. Collaborating partners appear to be able to compromise, since the many decisions within a collaborative effort cannot possibly fit the preferences of every member perfectly (Mattessich, et al., 2001). Beyerlein, et al. (2003) asserts that significant collaborative achievements can be accomplished by using the divergence (different perspectives that need to be considered) and convergence (reach agreement) process to view all perspectives. Active collaboration takes place when companies develop mechanisms – structures, processes and skills – for bridging organizational and interpersonal differences and achieving real value from the partnership (Kanter, 1994). Liedtka (1996) found that successful partnerships were able to work through points of conflict to achieve consensus and that the process of addressing and resolving conflicting opinions harnessed and leveraged the creative potential inherent in the diversity of the partners' views.

Successful collaborations appear to have members that have had training to develop their skills in facilitative leadership, facilitation, teamwork, coaching and change management. Having all members trained with these skills would enable all members to employ a common language and allow for a consistent vocabulary and communication across different business and geographic units (Straus, 2002). Gratton et al. (2007) maintains that teaching collaborative members skills on how to build relationships, effective communication

and resolving conflict creatively can enable successful collaboration. Successful collaborations have members that are given training on principles and practices of trust building, collaboration, alignment and responsibility (Hattori et al., 2004). Liedtka (1996) found that education in the mind shift from competition to collaboration and the skills that partnering requires was supported and provided in successful collaborations. Further, Dunkel & Arena (2007) contend that if people embrace the underlying assumption that collaboration is valuable and desirable then the behaviors and methods for collaborating can be taught. Sophisticated formal and informal learning systems appear to be a factor to successful collaborations. Well-designed training and development programs, processes for gathering information about lessons learned and problem solving allows the group to pool its data gathering and information processing skills to foster collaboration (Beyerlein, et al., 2003).

Behaviors

Much of the literature reviewed identified that mutual respect and trust amongst members is a key element to successful collaboration. The first step in a successful collaboration is to build trust between the partners. The four attributes of trust are:

1. Parties are authentic in their interactions with each other – they say what they mean and mean what they say
2. They have a history of delivering on their promises
3. They are able to fulfill their responsibilities within the specific domain of action
4. They are clearly interested and involved in how their action will affect each others well being (Hattori et al., 2004).

In successful collaborations partners are highly invested which means all four attributes of trust are present. Kanter (1994) adds that collaborative partners behave toward each other in honorable ways that justify and enhance mutual trust. They do not abuse the information they gain, nor do they undermine each other. Straus (2002) asserts that respect for human dignity,

belief that stakeholders have a right to be involved and a commitment to the collaboration will foster successful collaboration. According to Kegerise (1999), successful collaborations respect and understand each member for their different, individual roles and responsibility. Successful collaborations also understand and respect each other's organizational operations and culture (Mattessich, et al., 2001). Vicens (2007) found that respecting the people you're collaborating with will earn you their respect and foster a productive relationship. Also, a trusting relationship is important for the collaborative understanding of the problem and for joint thinking throughout the evolution of the collaboration. Members must get over their fears of others stealing their ideas and taking credit for them reminiscent of a competitive environment. They must develop trust in order to collaborate effectively (Rosen, 2007). Liedtka (1996) found that trust was earned and had two distinct elements. The first was an absolute faith in the technical competency of partners and second, partners must trust each other's intentions, as well as each other's ability to deliver. She also states that an important element of developing trust was the willingness to forgive each other as early stumbles are a reality in most developing partnerships.

Collaborating members need to believe that they will benefit from their involvement in the collaboration and that the advantages of the membership will offset costs such as loss of autonomy and turf (Mattessich, et al., 2001). Hattori et al. (2004) assert that successful collaborations have a goal to eliminate the self interest of each party. Mutual concern for the good of the whole leads to a successful collaboration. Collaboration requires sharing but people guarding their work and ideas sabotages collaboration. Members must share what they know to improve collective creation and make everyone more valuable (Rosen, 2007). Liedtka (1996) found that the collaborative partnership was seen as enhancing, rather than

reducing control, as the partners expanded their capability base through the larger capability base that partnering created. In successful partnerships, partners saw clear and tangible benefits available only through joint actions, benefits that exceeded the risks they entailed. Collaboration does not mean abdicating power, but rather sharing power. The key lies in aligning the organizational direction, commitment and capability to create shared responsibility for the success of the organization. Collectively the collaboration shares a responsibility for the organizational outcomes. This bias toward shared responsibility permeates the collaborative organization in all its work processes (Dunkel et al., 2007).

Effective collaboration requires that each individual fulfill their role effectively and provide some value-added contribution. Personal accountability for both the process used and the collaborative results is a requirement and results in successful collaborations (Beyerlein, et al., 2003). Hattori et al. (2004) assert that the primary behavior they witnessed in successful collaborations was responsibility. Liedtka (1996) indicated that partners were committed to their relationship, not because they were told to, but because it held the promise of producing an outcome that they cared deeply about.

Communication

A fourth category is communication. Communication was identified in all literature as a key factor to successful collaboration and is defined by Mattessich, et al. (2001) as the channels that collaborative members use to send and receive information.

According to Liedtka (1996) communication must be open and honest in a climate where support exists to bring substantive issues to the surface, however awkward and politically charged they may be. Hattori et al. (2004) support Liedtka by asserting that successful collaborations appear to have a culture where open conversations can happen and

address peoples' deeply held concerns. Further, Mattessich, et al. (2001) state that open and frequent communication is a necessity and the type of communication and the methods of communication should be decided and utilized in collaboration. A collaborative success depends on a culture that encourages and models open communication and requires a continuous flow of information and ideas. Connecting and finding people independent of business unit and location should be simple and potential collaborators should be easy to engage (Rosen, 2007). Kanter (1994) asserted that collaborative partners share information required to make the relationship work, including their objectives and goals, technical data, knowledge of conflicts, trouble spots or changing situations. Companies with strong communications across functions and widely shared information tend to have more productive relationships. The successful collaborative group operates in a constant cycle of sharing information, clarifying understanding, reaching agreements, and implementing decisions (Dunkel et al., 2007).

Collaborations require all stakeholders to have access to each other's information, ideas and perspectives (Beyerlein, et al., 2003). This was echoed by Straus (2002) who said that members would need access to relevant information about the business, its customers and its external environment. Collaborative members would be able to communicate easily with everyone else regardless of status, function, place or time. The flow of communication would be free and unhindered by bureaucracy. Information is shared openly so the companies can thoroughly understand each other's business – nothing is sacred (Hattori et al., 2004). Vicens (2007) contended that consistent communication with collaborators was the best way to make sure the collaboration was going in the planned direction.

Members in successful collaborations also establish informal communications and personal connections. Stable representation from collaborating organizations is needed to develop strong personal connections which will enable members to get to know each other (Mattessich, et al., 2001). In interpersonal communications members should feel comfortable with each other (Rosen, 2007). According to Kanter (1994), interpersonal integration and growing interpersonal relationships are the foundation for creating future value of the collaboration. Once people know each other personally this opens the door for exchanging information and resolving small conflicts before they get bigger. Liedtka (1996) asserts that collaboration requires commitment, not compliance. The reality of its successes is contingent on the ability of individuals scattered within and across organizations to build meaningful relationships.

Beyerlein, et al. (2003) suggests that collaborations should create higher standards for discussion, dialogue and the sharing of information. By doing this, collaborations build the capacity and commitment of each member to contribute to the collaborative process. Liedtka (1996) found that successful collaborations learned to move over time from common ground to a higher ground. The search for higher ground often involved using the tension created by opposing views to explore alternatives. The outcome of a successful process of dialogue resulted in both better decisions and a renewed sense of ownership for all members of the partnership.

Literature also suggests utilizing various methods of communication within collaborations. Rosen (2007) suggests using collaborative chaos, which is the unstructured exchange of ideas. It allows for brainstorming of solutions and ideas and fosters effective collaboration. Designing and facilitating collaborative meetings builds collaborative

relationships and fosters accountability (Conerly, et al., 2008). Email, voicemail, wireless phones and the internet are means to allow for effective methods of free flow communication. Groupware that supports teleconferencing, video conferencing, same time and different time collaboration should be available in successful collaborations. The successful collaboration would also use technologies that can enable members to document, transfer and share best practices and knowledge (Straus, 2002). The virtual environment, as well as the physical environment, must enhance collaboration (Rosen, 2007). Liedtka (1996) found that investments in infrastructures, especially in information technology, to make information available real-time to support the learning process and decrease coordination costs enabled successful collaborations.

Process and Structure

The fifth category is Process and Structure. This category is defined by the operations, management and decision making operations of a successful collaboration and includes all the resources required to make the collaboration successful (Mattessich, et al., 2001).

According to Mattessich, et al. (2001), the collaboration will include all representatives from each segment of the community who will be affected by the collaboration. Conerly et al. (2008) asserts that getting the right people on board from the beginning of the collaboration will aid in the collaboration being successful. Nothing diminishes trust faster than leaving a key stakeholder out of the process. The more stakeholders are going to be affected, the more buy-in and support the leader will earn by involving those who will be affected by the decision (Dunkel et al., 2007).

A successful collaboration has members that feel ownership of both the way the group works and the results or products of its work. The operating principles and procedures of a

collaborative group must promote a feeling of ownership about decisions and outcomes according to Mattessich, et al. (2001). Successful collaborations involve obtaining ownership and alignment about the work that will be done and the way it will be done (Conerly et al., 2008). Liedtka (1996) discovered that clear and realistic expectations for each partner's contribution were the markers that shaped members' perception of success along the journey. Expectations need to be joint and there must be a process through which each party makes clear its original expectations. Kanter (1994) found that collaborative partners develop linkages and shared ways of operating so they can work together smoothly. They build broad connections between many people at many organizational levels.

A successful collaboration clearly defines members' roles and responsibilities and the members understand how to execute their responsibilities (Mattessich, et al, 2001). Gratton et al. (2007) found that without this clarity, members will waste time and energy negotiating roles or protecting their interests rather than achieving the task. Hattori et al. (2004) echo this by asserting that successful collaborations clearly define the authority and responsibilities of each partner. Deciding who will work on what tasks and sticking to the tasks given will promote a successful collaboration (Vicens, 2007).

According to Mattessich et al. (2001), the collaborative structure must be flexible and open to varied ways of organizing itself and accomplishing its work. The structure of the collaboration must be flexible and not constrained by traditional boundaries or roles. The structure has the ability to form and re-form for different collaborative projects, accept dynamic changes and react to allow a new level of fluidity. The structure allows for broader roles for people that actively work across organizational boundaries (Beyerlein, et al., 2003). Straus (2002) found that the collaborative structure would have different hierarchies, teams

and multi-stakeholder task forces that coexist. Each structure would be organized according to one particular dimension such as function, product line, geography and most importantly customer. Each member would be a member of several different hierarchies and/or teams. This would allow for a structure that is fluid and adaptable and able to respond to external forces. The structure would be very complex and without clear lines of hierarchy.

One thing we've learned is that, in a collaborative organization, positional authority means very little. People's individual credibility and competence and the congruency between their stated beliefs and their actions, engender much more respect than their position or title (Straus, 2002).

In addition, the adaptability of the collaborative effort appears to allow the group to sustain itself even with major changes in people or goals (Mattessich, et al., 2001). Kanter (1994) contends that because collaborative ventures often make new demands, the flexibility of the company and those involved in the collaboration must be able to vary their own company's procedures to make collaborative decisions.

According to Beyerlein, et al. (2003), successful collaborations should also have performance management systems that foster commitment to collaboration and promote ownership. The system should define what behaviors are important, how they are monitored and how they are rewarded, both formally and informally. Liedtka (1996) found that successful collaborations chose a variety of different compensation systems to motivate and reward collaborative behavior which is reinforced by Straus (2002). Straus asserts that reward and recognition systems in organizations should support and reinforce desired behaviors. Further he says that in a collaborative environment, collaboration and team work would be rewarded, in addition to individual contributions.

Successful collaborations need sufficient resources to sustain a collaborative group. Resources should include the funds, people, equipment, materials and time to support and

nurture the collaboration (Mattessich, et al., 2001). Kanter (1994) observed that collaborative partners invest in each other to demonstrate their respective stakes in the relationship and each other. They show tangible signs of long-term commitment by devoting financial and other resources to the relationship. Liedtka (1996) found that partners owned only those commitments they had a voice in creating. She states that critical opportunities to recognize and incorporate input for all partners is done during the formal planning and budgeting processes and this is where partners provide their commitments. She also states that allowing time for the relationships to develop is another resource that must be provided to ensure collaboration success.

The literature states that leadership is important to successful collaborations. Mattessich, et al. (2001) asserts that the leader of the collaboration should have organizing, interpersonal and task related skills. They should be able to carry out their role with fairness. Because of these characteristics, they will be granted respect and legitimate leadership of the collaboration members. Leaders should be committed to the collaboration and act congruently with collaborative values (Straus, 2002). Liedtka (1996) found that active, visible senior management support for partnership endeavors was clearly essential to successful collaborations. Hattori et al. (2004) observed that senior leadership, in one successful collaboration, attended every partner meeting to model desired behaviors and demonstrate their ongoing commitment to the collaboration. It appears that it's not just the actual behavior, but also the perceived behavior of senior leaders that plays a significant role in determining how collaborative people are willing to be. The leaders' behaviors trickle down and are mimicked throughout an organization, so leaders' behaviors must be made visible (Gratton et al., 2007). According to Dunkel et al. (2007), the collaborative leader is

confident enough to know that the best decisions are often made with the input of others with specialized expertise and that successful collaborations have facilitative leadership.

Summary

This chapter reviewed literature on successful collaborations. Many factors were identified as being enablers to successful collaboration. While all of these factors are important there appeared to be five very broad categories that contained key factors that are needed for successful collaboration. Each key factor, derived from literature, is identified below within the related category:

- Environment/Culture
 - Support from leadership and those groups, both politically and socially, that have influence over the collaboration
- Goals/Objectives
 - Clear, concrete and attainable goals and objectives of the collaboration
 - Shared vision for the outcome of the collaboration
- Skills/Competencies/Behaviors
 - Allowing for and effectively managing conflict within the collaboration
 - Members trained in skills required for collaboration
 - Mutual respect and trust among collaborators
 - Personal accountability of the members for the collective outcome of the collaboration and belief that the outcome will provide an advantage
- Communications
 - Open, honest and frequent communication unhindered by status, location or function

- Continuous communication with access to each other's information
- Development of interpersonal communications which establishes and builds personal relationships
- Communication tools and methods to allow for effective infrastructures to support open and continuous communication
- Process/Structure
 - Members and stakeholders own the process of achieving the collaboration's goals
 - Roles and responsibilities in the collaboration are clear
 - The collaborative structure is very complex and is flexible to changes
 - Performance management and reward systems support collaborative behavior
 - Financial, personnel and time resources are sufficient for the collaboration
 - Leadership of the collaboration have collaborative skills and show visible collaborative behavior

These 17 factors were apparent in the literature review as key requirements for successful collaboration. The proposed research will further explore the presence of these, as well as other factors, in successful collaborations in for profit and military organizations.

Chapter 3: Methods

Introduction

This chapter describes the research methodology used to investigate key factors required for successful collaboration within the Tank – automotive and Armaments Command Life Cycle Management Command (TACOM LCMC). Exploratory research was performed to discover the factors considered key to successful collaboration. The research included a literature review on collaboration and interviews with selected leaders to isolate the key determinants of successful collaborations.

Data Collection Procedures

The data for this research was collected from a thorough literature review and from interviews of representatives of organizations engaged in successful collaborations.

Literature Data Collection

The literature review data was collected by reviewing articles, books and additional printed information on successful collaborations. A previous study on collaboration factors was discovered during the literature review. This study by Paul W. Mattessich, Marta Murray-Close and Barbara Monsey of the Wilder Research Center, reviewed over 400 studies on collaboration and identified 20 factors that enable successful collaboration (Mattessich, Murray-Close & Monsey, 2001). Using this study for the baseline factors, a literature review was conducted to compare key factors found in literature with those found in the Mattessich study. This comparison was done to build upon the findings of the Mattessich study and determine how these factors related to the findings in literature. The comparisons specifically considered how prevalent the Mattessich factors were in the literature; could their categories

be defined more broadly and could their factors be more specific in order to be relevant to the TACOM LCMC culture? By answering these questions during the literature review, information was gathered to answer key research questions.

The literature review consisted of reading and reviewing 45 articles and papers and three books about collaboration. Data from the literature review was collected and analyzed against the 20 factors from the Mattessich study. The Mattessich study has six main categories of collaboration which are

- Environment
- Membership characteristics
- Process and Structure
- Communication
- Purpose
- Resources.

However, these six categories appeared to be too narrow and did not necessarily match with the findings of the literature review conducted for this research study. The literature review expanded and redefined several of Mattessich's categories. Therefore, in order to code the data for the information discovered in the literature review, the main factor categories were revised into five broader categories and a sixth category labeled "Other" was added to capture and code data obtained which fell outside of the five primary categories. The six categories used to code the exploratory data obtained in this research study were:

- Environment/Culture
- Goals/Objectives
- Skills/Competencies/Behaviors

- Communications
- Process/Structure
- Other.

Communications was originally grouped with Skills/Competencies/Behaviors; however, it was such an important factor in the literature that it seemed to merit its own category.

Within each category, the factors that influence successful collaborations from the Mattessich study were used as a guide when reviewing literature. As information was gathered, it was aligned within the proper categories and where appropriate it was matched up with the Mattessich factors. Based on the results of the literature review, a set of 17 factors were found. Some of the factors are identical or similar to those in the Mattessich study and some of them are new. These revised six categories and 17 factors deduced from literature were then used to develop the interview questions and code the interview.

Interview Data Collection

Prior to initializing the in person interviews with the research participants, the researcher completed Lawrence Technological University's Institutional Review Board (IRB) process. This process coincides with the federal guidelines established by the Department of Health and Human Services and is used to protect the rights and welfare of the human subjects participating in research. The IRB process consists of completing protection of human participants training and submitting an application package consisting of proposed research, data collection methods, planned participants and protection of the participant's confidentiality. The application package was approved before the interviews were conducted.

The interview data was collected using in person interviews and phone interviews from military and non-military organizations. The interview method was chosen because of

the exploratory nature of the research and the need to obtain qualitative data. As stated by Trochim and Donnelly, “The purpose of the interview is to probe ideas of the interviewees about the phenomenon of interest” (Trochim & Donnelly, 2008). In addition, the interviews assisted with the appreciative inquiry approach taken during this research. The appreciative inquiry approach attempts to discover what is working well in an organization and builds upon these strengths to create positive change (Cooperrider, Whitney & Stavros, 2008). It is defined as

Appreciative Inquiry is the cooperative co-evolutionary search for the best in people, their organizations and the world around them. It involves the discovery of what gives “life” to a living system when it is most effective, alive and constructively capable in economic, ecological and human terms the process of determining what is working well and what has worked well in the past to build future successes (Cooperrider, et al., 2008, p.3).

A total of six organizations, three government and three non-government, were utilized for interviews. A total of 15 interviews within these six organizations were completed with people in various leadership roles who are responsible for their collaborative efforts. The participants were chosen based on references from LCMC leadership, recommendations during interviews and through personal networking. A minimum of two people from different affiliations within each organization were interviewed to ensure different perspectives on the same collaboration. In three of the organizations two people were interviewed. In the other three organizations, three people were interviewed. These organizations had more people interviewed because after the first interview with the leadership in the organization, additional contacts were recommended to provide more insight and perspectives. A table of the organizations, company and title of the person interviewed is shown in Table 1.

	Organization	Title of Person Interviewed
Government		
	PM-MRAP Acquisition	Project Manager MRAP
	PM-MRAP Technology	Director of Ground Vehicle Integration Center – TARDEC
	PM-MRAP Technology	TARDEC Liaison to MRAP
	PM-SKOT Acquisition	Product Manager SKOT
	PM-SKOT Logistics	Deputy Product Manager SKOT
	PM-PAWS Acquisition	Product Manager PAWS
	PM-PAWS Technology	Deputy Associate Director –PAWS
Non – Government		
	3M	Vice President, R&D Industrial and Transportation Business
	3M	Director-Government Market Center Leader Industrial & Transportation Business
	3M	Program Manager, R&D Industrial & Transportation Business
	GDLS	Chief Executive Officer
	GDLS	Vice President Engineering
	SAIC	Strategic Development Manager
	SAIC	Vice President, Advanced Mobility Products and Solutions
	SAIC	Assistant Vice President, Program Management

Table 1: List of Interviewees***Interview Process***

The interview questions were sent to the interviewees approximately a month before the actual interview along with an introduction to the research. The questions were asked the same way for all participants in the actual face to face or phone interviews. Answers were recorded using a digital voice recorder and notes taken manually by the researcher. Before recording, the participants granted permission to record the interviews. The digital voice

recordings were stored on two computers and the digital recording device to ensure safekeeping of the files. The interview questions and answers were then transcribed verbatim onto a laptop computer and evaluated for typographical errors. The errors were corrected and the interviews were sent back to the interviewees for confirmation that their responses were recorded accurately. Acknowledgement of the interview accuracy was obtained and the final transcriptions were then stored electronically for analysis. These files are stored on two computers and an external storage device for safekeeping.

Non-Government Interviews

The first set of interview data was gathered from three non-government companies to determine how they aligned or didn't align with the key factors identified from the literature review. These companies were chosen to provide a perspective beyond the military environment. Based on recommendations from the TACOM LCMC leadership and information from literature, three companies, each in a different business sector, were chosen for interviews to determine alignment.

The first company was 3M Corporation which has a long history of internal collaborative successes. The company's core methodology and processes for getting a product to market are based on the collaborative successes of its internal departments. The company has created several mechanisms to promote collaboration. One such mechanism is called new product forums. These forums are where all divisions share their latest product with the goal of stimulating new ideas across divisions (Collins & Porras, 1994). Three people were interviewed from this company based on recommendations from knowledgeable personnel. During the interview process, the first person at 3M interviewed suggested a third person to interview in order to collect additional data. This interview was scheduled and conducted.

The second company was General Dynamics Land Systems (GDLS), a wholly owned subsidiary of General Dynamics Corporation, a global company that provides many services to the defense industry. GDLS designs and builds armored vehicles and subsystems for the U.S. Army, U.S. Marine Corps, and international customers, and is the defense industry's largest supplier of armored military vehicles. All of the business groups collaborate across the corporate entities to leverage each other's technology and products to save time and costs during their vehicle and systems development, production and sustainment. Two people were interviewed from the company based on recommendations from TACOM LCMC leadership.

The third company was Science Applications International Corporation (SAIC). SAIC is a global Fortune 500 company that provides scientific, engineering, and technology applications to the nation and the world, in national security, energy and the environment, critical infrastructure, and health. The company uses internal collaborations to reach across their various product and service lines to provide the best solutions for their customers. Three people were interviewed from this company. During the interview process, the first person at SAIC interviewed suggested a third person to interview in order to collect additional data. This interview was scheduled and conducted.

Government Interviews

The second set of interview data was gathered from successful ongoing collaborations within the TACOM LCMC. Based on recommendations from TACOM LCMC leadership, several offices within the TACOM LCMC were identified as model examples of exceptional collaboration within the acquisition, logistics and technology structure of the TACOM LCMC. Because of time constraints of the researcher and interviewees, a minimum of two interviews were completed for each of three LCMC collaborative efforts. Each of the two

interviews were conducted with the lead representative of the acquisition, logistics or technology partner of the collaboration. The two interviews for each collaborative effort were done to obtain data on key factors for successful collaboration from two different perspectives. During the interview process, PM MRAP suggested a third person to interview in order to collect additional data. This interview was scheduled and conducted.

The first collaborative effort collected data from the office of the Project Manager for the Mine Resistant Ambush Protected (PM MRAP) vehicle. The MRAP vehicle is a joint program between the United States Army and the United States Marine Corps. The program, led by the Army, is a very fast paced development, production and fielding program initiated to provide an urgent protection need for the conflict in Iraq and Afghanistan. As applied to the MRAP program, the LCMC concept has helped accelerate the development, production and fielding of this critically important family of vehicles (Deans, 2008). The program requires tremendous collaboration not only across the acquisition, logistics and technology community within the TACOM LCMC but also across the Department of Defense (DOD) and the program's industry partners. The interviews were conducted with personnel that work within and collaborate with the MRAP office.

The second collaboration effort interview was with the office of the Product Manager for Petroleum and Water Systems (PM PAWS). The PAWS Product Manager leads a fully integrated team, which develops, produces, fields and sustains world class petroleum and water systems. The PAWS acquisition personnel procure the equipment. The PAWS engineering is provided by the ground vehicle technology integration organization within the TACOM LCMC, which is TACOM's Research, Development and Engineering Center (TARDEC). Logistics and sustainment is provided by TACOM's Product Support Integration

Directorate (PSID). The interviews were conducted with personnel that work within and collaborate with the PAWS office.

The third collaboration effort interview was with the office of the Product Manager Sets, Kits, Outfits and Tools (PM SKOT). This office is responsible for research, development, acquisition, fielding, and logistics support of the modernized and legacy hand carry, containerized, and mobile tool sets, kits, and outfits, diving equipment, and shop support equipment. The TACOM Integrated Logistics Support Center (ILSC) and PM SKOT collaborate to develop, acquire, field and support all the tools the Soldiers need to fulfill their mission. The interviews were conducted with personnel that work within and collaborate with the SKOT office.

Interview Questions

The interview questions were developed from the results of the literature review. The questions are based on the 17 factors discovered and the revised six categories. The first two questions recorded demographic data of the participants in case the data analysis showed differences that could not otherwise be explained. The rest of the questions were designed using the appreciative inquiry approach. Questions three and four were developed to ensure the researcher understood the interviewee's definition of collaboration and to capture their perspective of what defines success in a collaboration. Question five focused on specific factors the interviewee believed were important for collaborations. Questions six through ten were designed to trigger any additional factors from the interviewee in the five categories deduced from the literature review. Question eleven was designed to draw out any additional factors for the sixth broad category, Other. Question twelve focused on the benefits the interviewees had realized from their collaborative successes. Question thirteen focused on

catching any additional items on collaboration that the interviewees felt they should add. The questions asked during the interviews are as follows:

Demographic Questions:

1. Demographic
 - 1.1. How long have you been in your current position?
 - 1.2. How long have you been with your current company/in the Army or with the government?
 - 1.3. How long have you been in your current career field?
 - 1.4. What was your position before entering your current career field?
2. Data Recorded by researcher
 - 2.1. Gender
 - 2.2. Military or Industry Organization
 - 2.3. For Profit or Non-Profit Organization

Collaboration Questions:

3. How do you define collaboration?
4. How have you defined success as far as evaluating your collaboration?
5. In your experience, what is (are) the most important factor(s) that has (have) made your collaboration successful?
 - 5.1. What made it possible?
6. Are there any additional factors that have particularly made your collaboration successful with respect to the environment/culture of the collaboration?
7. Are there any additional factors that have particularly made your collaboration successful with respect to the goals/objectives and vision of the collaboration?

8. Are there any additional factors that have particularly made your collaboration successful with respect to the skills/competencies/behaviors of the members of the collaboration?
9. Are there any additional factors that have particularly made your collaboration successful with respect to communications?
10. Are there any additional factors that have particularly made your collaboration successful with respect to the processes/structure and resources for the collaboration?
11. What one change in your collaboration could make it even more successful?
 - 11.1 Why?
12. What are the biggest benefits you have seen from your collaborative successes?
13. Is there anything else I should have asked regarding key factors for successful collaboration?

Data and Analysis

The interview data was analyzed using thematic analysis. According to Boyatzis, thematic analysis is a process or way of analyzing qualitative data (Boyatzis, 1998). Boyatzis goes on to say that the thematic analysis process is a way to explicitly code qualitative data into themes or indicators. Using thematic analysis, the transcribed interview data was then inductively analyzed and coded into the five main categories identified in the literature review and the sixth, other category. During the coding, care was taken to identify additional information, such as benefits of collaboration, barriers to collaboration, links between the factors and similar patterns or differences based on any of the demographics or business sectors. Data was also examined for similarities and differences across the interviews to determine if there were additional key factors or categories beyond the literature review that

were required for successful collaborations. Each interview was reviewed three times to ensure all data was captured and coded correctly. After the interview data was compared and analyzed with the literature review, the data was sorted and coded into the final categories and factors.

Summary

Exploratory research and thematic analysis were used to discover key factors required for successful collaboration. Utilizing the appreciative inquiry approach for developing the interview questions allowed the interviews to be conducted from a positive mindset. This provided the opportunity for the interviewees to provide substantial input on the collaboration factors that are currently working well in their organizations. The use of interview responses compared to factors found in literature provided insight into the collaboration aspects of the TACOM LCMC and provided a preliminary understanding of the collaboration required for success in a military environment. The next chapter discusses the results and findings of the data collected.

Chapter 4: Analysis and Results

Introduction

The purpose of this study was to use exploratory research to identify the key factors for successful collaboration within the Tank– automotive and Armaments Command Life Cycle Management Command (TACOM LCMC). Collaboration is fundamental to any LCMC being successful. Specifically, the main research questions were –What are the key factors required for successful collaborations?” and –What are the key collaboration factors required for successful long term collaborations within the TACOM LCMC?”

This chapter presents the findings to these questions based on two sets of data. The first set of data was collected from a literature review of more than 45 articles and papers and three books on successful collaborations. Prior research done by Paul W. Mattessich, Marta Murray-Close and Barbara Monsey (2001) of the Wilder Research Center, was used as the baseline for this study. Using the prior study as the baseline, the literature review was conducted to compare key factors found in the literature with those found in the Mattessich study (Mattessich, Murray-Close & Monsey, 2001). The literature review resulted in identification of 17 key collaboration factors in five major categories.

The second set of data was collected using qualitative interviews with 15 members of successful military and industry collaborations. The interview data was recorded using a voice recorder and transcribed resulting in over 90 pages of double spaced transcripts. This data was analyzed using thematic analysis and compared to the results of the literature review to develop a collective list of key factors. A sixth category labeled –Other” was used to capture responses judged to fall outside the factors generated from the literature review.

In qualitative research every idea is relevant, whether it is stated once or a multitude of times” (Felker, 2008). Thus, it is important to understand that because every interviewee did not infer or mention a specific factor does not mean it wasn’t important to their collaboration.

The findings of this study are organized in the sequence in which the data was collected. First, the categories and factors identified in the overall literature review are discussed. Then these five main categories and the factors associated with each category are discussed based on the findings from the military and industry interviews. Each factor has a shaded table that shows if the interviewees cited the factor during the interview. Finally, the findings for the “Other” category are discussed. An outline of chapter 4 is show in Figure 4.

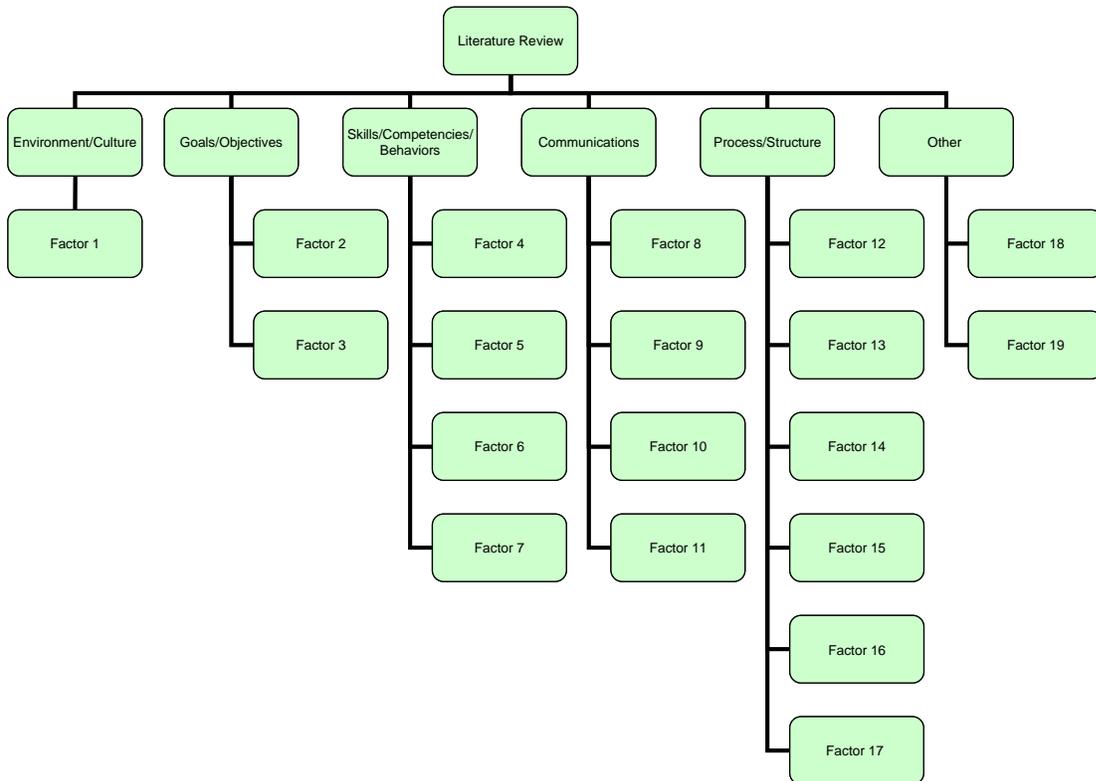


Figure 4: Chapter 4 Discussion Outline

Literature Review Results

The literature review resulted in a broadening and renaming of the six main categories of collaborative factors from the Mattessich et al. study (2001). This was done to capture various findings in the literature research and also resulted in an expanded definition for each of the categories. These six main categories from the Mattessich et al. study (2001) and the resultant renamed categories from the literature search are shown in Table 2.

Main Categories from Mattessich Study	Main Categories for LCMC study
Environment	Environment/Culture
Membership Characteristics	Skills/Competencies/Behaviors
Process and Structure	Process/Structure
Communication	Communication
Purpose	Goals/Objectives
Resources	Other

Table 2: Comparison of Factors from Mattessich et al. Study (2001) and Overall Literature Review

Key collaboration factors within each of the above categories emerged from the literature review. The literature review factors, when compared to the 20 original Mattessich et al. study (2001) factors, revealed six factors that were identical, seven factors that were similar and five new factors. Seven of the Mattessich factors were not found in the literature search. This finding does not mean that these seven are not valid. It just means they weren't prevalent in the paper, articles and books reviewed for this study. The comparisons of the original Mattessich et al. (2001) collaboration factors to those found in the literature review are shown in Table 3.

Mattessich et al. (2001) Study factors	Overall Literature Review factors
Identical	
Mutual respect, understanding and trust	Mutual respect and trust among collaborators
Development of clear roles and policy guidelines	Roles and responsibilities in the collaboration are clear
Established informal relationships and communication links	Development of interpersonal communications which establishes and build personal relationships
Concrete and attainable goals and objectives	Clear, concrete and attainable goals and objectives of the collaboration
Shared Vision	Shared vision for the outcome of the collaboration
Sufficient funds, staff, materials and time	Financial, personnel and time resources are sufficient for the collaboration
Similar	
Favorable political and social climate	Support from leadership and those groups, both politically and socially, that have influence over the collaboration
Members see collaboration as in their self interest	Personal accountability of the members for the collective outcome of the collaboration and belief that the outcome will provide an advantage
Members share a stake in both process and outcome	Members and stakeholders own the process of achieving the collaboration goals
Flexibility (related to adaptability)	The collaborative structure is very complex and is flexible to changes
Adaptability (related to flexibility)	See flexibility
Open and frequent communication	Open, honest and frequent communication unhindered by status, location or function
Skilled leadership	Leadership of the collaboration have collaborative skills and show visible collaborative behavior
New	
	Allowing for and effectively managing conflict within the collaboration
	Members are trained in skills required for collaboration
	Continuous communication with access to each other's information
	Communication tools and methods to allow for effective infrastructures to support open and continuous communication

	Performance management and reward systems support collaborative behavior
Not Found	
History of collaboration or cooperation in the community	
Collaborative group seen as a legitimate leader in the community	
Appropriate cross section of members (related to new factor – diversity of the collaboration)	
Ability to compromise (related to conflict management)	
Multiple layers of participation	
Appropriate pace of development	
Unique Purpose	

Table 3: Comparison of Factors from Mattessich et al. Study (2001) and Overall Literature Review

In summary, the categories, definition of the categories and the related category factors which emerged during the literature review are:

Environment/Culture

This category of collaboration is defined as the physical location and the social environment where the group exists. The group has a history of cooperation and collaboration which enables them to trust the process of collaboration and the collaboration is supported politically and socially by people who control the resources (Mattessich, et al., 2001). The top executive's philosophy and support will drive the success of the collaboration (Gratton et al., 2007). The collaboration is given formal status and cannot be broken on a whim (Kanter, 1994).

- Factor 1: Support from leadership and those groups, both politically and socially, that have influence over the collaboration

Goals/Objectives

This category of collaboration is defined by the purpose of the collaboration and the reason it exists which is driven by a need, crisis or opportunity. The collaboration has clear attainable goals and objectives and experiences small wins to motivate the collaboration (Mattessich, et. al., 2001). There is a common ground, a sense of membership and the vision, mission and objectives are developed jointly with long term goals.

- Factor 2: Clear, concrete and attainable goals and objectives of the collaboration
- Factor 3: Shared vision for the outcome of the collaboration

Skills/Competencies/Behaviors

This category of collaboration is defined by the attitudes, opinions, skills and behavior of the members of the collaboration (Mattessich, et. al., 2001). The collaboration should allow for and effectively manage conflict. Members should have conflict management, teamwork, coaching, change management, communication, relationship and trust building skills. The collaboration should have mutual respect and trust among the members. The collaborative members believe they benefit from joint action and sharing and they eliminate their self interest and have personal accountability for the outcome of the collaboration.

- Factor 4: Allowing for and effectively managing conflict within the collaboration
- Factor 5: Members trained in skills required for collaboration
- Factor 6: Mutual respect and trust among collaborators
- Factor 7: Personal accountability of the members for the collective outcome of the collaboration and belief that the outcome will provide an advantage

Communications

This category of collaboration is defined as the means used to send and receive information (Mattessich, et. al., 2001). Communication needs to be open, honest, continuous and easy

regardless of status, function, place, time or bureaucracy. Communications involve the access and sharing of each others information and the use of informal communications to build personal connections and meaningful relationships. The communications move from a common ground to a higher level of communications and utilize infrastructures and technology to make communication easier

- Factor 8: Open, honest and frequent communication unhindered by status, location or function
- Factor 9: Continuous communication with access to each other's information
- Factor 10: Development of interpersonal communications which establishes and builds personal relationships
- Factor 11: Communication tools and methods to allow for effective infrastructures to support open and continuous communication

Process/Structure

This category of collaboration is defined by the management, operations and decision making process of the collaboration which involves key stakeholders and includes the resources to make the collaboration successful (Mattessich, et. al., 2001). Key stakeholders are involved in the process. There is ownership from the collaborative members for the results of the group and the way the group works. The roles, responsibilities and expectations of each member of the collaboration are clear. There are non-traditional boundaries such as a matrix structure, the structure is flexible and the collaboration can adapt to major changes.

Performance management and reward systems motivate collaboration. The collaboration has adequate resources such as time, people, finances, equipment, and material to support and

sustain the effort. The collaboration leaders have real and perceived collaborative behaviors and skills.

- Factor 12: Members and stakeholders own the process of achieving the collaboration's goals
- Factor 13: Roles and responsibilities in the collaboration are clear
- Factor 14: The collaborative structure is very complex and is flexible to changes
- Factor 15: Performance management and reward systems support collaborative behavior
- Factor 16: Financial, personnel and time resources are sufficient for the collaboration
- Factor 17: Leadership of the collaboration have collaborative skills and show visible collaborative behavior

Other

There is no definition for this category. It will be used to capture data from the interviews that don't appear to fit into any of the other five categories.

Interview Data Results aligned to Literature Review Results

This section of the chapter discusses the results of the 15 interviews and analyzes how each of the interviewee's responses aligned with the categories and factors discovered in the literature review. First, an overall summary is presented and then the results of both the military and industry interviews are discussed for each factor. In each factor discussion there is also a summary table showing how military and industry cited each factor. For the purpose of this chapter, military means TACOM LCMC.

Overall Summary

Overall interview responses are shown in Table 4. The table shows with gray shading, which of the 17 factors derived from the literature review were cited by the interviewees. The three different military offices interviewed are labeled TACOM 1, 2 and 3 and the three different industry offices interviewed are labeled Industry 1, 2 and 3.

			TACOM 1		TACOM 2			TACOM 3		Industry 1		Industry 2			Industry 3		
Environment/Culture			A	B	A	B	C	A	B	A	B	A	B	C	A	B	C
	<i>Factor 1</i>	Support from leadership and those groups, both politically and socially, that have influence over the collaboration															
Goals/Objectives																	
	<i>Factor 2</i>	Clear, concrete and attainable goals and objectives of the collaboration															
	<i>Factor 3</i>	Shared vision for the outcome of the collaboration															
Skills/Competencies/Behaviors																	
	<i>Factor 4</i>	Allowing for and effectively managing conflict within the collaboration															
	<i>Factor 5</i>	Members trained in skills required for collaboration															
	<i>Factor 6</i>	Mutual respect and trust among collaborators															
	<i>Factor 7</i>	Personal accountability of the members for the collective outcome of the collaboration and belief that the outcome will provide an advantage															
Communications																	
	<i>Factor 8</i>	Open, honest and frequent communication unhindered by status, location or function															
	<i>Factor 9</i>	Continuous communication with access to each others information															
	<i>Factor 10</i>	Development of interpersonal communications which establishes and builds personal relationships															
	<i>Factor 11</i>	Communication tools and methods to allow for effective infrastructures to support open and continuous communication															
Process/Structure																	
	<i>Factor 12</i>	Members and stakeholders own the process of achieving the collaborations goals															
	<i>Factor 13</i>	Roles and responsibilities in the collaboration are clear															
	<i>Factor 14</i>	The collaborative structure is very complex and is flexible to changes															
	<i>Factor 15</i>	Performance management and reward systems support collaborative behavior															
	<i>Factor 16</i>	Financial, personnel and time resources are sufficient for the collaboration															
	<i>Factor 17</i>	Leadership of the collaboration have collaborative skills and show visible collaborative behavior															

Table 4: Overall Interview Response Summary

Factor Summary

Category 1: Environment/Culture

Factor 1: Support from leadership and those groups, both politically and socially, that have influence over the collaboration

Environment/Culture			TACOM 1		TACOM 2			TACOM 3		Industry 1		Industry 2			Industry 3		
			A	B	A	B	C	A	B	A	B	A	B	C	A	B	C
	<i>Factor 1</i>	Support from leadership and those groups, both politically and socially, that have influence over the collaboration															

In general, most interviewees believed that support from leadership and the groups that have influence over the leadership was important to having a successful collaboration. The results from the military interviews indicate that synchronizing organizations together toward a common goal for the collaboration was critical because without this, the collaboration was not going to work. In one collaboration, it was stated that senior leadership focus “really set the seed at the senior levels at all the commands” which eliminated many of the barriers and obstacles to collaboration and enabled everyone to support the collaborative efforts. In another, the culture says that “I don’t work for a specific office such as the acquisition center or the Integrated Logistics Support Center (ILSC), I work for the PM and the Soldier and the leadership at all levels that fosters this culture is a key to its collaboration success.” It was also stated that being empowered and having the ability to let the working partners/levels collaborate helped in achieving collaborative success.

Several of the interviewees indicated that more buy-in from TACOM LCMC leadership for the collaborative efforts would make the current successful collaborations even more successful. One person felt more leadership awareness of the issues could help the collaboration. Others felt the culture and environment of leadership outside of and within the TACOM LCMC is not supportive of collaborations as evidenced by the following comments

The biggest problem we have is we are stove piped within our LCMC and the issue is with command and control. If we look at TARDEC for example, they are orientated to RDECOM not the customer first.

Within the PEO/TACOM elements I still don't believe life cycle management has advanced to the state it has at lower levels when I look at the leadership levels. There are certain rice bowls, functions and things that people are not necessarily as willing to share.

It's important to note that the interviewees did not see these issues as barriers to success.

However, if these issues were less prevalent and there was more senior leadership buy-in to the collaborations, more success overall could be achieved.

The results from the industry interviews indicate that leadership should empower the collaborative group and define their empowerment. This would show leadership support by setting the expectations of the group. One interviewee stated that

I think the most important factor (for collaboration success) is the expectation that the people will collaborate. This is set by the executive offices, we expect people to collaborate and executive leadership has to have the expectation of collaboration

The leadership support of the collaboration helps to define the culture and acceptable norms.

As another industry interviewee explained, "To us it's very normal to call somebody up, even total strangers and say my name is this, I need this type of help can you help me? This is an acceptable part of our culture."

One industry interviewee spoke specifically to the importance of leadership support of collaborations when he stated that "Because some efforts in a collaboration have a matrix organization and if the employee wants to participate and do the right thing, but the employee's manager, says no I don't want you to do that or pulls the employee in a different direction, they are not in alignment with the mutual goals of the collaboration."

Lastly, interviewees representing two different industry collaborations underscored the importance of leader support. One participant stated that management approval and buy-in

for collaborations across organizations is a critical factor for successful collaborations and stressed that leadership “needs to be on board.” This sentiment was echoed by yet another interviewee who attributed their collaboration’s success to “having a culture within the organization that fosters or promotes collaboration and because our chief executive officer realized we could achieve more together.”

Category 2: Goals/Objectives

Factor 2: Clear, concrete and attainable goals and objectives of the collaboration

		TACOM 1		TACOM 2		TACOM 3		Industry 1		Industry 2		Industry 3	
Goals/Objectives													
	<i>Factor 2</i> Clear, concrete and attainable goals and objectives of the collaboration												

In general, most interviewees believed that having clear and attainable goals of the collaboration was important to having a successful collaboration. The results from the military interviews indicate that having goals that are clear to all collaborative partners is important. This is because clear goals, such as a schedule to be met or an urgent need, helps to ensure everyone has an understanding of the boundaries, requirements and priority of the collaboration. One interesting facet that came out of one of the interviews is that not only should the goal be understood, but the clarity and degree of understanding needs to be the same among members or it could impact the collaboration. In one of the more mature collaborations it was stated that when they talk among members they continuously reinforce the goals and the goals are not even written down, “They just know them.”

The results from the industry interviews indicate that understanding and having clear goals in the collaboration enable members to make sure they are all on the same page for what the collaboration is and is not about. In addition, it was indicated that a collaboration must clearly know what the goals are in order to deliver as promised. A couple of interviewees

indicated that taking the time early in the collaboration to understand goals was another key to success. This is because “taking the time upfront before the collaboration starts to understand the expectations, goals, values and to define success and interim milestones” enabled the collaborators to know “where each ... was coming from and understand each others priorities.”

Another aspect of the definition of the goals/objectives category was noticeably discussed in the interviews. Interviewees discussed how they used small *wins to motivate the collaboration* and this was mentioned enough to indicate some importance. Military respondents stated that “we get to see a lot of little successes here” which was considered a big thing to this collaboration because “success breeds success.” Another interviewee said “I think the best way of getting buy-in (for the collaboration) is to find an early success and use that as an example of where it can go and what it can do.” One industry participant echoed these sentiments and emphasized the importance of having a sense of accomplishment and early successes because “when you give people that sense of accomplishment, however small it is that sense of progress goes so far in building that collaboration.” Further stated, “These interim successes feed this sense of yes, this is a good thing lets keep doing it.”

After reviewing all the data and definitions, this idea of small wins, was not made into a separate factor because small wins appears in the definition of the goal/objective category. Additionally, one could argue that small wins enable the ability of the collaboration to achieve attainable goals because each large collaborative goal could have many small goals in its plan.

Factor 3: Shared vision for the outcome of the collaboration

Goals/Objectives		TACOM 1		TACOM 2			TACOM 3		Industry 1		Industry 2		Industry 3		
<i>Factor 3</i>	Shared vision for the outcome of the collaboration														

In general, most interviewees believed that having a shared vision for the outcome of the collaboration was important to having a successful collaboration. During the analysis of the interviews, the theme of common goals kept appearing; particularly during the interviewees' definitions of collaboration and their definitions of success within the collaboration. This theme correlated very well with the shared vision factor because common and shared are synonymous and because goals are often referred to as visions. Common goals did not seem to fit well with factor two which is more along the lines of having clear goals within the collaboration not necessarily having a shared vision or common goals.

The results from the military interviews indicate that having common goals which are clear to all collaborative partners is important. One interviewee stated a key success factor was —developing a common vision of where you wanted to go” and as collaborative partners —we developed our vision together.” Another interviewee stated a key factor of success in their collaboration was to —Have a common goal. Our goal was not to make money, or see how many people we could assign to the project. Our goal was to get the equipment on the vehicle, the same that theirs was.”

The shared vision and common goal theme appeared to be most prevalent when the interviewees were defining collaboration or defining how they knew their collaboration was successful. Many interviewees defined collaboration as working together to achieve a common goal while success was defined as achieving or meeting the common goal. This was true for both the military and industry interviews. For example, industry interviewees stated

In order to achieve those metrics of success it means you all have to be on the same page with the common goals and objectives you want to be able to achieve

Collaboration is defined as organizations and people working together towards a common goal and success is achieving that common goal

Industry went on to say they have seen the most successful collaborations when there is a shared understanding and willingness to achieve a common goal and “if you don’t have a common purpose, I find it difficult to collaborate.”

Category 3: Skills/Competencies/Behaviors

Factor 4: Allowing for and effectively managing conflict within the collaboration

Skills/Competencies/Behaviors		TACOM 1		TACOM 2		TACOM 3		Industry 1		Industry 2		Industry 3	
Factor 4	Allowing for and effectively managing conflict within the collaboration												

In analyzing the data for this factor, it appears that managing conflict in collaboration is important and industry seemed to cite this factor more than military. The results from the military interviews indicate that managing conflict is important because it helps to de-conflict or mitigate personality conflicts and being able to resolve issues helps with compatibility conflicts over time. As stated in the interviews, this is important to our environment —Because invariably you will not always have two-three people in leadership that will see things eye to eye. It’s the processes you establish that mitigate the risks of incompatibility in a collaborative situation.”

Industry echoed these sentiments by saying that minimizing personality conflicts is one of the most important factors to making their collaborations successful. This is because “if you don’t resolve them they will come back through as mistrust” and “you won’t be able to move the collaboration forward until you get past sticking points.” Additionally, another industry interviewee mentioned that they are successful because they were able to overcome differences. The importance of being able to negotiate and understand member’s wants and needs in the collaboration was also cited by industry interviewees as a factor for managing conflict. One interviewee stated this by saying “collaboration isn’t about agreeing all the

time.” “You have to be able to influence and negotiate to a common point.” (You have to) understand what you’re trying to accomplish and how you are going to get there.”

Factor 5: Members trained in skills required for collaboration

		TACOM 1		TACOM 2		TACOM 3		Industry 1		Industry 2		Industry 3	
Skills/Competencies/Behaviors													
	Factor 5 Members trained in skills required for collaboration												

Of all the factors, this one was cited the least by industry and was the lowest in combined military and industry citations. Preliminary analysis shows that this may be because collaborative skills show up in other factors. Collaborative skills such as communication, interpersonal relations and managing conflict which includes negotiation and persuasion skills, often appeared within many of the factors. A comprehensive list of collaborative skills was not investigated as part of this research. Two military interviewees cited this factor as important to collaboration success. In defining the right people for collaborations, one interviewee stated that “having the right skills by being able to work as a collaborative team is critical.” He goes on to say “they have to deal with making decisions, often hard decisions, and people have to be able to work together outside of their rice bowls.” Mentorship at all levels (in the organization) was cited as being an important collaborative skill because it helps to get buy-in from all of the people that are collaborating. Industry cited looking at the skills and characteristics of the people that enter a collaboration is important to ensure they bring the required skills.

Factor 6: Mutual respect and trust among collaborators

		TACOM 1		TACOM 2		TACOM 3		Industry 1		Industry 2		Industry 3	
Skills/Competencies/Behaviors													
	Factor 6 Mutual respect and trust among collaborators												

Overall, mutual trust and respect was cited as an important factor for successful collaborations and in analyzing the results it appears that industry cited the factor more than the military.

The results from the military interviews indicate that mutual trust and respect is important to successful collaborations. Two military individuals cited this as one of their most important factors for collaboration because the trust factor assists with building relationships, and honest discussions about the ability to achieve goals help to reinforce the establishment of trust and relationships. There also needs to be mutual respect when collaborating with others, “You need to have a mutual level of respect for that person’s role, what they’re doing and what they’re trying to accomplish.”

Analyzing the industry interviews revealed similar themes regarding respect. One interviewee cited respect as one of the most important factors for successful collaboration. Another industry interviewee viewed mutual respect as a way to continuously improve their collaborations and stated “We respect each others diversity and roles and responsibilities, but we don’t use them as a means to an end; we use them for continuous improvement and collaboration.”

In terms of trust three different industry interviewees cited this factor as one of the most important factors for successful collaborations. One participant stated that trust is the “cornerstone and foundation of collaboration” and is “extremely important” because “your word is your bond.” Trust was also related to communications in several of the interviews and one source said “Trust and confidence that when somebody tells you something it’s true or they promise something they will deliver and that you can believe them and what they say.” Another interviewee commented, “It’s the whole notion of not feeling like you’re getting zoomed or sold and because of all the agendas you may not trust those in the room” which makes it difficult to get the tasks done collaboratively. Yet another interviewee echoed, “You have to have open communications and trust. Your collaborative partners have to trust

each other.” Without trust it is hard to reap the benefits of collaboration and as stated by one interviewee –it’s tough to get the most out of partnering and collaboration when many throughout an organization lack trust.”

Factor 7: Personal accountability of the members for the collective outcome of the collaboration and belief that the outcome will provide an advantage

Skills/Competencies/Behaviors			TACOM 1		TACOM 2		TACOM 3		Industry 1		Industry 2		Industry 3	
	Factor 7	Personal accountability of the members for the collective outcome of the collaboration and belief that the outcome will provide an advantage												

Of all the factors, this one was cited the least by the military. In contrast, all but two of the industry interviewees noted that this factor is important to successful collaborations. The results from the military interviews show that the one interviewee who cited this factor, indicated that it was one of the most important factors for successful collaboration. He states, –recognizing that we are accountable for all the successes and failures” enables us to feel like we are responsible to help fix problems and find solutions if another collaborative partner encounters issues. We take the initiative to help and –we can do it without being told.”

Personal accountability for the outcome of the collaboration and the belief that the collaborative outcome would provide an advantage was very prevalent in the industry interviews. One interviewee stated this as their most important factor and said –I think most important is the belief that we can achieve more through collaboration. We can offer better solutions to complex problems that in the end help both our customers and our company succeed.” This belief that the collective outcome is an important factor is echoed by another interviewee who said –getting more out of the technology than just” an application –to one market” is a measure of our success. He goes on to say that –being able to proliferate the

technologies” throughout the company is critical to our success ~~and~~ the only way that happens is through collaboration with people across our business units.”

Success in terms of collaboration for one interviewee was ensuring he creates an environment where people believe they contribute to the bottom line. Success to another industry individual was defined as having that individual sense of accomplishment, of being able to put hard work into a collaboration and have something positive come out of it. This individual sense of responsibility is embedded in one industry culture which says ~~there~~ is more than the bottom line, and our vested interests are in doing a good job for the” Soldiers. This individual responsibility for a collective outcome fosters collaboration. Accepting accountability for the outcome of the collaboration and not just looking out for ones self was mentioned by another contributor who said ~~being~~ on the same wavelength as to the outcome of the collaboration and not posturing, being greedy or establishing ones position” is an important factor for collaboration.

Category 4: Communications

Factor 8: Open, honest and frequent communication unhindered by status, location or function

		TACOM 1		TACOM 2		TACOM 3		Industry 1		Industry 2		Industry 3	
Communications													
	<i>Factor 8</i>												
	Open, honest and frequent communication unhindered by status, location or function												

A majority of the interviewees discussed the ability to have open, honest and frequent communications unhindered by status, location or function as an important factor for successful collaborations. All of the military respondents touched on this factor and when combined with the industry responses, this factor had the most people cite it overall.

Military interviewees all cited this factor as being important for successful collaborations. One interviewee expressed this factor as a key element to their collaborative success and stated

I have tried to create a climate where people are not afraid to talk about bad news. Sometimes it may be bad news, but they are not afraid to talk to me about it. Open and honest communication channels are a key element to success and solving problems as quickly as possible.

Being able to discuss issues and opinions openly to anyone in the collaboration was repeated by another military interviewee. He said, “I think one of the keys is that we are allowed to express our opinions without fear of retribution. Our team is allowed to provide constructive input to issues that are out of our lane without a fear of negative reaction.” It appears that some form of underlying trust in other members is prevalent in being able have open and honest communications because “when people correct you, we don’t seem to take it negatively.” In the interviews, it was also noticed that communication wasn’t just about sharing information with each other, but also involved listening to each other. A military respondent expressed this by saying “it’s a two-way street of being able to listen and understand each other’s needs and being honest and flexible about the ability to achieve them.” This type of “interactive communication is key and critical” to collaboration success because it allows for a “free-flowing of ideas” and critical feedback to keep communications open and keep the collaboration on track to meet its goals. As stated by one military interviewee, “because each organization does things differently it takes really tight communications to make sure people are going in the right direction and we have had to work hard with communications by breaking down the stovepipes .”

It was observed during the military interviews on this factor, that several interviewees mentioned that being collocated enabled open, honest and frequent communications and

helped the collaboration achieve success. One interviewee said “Collocation helps to share information and makes open communication easier; everyone shares it the first time.” This sentiment was shared by another respondent who stated “I am in close proximity to all my key players and I can go sit with people when needed to clear up issues.”

Industry interviewees believed that open, honest and frequent communications was an important factor. However, they did not appear to believe location was a factor but they had to be able “to reach out and touch people in real time” for the collaboration to be a success. This was done in many ways and the companies “evolve so it becomes even easier to collaborate with people in the next building or the next country.” Industry interviewees discussed the importance of open and honest communications in collaborations. One interviewee stated “we knew our communications weren’t efficient and effective as they could be” because the flow of communication wasn’t open and there were “communication gaps which hindered our early collaborative efforts.” “The ability to communicate clearly and precisely is important so there are no misunderstandings” said one respondent. Listening was also mentioned by one interviewee who said “I have seen in our collaboration successes that people listen to each other.” These open communications were cited as a key by one interviewee who said “open communications is a key and I mean totally open not hiding stuff.” The ability to be open enables one to “have a good collaborative environment” in which “people are going to feel like they can speak up and offer their ideas without feeling like others will call it stupid or bad mouth it.”

Another respondent discussed that an upfront definition of goals and how to communicate within the collaboration was important. The most important form of

communications, according to this respondent was “face to face” communications because it helps to establish interpersonal communications.

Factor 9: Continuous communication with access to each other’s information

		TACOM 1		TACOM 2		TACOM 3		Industry 1		Industry 2			Industry 3	
Factor 9	Continuous communication with access to each others information													

A majority of the respondents indicated that continuous communication with access to each others information is needed for successful collaborations. Among the military interviewees, one defined collaboration as the “process of sharing data and information” and another defined collaboration as the “sharing of pertinent information.” Several respondents discussed collocation as an enabler to continuous communications. Collocation allows the members to share information “the first time” and “at the same time.” As another interviewee stated being “embedded is better because you get the daily ins and outs of the culture and decision making process which doesn’t always get passed down; but because you are physically located close it’s better.”

Constant communication with collaboration members was cited by one respondent as being the “key to bringing us all together on the same sheet of music” because as another interviewee said “members can go to anyone in the organization and there is constant contact.” Many participants stated how they achieved this continuous communication. One cited quarterly review meetings with all collaboration partners to revisit the vision, mission, goals and objectives of the collaboration to make sure they were all going in the same direction. Two additional respondents stated weekly staff meetings allowed continuous communications and enabled everyone to share their information. As one interviewee said “we have weekly staff calls where key leaders brief their information. All team members know what each other is doing”

Industry responses also indicated that this factor was important to successful collaborations. One respondent echoed the ability of weekly, monthly and quarterly meetings to achieve this continuous communication because they “keep people focused and help with agreement upon how you are going to communicate and everyone knows what’s going on.” An additional method of achieving continuous communication to enable collaboration was the use of company sponsored forums. As discussed by one interviewee, “it’s a very important cross pollination and collaboration mechanism for people all across the company. It’s where people from anywhere in the company can gather and share information and ideas.”

The ability to have access to other member’s information is critical to collaboration because as one respondent said “I don’t want to reinvent the wheel.” Understanding what other members are doing and the fact that people are “always providing input” to the collaboration is crucial to “situational awareness.” This continuous communication in both “written and oral” forms was cited as a key success factor because “it confirms intent and keeps everyone on the same page.”

Factor 10: Development of interpersonal communications which establishes and builds personal relationships

			TACOM 1			TACOM 2			TACOM 3			Industry 1		Industry 2		Industry 3		
Communications		Development of interpersonal communications which establishes and builds personal relationships																
	<i>Factor 10</i>																	

In analyzing the data for this factor, it appears that developing interpersonal communications to build personal relationships is important and that military respondents cited this more than industry. One military respondent stated the building of relationships and partnerships is one of the most important factors for having successful collaborations. An additional interviewee defined success of the collaboration as “the strength and well being of the collaboration

relationships.” He went on to define this as success because it —builds long term relationships.” This sentiment was echoed by another interviewee who said —So much we do is about relationships and relationships are the key” to successful collaborations. The building of interpersonal communications helps to establish these relationships and being compatible in —traits and philosophies” helps to establish a collaborative culture. As one interviewee said, —we even stop by just to talk to each other to say “Hi. How are you doing?” and this level of interpersonal communications goes a long way to build relationships.

Industry also discussed this factor and echoed the military sentiments. One interviewee stated —we had good, frequent communications in our collaboration” and they are important because —people are going to feel like collaborating more with people they are more familiar with and familiarity comes from frequent communications.” Another interviewee responded by saying —the relationship part is important because we will all meet somewhere again someday, sooner or later, and how we relate, work and treat each other is our personal credibility quotient and it will either negate or facilitate further collaboration.” The ability to maintain —cordial and personal relationships” helps the collaboration as one interviewee said. This statement links to the military idea that interpersonal communications and the building of relationships leads to long term collaborations.

One industry respondent also cited this factor as a key success factor for their external collaborations and emphasized the importance of it to their business. As he said, you need to build —personal relationships with the customer and really understand what they need and satisfy that need.” He went on to say that —the old boy network is important in this business and having those close relationships helps to have insights to key issues and strategic goals to enable us to position ourselves better to serve the customers.”

Factor 11: Communication tools and methods to allow for effective infrastructures to support open and continuous communication

			TACOM 1		TACOM 2		TACOM 3		Industry 1		Industry 2		Industry 3	
	Factor 11	Communication tools and methods to allow for effective infrastructures to support open and continuous communication												

Having tools and methods to enable open and continuous communications was an important factor to both industry and military. It was observed however, that the levels of tools, methods and technologies used in industry were much more sophisticated than those used in the military. One military responder stated that tools such as the “Army Collaborative Environment (ACE) help collaborations be successful.” Two other interviewees felt that documentation between the collaborators was essential. They stated “documenting the goals and expectations of the collaboration was a key part of the communication because it provided clarity to all members of the collaboration” and “putting expectations in writing and having them reverberated back” to him from members of the collaboration helped another interviewee “clearly articulate their intent of the collaboration expectation.”

Communication methods in industry appeared to be flexible. For example, one respondent stated “we adapted a new communication and reporting methodology because each business unit had different reporting procedures.” Another said “communication is key and my collaboration partner and I had a method where we built a stack of charts that either of us could communicate with anyone at any time.”

More sophisticated tools and methods for collaboration were discussed by two different industry interviewees. The first discussed how they have offices located all over the world and are basically a virtual company but their infrastructure allows for successful collaborations. As he said “we are scattered but because of the technology we have, it’s as if

we are all sitting next door to each other all the time.” The second discussed how they were continuously improving their collaboration systems to maintain and grow their collaborative culture. He stated,

We are continually evolving our communication abilities with respect to collaboration. We do this because collaboration becomes easier if you have digitally enabled, web enabled systems to establish the communications and collaboration so you don’t have to travel so much and you can collaborate 24/7/365. I think the development of the software to create collaboration portals and sites has helped and we are adding new capabilities right now like internal collaboration websites.

Category 5: Process/Structure

Factor 12: Members and stakeholders own the process of achieving the collaboration’s goals

		TACOM 1		TACOM 2		TACOM 3		Industry 1		Industry 2		Industry 3	
Process/Structure													
	<i>Factor 12</i> Members and stakeholders own the process of achieving the collaborations goals												

In analyzing the data for this factor, it appears that owning the process of achieving the collaboration goals is important and industry respondents cited this factor more than military. This was the only factor cited by all of the industry respondents.

The two military respondents discussed how the development of their collaborative culture had empowered the collaboration members to own the process of achieving the collaboration goals. As one stated “we have been able to foster a culture of I don’t work for (x) organization or (y) organization, I work for the (z) team.” The other respondent echoed this by discussing how the people in the collaboration are working together more effectively and efficiently “because of the collaborative environment we created and the processes that we established.” This organization was able to get “total buy-in from the people” and this included “buy-in at lower levels because they are doing the work down there to indoctrinate and bring new folks into that (collaborative) culture and understand the process.” One of the

military interviewees stated that the members in the collaboration were able to “put down our rice bowls” and then “things happened very fast.” This sentiment was echoed by the other interviewee who said —“we are all developing the strategy together simultaneously, everyone has a voice, agrees to a course of action and we execute without throwing anything over the fence. It’s all done real time”

The ownership of the collaboration goals and processes by the members and stakeholders of the collaboration was emphasized as an important factor by all of the industry respondents. One interviewee emphasized the stakeholders importance in the collaboration process and stated

The most important element to me, on the people side, is making sure you have the key stakeholders in the room that actually are going to own the outcome. Our bosses should be part of the process because they ultimately own it. If they aren’t, it won’t be successful. If we are going to put time and energy into the process of collaboration, then we must have the key stakeholders there, without them you might as well not do it.

Another interviewee discussed success in terms of the members of the collaboration owning the process and said —“if I can achieve an outcome and the team generally is supportive of the decision, process and outcome, that is one mark of success for me.” Yet another summed up both of these sentiments by saying

The processes are very important because they bring in all the vested parties to the decision process. Everybody has an understanding of what’s going on and what their role is and how important they are to the success of the program.

Several respondents discussed the processes that their members and stakeholders own and use to achieve their collaboration goals and how the culture enables them to own the process. As one respondent said —“its one of(our) strengths, because our culture says you collaborate and when somebody needs something you help them. That’s our culture.” This was reiterated by another industry respondent who said —“it’s the same thing with collaboration

in the company, if we know collaboration helps; you achieve more as a team or as a company and that is enough reason to do it (collaborate).” The processes established to achieve the collaboration goals are important and –you want to adhere to, but tailor, proven processes” because they bring in different facets of the organization and it enforces the collaborative culture. An example cited by one respondent was the Integrated Product Team (IPT) process and as a member of this team you ultimately own the process. One respondent discussed how they have a system that measures metrics and successes for their business units and stated that by using this process a unit –cannot realize the goals” of the system –without collaborating. It’s too multifaceted and you have to collaborate.”

Factor 13: Roles and responsibilities in the collaboration are clear

			TACOM 1		TACOM 2		TACOM 3		Industry 1		Industry 2		Industry 3	
Process/Structure														
	Factor 13	Roles and responsibilities in the collaboration are clear												

This factor was cited as important for both the military and industry respondents. A military respondent stated, in their definition of collaboration, that collaboration is –defining the roles and responsibilities of the customers and customer base.” Another respondent stated

One other characteristic of why things work (in our collaboration) is that roles (are) clearly defined and established. While sometimes there is overlap, I think it’s important in any collaborative effort that everyone understands what their role is and definition of the role

A third interviewee said the roles and responsibilities of members in the collaborations need to be clear –so that people understand what their lane is.”

Industry reiterated the military sentiments. However, two of the industry respondents stated that this factor was one of the most important factors that have made their collaborations successful. One of these respondents said –understanding who will do what, what are the expectations of each other and...the ground rules” for the collaboration is

important. The other respondent said it's important to have ~~w~~orkable rules of engagement between the parties; everyone has to agree because each team will have unique capabilities and there will be some overlap areas." A third respondent said to ensure there is a good match and that expectations are clear it's important to ~~t~~ake the time up front to understand the roles and responsibilities" and where each person is in the teaming process." This understanding of what each party brings to the process and the expectations of the members helps to form successful collaborations.

Factor 14: The collaborative structure is very complex and is flexible to changes

		TACOM 1		TACOM 2		TACOM 3		Industry 1		Industry 2		Industry 3	
Process/Structure													
	Factor 14 The collaborative structure is very complex and is flexible to changes												

The ability of the complex structure of the collaboration to be flexible was cited as an important factor to both the military and industry interviewees. For the military the collaborative structures are very complex because as one interviewee stated

The majority of the folks are matrixed to our PM. I probably have only 3% of the whole organization that is actually in the PEO, the rest is part of TACOM, the Acquisition Center or are Engineers. What we have here I call the Galapagos Islands of the acquisition corp.

Another respondent described their complex collaboration as ~~a~~ model of collaboration" because they ~~l~~iterally had daily telecoms with AAE, AFSB [Army Field Support Brigade], PM, ILSC, TARDEC, HQ AMC, Rock Island, Bluegrass, everyone was on the line and got marching orders in their lane." In this complex collaboration the PM was in control and was able to get problems solved by utilizing many different competencies in several separate commands.

For the military respondents flexibility is important ~~b~~ecause we operate in an environment of change." Having a flexible and complex structure allowed one interviewee to

take on a new mission which was outside of his portfolio. This new mission benefited from his collaborative culture because “we are bringing other organizations together using that same culture/attitude to solve problems” so this mission didn’t upset his current culture. The ability of the collaboration to be flexible to major changes was also reinforced by comments of two interviewees who discussed major changes in personnel. As one person stated, we have had a 100% turnover in people and these “new people come in and get embedded in the culture and we move forward.” The changes in “midlevel managers have contributed to the turmoil. But the people in the positions are now on board and see the value of the culture and the organizational structure.” The other interviewee said that while we have had this large turnover in people, “we have established a culture of collaboration” that allows new people to come in and embrace the culture. A third interviewee explained why this complexity and flexibility helped his collaboration. He discussed the fact that the military workforce has “been adding and increasing a lot more government people in the workforce as we have been through this era of persistent conflict.” He then went on to say that

You’re bringing a lot of new people and fresh ideas into the area and you’re able to leverage these new ideas and fresh approaches. This command is extremely busy. The people I have, have ingenuity and fresh ideas. Give them a problem, let them study it and have them come back with recommendations, and we have had some good ones. We don’t continue to do the same old stuff because that way it’s been done.

Yet a fourth respondent discussed that having a structure where we are “empowered to have flexibility” and the member having the “flexibility and willingness to focus on the end objective rather than the details” has “frced a more collaborative spirit.”

This factor was also important to industry and one respondent said that a collaboration should “reach consensus on the structure of the collaboration early, but have the ability to reexamine the structure on the back side” to see if it needs changing as the collaboration

changes. This flexibility with the structure and ~~the resources~~” was important to another interviewee as they said ~~“You have to be flexible. Maintaining flexibility and agility in the collaboration is important because there are always going to be unknowns. Collaborations will continue to prosper if they are flexible.”~~ Yet another interviewee discussed the complexity of collaboration by stating ~~“efforts in collaboration have a matrix organization”~~ and understanding the ~~“implications of a matrix organization”~~ is one part of having a successful collaboration. Further, they state that in a matrix organization collaboration can be as simple as ~~“getting on the phone and getting useful information”~~ or on the other extreme, ~~“major years of effort between two organizations or entities working together.”~~ Collaboration is complex and the structure is usually complex

Factor 15: Performance management and reward systems support collaborative behavior

Process/Structure			TACOM 1		TACOM 2		TACOM 3		Industry 1		Industry 2		Industry 3	
	<i>Factor 15</i>	Performance management and reward systems support collaborative behavior												

This factor was recognized by both the military and industry respondents as an important factor. However, the industry respondents appeared to tie this factor into the performance management systems of their company where as the military appeared to tie it into the importance of recognition and awards. One military respondent stated he believes that this factor is missing in his collaboration and said ~~“recognition of the successes has also been missing. So far we are doing good; no recognition”~~ He said that introducing this factor into his collaboration ~~“would help reinforce the (collaborative) efforts.”~~ Another interviewee within the same collaboration replied that the collaboration is ~~“asked to do some challenging~~

things but you are rewarded for them; there's team and individual awards." It is interesting to note these different responses within the same collaboration.

Industry also cited rewards as being important to collaboration success because it's important that members of the collaboration have "that sense of reward" and an understanding of how people feel they are rewarded. It's the whole rewards and recognition; whether it's on an individual's accomplishment or a team accomplishment." Another industry interviewee echoed this by saying you need to have "recognition for other's contributions, even if you don't like them (you must) recognize their contribution" because it will make your collaborations more successful.

In addition to rewards and recognition, industry respondents also discussed how collaboration within their company is measured in their performance management systems. One respondent discussed how his management implemented collaboration into their system. As he said

Besides just preaching it he (his executive) took some steps to ensure we lived it; he measured it. One way was by making it part of his subordinate leader's evaluations and that trickled down to me. It was one of the things I was asked to provide examples for at my level on how I helped collaborate for the good of the company.

This same respondent then discussed not only how collaboration was measured, but how it was rewarded because bonuses were tied to meeting collaboration metrics and goals. He also said that you need to recognize the collaborative team because if you don't "you're still short on where you need to be for collaboration."

A second industry interviewee discussed how they have a system that measures collaboration metrics and successes for their business units and this system of metrics and measures is part of their award and performance evaluation system. Another interviewee discussed how their reward and performance systems have metrics that value their culture of

collaboration. This system also has intangible measures because in this company the culture expects collaboration. If you are not collaborating, your career could be derailed because “if you get a reputation of being uncooperative, two things will happen – nobody will come back to you and the next time you need a favor from somebody else you will have a more difficult time” and you will not be able to meet your performance evaluation goals.

Factor 16: Financial, personnel and time resources are sufficient for the collaboration

		TACOM 1	TACOM 2			TACOM 3	Industry 1		Industry 2		Industry 3	
Process/Structure												
	Factor 16 Financial, personnel and time resources are sufficient for the collaboration											

Ensuring the collaboration has sufficient resources appears to be an important factor for both the industry and military interviewees. Three of the military sources cited that having the financial resources was a factor in their successful collaborations and one respondent said everyone in the collaboration needs to review the dollars. As another stated, we “have the ability from a financial standpoint to execute” and this was echoed by a second interviewee who said “budget was not constrained or a deciding factor. We weren’t limited, we were able to look at the best way to meet the goals and say this is what’s required. I was unrestricted on what ever it took to collaborate.” A third interviewee cited that having the right equipment and materials readily available to test and support the collaboration was one of the most important factors to successful collaboration.

Industry believed this factor was required for successful collaborations and two respondents cited it as one of the most important factors. As one interviewee said “marshalling of the correct resources is extremely important” and includes “making sure you have the right people on the team (who) can deliver what you need.” The other interviewee stated that “I need factors such as schedule and resources” and this includes “people,

computer, labs, vehicles, etc.” A third interview provided the reason why this factor is important by stating that “if you don’t resource them (people, money, training) the collaboration may not succeed” and lastly a fourth interviewee said “commit adequate resources or don’t even try.” A few of the interviewees stated the importance of allowing time in collaborations. As one leader said “we provide people the time to attend functions” and we fund the functions. “Time is another big factor and taking the time to stop and really do the collaboration is important” replied another interviewee when asked about resources for successful collaborations. Yet another interviewee said “Planning more time upfront to plan the collaboration” is important to ensure the collaboration success.

Factor 17: Leadership of the collaboration have collaborative skills and show visible collaborative behavior

			TACOM 1		TACOM 2		TACOM 3		Industry 1		Industry 2		Industry 3	
	Factor 17	Leadership of the collaboration have collaborative skills and show visible collaborative behavior												

Collaborative behavior by leadership of the collaborations appears to be important to successful collaborations. This factor was cited by all but one of the military interviewees and seemed to be cited more by the military than industry. Having a leader that has collaborative skills and visible collaborative behavior is important to creating a collaborative culture because as one interviewee said “in order to build the culture the folks need to see it being done, because they are going to do far more of what they see than what they hear.” He continued and said

...a characteristic that totally affects the culture is the folks in the organization need to see the leadership walk the talk. In other words I can collaborate with my (partners) all day long, and we can preach to our organization, but if they actually don’t see us doing it, if they catch us saying different things at different times it will hurt the collaborative culture.

This philosophy, that actual and perceived behavior of the leadership needs to be collaborative, was echoed by another interviewee who said —“leadership plays a key role in this” because my partner, myself and the other leaders are what the organizations see and —a lot of leadership at the ground level has helped pull us all together and create this culture.” It appears that collaborative behavior of the leadership can permeate throughout an organization. This was supported by one leader who told of a scenario where he and other leaders in his collaboration worked over a weekend and it inspired the rest of the people in a collaboration to do the same. One leader said the benefit of having this behavior is —“the more collaborative I am the more work I get done.”

Their own leadership collaborative skills were also discussed as a factor to collaboration success and one leader said —“don’t dictate and be the dictatorial type” because —“do value his and her opinion and if it passes the common sense test of what they are actually telling me then I will go their route.” He went on to discuss how he empowers his people and has a philosophy —“how you act around others actually leads to how much openness you are going to have” within your collaboration. Not being a dictatorial leader was also an important collaborative skill a leader should possess said another interviewee. Lastly one interviewee when asked what change could make collaboration more successful replied —“more practice and less talk about the LCMC (philosophy) at higher levels.”

Category 6: Other

In analyzing the data from the interviews two additional factors appeared to be key to successful collaborations. The first factor is Factor 18: Diversity of the collaboration which aligns with the definition of Category 3: Skills/Competencies/Behaviors. The second factor is Factor 19: Collocation which aligns with the definition of Category 5: Process/Structure.

Additional less important and thus unnumbered factors that were mentioned during the interviews are also discussed.

Factor 18: Diversity of the Collaboration

			TACOM 1		TACOM 2		TACOM 3		Industry 1		Industry 2		Industry 3	
Factor 18	Diversity of the collaboration													

Both industry and military respondents cited having diverse people and skills in the collaboration is a factor that made their collaborations successful. After careful consideration of all the data it was determined that this key idea should be made a separate factor under the category of Skills/Competencies/Behaviors. The data that supports this decision is given below.

Data from the interviewees indicated that diversity of the people in the collaboration was important to successful collaboration. One military interviewee said “the mix of skill sets and respecting the skills of others is what I believe is the key” to successful collaborations. Another military respondent explained why diversity in his collaboration helps make it successful by stating that diversity brings “alternative views of a given topic and multiple perspectives” which gives you the “ability to look at it from different perspectives.”

Industry also seemed to believe diversity of the collaborative group was important and one respondent cited it as one of the most important factors in successful collaborations. He explained that people with different experiences, behaviors, strengths and personalities give a better solution to the collaboration and said “understanding how the collaborative parties complement each other is vital” and “collaboration can be more successful if you have organizations or people involved that complement each other.” Another respondent stated that having a “mix of both years of experience and raw capabilities” and people with different skill sets such as “engineers, human factors people, etc” brings new and “wild” ideas to the

collaboration. He also said –It’s good to have a mix of those that fundamentally know the issues and those that know nothing about it” because this brings better solutions and ideas to the collaboration. Additionally, an industry interviewee added that –the collaboration is only as good as the people collaborating. It’s only as good as the people and knowledge they bring to the collaboration.”

Lastly, a final interviewee summed up the importance of having a diverse set of people involved in the collaboration. He described how diversity can take collaboration to a higher level by using the goodness of different cultures. He said

The diversity is the power that really allows collaboration to realize its full potential. In the past when you match perfectly it’s tough to collaborate because you have the exact same way of looking at things and it’s difficult to find the power in the collaboration. A very diverse background is very interesting - you can take it to another level because you are now getting different views of the same thing, you still have a common goal but the different views allow you to get one plus one equals three rather than one plus one equals two.

Factor 19: Collocation of members

			TACOM 1		TACOM 2		TACOM 3		Industry 1		Industry 2		Industry 3	
Factor 19	Collocation of members													

Collocation of the collaborating partners appeared to be an important factor for the military respondents but only one industry interviewee cited it as being important.

After careful consideration of the data, it was determined that this idea should be made into its own factor under the category of Process/Structure. The data to support this factor is given below.

Data from the interviewees indicate that collocation is import to successful collaboration. One military interviewee said is it one of the most successful factors for his collaboration and stated –one of the things I think that makes us so successful is we are all here in one building.” Another respondent stated that the –location of the people and being

embedded with (our partner) helps” the collaboration. This is because, as another interviewee said —collocation keeps us together and integrated.” One interviewee explained that collocation is an enabler to his collaboration success and helps, though it’s not an absolute requirement. Several of the respondents tied collocation to being able to collaborate easier because it helped with communications. As one interviewee said —location, it’s probably the largest, probably the most important” because I am able to communicate easily.

Lastly, a final military interviewee summed it up by saying —we are collocated and I believe collocation is key to collaboration” because —we can focus at the program level.” However, when different leadership reaches down and pulls stuff —we end up getting mixed.” He then went on to use an analogy to explain how collaboration at higher levels needs to work. He explained

To use a warfighter example we use task organizations on the battlefield all the time. In combat operations, there is a commander in charge. He doesn’t own all the assets he has but they are under his operational command and control. For example, you take an air defense team. They are from an air defense battalion. That company is attached to that battalion for that operation. When they are in that operation they take all command and control from that task force commander that he is attached to; although all his support equipment, ammunition and his people come from his higher HQ. That’s what is missing from our model right now. We’re kind of pulled and people are spread out all over the place.

The one industry respondent described collocation as a success factor by saying —proximity is a success factor” because it is a —convenience and efficiency factor” which —makes it easier to collaborate”.

Data for Results for all Factors

The charts below depict the data and responses discussed in the previous section, Factor Summary. The data is shown using two different sets of responses.

First, Figure 5 shows graphically, the combined military and industry responses to a particular factor. Secondly, Figure 6 depicts the separate military and industry responses to each factor. These graphs enable the reader to visually look at the data that was described in the previous section. These graphs represent all 19 factors found in this study.

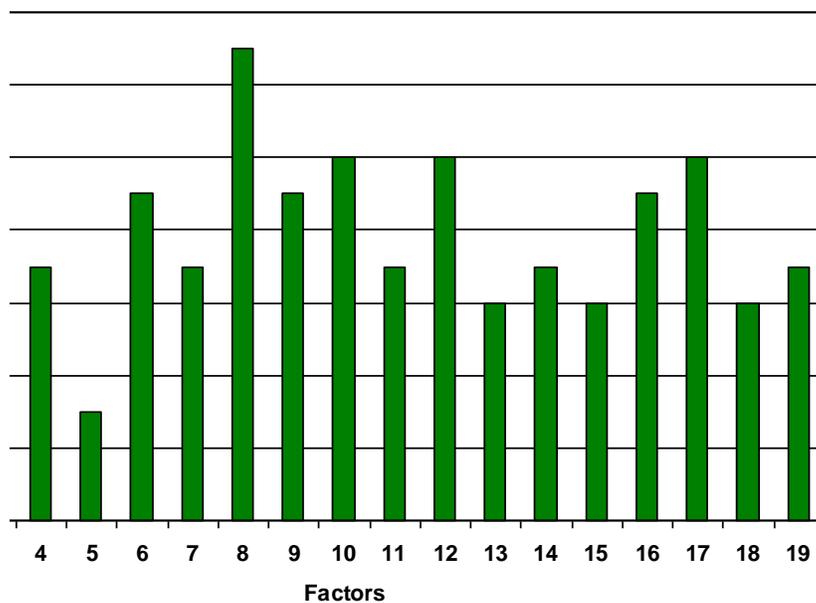


Figure 5: Combined Military and Industry Responses to Factors

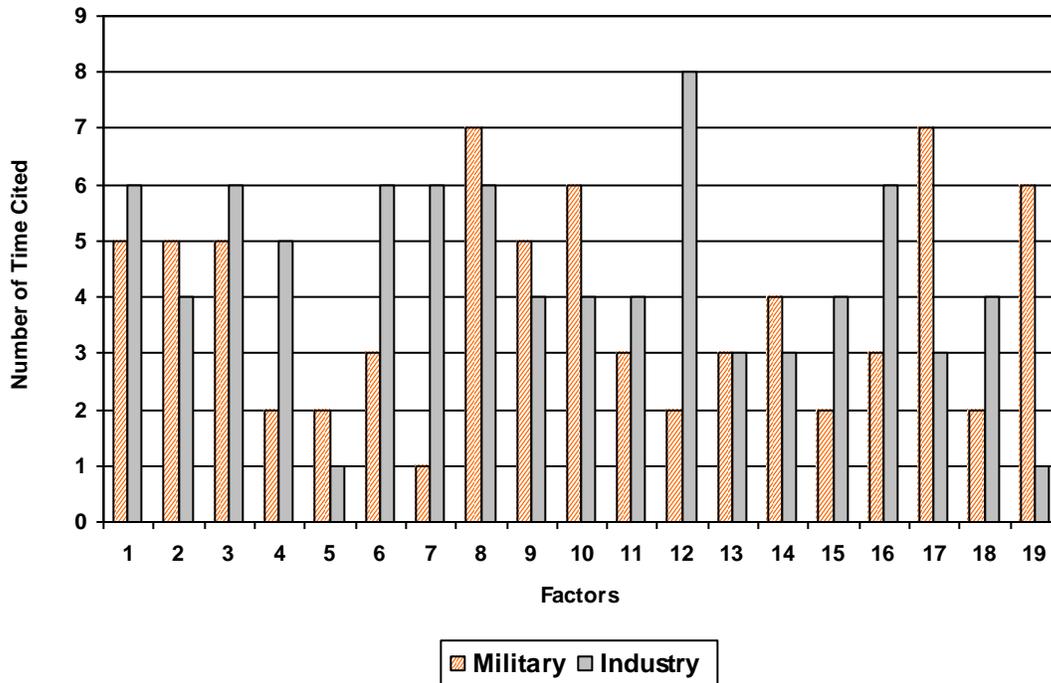


Figure 6: Military and Industry Responses to Factors

Additional Factors

As stated previously, all ideas are relevant in qualitative research. Thus, additional factors mentioned in the interviews are listed below. Though these ideas are relevant, they were not considered “key” factors for successful collaboration in this study. This is because the factor was only mentioned once in the interviews.

- A. Having the right people on the right jobs
- B. Aligning Product and Project Managers (PM's) with logistics and technology in right locations and along commodity lines and be given the authority and funding as the life cycle manager
- C. Isolated by ourselves from the rest of the LCMC
- D. Urgent needs and streamlined processes
- E. Clear command and control

- F. Common something makes it collaborative
- G. Same education - allows for same dialogue
- H. Establish processes and business process around the culture you are trying to achieve
- I. Speak with one voice -it needs to be with one voice
- J. Ability to replicate what the collaboration achieved someplace else
- K. Pacing - you have to recognize times for rest, inspiration and when to stop
- L. Internal collaboration helps external collaboration
- M. Defining the values in the collaboration
- N. Facilitator to help start the collaboration
- O. It's a shared understanding and willingness by both parties
- P. Team spirit- they feel like a team
- Q. Passion for solving a problem
- R. Pride of team accomplishments - sense of accomplishment
- S. Pride and joy of accomplishing something big - its for a greater purpose
- T. Continuous improvement and strengthening the methods of collaboration so it can lead to more successful collaborations

Summary

In summary, the purpose of this research was to gain a deeper understanding of the key factors that influence collaboration, particularly with application toward the TACOM LCMC. Fifteen interviews were conducted within six different organizations that have successful collaborations and embrace a collaborative culture. Three of the organizations are within the TACOM LCMC and three are within Industry. The qualitative data from the interviews was analyzed using thematic analysis and compared with the data discovered in the

literature review for this research. Using prior research on factors for successful collaboration, the data from the literature review and interviews was compared and analyzed to discover similar or new factors that are applicable to the TACOM LCMC environment. The interview data was evaluated based on the applicability to the factors resulting from the literature review; the data compared and assessed any major differences from military or industry perspectives; the data was analyzed for links that appeared between the factors and the data was reviewed for any emerging or new factors required for successful collaborations. Echoing the results from the Mattessich study, it appears that the successful (or mature) collaborations have some quantity of each factor present (Mattessich, et. al., 2001). Chapter 5 will discuss the data further and present key findings and their implication for further research.

Chapter 5: Conclusions and Recommendations

Introduction

Collaboration in organizations is dependent upon many factors. Chapters 2 and 4 data revealed that many factors are needed for successful collaborations. The data indicated that there were some common but also some differentiating factors between military and industry collaborations. The data further suggested that there are several links and interdependencies among the factors and that all factors in some quantity need to be present for the collaborations to be successful. This chapter discusses the three areas of:

- Key Factors for Successful Collaboration
- Similarities and Differences between Military and Industry Factors for Collaboration
- Links and Interdependencies among the Factors.

This chapter also provides recommendations for future research and discusses the limitations of this research.

Key Factors for Successful Collaboration

Many key factors for successful collaborations emerged from the both the literature review and interview data. The literature review resulted in 17 factors binned into 5 categories. The interview data added validity to the factors from the literature review and brought forth two additional factors, which resulted in 19 factors that appear to be needed for successful collaborations. A factor was considered key if it was cited more than one time by both the military and industry interviewees. Thus, a combined frequency response to the factor of two or greater resulted in determining if it was a key factor.

The resulting 19 factors are sorted into five generalized categories and are:

Environment/Culture

- Factor 1: Support from leadership and those groups, both politically and socially, that have influence over the collaboration

Goals/Objectives

- Factor 2: Clear, concrete attainable goals and objectives of the collaboration with small wins achieved during the course of attaining the goals
- Factor 3: Shared vision for the outcome of the collaboration

Skills/Competencies/Behaviors

- Factor 4: Allowing for and effectively managing conflict within the collaboration
- Factor 5: Members trained in skills required for collaboration
- Factor 6: Mutual respect and trust among collaborators
- Factor 7: Personal accountability of the members for the collective outcome of the collaboration and belief that the outcome will provide an advantage
- Factor 18 (New): Diversity of the Collaboration

Communications

- Factor 8: Open, honest and frequent communication unhindered by status, location or function
- Factor 9: Continuous communication with access to each other's information
- Factor 10: Development of interpersonal communications, which establishes and builds personal relationships
- Factor 11: Communication tools and methods to allow for effective infrastructures to support open and continuous communication

Process/Structure

- Factor 12: Members and stakeholders own the process of achieving the collaboration's goals
- Factor 13: Roles and responsibilities in the collaboration are clear
- Factor 14: The collaborative structure is very complex and is flexible to changes
- Factor 15: Performance management and reward systems support collaborative behavior
- Factor 16: Financial, personnel and time resources are sufficient for the collaboration
- Factor 17: Leadership of the collaboration have collaborative skills and show visible collaborative behavior
- Factor 19 (New): Collocation of members

Similarities and Differences between Military and Industry Factors for Collaboration

Analysis of the interview data shows that there seem to be many commonly agreed upon factors for successful military and industry collaborations. There also appears to be several differentiating factors in successful collaborations between these two sectors. For purposes of this study, the researcher's choice determined that a significant difference in the factors was identified if at least twice as many respondents in one sector cited the factor versus the other sector. The responses were considered common if the difference was less than twice that of the other sector.

A key finding of this comparison is that both the military and industry sector agreed that all of the factors in the environment/culture, goals and objectives, and communication

categories as well as two factors from the Process/Structure category were essential to successful collaborations. Further, the entire category of Skills/Competencies/Behaviors and five of seven factors in the Process/Structure category were different between industry and military collaborations. This result was unexpected. It was expected that there would be common and different factors between military and industry that would be dispersed among various categories. It was not expected that the common and different factors would be so clear cut and aligned with their respective categories.

The following framework in Table 5 shows the break out of the factors that are common and different between the two sectors.

<u>Common</u>	<u>Different</u>
<p>Environment/Culture</p> <ul style="list-style-type: none"> • Factor 1: Support from leadership and those groups, both politically and socially, that have influence over the collaboration <p>Goals/Objectives</p> <ul style="list-style-type: none"> • Factor 2: Clear, concrete attainable goals and objectives of the collaboration with small wins achieved during the course of attaining the goals. • Factor 3: Shared vision for the outcome of the collaboration <p>Communications</p> <ul style="list-style-type: none"> • Factor 8: Open, honest and frequent communication unhindered by status, location or function • Factor 9: Continuous communication with access to each others information • Factor 10: Development of interpersonal communications which establishes and builds personal relationships • Factor 11: Communication tools and methods to allow for effective infrastructures to support open and continuous communication <p>Process/Structure</p> <ul style="list-style-type: none"> • Factor 13: Roles and responsibilities in the collaboration are clear • Factor 14: The collaborative structure is very complex and is flexible to changes 	<p>Skills/Competencies/Behaviors</p> <ul style="list-style-type: none"> • Factor 4: Allowing for and effectively managing conflict within the collaboration • Factor 5: Members trained in skills required for collaboration • Factor 6: Mutual respect and trust among collaborators • Factor 7: Personal accountability of the members for the collective outcome of the collaboration and belief that the outcome will provide an advantage • Factor 18 (New): Diversity of the Collaboration <p>Process/Structure</p> <ul style="list-style-type: none"> • Factor 12: Members and stakeholders own the process of achieving the collaborations goals • Factor 15: Performance management and reward systems support collaborative behavior • Factor 16: Financial, personnel and time resources are sufficient for the collaboration • Factor 17: Leadership of the collaboration have collaborative skills and show visible collaborative behavior • Factor 19 (New): Collocation of members

Table 5: Common and Different Factors between Military and Industry

Common Factors

In terms of similarities, both military and industry cited the following categories and their related factors as key to successful collaborations: Environment/Culture,

Goals/Objectives and Communications. In addition within the Process/Structure category, Factor 13 (roles and responsibilities) and Factor 14 (collaboration structure is complex and flexible) were similar.

These results indicate that successful collaborations in any organization need to have support from leadership for the collaboration (Factor 1) with clear goals (Factor 2) and a vision of the collaboration (Factor 3). Small wins along the way will enforce the collaboration and communication methods must be open, honest and frequent (Factor 8), continuous (Factor 9) and interpersonal to establish and build personal relationships (Factor 10). Effective communication tools and methods must be used to allow for an effective infrastructure to support open and continuous communications (Factor 11) which can range from daily meetings to advanced technological methods of collaboration. The roles and responsibilities in the collaboration must be made clear (Factor 13) and the structure of the collaborations is very complex and flexible to changes (Factor 14).

There may be several reasons for these similarities. This research speculates that having a culture that embraces collaboration is important regardless of the organization. The research also suggests that the collaborative culture is built by defining the goals, vision, roles and responsibilities of the collaboration members and uses a variety of methods for effective communication.

Two additional findings in the data proved to be very interesting. Within the communications category it was observed that the communications tools, methods and infrastructures to support open and continuous communications, Factor 11, was much more sophisticated in industry than those used in the military and the military relies more on the development of interpersonal relations. It was also noted by industry and military

interviewees that the development of interpersonal communications and building of personal relationships (Factor 10) leads to long term collaboration success. The military particularly appears to rely heavily on these interpersonal relations for long term collaboration success which seems difficult given an environment of continuous movement of personnel in a military organization.

Differences

In terms of differences, the category of Skills/Competencies/Behaviors and all its related factors showed significant differences between the military and industry respondents. The second category, Process/Structure, revealed 5 of the 7 factors as having significant differences. Each category and factor is discussed next.

In the Skills/Competencies/Behaviors category, industry responses were much more prevalent for Factors 4 (managing conflict), Factor 6 (respect and trust) and Factor 7 (personal accountability for the outcome of the collaboration). Interpretation of this data indicates that industry collaborations view these Skills, Competencies and Behaviors as more important than the military collaborations and this could be for several reasons. One may be because in the military organizations people move around more frequently than in industry and its difficult to build the respect and trust and develop a sense of personal accountability for the collaboration. Another reason may be that because the military is a hierarchical organization, conflict may be avoided more than in industry. Additionally, there is an inherited sense of loyalty and people in the military environment may tend to compromise rather than working through their conflict.

Industry cited Factor 18 (diversity of the collaboration), twice as often as the military. This could be because collaborations in industry appear to build longer term relationships than

the military due to the more stable environment in which they operate. These long term relationships understand, embrace and utilize each member's diversity. The military cited Factor 5, (members trained in skills for collaboration), twice while industry cited it only once. Though this is a significant difference from the definition of this research this was the factor cited the least within the research using the combined military and industry responses. The reason for this may be the skills required for collaboration are embedded in other factors. In the book Radical Collaboration, the authors discussed five essential skills that help build long term, successful relationships. The five skills are (Tamm and Luyet, 2004, p. 9-10):

- A. Essential Skill #1: Collaborative Intention: Individuals stay in the Green Zone, maintain an authentic, nondefensive presence and make a personal commitment to mutual success in their relationships.
- B. Essential Skill #2: Truthfulness: Individuals commit to both telling the truth and listening to the truth. They also create a climate of openness that allows all people in the relationship to feel safe enough to discuss concerns, solve problems and deal directly with difficult issues.
- C. Essential Skill #3: Self-Accountability: Individuals take responsibility for the circumstances of their lives, the choice they make either through actions or failing to act, and the intended or unforeseen consequences of their actions. They would rather find a solution than find someone to blame.
- D. Essential Skill #4: Self-Awareness and Awareness of Others: Individuals commit to knowing themselves deeply and are willing to explore difficult interpersonal issues. They seek to understand the concerns, intentions and motivations of others, as well as the culture and context of their circumstances.
- E. Essential Skill #5: Problem-Solving and Negotiating: Individuals use problem-solving methods that promote a cooperative atmosphere. They avoid fostering subtle or unconscious competition.

If one compares these essential skills with the factors, it can be seen they are embedded in factors 4, 6, 7, 8 & 10. Thus, the skills required for collaboration may be integrated with other factors. Further research on the skills required for collaboration would be helpful to understanding and providing support for this explanation.

In the Process/Structure category, industry responses were cited twice as often for Factor 12 (members own process of collaboration), Factor 15 (performance management and

reward systems support collaborative behavior) and Factor 16 (sufficient resources). In terms of Factor 12, this was the only factor cited by all of the industry respondents and this could be because in Factor 15, the industry respondents appeared to tie this factor into the performance management systems of their company whereas the military appeared to tie it into the importance of recognition and awards. It could also be that this factor is closely linked with Factor 7 (personal accountability) and it's difficult for military to own the process if they do not accept personal accountability for the collaboration outcomes. The importance of having the right people, equipment, funding and allowing time for the collaboration was cited more by industry and this could be because of the natural volatility of the military environment. Further explained, the military has people that continuously move from positions, their resources are ever changing and they are currently in a fast paced environment. It is possible that these factors impede allocation of sufficient resources for the collaboration.

Factor 17 (leadership has collaborative skills and behavior) and Factor 19 (collocation of members) was cited more by the military than industry. This finding could be due to many reasons. First, there could be a difference in leadership training between the two sectors, with industry possibly placing more emphasis on the development of collaborative skills. Secondly, because individuals in industry are evaluated and rewarded for their collaborative behavior it becomes a part of their culture and would drive leaders to behave more collaboratively. Further, because these skills and behaviors are embedded in the industry culture, they may be prevalent and this factor may not stand out as significant for them. Lastly, because industry seems to use more advanced and sophisticated methods of communication, they may not view collocation as necessary to collaboration.

Links and Interdependencies between the Factors

Analysis of the interview data revealed several links and possible interdependencies between the factors. As the interview data was being sorted and analyzed, notes were carefully taken when a link between factors appeared. In some instances, the interviewee commented that the factors were linked or dependent upon another factors. In other instances, such linkages were implied and interpreted by the researcher. An example of an interviewee commenting on the linkage between Factor 4 (managing conflict), and Factor 6 (trust), was when the interviewee said —if you don't resolved them (conflicts) they will come back through as mistrust.” An example of an implied dependency is when an interviewee linked Factor 6 (trust) and Factor 8 (open and honest communications), by stating —We are allowed to express our opinions without fear of retribution.”

These links show that several factors are related to one another and this is intuitive for many of the factors. For example, one would expect open and honest communications would be related to respect and trust, and continuous communications would be related to collaborative vision and goals. Figure 7 shows the links. The colors of the lines are not significant but used for clarity in viewing the links.

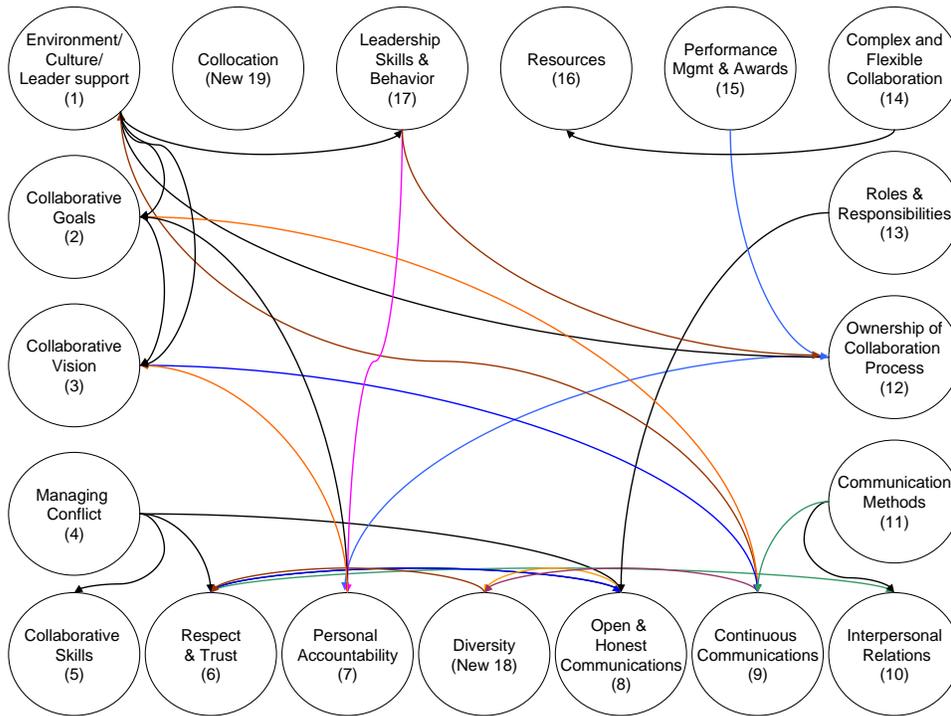


Figure 7: Linkage between Factors

As the data was being analyzed, some factors seemed to have more links than others. Specifically, when viewing the data from across the five categories, there seemed to be a continuous pattern of links between the categories. The links with only one line within categories and across categories were taken off the chart to clearly view these continuous links and thus, there appeared to be a pattern of significant and continuous links within the data. These are shown in Figure 8. The interpretation of this information seems to indicate Factors 1, 2, 3, 7, 9, 12 and 17 are all interlinked and very dependent upon each other. There appears to be a pattern of interdependency that says leadership support for the collaboration, the collaborative goals and vision, personal accountability and ownership of the collaboration

process, continuous communications and the leaders of the collaboration having collaborative skills and behaviors are all very much dependent upon each other. Perhaps, having these core seven factors in collaboration would be the difference between a satisfactory collaboration and a great collaboration.

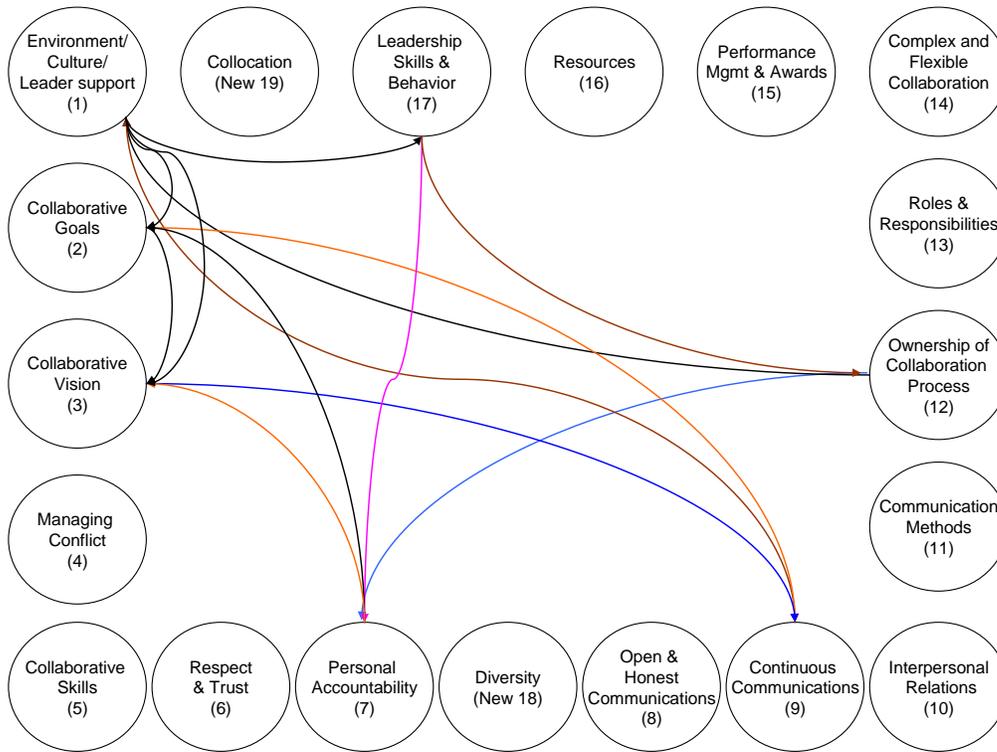


Figure 8: Key Linkages between Factors

Key Factors Summary

In summary, each of the key factors for successful collaboration revealed in this research is important for any collaboration. There appear to be commonly agreed upon factors between military and industry collaborations, and factors that are different between the two sectors. These similarities and differences are uniquely divided by categories of factors. Similarities important for successful collaborations include having an environment/culture

that embraces collaboration, establishing goals/objectives for the collaboration and establishing effective communications. The military relies on the development of interpersonal relations for long term collaboration, which is difficult given the environment of continuous movement in a military organization. Roles and responsibilities and understanding that the collaboration is complex but flexible are also two factors that are similar. Differences that appear to be important include the Skills/Competencies/Behaviors of the members of the collaboration. It appears that industry places more emphasis on managing conflict, mutual respect and trust, developing personal accountability for the collaboration and diversity of the collaboration members. Neither sector responded significantly to members having collaborative skills and this could be because these skills are embedded in other factors. Another difference between the two sectors includes several components of the Process/Structure of the collaboration. These include industry placing more emphasis than the military on members owning the process of collaboration, having a performance management and reward system that support collaborative behavior and establishing sufficient resources for the collaboration. The military placed more importance than industry on having leaders of collaborations that have collaborative skills and behaviors and the collocation of the collaboration members.

There appears to be a very strong link for successful collaborations between factors 1, 2, 3, 7, 9, 12 and 17. This research seems to suggest that these basic seven core factors could enable a mediocre collaboration to be a great collaboration. Of these factors, all are similar between military and industry with the exception of personal accountability for outcome of the collaboration and ownership of the collaborative process where the military cited once and twice respectively. The other difference is in factor 17 where the military cited almost

unanimously that the leader of a collaboration should have collaborative skills and behaviors. It is therefore recommended that the TACOM LCMC focus their near term efforts to enhance collaboration on these seven factors and develop plans to implement these core factors within ongoing and future collaborations. Long term efforts to build a collaborative culture within the TACOM LCMC would include implementing all 19 factors into the TACOM LCMC environment and culture.

In conclusion all 19 factors are important to collaborations. There appears to be an important pattern of interdependency that says leadership support for the collaboration, the collaborative goals and vision, personal accountability and ownership of the collaboration process, continuous communications and the leaders of the collaboration having collaborative skills and behaviors are core factors for successful collaborations. Concentrating resources on developing these core factors will begin to increase successful collaborations within the TACOM LCMC and allow for the continuous building of all the factors into the workplace to create a collaborative culture.

Opportunities for Further Research

There are significant opportunities for further research in the area of collaboration. During the interviews many of the interviewee's were excited to discuss this subject and also asked many questions which indicated more research is needed. Below is a list of research questions and opportunities for research on collaboration.

- What are the skills required for successful collaborations?
 - Are the skills different between types of organizations (military, industry, education, etc.)?

- Is there a ranking of importance for the factors and is the ranking different for different organizations?
- If building interpersonal relationships in the military is difficult because of the movement, then why is it a key element in military collaborations?
- Are the seven linked factors the foundation required to begin a successful collaboration?
- If collaboration is missing one factor would the collaboration fail?
- Is there a difference in collaborations with respect to participant demographics such as age, location, gender, etc.?
- Are the factors more prevalent or pronounced in emerging or mature collaborations?

Limitations of the Research

This research has several limitations. The time of the project was limited and this impacted the amount of data that could be captured from both the literature review process and the interview process. More data from both would provide richer and more descriptive factors and possible convergence on the conclusions of this research. The research is also limited by the researcher's inexperience with performing qualitative research and thematic analysis. This type of analysis and research improves as one conducts it. Interpretation of the data is also a limiting factor and it should be noted that there may be additional links between the data that may not have been captured. The interview process was also limited as more probing questions could have been asked had there been more time allocated. It should be noted that there may be additional links between the data that may not have been captured due to the small and limited amount of data collected for this research. In addition, the nature of qualitative research has its own inherent limitations.

References

- About Army Business Transformation. (2008). Retrieved March 11, 2009 from
<http://armybtkc.army.mil/bt/index.htm>
- Army Posture Statement. (2007). Retrieved March 11, 2009 from
<http://www.army.mil/aps/07/addendum/m.html>
- Beyerlein, M., Freedman, S., McGee, C., & Moran, L. (2003). The Ten Principles of Collaborative Organizations. *Journal of Organizational Excellence*, 22(2), 51-63. Retrieved August 21, 2008, from Business Source Complete database.
- Boyatzis, R.E. (1998). *Transforming Qualitative Information*. Thousand Oaks, CA: Sage Publications.
- Cannon, M. & Cole, R. (2006, January). Designing and Building an LCMC – Blueprint for a High Performance Organization. *Army AL&T*, PB 70-06-01,10-14.
- Christle, G.E, Johnson, R.V., & Wilson, J.C. (2006, March). Dual-Hatting Army PEOs: PEO/LCMC Assessment. Alexandria, VA: CNA Corporation.
- Collins, J.C & Porras, J.I. (1994) *Built to Last*. New York, NY: HarperCollins Publishers.
- Conerly, R., Kelley, T., & Mitchell, J. (2008). *The Collaborative Organization*. Retrieved August 12, 2008 from
<http://www.collaborativeleaders.us/TheCollaborativeOrganization.pdf>
- Cooperrider, D., Whitney, D. & Stavros, J. (2008). *Appreciative Inquiry Handbook for Leaders of Change*. Brunswick, OH: Crown Custom Publishing.
- Deans, K. (2008). Life Cycle Management Command Metric Case Study. Fort Belvoir, VA: United States Army Materiel Command

Department of the Army (2003). Army Regulation 70-1, Research, Development, and Acquisition, Army Acquisition Policy (AR 70-1). Washington, DC: U.S. Army Publishing Directorate.

Department of Defense. (2007). Directive 5000.1: The Defense Acquisition System. Washington, DC: author. Retrieved March 10, 2009 from <https://acc.dau.mil/CommunityBrowser.aspx?id=189575>

Dunkel, L. & Arena, C. (June 2007). *Leading in the Collaborative Organization*. Retrieved November 10, 2008 from https://www2.interactionassociates.com/html/pdf/IA_Leading_in_the_Collab_Organization.pdf

Dunwoody, A. (2009, March). The Evolution of the Materiel Enterprise: Achieving Institutional Adaptation [Electronic version]. *Army Magazine*, 59(3), 46-52.

Evans, P., & Wolf, B. (2005, July). Collaboration Rules. (cover story). *Harvard Business Review*, 83(7/8), 96-104. Retrieved November 11, 2008, from Business Source Complete database.

Felker, J. (2008). *Geographic Mobility of Knowledge Workers in the European Union: Implications from an Organizational Perspective*. Doctoral Dissertation, Lawrence Technological University, 2008.

Flanagan, M.P. (2007, March). *Life Cycle Management Commands: Wartime Process or Long Term Solution?* Carlisle, PA: U.S. Army War College.

- Gratton, L & Erickson, T. (2007). 8 Ways to Build Collaborative Teams. *Harvard Business Review*, 85(11), 100-109. Retrieved August 7, 2008, from ABI/INFORM Global database. (Document ID: 1370899981).
- Gray, B. (1989) *Collaborating*. San Francisco, CA: Jossey-Bass.
- Hattori, R., & Lapidus, T. (2004, June). Collaboration, trust and innovative change. *Journal of Change Management*, 4(2), 97-104. Retrieved November 16, 2008, doi:10.1080/14697010320001549197.
- Hermes, C.D & Roddin, M.I. (2006, April) An Interview With Army Acquisition Executive (AAE) Claude M. Bolton Jr. — Creating the LCMC Construct. *Army AL&T*, PB 70-06-02, 20-25.
- Kanter, R. (1994, July). Collaborative Advantage: The Art of Alliances. *Harvard Business Review*, 72(4), 96. Retrieved November 11, 2008, from Business Source Complete database.
- Kegerise, K. (1999, March). Keys to Successful Collaboration. *Developments*, 13(1) 5-8
Retrieved November 14, 2008 from
<http://www.education.pitt.edu/ocd/publications/dev1999-03.pdf>
- Kern, P.J. & Bolton, C.M. (2004, August) *Memorandum: Subject: Life Cycle Management (LCM) Initiative*. Washington, DC: Department of the Army.
- Liedtka, J. (1996, May). Collaborating across lines of business for competitive advantage. *Academy of Management Executive*, 10(2), 20-34. Retrieved November 16, 2008, from Business Source Complete database.
- Long, B. (2008, May). TACOM Life Cycle Management Command 2008 Strategic Plan. Warren, MI: U.S. Army TACOM LCMC.

- Management Skills: A Jossey-Bass Reader. (2004). San Francisco, CA: Jossey-Bass Publishers.
- Mattessich, P. W., Murray-Close, M & Monsey, B. (2001). *Collaboration: What Makes It Work*, 2nd ed. Saint Paul, MN: Fieldstone Alliance.
- Mortensen, W.E & Yakovac, J.L (2006, July) *Memorandum: Subject: Collaboration Among Organizations is key to Life Cycle Management Success*. Fort Belvoir, VA: U.S. Army Materiel Command.
- Nix, N., Lusch, R., Zacharia, Z., & Bridges, W. (2008, March). Collaborations Will Only Work Under the Right Conditions. *Marketing Management*, 17(2), 18-24. Retrieved November 16, 2008, from Business Source Complete database.
- Pillsbury, J.H. (2006, April) The AMCOM LCMC-Maximizing System Performance While Delivering Unparalleled Soldier Support. *Army AL&T*, PB 70-06-02, 20- 25.
- Reynolds, G. (2008, April). TACOM Life Cycle Management Command Playbook. Warren, MI: U.S. Army TACOM LCMC.
- Rosen, E. (2007). *The Culture of Collaboration*. San Francisco, CA: Red Ape
- Stephenson K. (2007, February) *TACOM LCMC: Getting to Great*.
- Straus, D. (2002). *How to Make Collaboration Work*. San Francisco, CA: Berrett-Koehler.
- Talbot, R. (2008, June). *Transforming an Army at War: Oral History Interview with MG. William M. "Mike" Lenaers*. Warren, MI: United States Army TACOM Life Cycle Management Command.
- Tamm, J. & Luyet, R. (2004). *Radical Collaboration*. New York, NY: HarperCollins.

Teresko, J. (2006, February). Learning From Toyota – Again. *Industry Week*, 34. Retrieved November 15, 2008 from Lexis Nexus Database.

Trochim, W. & Donnelly, J. (2008). *The Research Methods Knowledge Base*. Mason, OH: Cengage Learning.

Vicens Q, Bourne PE. (2007). Ten Simple Rules for a Successful Collaboration. *PLoS Computational Biology* 3(3): e44. Retrieved November 5, 2008 from <http://www.ploscompbiol.org/article/info:doi%2F10.1371%2Fjournal.pcbi.0030044;jsessionid=E7224B0891876056A05353F0115823E4>

Weiss, J., & Hughes, J. (2005, March). WANT COLLABORATION?. *Harvard Business Review*, 83(3), 93-101. Retrieved August 12, 2008, from Business Source Complete database.