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INFORMATION ON ARMY PLANNED FUTURE STATE AGILE WORKFORCE TO MEET THE EVER-CHANGING NEEDS OF THE ARMY

December 2015

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This publication addresses whether the conventional principle that the Table of Distribution and Allowances (TDA) is a one-size-fits-all tool to make human resource/human capital decisions based on the TDA's methodology.

Our research found that this is an unsupported and perhaps costly assumption that will not support, or enhance, the Army's 2025 expressed goal, also known as "Force 2025." The overarching goal of "Force 2025" is the creation of a leaner force equal to, or more capable than, today's forces. Our research focused on the second- and third-order effects that decisions made to use a TDA could potentially have on an organization and the organization's ability to remain competitively relevant.

This paper demonstrates why TDA is not the best, or even the preferred, method to make human capital decisions for research and development organizations that are primarily funded through the reimbursement mechanism. We believe these organizations focus on methodologies that make civilian workforces leaner and more efficient by using cross-knowledge transfers and a cross-utilization of resources and creating holistic synergies by the practice of working on multiple projects simultaneously. We believe our findings have broader applications to other reimbursable funded organizations; however, the extent and scope of our findings will be solely focused on the Army's R&D organizations.

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TABLE OF CONTENTS

LIST OF FIGURES

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LIST OF TABLES

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LIST OF ACRONYMS AND ABBREVIATIONS

AMC	Army Materiel Command
AMCSO	Army Management Structure Code
AR	Army Regulation
ASI	Additional Skill Identifier
ARDEC	Armament Research, Development and Engineering Center
ASA	Assistant Secretary of the Army
AUTH STR	Authorized Strength
CIVCC	Civilian Career Code
CONUS	Continental United States
CPLAN	Command Plan
DA	Department of Army
DAMO-FMP	Force Accounting and Documentation Division
DCS	Deputy Chief of Staff
DICE	Duration, Integrity, Commitment and Effort
DOD	Department of Defense
FTE	Full Time Equivalent
FY	Fiscal Year
G-3/5/7	Army General Staff Operations and Plans
GFEBS	General Fund Enterprise Business System
GS	General Service
HQDA	Headquarters Department of Army
LIC	Language Identifier Code

M&RA	Manpower and Reserve Affairs
MACOM	Major Army Command
MDEP	Management Decision Package
MFORCE	Master Force
MSC	Major Subordinate Command
MTOE	Modified Table of Organization and Equipment
OCONUS	Outside the Continental United States
OMA	Operations & Maintenance Army (funding term)
PARNO	Paragraph Line Number
PERLN	Personnel Line Number
POSCO	Personnel Occupational Specialty Code
PPBE	Planning Program Budget & Execution
PEO	Program Executive Office
PM	Program Manager
R&D	Research & Development
RDT&E	Research Development Testing & Evaluation
RDEC	Research Development Engineering Centers
RDECOM	Research Development & Engineering Command
REIM-C	Reimbursable Command
REIM-S	Source of Reimbursement (Customer)
REQ STR	Required Strength
SME	Subject Matter Expert
SUPV	Supervisory
TDA	Table of Distribution and Allowances

UIC	Unit Identification Code
USAFMSA	United States Army Force Management Support Agency
USAMAA	U.S. Army Manpower Analysis Agency
WfGAP	Workforce Governance and Auditability Pilot

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I. INTRODUCTION

A. OVERVIEW

This paper examines Army tools and processes for managing manpower and equipment in sustaining base organizations and provides a recommended agile approach to managing human capital in the future sustaining base workforce. The "sustaining base" of the Army consists of all the civilian and military headquarters, logistics, acquisition, research and development, and other staff organizations that support the "tactical" Army that deploys and fights wars. Some sustaining base organizations such as Research Development Test and Evaluation (RDT&E) require the ability for flexibility to move personnel around freely to support multiple missions. The current Table of Distribution Allowance (TDA) structure is very rigid and does not easily allow for these organizations to move personnel around supporting multiple missions. To get started on the examination, this chapter identifies and describes the current standard, the TDA, after which it discusses the concept of cross-utilizing personnel and introduces the new Workforce Governance and Auditability Pilot (WfGAP) program.

1. Description and History

The Army has historically used two methods to document the organizational structure as well as the requirements and authorizations for personnel and equipment. Deployable units, originally called line units, are organized and built around the Modified Table of Organization and Equipment (MTOE) and consist of only uniformed service members. Non-Deployable units, otherwise known as sustaining base units, trace their beginnings primarily to staff units and are organized and equipped based on the TDA. The TDA can have military members, civilian members or a combination of both. Both MTOEs and TDAs are congressionally mandated and published in public statutes ("History of Tables," 1995). Since this study focuses on sustaining base organizations, MTOEs and tactical units are outside the scope of this paper and will not be covered further.

Originally the table of allowances (equipment) was published separately from the table of organization. In 1936 the term became "table of distribution" which authorized personnel for such units. In 1943, the two tables were consolidated making what is today's Table of Distribution and Allowances ("History of Tables," 1995). The TDA unit is designed in a way that after the mission is completed, the TDA may be rescinded and the unit reorganized under a new TDA, reassigned, or retired. TDA units can exist in the Continental United States (CONUS) or outside the Continental United States (OCONUS). A TDA identifies both the unit and the installation or geographic location to which it is assigned (Department of the Army, Regulation 71-32, 2013).

Today, TDA units' primary mission is to provide staff, logistics, and sustainment support to the tactical Army. "In 1905 34 percent of officer in the Regular Army were assigned or detailed to organizations other than line units." The number rose to a high of 60 percent throughout the 1930s. "In June of 1989, as the Army began its current reduction, the Active component had 55 percent of its authorized officer strength (43,929 of 80,066), 24 percent of its authorized warrant officer strength (3,474 of 15,415), 22 percent of its authorized enlisted strength (126,195 of 578,322), and almost 100 percent of its authorized civilian strength (397,783 of 397,790) in TDA units" (History of Tables," 1995).

2. Management of TDAs

DOD regulation 1100.4, dated February 2005, provides manpower guidance for all DOD organizations and is under the cognizance of Under Secretary of Defense for Personnel and Readiness. Army Regulation (AR) 570–4, dated 8 March 2006, provides additional guidance for Army organizations. The Assistant Secretary of the Army (Manpower and Reserve Affairs) is responsible for and has approval authority for all manpower policies in the Army. The Deputy Chief of Staff, G-3/5/7 (DCS, G-3/5/7) has direct responsibility for Army TDA formulations and approvals ("How the Army Runs," 2013).

To establish a new TDA for an organization the United States Army Force Management Support Agency (USAFMSA) initiates the documentation process based on

the information provided by Headquarters Department of Army (HQDA) G-3/5/7 staff sections ("How the Army Runs," 2013). The TDA is then staffed with Army commands and the appropriate staffs / subject matter experts (SMEs). Once agreed upon and approved, the newly established TDA is put into the Command Plan process. The Command Plan process is the annual force management process designed to account for force structure decisions and directives from the Army leadership

Existing TDAs and newly implemented TDAs are in the Command Plan process and are reviewed annually in June to ensure alignment with HQDA's Master Force (MFORCE) policy. The Command Plan serves to document the implementation of the MFORCE policy. The MFORCE policy adjusts previous years' force structure, establishes new force structure and aligns force structure requirements and authorizations. The MFORCE also provides manpower, personnel and equipment requirements and authorizations. Requirements identify the numbers and categories of personnel positions and equipment needed to accomplish unit missions, while authorizations reflect those required positions and items of equipment that are funded and may be filled or procured and maintained on hand. Typically, an organization's TDA will reflect a number of positions by specialty and items of equipment by type that are required along with an equal or lower number of positions that are funded and therefore authorized. The appendix contains a few lines of a typical TDA.

Once the TDAs are scrubbed and the numbers match, manpower end strength is not adjusted until approved guidance is issued by HQDA the following June. The approved TDAs provide the commands with not only the requirement for each position but also authorization for funded positions. An approved TDA also identifies those requirements that will remain unfunded ("How the Army Runs," 2013).

Army units may request changes to their TDAs based on mission needs. These requests must be staffed through USAFMSA for HQDA G-3/5/7 approvals to ensure consistency with overarching Army requirements. The approval process can take several months, resulting in a significant time gap between when units receive new mission tasking and when they obtain the TDA authorizations for personnel and equipment to accomplish those missions.

3. Management of Workforce to Workload

In view of the inflexibility of the TDA construct and the contrasting success that the private sector has had with cross-utilization of personnel, the Army has initiated a pilot program called Workforce Governance and Auditability Pilot (WfGAP). WfGAP is a construct in which an organization is allowed to assign personnel to multiple tasks or functions based on multiple authorities and sources of funding. Under WfGAP, some employees may be paid based on their assigned TDA positions using direct funds, meaning those funds directly allocated to the unit by the Army Budget Office via the budget process. Other employees may be assigned dynamically to single or multiple tasks and paid with reimbursable funds received from their customers. Reimbursable funds are those that are provided by one organization to another to perform a specific function, such as procuring equipment or performing research and development. They may be used for employee pay, contracts, and other RDT&E functions. Reimbursable funds may be provided by any Department of Defense (DOD) entity, other government entities, and / or from the private sector. This allows the organization to task employees to support various missions while charging billable time to what they actually work on instead of charging only to a general pay fund. The combination of funding sources, coupled with the ability to quickly align labor effort with changing customer requirements, lends WfGAP well to the government RDT&E environment.

B. IMPROVING ORGANIZATIONAL AGILITY

Laws and policies covering uniformed personnel give Army MTOE units great authority and flexibility in assigning and cross-utilizing personnel to ensure units have adequate manpower with the specialized skills to perform assigned missions. The rules covering civilian personnel, on the other hand, are much more restrictive, so most TDA units, which are comprised primarily of civilian personnel, are not nearly as agile as MTOE units in cross-utilizing personnel and shaping units for changing missions.

Civilian employees have a requirement to work within their job descriptions 90% of the time. They are only allowed to work outside their job description more than 10% of the time if management gets a waiver, and the persons affected agree to the extended

work outside their position descriptions. Many unit TDAs are very diverse, and in many cases there is only one authorization for a particular job description (i.e., one logistician, one administrative assistant, one budget analyst) so it becomes very hard to justify why a logistician is being trained in finance when the individual is in a position authorized for a logistician. When cross-utilization happens for any significant length of time, there is an official personnel action required, which details that person into that position and their originally assigned position is filled by a temporary hire. The process is very time consuming and there is no easy way to move people within the organization to maximize the skills of the employees for the benefit of the organization.

In the RDT&E field, the mandated percentage of time spent in an assigned job severely hinders the ability to properly plan and find the correct people to perform the required mission. In RDT&E, planning is conducted years out and the determination for the requirement for a very specific skill set for a specific amount of time such as ½ man-year or two man-years makes it difficult to always follow the standard TDA structure. The time it would take to change the TDA for the proper required structure and then to hire a person makes it extremely difficult for the RDT&E Program Manager (PM) to properly conduct the Planning, Programming, Budget & Execution (PPBE) process and obligate funds correctly while maintaining required manning levels. The ideal situation would allow personnel to be in a pool of specialized skills and then utilized across many different requirements.

Many different industries successfully execute cross-utilization of their employees, and have for many years. The manufacturing, retail, and fast food industries are some of the biggest proponents of employee cross-utilization. The purpose of this process in the private industries is to increase profits while keeping expenses to a minimum.

Manufacturing has seen significant technological advances since the Industrial Revolution resulting in increased productivity and reduced manpower requirements. Those fewer employees must possess a wider variety of skill sets than their peers of the past, due to their need to keep up with the evolving technologies and increased complexity of manufacturing tasks performed by humans. Thus, manufacturing

companies must have the ability to adapt, organize, and train their workforces based on rapidly changing technologies and manufacturing techniques.

Retail and fast food industries likewise have a need to incorporate cross-utilization practices. The rise in people using the Internet for shopping, as well as people wanting to eat healthier has caused these industries to reduce their labor forces. These industries have to find a way to supply good customer service while employing fewer people in order to maintain profit margins. These fewer employees must be cross-trained and cross-utilized among a wide variety of tasks to run their fast food and retail operations.

While the private sector has had some big success stories with their cross-utilization of personnel, the Army has not done a very good job with cross-utilizing TDA personnel. In order to remain agile and look to meet the MFORCE 25 policy requirements, the Army has to find a way to allow certain TDA organizations to better cross-utilize their personnel. WfGAP is a pilot program that might just provide that ability to Army organizations.

C. SUMMARY

In this chapter, the history of TDAs was introduced, showing not only how they came to be, but also how rigid they are in structure. The management of the TDA's was also reviewed, including how the TDA is established from the Command Plan and MFORCE policy. This chapter also discussed the WfGAP workforce pilot program that the Army is looking at using in some organizations. Cross-utilization by the Army and also by the private sector at a broad overview was looked at to show how the Army is currently using cross-utilization compared to some of the methods used by the private sector.

II. PROBLEM STATEMENT

The current mechanism, the TDA, for managing Army organizations, manpower, and equipment, and the HQDA approval process, is very rigid and time-consuming, resulting in the inability of Army sustaining base organizations to rapidly adapt to changing missions or operating conditions.

The primary problem is the lack of flexibility in the utilization of personnel when funding is available but the TDA position and position description does not allow for easy movement of personnel. Is it possible for an organization to change its TDA structure quickly to accommodate changes in mission using direct funding? Is the only way to change the organizational structure and accommodate mission requirements to use reimbursable funding sources? Once these factors are determined, the scope will be narrowed to determine good ways to move or hire personnel that might not fill traditional TDA positions.

A. RESEARCH OBJECTIVES

The primary objective of this research is to determine the feasibility of cross-utilizing personnel in RDT&E organizations in an employee pool structure versus the traditional TDA structure. This research will examine both cross-utilization of personnel and the static structure format of the TDA. The research will examine how these structures are affected by direct and reimbursable funding and if one or both types of funding allow for a cross-utilization of personnel.

1. Research Questions

Research questions that guide this study in an effort to determine if and where there might be some flexibility in the TDA process to allow for a cross-utilization pool.

- Research Question #1: Under the current TDA structure and guidelines, can a Research and Development organizations effectively meet mission requirements?
- Research Question #2: What key factors of the business model used by Research & Development (R&D) or similar organizations cause the

current TDA process to be inaccurate regarding human capital and resource decision-making?

- Research Question #3: What are the unintended consequences an organization can face because of human capital and resource decisions made using the current TDA process?

2. Purpose and Benefit

This study will further define cross-utilization and discuss the impact on the workforce and the organization. It will also address initiatives from a pilot program that is looking at ways of incorporating the cross-utilization pool.

Cross-utilization is nothing new. It has become more popular as technology and the economy have changed. Cross-utilization of employees allows businesses to use technology to the maximum extent while cutting down on the expenses related to personnel. Cross-utilization tries to maximize the employees' skills in the most efficient and effective manner. The most common method used by companies is cross-training where they train employees in multiple other areas so they can switch roles as required and as time allows. This ensures employees are not wasting time with less profitable tasks. The first recorded evidence of larger companies using cross-utilization of employees was Northwestern Mutual Life Insurance in the 1950s. In order to see how computers would impact businesses worldwide, Northwestern conducted a study bringing employees together from various departments ("Cross-Functional Teams," n.d.). The cross-utilization study led to Northwestern to be one of the first companies in the United States to create an Information Technology department ("Cross-Functional Teams," n.d.).

This gave Northwestern a huge advantage as computers became more popular in the business world. The success created by Northwestern was followed by a slow growth of employee cross-utilization throughout the 1960s and 1970s. That growth accelerated rapidly in the 1980s. Through the years it has been determined that to successfully use cross-functional employees there are a few principles that must be followed: "Team members must come from the correct functional areas, the team must have both the authority and the accountability to accomplish the mission it has been given, and

management must provide adequate resources and support for the team, both moral and financial" ("Cross-Functional Teams," n.d.).

In the DOD, hiring freezes and reduction in forces are causing an increasing loss of knowledge and experience. Organizations are seeing their experienced and knowledgeable employees retiring or taking promotions with other organizations while any replacement hires are younger and lacking experience. This is especially true in the RDT&E career field. The current personnel policies that are structured around the TDA are creating a huge knowledge gap in those organizations, because the policies provide little opportunity to train incoming personnel since incumbents must vacate their positions before replacements can be hired. This rigid structure also applies to moving people within the organization to make an organization perform better because they are assigned to a specific position that is funded by specific dollars, and moving people to different positions requires lengthy personnel actions. Finally, the slow TDA change process and rigid personnel structure are not agile enough to support broad employee position descriptions or rapid organizational restructuring to support the diverse and dynamic missions performed by RDT&E organizations

3. Scope / Methodology

The research and recommendations contained in this thesis will focus on Army research and development organizations. The data was collected through literature focusing on cross-utilization of resources, lean practices, actual execution data from R&D organizations, guidance documents sent from Army Materiel Command, and pilot data from ongoing initiatives that focus on managing resources to workload.

4. Thesis Statement

This research will determine to what level a cross-functional TDA pool can be used to help increase productivity and ensure that the right personnel are available with the right skill sets when needed to meet RDT&E organizations' mission requirements. This study will analyze the current system and a cross-functional solution to determine if direct and or reimbursable funds can be used to support the cross-functional structure without hindering the hiring and TDA documentation requirements.

5. Report Organization

This study is written in five chapters. Chapter I provides the background to the research. Chapter II provides the objectives, questions and methodology of the research. Chapter III is a review of literature on organizational change and the formation of cross-functional teams. Chapter IV covers the analysis of the data and the methodology of the data analysis. Chapter V will discuss the conclusions and make any recommendation found from this research.

B. SUMMARY

This chapter starts with the problem statement and turns that problem statement into the research objectives and ultimately establishes the research questions. The purpose and benefits are examined as to how some organizations with in the Army can take advantage of some cross-utilization human resource structures. The scope and methodology for the research are introduced, and the thesis statement is defined. It finishes with the organization of the report and how the information is laid out in each chapter.

III. CHALLENGE OF CHANGE

A. IMPLEMENTING CHANGE

Cross-utilization can be a powerful tool for achieving synergy, expanding capacity and increasing efficiency within an organization. However, literature suggests there can be pitfalls to implementing this change without a well-thought-out plan, measurable objectives and achievable goals. In the effort to implement cross-utilization, cross-training, and other synergy strategies it is critical that leaders ensure their actions are in alignment with the organization's goals and principles so that value will be added to the organization's processes.

1. Synergy Strategies

In business, synergy "refers to the ability of two or more units or companies to generate greater value working together than they could working apart" (Goold & Campbell, 1998). Common synergy strategies observed in businesses include:

- Shared Know-How
- Coordinated Strategies
- Combined Business Creation

The Shared Know-How strategy uses cross-utilization and training to expose individuals to new ways of thinking, procedures and methods. This effort adds value to the organization and organizational processes by expanding the collective pool of knowledge and shared best practices. Shared Know-How strategies can be implemented through top-down-driven policy but can also exist if leaders create a sharing and collaborative environment (Goold & Campbell, 1998).

Coordinated Strategies, directed by leadership, can be a tool to reduce competition within the organization and leverage the organization's full talents and capabilities against a competitor. However, this top-down-driven strategy must be careful not to stifle innovation and creativity within the organization (Goold & Campbell, 1998).

Combined Business Creation is an excellent example of cross-utilization and training in action. Organizations can enter into new activities, or reinvent themselves in a changing environment, by combining internal talents and distinct activities in new teams and partnerships. By rearranging the organization's units and components, regeneration and increased capacity can be achieved without adding excessive overhead or costs (Goold & Campbell, 1998).

2. Bias Roadblocks

Biases exist that render leaders and managers unable to realize the drawbacks and opportunity costs of implementing cross-utilization, cross-training, and other efforts to achieve synergy. These biases include:

- Synergy Bias
- Skills Bias
- Upside Bias

Synergy Bias exists when leadership feels compelled to blindly implement synergy strategies by overestimating the benefits without taking into account the risks. This bias can occur when leadership feels compelled to increase profits, reorganize following acquisition of another company or unit, or it can be emotionally-driven because it's something leadership feels they are supposed to do because of their positions within the organization (Goold & Campbell, 1998).

Leadership will suffer from Skills Bias if there is a "lack of operating knowledge, personal relationships, or facilitative skills required to achieve meaningful collaboration, or they may simply lack the patience and force of character needed to follow through." (Goold & Campbell, 1998) Leaders must possess the required skills, or include someone on the team with the appropriate background, before the synergy strategy is implemented. Without these critical skills, disparate units and stovepipes within the organization will never be brought together to form a collaborative and effective team.

Unforeseen consequences, both good and bad, will occur when synergy strategies are implemented. Upside Bias exists when leadership focuses only on the good and fails

to recognize the negative impacts of synergy. Positive outcomes reinforce the decision to implement a synergy strategy as a good one. The commonly held belief that "cooperation, sharing, and teamwork are intrinsically good for organizations" perpetuates this bias (Goold & Campbell, 1998).

3. Additional Challenges to Change Implementation

Factors for success during the formation of cross-functional teams include strong leadership, clear goals, accountability and a systematic approach that prioritizes success. A study of 95 teams in 25 major corporations found 75% were dysfunctional because they failed three or more of the following criteria:

- Staying on budget
- Staying on schedule
- Remaining within specifications
- Meeting customers' needs and expectations
- Maintaining alignment with organizations goals
- Institutional inertia and the inability to breakdown existing organizational stovepipes is a major obstacle in the path to success (Tabrizi, 2015).

B. TOOLS FOR SUCCESS

1. Soft Factors

A disciplined approach that considers both potential benefits and negative outcomes must be followed to successfully implement a synergy strategy that involves cross-functional teams and cross-training. Leaders must effectively convey the strategic goals they seek, but also articulate the operational objectives that must be achieved to reach that goal. With that knowledge, managers down the line can implement action plans in alignment with leadership's vision. Additional recommendations for success include:

- Identify an end-to-end accountable leader
- Clearly establish and identify goals, resources, and deadlines

- Evaluation to see if goals and objectives are being achieved (Tabrizi, 2015)

Change management is often centered on the ideas of leadership, organizational culture, and motivation. These ideas are important and critical to effective change management but by their nature are difficult to quantify and measure. Change management must also include hard aspects that are measurable, quantifiable, and reportable.

2. Hard Factors

a. Duration, Integrity, Commitment and Energy

Four key factors identified in change management are Duration, Integrity, Commitment and Effort (DICE). Duration is the amount "of time until the change program is completed if it has a short life span; if not short, the amount of time between reviews of milestones" (Sirkin, Keenan, & Jackson, 2005, p. 3). A common assumption is that shorter projects with fewer milestones have a greater chance of success. However, research suggests longer projects with frequent reviews and milestones are more successful. Reviews and milestones provide the opportunity to identify and mitigate unplanned risks before they become issues and find solutions for issues that have presented themselves. Milestone reviews also provide the opportunity to assess whether stakeholders' needs and expectations are being met (Sirkin et al., 2005).

Integrity refers to ability of managers, supervisors, and staff to effectively perform the tasks necessary for the desired changes to occur. To successfully implement change, senior leadership must build a team with the rights skills and attributes to accomplish the task. A capable and effective *leader*, not manager, must effectively lead the change initiative. Top managers excel at minimizing risk while maintaining the status quo. Change initiatives require changing the status quo, which demands a leader with problem-solving skills, disciplined methods, a sense of accountability, organizational know-how, and the ability to operate in unclear, uncharted territory (Sirkin et al., 2005).

Commitment to change refers to buy-in from the very top of the organization and also the workers who will be executing the new procedures and processes. To instill a

sense of commitment, the organization must present a united front from the top-down with the support of middle management. Action that supports the change initiative, not just words, is also needed to cement change. Leaders and managers have to "talk the talk" but also "walk the walk." Prior to initiating change, leadership can solicit ideas and inputs from mid and lower level managers. If their inputs are seen and heard in guidance issued from the top, the change initiative has a better chance of gaining momentum with a series of quick victories (Sirkin et al., 2005).

Effort refers to the amount of increased work associated with a change initiative. Piling excessive demands on a fully burdened workforce is not a strategy for success. Not only will the change initiative likely fail but normal work will also be compromised. A general rule-of-thumb is no workload should increase more than 10% during a change initiative. Delaying unimportant projects or tasks and increasing the size of the workforce creates the capacity to initiate change but both options take time and money (Sirkin et al., 2005).

b. DICE Framework

Applying these definitions with the DICE Framework provides a standard and measurable tool to determine whether the conditions for change exist before the change is initiated and also during the initiative. By using this tool, senior leadership can take the necessary steps, tradeoffs, and interventions to remove roadblocks on the path to success.

The first step in this process is to measure each of the DICE factors on scale of 1 to 4. Low scores mean the factor will contribute to the change initiative's success while a high score will be a detractor. Recommended questions include:

- Duration: Do formal project reviews occur regularly? What is the average time between reviews?
- Integrity: Are the team leaders capable? How strong are team members' skills and motivations?
- Commitment: Do senior executives regularly communicate the reason for the change and the importance of its success? Do the employees most affected by the change understand the reason for it and believe it is worthwhile?

- Effort: What is the percentage of increased effort employees must make to implement the change effort?

Researchers studied 225 change projects and found there were three distinct zones within the DICE Framework. Scores between 7 and 14 are normally successful and fall within the Win Zone. Scores between 14 and 17 are unpredictable and are in the Worry Zone. Unsuccessful changes initiatives scored greater than 17 and are in the Woe Zone (Sirkin et al., 2005).

c. Using the DICE Framework

The DICE Framework can be used to track the progress of change projects and create early-warning indicators that a project is going off-track and no longer likely to succeed. Tracking progress can identify areas in need of greater resources and also areas consuming too many resources. Personnel movement, reprioritization, and increased milestone reviews can help an initiative get back on glideslope and back into the Win Zone (Sirkin et al., 2005).

A second recommendation, similar to the first but on larger scale, is for organizations to use the DICE Framework to manage a portfolio of projects. The first recommendation focused on the scores of an individual project while the second recommendation is focused on a portfolio of projects, each with individual scores, as part of a portfolio meant to create change. Priorities must be established within the portfolio with the understanding that efforts to move a priority project into the Win Zone might move an accompanying project into the Worry or Woe Zone (Sirkin et al., 2005). It is necessary for leadership to understand the relationships between projects and the second and third order effects a decision on one project makes throughout the entire portfolio.

The final recommendation is to use the DICE Framework to force conversation within the organization. This conversation helps everyone involve understand the end state to be achieved by sharing a common language and shared analytical processes regarding the DICE factors.

Conversations about DICE scores are particularly useful for large-scale transformations that cut across business units, functions, and locations. In this situation, it

is critical to find the right balance between centralized oversight and controls that ensure everyone in the organization takes the effort seriously and the autonomy required for transformation to succeed. Teams must have the flexibility and incentive to produce customized solutions for their markets, functions, and competitive environments. This balance is difficult to achieve without an explicit consideration of the DICE variables (Sirkin et al., 2005).

Leadership can use the DICE factors discussed above to create standardized, understandable, and quantifiable framework to understand change initiatives. This framework enables meaningful discussions and creates a collaborative environment to leverage the insights and ideas of top-level executives, middle management, and those working on the frontlines of the change initiative.

C. CROSS-FUNCTIONAL TEAMS

Cross-functional teams provide the means to implement change within an organization. These teams are defined as "a small group of individuals that cross formal departmental boundaries and levels of hierarchy (IMA, 1994). The goal of a cross-functional team is to add value to the organization, organizational processes, and ultimately the customer. To be effective, a cross-functional team must communicate effectively, coordinate disparate activities, and leverage the unique skills each team member provides the team. Supporting organizational structures, flexibility, accountability, a defined purpose, and training programs are enablers needed for the team to succeed (IMA, 1994). Forming cross-functional teams can create many benefits for an organization but the potential risks must be understood and mitigated to be successful.

1. Benefits of Cross-Functional Teams

a. Shared Mental Model

Shared mental models are used to organize information to form an understanding of a system's functions, the system's current status, the effect inputs will have on the system's condition, and the system's operating environment. Within a team, a shared mental model is "knowledge and understanding about the team's purpose, characteristics,

connections and linkages among collective actions, and various roles and behavior patterns required of individual members to successfully complete collective action." (Marks, Sabella, Burke, & Zaccaro, 2002, p. 5).

Shared mental models create the cognitive framework for team members to understand the dynamics associated with teamwork. Individual members are able to predict what information, support, or assistance team members require to successfully complete a task. Team performance is increased when individual members possess a shared mental model (Marks et al., 2002).

b. Coordination and Backup

Team members' actions must be coordinated in both time and space through a combination of mental and action-oriented-processes. This coordination is necessary to ensure team goals are achieved. Effective communication is a critical component for successful coordination. Poor communication creates inefficiencies and leads to a breakdown in the proper sequencing of events.

Backup occurs in the team environment when one teammate assists another either partially or in full while performing a task or function. Backup can be action-oriented but can also be part of verbal feedback mechanisms. Research on the subject suggests these activities are "critical to team effectiveness, especially in challenging and highly interdependent, time-critical situations in which undetected mistakes by members jeopardize team success" (Marks et al., 2002, p. 6).

2. Training Methods

a. Positional Clarification

Positional clarification is a simple form of training and involves a verbal discussion among team members. Each member presents information on his function, role, and responsibilities in the team. The goal of positional clarification is to increase awareness of the roles other team members perform but does not require knowledge on how other team members perform their tasks.

b. Positional Modeling

Positional modeling includes the same roles and responsibilities discussion required in positional clarification but adds an observation requirement. Team members must observe other members of the team perform in the work environment. These observations of inter-role behavior provides team members with a greater understanding of the contributions made by other team members as the coordination required to enable those contributions.

c. Positional Rotational

The most in-depth and detailed training method is positional rotational. Team members actively participate and perform the roles of other team members. This hands-on experience gives team members a deeper, more ingrained understanding of other team members' roles and responsibilities. This form of training requires the most time to conduct and places the greatest demand on organizational resources.

3. Effectiveness of Training Methods

Michelle Marks, C. Shawn Burke, Mark Sabella, and Stephen Zaccaro used computer simulation methodology to conduct research on whether cross-training improved the creation of shared mental models within a team, the impact the model made on team performance and coordination.

In their first experiment, the researchers found the two least in-depth forms of training, positional clarification and modeling, resulted in a greater amount of shared mental models compared to the control group who did not receive cross-training. It was noted there was not a significant difference in the percentage of sharing between the two forms of training.

The second experiment found very similar results when the more detailed types of training, positional modeling and positional rotational were compared to a control group receiving the least in-depth form of training, positional clarification. The more in-depth training programs created more shared mental models than was created in the control

group, but there was only minimal difference between the groups receiving more in-depth training.

The researchers determined "cross-training facilitated the development of team-interaction mental models" (Marks et al., 2002, p. 10). More in-depth training results in the creation of stronger mental models among teammates but the most in-depth form of training, positional rotational, produces only marginal results compared to the intermediate option, positional modeling.

Therefore, the level of investment in cross-training should only be made to the extent needed for the team to succeed at the assigned task. Teams requiring extensive coordination, feedback mechanisms, and backup assistance should receive positional modeling training when the "sequence and timing of interdependent actions is critical" for success (Marks et al., 2002, p. 11). Positional clarification is adequate for teams that only need a basic understanding of team members' roles and responsibilities to make communication effective and make appropriate trade-off decisions. The most in-depth and resource-intensive form of training, positional rotational, should be considered only when "the severity of consequences of team failure, the logistics involved in finding an external replacement, and the resource investment in resources" is analyzed and considered (Marks et al., 2002, p. 11).

D. RISK ASSOCIATED WITH CROSS-FUNCTIONAL TEAMS

1. Reduction in Core Competencies

A loss or reduction of core competencies may occur when an organization is realigned under a team structure. Technical specializations that were once protected by functional boundaries and organizational stovepipes can be lost in a team environment that prioritizes a broad portfolio of functions rather than focused, deeper specializations. This erosion of capability might be a slow process as the organization's culture, beliefs, and assumptions adapt as part of the change implementation. Core competencies can also be eroded as the organization's support elements are realigned to support a team structure.

2. Increased Costs

The realignment of support elements and resources in a team environment will lead to an increase in operating costs for the organization during transition. The need for team-focused information will place new demands on the organization's communication and information systems. These systems must be able to meet the new demand while still serving the areas in the organization that are not part of the change initiative. Performance management and human resource systems must also be realigned to support and recognize team performance as well as individual contribution to the team's success. An example would be "a transition from a tenure or grade-based system to a salary scheme that rewards for skills or knowledge contributed to the team as a unit" (Cross, 2000, p. 33).

3. Confusion and Conflicting Goals

Confusion will also create risk during the transition. Employees may experience anxiety and doubt as their individual identities are woven into the team's identity. Individual employees might also feel uncomfortable when making the shift to a team-based performance system no longer based on the individual.

Productivity will lag while cross-training occurs and teams form. Individuals must learn new processes and break old habits for the team to be successful. The potential exists for individuals to willingly or unconsciously cling to old habit patterns. This will further reduce productivity by creating inconsistencies with word and action as individuals are pulled between competing interests (Kegan & Lahey, 2001). Underground power struggles may also hinder the transition as formal and informal networks are realigned in a team-based environment (Cross, 2000).

E. ALTERNATIVES TO CROSS-FUNCTIONAL TEAMS

1. Community of Practice

If the risks and costs of forming a team-based organization outweigh the benefits, forming a community of practice is a viable alternative to still capture some of the advantages teams offer. A community of practice is "an informal group of people who

interact with one another regularly on work related issues and challenges" and are "very effective vehicles for collaboration and knowledge transfer in helping participants solve problems quickly" (Cross, 2000, p. 34). Communities of practice are more fluid in their mission, membership and duration compared to formal teams and do not require organizations to realign human resources and performance systems. This simple alternative to a team-based structure can help an organization succeed at innovation by "easing the transfer of relevant practices, reusing explicit knowledge assets, and refreshing knowledge bases" (Cross, 2000, p. 34).

2. Enable Collaboration

Organizations can also take steps to enable collaboration within existing organizational structures if teams are not a viable or cost-effective solution. One option is to map out critical knowledge processes and identify key nodes where improved collaboration will yield positive results and increased efficiencies. Once these nodes are identified, the means to effectively collect, analyze, and disseminate information must be available. Electronic bulletin boards, video teleconference, and collaborative software can bring people together that are otherwise physically separated (Cross, 2000).

Administrative and human resource policies that focus on managing organizational knowledge will foster and encourage collaboration. Employees should be incentivized to develop "a deep technical understanding of a specialty combined with an understanding of upstream and downstream activities in a core process" (Cross, 2000, p. 35). This will develop a workforce able to rapidly and effectively solve problems within the organization because of their professional networks and familiarity with organizational processes.

IV. STATISTICAL ANALYSIS OF THE IMPACT OF TDA METHODOLOGY ON ARMY STAFFING REQUIREMENTS

This chapter focuses on how the current TDA functions, where it is applicable, where it breaks down, and how decisions made using the TDA can effect an organization.

The overall goal is to analyze the current TDA to show how it does not meet the goal to achieve an agile workforce that has the ability to respond to the ever-changing environments that it will encounter. “Force-employment is defined as Army forces in 2025 conducting decentralized, distributed, and integrated operations to prevent, shape, and win using agile, responsive, and innovative combined arms capabilities and special operations forces” (US Army, White Paper, 2014).

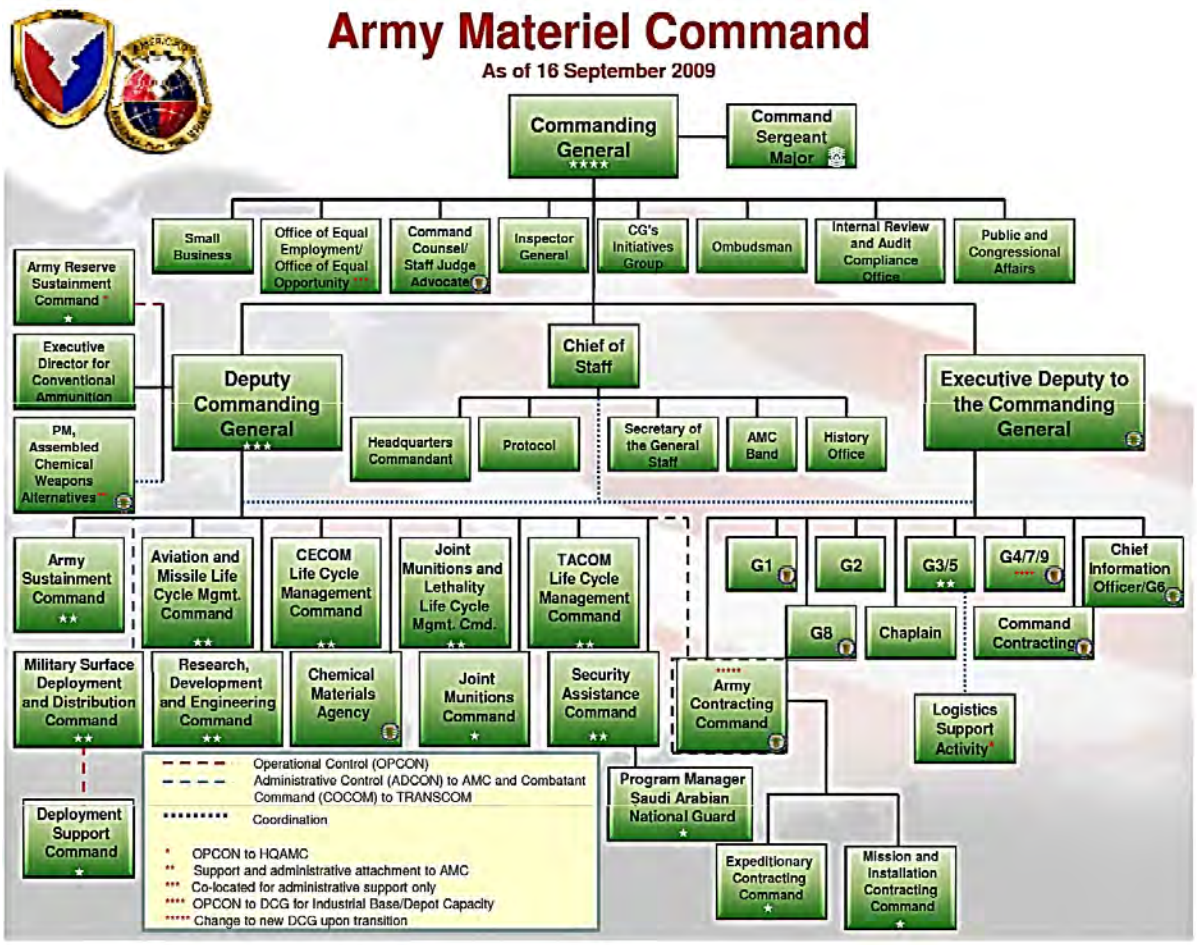
The key to obtaining an agile workforce is to have the resources available to meet the changing needs. This plays an important role in the RDT&E environment where the workforce needs to be able to adjust its skill set to best meet new requirements. The current TDA process, with a lengthy and labor-intensive process, stifles the ability for an organization to react in a fast enough to be both efficient and effective.

The current TDA process is the mechanism used to allocate resources to the assigned mission. In order to reprogram these resources, a reprogramming actions must be processed as an out-of-cycle TDA change. Reprogramming actions for reimbursable manpower must clearly show the type of resource (grade and series of the required employee), the reimbursing command (REIM-C) and the source of reimbursement (REIM-S) (Customer).

The current TDA process is a rigid, top-down process that can be difficult and time consuming to follow. The issue with this process is as levels of reporting are added to the TDA change process it becomes extremely cumbersome and in the end breaks down. The process is not set up to handle an organization whose business model, such as the one used by RDT&E organization, is to use a single resource to support multiple customers and projects throughout a given year.

The challenge of managing the TDA is illustrated by an example using the Army Materiel Command (AMC), an Army Major Command (MACOM), whose commander reports directly to the HQDA. The AMC Organizational Chart is depicted in Figure 1.

Figure 1. Army Materiel Command Organizational Chart



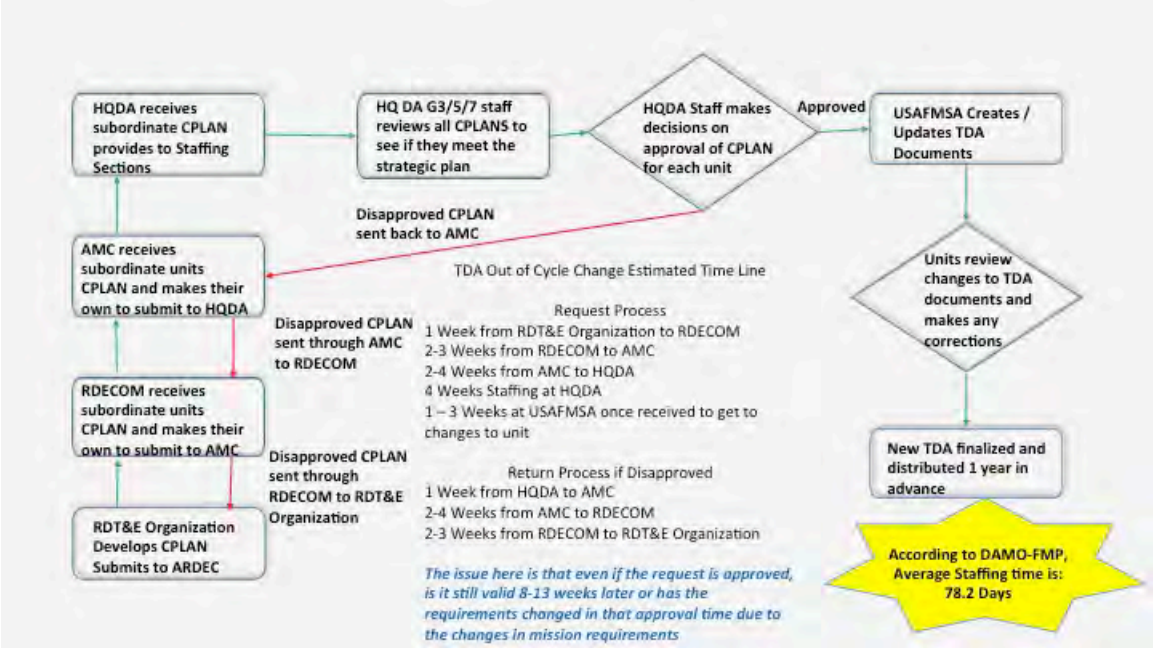
Source: Department of the Army, (2009, September 16), Army Materiel Command, retrieved from http://imagestack.co/121816644-army-command-structure-organization-chart.html.

One of AMC's major subordinate commands is the Research, Development, and Engineering Command (RDECOM), which has a large number of subordinate units. If the subordinate command wants to make a change to a unit TDA, here are the steps that must be followed:

- Identify requirement
- Submit request for out-of-cycle through RDT&E organization to RDECOM
- RDECOM review / Concur
- Submit request up to AMC
- AMC review / Concur
- Submit request over to HQDA
- HQDA review / Concur

Depending on the number of deferrals, disapprovals, or requests for justification or clarification, this process can take months. Figure 2 diagrams this process.

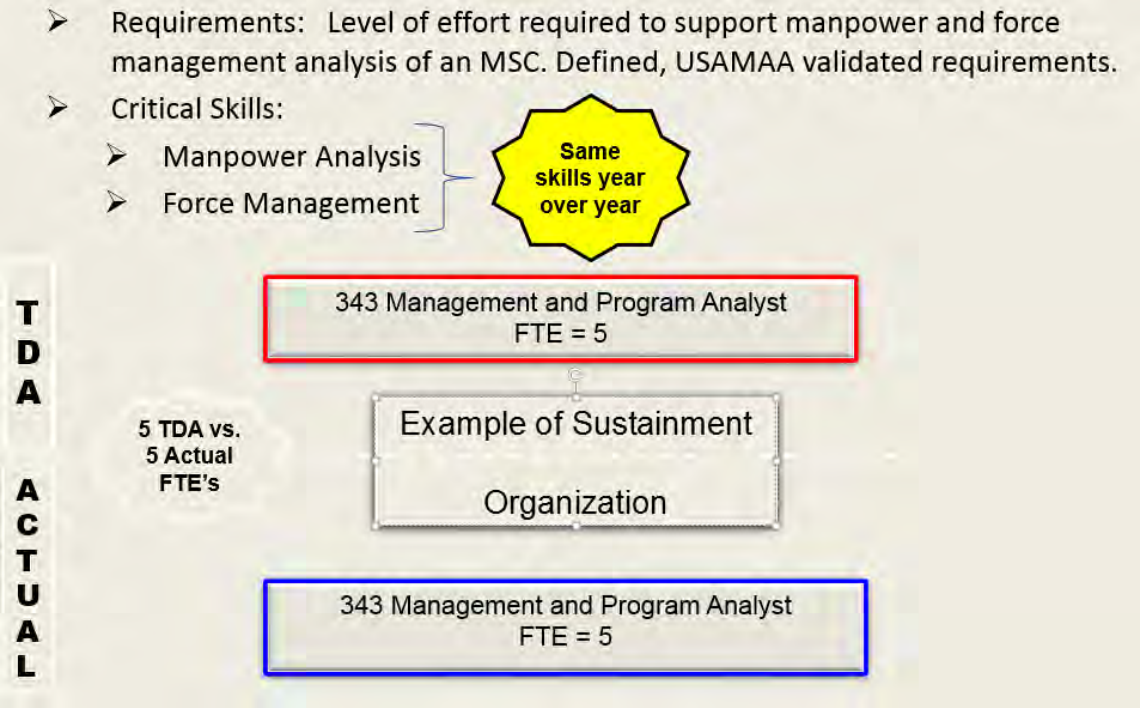
Figure 2. TDA Map Process



Adapted from Department of the Army, (2013, July 1), *Force Development and Documentation* (Army Regulation 71-32), Washington, DC: Headquarters, Department of the Army.

The current TDA process is set up to manage in a one to one style relationship. This means one resource to one effort. In other words a TDA may authorize a single resource (i.e. General Service (GS) GS 11, 0343(program assistants)) to a single program for a full year. This program assistant will only support this single effort for the year. This one to one type relationship is usually found in sustainment type operations where the work is constant and repeatable year to year. These types of operations focus on either maintaining a product or the administrative support that goes into managing a program. Since the work is consistent and definable from year to year there is also a general ability to establish a standardized organizational design. An example of where a TDA does work is illustrated in Figure 3.

Figure 3. Functional TDA



The level of effort and required resources are standard year to year with little variability in workload requirements. Source: Jones, Marc, (16 January 2015), AMC-RDECOM Laboratory Business Model Discussion, presented at Picatinny Arsenal, NJ.

1. TDA Process in a RDT&E Organization

The one to one relationship does not work well in the reimbursable RDT&E environment where requirements and required resources can change multiple times throughout the year. RDT&E organizations have a dynamic organizational design where the organization often adjusts on the fly to fit the immediate mission requirements. These organizations often end up having reimbursable funded overhires which allow them to work in a one resource to many effort relationship. In other words a single resource can perform work for multiple customers on multiple projects utilizing various combinations of funds throughout a single year.

To establish a baseline of how an RDT&E organization functions, data was pulled on six different RDT&E organizations in the Army and examined the customers the employees currently supported. This involved analyzing roughly 11,821 different employees' labor charges, 83,000 entries to determine how many customers an average employee supports in a given year. The 11,821 data records showed that RDT&E employees support on an average of 2.52 customers per year. The data was pulled from the Army financial system, GFEBS, as is displayed in Table 1.

Table 1. RDT&E Work

Organization A	
Average	2.458745
Max	10
Min	1
Std Dev	1.522685

Organization B	
Average	2.6375
Max	8
Min	1
Std Dev	1.157336

Organization C	
Average	4.062633
Max	10
Min	2
Std Dev	1.622331

Organization D	
Average	1.700599
max	8
min	1
Std Dev	1.107126

Organization E	
Average	2.311199
Max	14
Min	1
Std Dev	1.629123

Organization F	
Average	2.1585
Max	10
Min	1
Std Dev	1.386824

Number of customer supported per employee. Adapted from: U.S. Army General Fund Enterprise Business System, (2015), retrieved from https://prodep.gfebs-erp.army.mil/

TDA guidance requires identification of each resource in terms of grade, series, project supported, and source of funding which in the RDT&E world would mean any customer that a resource supports. Under the current TDA process any time one of these resources deviates from the job description for more than 10% of their reporting period, there is a requirement to do an out-of-cycle change. The data shows that employees in all six organizations on average support more than one customer per year. Based on this guidance, and to keep TDAs accurate this would equate to a minimum of 11,821 out-of-cycle changes to the TDA. This does not take into account any changes to the resources identification requirements mentioned earlier in the paragraph.

The statistical data presented above demonstrates that an RDT&E organization under a TDA business model cannot accurately maintain a valid TDA. The simple fact that in theory an out-of-cycle TDA change request would need to be submitted and approved multiple times a day to ensure the TDA and the data it represents is accurate makes the current process less than optimal. This situation is potentially dangerous to an RDT&E organization since decisions regarding staffing will be made using inaccurate TDA data.

This data was then broken down into a smaller subset to analyze how many customers and different programs an employee charges to get a better understanding of the possible workload that would be required to ensure the TDA remains accurate.

Initially, a sampling of charges from 2,300 employees from organization F was analyzed. These employees supported weapon system, munition, and quality / system safety divisions. The data showed even more convincingly the amount of out-of-cycle changes that would need to be processed. Even if the out-of-cycle changes were processed as required, they would still not be fully accurate since they can only be done monthly. Certain employees support multiple programs and customers per month. A final look at a sampling of organization F's quality division shows graphically how the worked charged is in line with the data presented in Table 2.

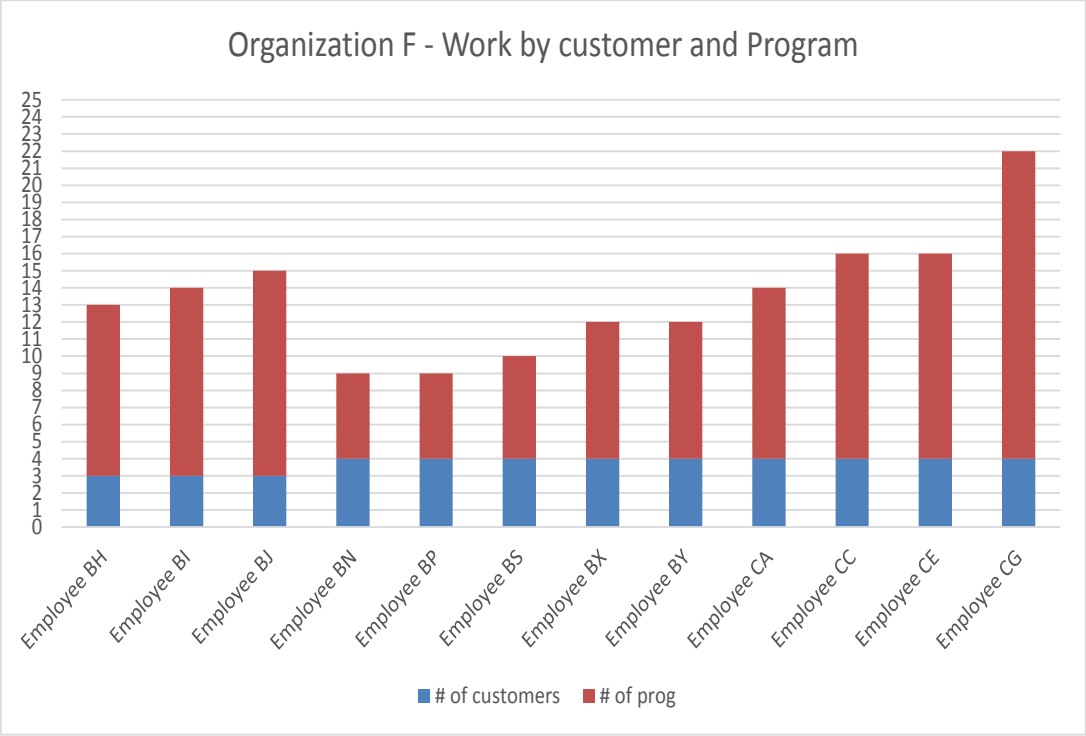
Table 2. Organization F – Weapon, Munition, Quality/System Safety Division

Programs Supported Per Employee		Customers Supported Per Employee	
Average	6.25	Average	2.92
Min	1	Min	1
Max	43	Max	13
Range	42	Range	12
Std Dev	5.74	Std Dev	2.18

Adapted from U.S. Army General Fund Enterprise Business System, (2015), retrieved from https://prodep.gfebs-erp.army.mil/

The graph in Figure 4 shows a sample of actual employee work charged in Fiscal Year (FY)14 for an RDT&E organization. The full data looked at 100 engineers with the following basic results displayed in Table 3.

Figure 4. Subset of RDT&E Employees Actual Work at Organization F



Adapted from U.S. Army General Fund Enterprise Business System, (2015), retrieved from https://prodep.gfebs-erp.army.mil/

Table 3. Actual Work at Organization F

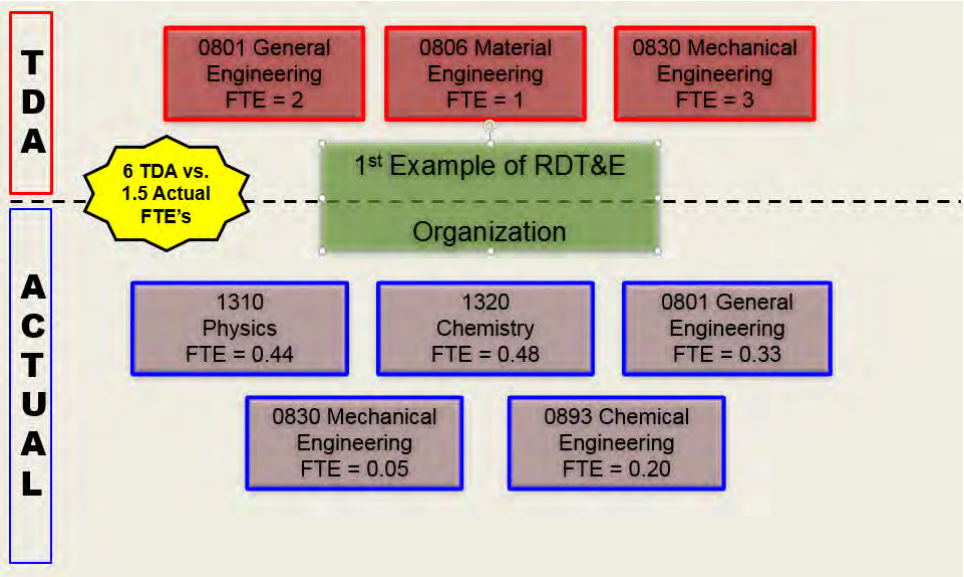
Programs Supported	
Average	6.04
Max	29
Min	1
Range	28
Std Dev	4.997839533

Customers Supported	
Average	2.78
Max	8
Min	1
Range	7
Std Dev	1.565758602

Adapted from U.S. Army General Fund Enterprise Business System, (2015), retrieved from https://prodep.gfebs-erp.army.mil/

The requirements in an RDT&E organization are much less stable based on the type of work being conducted. The employees are required to be budgeted for two full years in advance, but rarely can be to the level of detail required by the current TDA process. The RDT&E organization reviewed used the approach of applying resources that best fit the efforts being completed. They did not manage the workforce to a structured TDA. The initial TDA was established based on a "best estimate" of what a program would require and then executed that program in a manner that allowed for optimal use of available resources. In Figure 5, the image shows how a project was originally planned for on the TDA versus the actual execution of the effort.

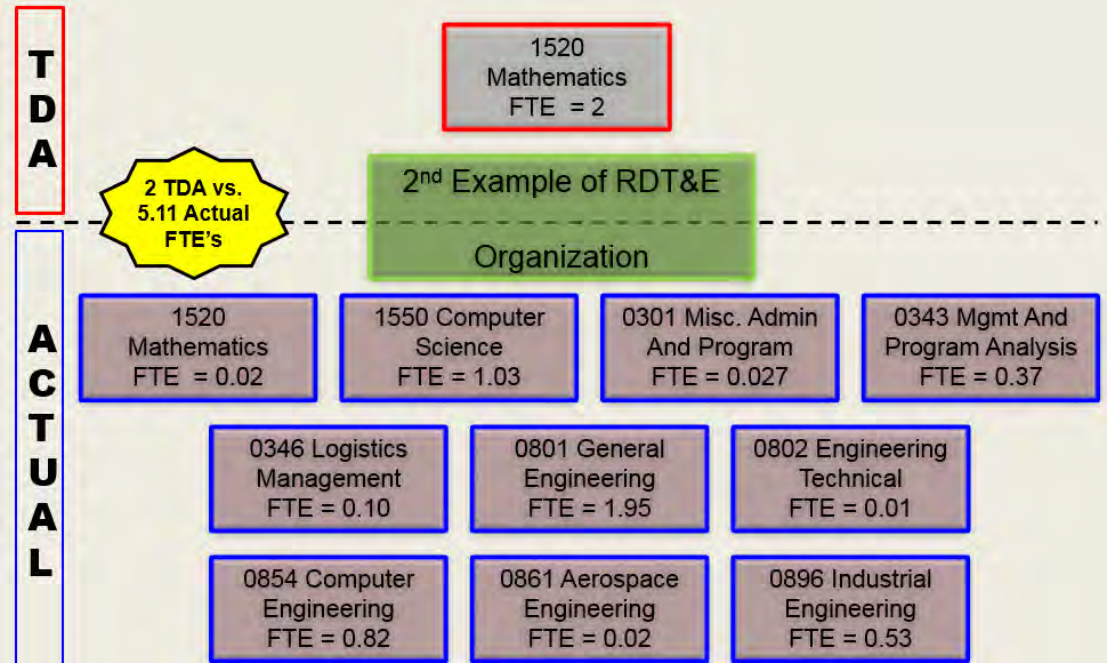
Figure 5. Planned vs. Actual Execution of Project



Source: Jones, Marc, (16 January 2015), AMC-RDECOM Laboratory Business Model, discussion, presented at Picatinny Arsenal, NJ.

The data shows the initial estimation for the project required two FTE general engineers, one FTE mechanical engineer, one FTE aerospace engineer, one FTE chemical engineer, and three FTE general physical science employees (one SES and two GS employees). This initial estimate required eight TDA positions. When the program was executed using the available resources it actually utilized six FTEs in positions such as Clerk and Administrative, multiple engineering disciplines, and chemistry. This example shows how the TDA overestimated the number of FTEs and incorrectly estimated the skill sets required to meet the requirements to budget for full FTEs. The TDA does not have the flexibility to budget partial FTEs, making it nearly impossible to define the required resources. Figure 6 shows where the initial TDA estimate underestimated the required FTEs to meet program requirements.

Figure 6. Underestimation of Requirements



Source: Jones, Marc, (16 January 2015), AMC-RDECOM Laboratory Business Model Discussion, presented at Picatinny Arsenal, NJ.

This example shows an expected effort only requiring two FTE mathematicians. However, in the year of execution the project required 5.11 FTEs of ten different disciplines. The example above show what is referred to as "blended manpower."

Blended manpower occurs when a resource is charted to multiple customers and fund types throughout a FY. This cross-utilization of resources ensures they are being applied to a program when most effective. The concepts of cross-utilization or blending manpower are not considered the correct method of program management under the current TDA process.

2. Decisions Made Using TDA

As previously stated, the TDA is used to make human capital and manpower requirements decisions. This means the data in the current TDA is one tool used to determine if the Army has the correct personnel resources to complete a mission. This can be detrimental to an RDT&E organization because decisions are made based on inaccurate information that can result in an organization's hiring being restricted based on the assumption that it is currently overstaffed. This is a danger especially when it comes to the reimbursable RDT&E organizations that are unable to maintain the accuracy of their TDAs due to the sheer number of customers and programs their employees support throughout a given year.

Decisions such as hiring at a 6:1 ratio have been made to try and reduce the size of organizations based on the fact that they have hired beyond the authorizations listed in their TDAs. This restriction only allows an organization to hire 1 resource for every six that leave the organization. This type of decision can have extreme adverse effects especially organizations which has a large percentage of the workforce eligible for retirement. The potential loss of institutional knowledge is a major risk and a hiring restriction limits the ability to backfill retiring employee with enough time to train new employees in order to ensure the program / customer being supported is not greatly impacted.

The original intent of mandating organizations to get down to or below their current approved TDA was initially imposed to ensure the organizations would remain affordable and not grow to size that could not be supported. One organization analyzed would need to reduce the workforce 1,100 people to comply with the TDA. The initial effect on the organization that this would have is it reduces its capability and capacity to

provide support to the Army and DOD as the principal RDT&E organization in its current field. The Army's "Lethality" competency area is "world class" as cited in the Army Science Board Summer Study 2013, which means the cut in resources would not be easily mitigated through private industry (Department of the Army, Army Vision, 2014).

A cut in resources of this magnitude could potentially cause the organization to lose any gains made in core competency areas such as prototyping, fuze management, small arms technology, quality and product assurance and logistics research and engineering. These capabilities have been built up over the past ten plus years through significant investments in infrastructure and equipment. These investments likely would not be recouped, resulting in being part of the lost resource.

The cut in people may reduce the size of the workforce and improve affordability, but it can severely reduce the organization's capability and capacity to meet mission requirements. These requirements help produce technologies that help our Army to remain both lethal and agile. The RDT&E environment is going to become even more important as the Army strives to meet the goals set out in the Force 2025 strategy that will require the Army to be leaner and able to react from many different fronts. Old systems will need to be upgraded and new systems will need to be developed to ensure missions can be completed. This will require the RDT&E workforce to remain world class and industry leading when it comes to developing and supplying the troops with the latest and greatest system.

As shown in this chapter, the business model used by RDT&E organizations is not well supported by the current TDA process to accurately measure the human resource requirements. The decision made using information from the current TDA process can have severe unintended consequences since the information the process is supplying can be inaccurate. Results of these decisions can negatively affect an organization, potentially causing it to not be able to meet mission requirements. The statistical data shows that the current process would need daily updates to accurately reflect the RDT&E organization it is measuring. That frequency of updates is not feasible under the current TDA process,

meaning the data in a TDA will remain inaccurate. Therefore, decisions made using the current process do not always achieve the desired outcome.

V. CONCLUSION AND RECOMMENDATIONS

A. CONCLUSION

The Army has used the current TDA business model for nearly 80 years with little to no change. This model works well in a stable state organization that performs the same mission and function repeatedly year after year. An example of this is in a sustainment organization that deals with base operations where they are able to offer a person to a position with little need to deviate from that model. This allows the Army to easily determine budget commitments and predict future requirements with a certain degree of accuracy.

During the 80 years that the Army has used the current TDA process, private industry has been forced to move from a similar manning process to a more agile business model that allows them to provide goods and services as inexpensively as possible while keeping their overhead at a level that allows them to still make a profit. The only way industry could make this happen was to change its approach in relationship to using resources. Manufacturing, retail and fast food industries have lead the charge in obtaining an agile work force by implementing a cross-utilization business model to manage their employees.

The Army's "Force 2025" goal is to create a leaner, agile force equal to, or more capable than today's force. Lean and agile does not necessarily need to mean smaller or less dependent on human resource. Instead, the force needs to provide more capability with the resources provided to reduce areas of waste. Waste can mean reducing duplicative efforts, adhering to policies that no longer apply but are still enforced, and underutilization of resources.

The Army's current TDA business model is incapable of meeting the "Force 2025" requirements especially as it relates to the RDT&E organizations that must have the flexibility to move resources quickly to meet the ever-changing warfighter requirements. The current TDA model is not an accurate way to assess all Army organizations regarding human capital resources. The TDA should not be used as a one-

size-fits-all approach as it can have severe unintended negative effects on an organization. The key to using the current TDA process is to use it only on the organizations that have the capability to be accurately tracked. Organizations that fit this process have well-defined customer requirements that change little from year to year. These organizations' resources are easily budgeted for and mostly support a single customer for an entire year. In these organizations the current TDA model has the ability to produce accurate human capital data. However, only 90% of the Army falls into this category. The other 10% of the Army, the reimbursable funded R&D organizations, cannot be accurately measured, resourced, or manned using the current TDA process.

The Army's RDT&E organizations' business model, which is adapted from the principals of cross-utilization, does not fit with in the concepts of the TDA process and as a result causes the current TDA process to produce inaccurate information resulting in decisions that have an adverse effect on organizations. A cross-utilization business model, used in conjunction with a process similar to one being developed in the WfGAP will give an avenue for an organization to utilize resources amongst multiple programs throughout a given year. The business model RDT&E organizations follow allow them to work more efficiently and remain agile to ensure they have the capability and capacity to meet the changing needs of the warfighter. Unlike sustainment organizations whose mission and program requirements are relatively rigid, an RDT&E organization must be fluid, agile and able to change.

Planning for an RDT&E project is difficult because of the nature of research and development. RDT&E can require multiple resources of different disciplines throughout the year based off each new discovery. Unlike sustainment organizations, these positions rarely require full FTEs. The RDT&E business model utilizes the proper resource at the proper time it is needed and then applies that resource to another program. This model allows the organizations to efficiently utilize and cross-utilize their resources, enabling them to sustain their capabilities and capacities to meet mission requirements. It also ensures organizations are agile enough to quickly transition from one technology development to the next depending on is needed in the current operational environment.

B. RECOMMENDATIONS

Change within very structured organizations such as the Army can prove very difficult and can meet a lot of resistance. This institutional inertia that resists change is rooted in the belief that we have always done it that way, and it works. Cross-utilization can be a powerful tool for achieving synergy, expanding capacity and increasing efficiency with in an organization. In order to implement change such as cross-utilization into the Army, it is critical that leaders ensure their actions are in alignment with the organization's goals, and principles while ensuring that value is added to the organization's processes. It is also important to make sure when an organization implements change, that it provides strong leadership, creates and communicates clear goals, accountability, and a systematic approach that prioritizes success.

Using synergy strategies such as sharing know-how, sharing tangible resources, coordinating strategies and combining business creation will help effect the change required to move away from rigid business models. While using these strategies, it is important to steer clear of common biases such as synergy bias, skills bias and upside bias, in order to effectively allow the desired change to truly evolve. Along with these strategies, it is important to also address some of these challenges such as staying on budget and schedule, remaining within specifications, meeting customers' needs and expectations, and maintaining within the organizations goals.

One of the major tools for success in implementing change is the use of the DICE Framework. This framework provides key factors identified in change management. And include duration, integrity, commitment and effort. The DICE Framework provides a standard and measurable tool to determine whether the conditions for change exist before the change is initiated and also during the initiative. By using the DICE Framework, leadership can take steps to mitigate risks that might affect the effective implementation of the cross-utilization change. This framework also allows leaders to track progress and ensure the change is staying on the desired track.

The decisions made using a TDA can have devastating unintended consequences that can negatively affect the capability to support the warfighter. There is a need for

other mechanisms to more accurately make resourcing decisions for the 10% of the Army that cannot be accurately measured using the current TDA process.

An alternative such as the AMC WfGAP initiative needs to be considered to ensure an RDT&E organization can remain agile, with regard to workforce composition, while allowing it to meet the customers' requirements. The WfGAP initiative allows organizations to hire and manage their workforce based off customer and program requirements. This pilot, which requires the organization to provide historical data that demonstrates sound budgeting practices and efficient resource utilization, allows the organization maximize the effectiveness of resources by applying them to multiple projects at a given time without having to adjust the TDA. This type of pilot also gives the organization the ability to staff itself above the approved TDA based on customer demand. Customer demand is determined using historical trends and projected funding which helps ensure the organization will be in the best possible position to meet the changing requirements of the customer base. An organization under the pilot program will be exempt from the hiring restriction imposed based off data generated from the current TDA process and can utilize more appropriate and effective resource management tools.

The ability to hire for a position using a more open position requirement is also an approach that would enable an RDT&E organization to establish manning in a way that supports rapid mission changes. One way to make this possible is to use a generic position description to hire against. If a position called for a Mechanical Engineer, instead of using the position description for a Mechanical Engineer, use a position description for just an Engineer. This would allow the organization to hire based on current and projected mission requirements. The organization could then hire an employee that has multiple engineering disciplines. That employee then can support multiple mission requirements with multiple disciplines and not require a change to the TDA to truly keep it accurate.

Establishing change is very challenging and takes a well-coordinated strategy before implementation begins. Using the DICE Framework to help implement this cross-utilization change described in this paper will allow the RDT&E organizations to remain

flexible in their operation. The DICE Framework's measurable matrices allows the Army to have a solid, proven process to control the change and ensure success.

A disciplined approach, which looks at both potential benefits and negative outcomes, must be followed to successful implement a synergy strategy that involves cross-functional teams and cross-training. Leaders must effectively convey the strategic goals they seek but also articulate the operational objectives that must be achieved to reach that goal. With that knowledge, managers down the line can implement action plans in alignment with leadership's vision. Additional recommendations for success include:

- Identify an end-to-end accountable leader
- Clearly establish and identify goals, resources, and deadlines
- Evaluation to see if goals and objectives are being achieved

Recommendations for further research on this topic include studying the effects of hiring restrictions and hiring freezes on employee retention and the organization's ability to retain core knowledge. Also, conduct research to determine if organizations in private industry have a process in effect that allows them to remain agile and lean with regards to human resource management. If so that model could be applied to Army organizations to be better positioned to meet the Force 2025 policy goals. Lastly, look at the applicability of the WfGAP program to other reimbursable organizations outside the RDT&E community.

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APPENDIX

This appendix contains an excerpt of a TDA to provide an example of what a TDA looks like and how the required strength and the authorized strength are determined. At the end of this appendix is a glossary of some of the headings for readability.

Figure 7. Sample TDA

PREPARED ON 06-NOV-2015 13:19 [redacted] - TDA PAGE 1

UICOD [redacted] EDATE 01-OCT-2016 DOCNO AEW6DYAA CCNUM 0117

DOCUMENT STATUS - APPROVED CUASC AE REPCO N

SECTION II - PERSONNEL

PARNO	PERLN	PARTL/ PSNTL	GRADE	UICDR/ POSCO	SQI2D	ASI01	ASI02	ASI03	ASI04	LICCO	LPIND	BRNCK	CIVCC	IDENT	PPSST	PSIRQ	PPSRQ	REQ STR	AUTH STR	PRMK1	PRMK2	PRMK3	PRMK4	TDUIC	AMSCO	MDEP	CMU	CAPC	PSC	MMC	CTYPE	PSN#	SUPV	CP
150		[redacted]																																
	01	PROG EXEC OFFICER [redacted]	00	00301									ES	C	A	E	G	1	1	DL					435A9800	X4SA		F110		L	121			51
	02	MILDEP-RC RQMTS LNO	06	51Z00		4Z						RD		K	A	E	7	1	1	92	96	TM			121R9200	WRFT		F110		F				
	03	DPEO [redacted]	00	00301									ES	C	A	E	G	1	1	DL					435A9800	X4SA		F110		L	121			51
	04	SUPV PORTFOLIO MGR	04	00301									NH	C	A	E	G	1	1	DC					435A9800	X4SA		F110		E	101		S	51
	05	EXECUTIVE OFFICER	04	00301									NH	C	A	E	G	1	1	DC					435A9800	X4SA		F110		H	101			51
	06	SR SCIENT-ENGINEER	04	00801									NH	C	A	E	G	1	1	DC					435A9800	X4SA		F150		H	101			16
	07	ATTORNEY ADV	04	00905									NH	C	A	E	G	1	1						435A9800	X4SA		Y415		H	101			56
	08	EXECUTIVE ASSISTANT	02	00303									NH	C	F	A	G	2	1						435A9800	X4SA		F110		H	101			51
		TOTAL FOR PARA 150																8	7															
		TOTAL OTHER-PERS 150																1	1															
150A		[redacted]																																
	01	SUPV DIR PROG MGMT	04	00301									NH	C	A	E	G	1	1	DC					435A9800	X4SA		F110		E	101		S	51
	02	SUPV ACQN MGMT SPEC	04	00301									NH	C	F	A	G	2	2	DC					42380800	FPMH	RI	F110		E	101		S	51
	03	SUPV CONGR AFFAIR SPEC	04	00301									NH	C	F	A	G	1	1	DC					435A9800	X4SA		F110		E	101		S	51
	04	ACQN MGMT SPEC	04	00301									NH	C	F	A	G	9	9	DC					43261200	MPEI		F110		H	101			51
	05	ACQN MGMT SPEC	04	00301									NH	C	F	A	G	2	2	DC	DF				42380800	X4SA	RI	F110		H	101			51
	06	ACQN MGMT SPEC (RPTS)	04	00301									NH	C	F	A	G	1	1	DC					42380800	MU2Z	RI	F110		H	101			51
	07	SPECIAL PROJ ANALYST	04	00301									NH	C	A	E	G	1	1	DC					42380800	MU2Z	RI	F110		H	101			51
	09	PROGRAM ANALYST	04	00343									NH	C	F	A	G	3	3	DC					42380800	FPMH	RI	F110		H	101			11
	10	PROGRAM ANALYST	04	00343									NH	C	F	A	G	2	0	DC					435A9800	X4SA		F110		H	101			11
	10A	SUPV RESOURCE MGT OFCR	04	00501									NH	C	F	A	G	1	1	DC	DY				435A9800	X4SA		C400		E	101		S	11
	11A	BUDGET OFFICER	04	00560									NH	C	F	A	G	1	1	DC	DY				42380800	FPMH	RI	C400		H	101			11
	12A	BUDGET ANALYST	04	00560									NH	C	F	A	G	1	1	DC	DY				42380800	MU2Z	RI	C400		H	101			11
	13A	COST ESTIMATOR	04	01515									NH	C	F	A	G	3	3	DC	DF				43261200	MPTV		F110		H	101			36
	14A	ACQN MGT SPEC	03	00301									NH	C	F	A	G	1	1	DD					42380800	MU2Z	RI	F110		H	101			51
	14Z	ACQN MGT SPEC	03	00301									NH	C	F	A	G	2	0	DD					435A9800	X4SA		F110		H	101			51
	15A	COMM MGT SPEC	03	00301									NH	C	F	A	G	1	1						42380800	MU2Z	RI	F110		H	101			51
	16A	PROGRAM ANALYST	03	00343									NH	C	F	A	G	1	1	DD					42380800	MU2Z	RI	F110		H	101			51
	17A	BUDGET ANALYST	03	00560									NH	C	F	A	G	3	3	DD	DX				42380800	MU2Z	RI	C400		H	101			11
	18A	PROG MGMT SPEC	02	00301									NH	C	F	A	G	1	1						42380800	MU2Z	RI	F110		H	101			51
		TOTAL FOR PARA 150A																37	33															
150B		[redacted]																																
	01	CHIEF INFORMATION OFF	04	00301									NH	C	A	E	G	1	1	DC					435A9800	X4SA		F110		E	101		S	51
	02	PROJ DIR	04	00301									NH	C	A	E	G	1	1	DC					435A9800	X4SA		F110		E	101		S	51
	03	PROG MGMT SPEC	04	00301									NH	C	F	A	G	2	2	DC					42380800	MU2Z	RI	F110		H	101			51
	04	SUPV DEPUTY CIO	04	00340									NH	C	A	E	G	1	1	DC					42380800	FPMH	RI	F110		E	101		S	51
	05	SUPV TELECOM SPEC	04	00391									NH	C	F	A	G	1	1	DC					42380800	FPMH	RI	W299		H	101		S	34
	06	SW ARCHITECT	04	01550									NH	C	F	A	G	2	2	DC					43261200	MPEI		F150		H	101			16
	07	INFO TECH SPEC	04	02210									NH	C	F	A	G	6	6	DC					42380800	MU2Z	RI	W310		H	101			34
	08	INFO TECH SPEC	03	02210									NH	C	F	A	G	4	4	DD					43261200	MPEI		W310		H	101			34
		TOTAL FOR PARA 150B																18	18															
150C		[redacted]																																
	01	SUPV DIR OCLD	04	00301									NH	C	A	E	G	1	1	DC					435A9800	X4SA		F110		E	101		S	51
	02	SUPV DEP OCLD	04	00301									NH	C	F	A	G	1	1	DC					435A9800	X4SA		F110		E	101		S	51

Source: U.S. Army Force Management Support Agency, (2015), FMSWeb, retrieved from https://fmsweb.army.mil/unprotected/splash/.

This is an example of a TDA that shows only the first few sections of an organization. A TDA is normally approved under a parent UIC. That parent UIC ends in AA. Then each organization under that parent UIC receives a two-digit identifier such as 01 or 02 etc. Each organization is then assigned a paragraph number. In this example it is paragraph 150. Then each section in that organization is assigned another paragraph

identifier to indicate which section belongs to that parent organization. In this example 150 is the parent organization, and the sections are 150A, 150B etc. Within each paragraph there is a personnel line number that indicates how many different specialties work in that section. In paragraph 150, there are eight personnel line numbers. In paragraph 150A, there are 18 personnel line numbers. The next column is a position title, followed by the grade and personnel occupational specialty code. There is an area that allows for the identification of any unique skills the position requires such as the ability to read or speak another language. The CIVCC identifies the civilian career code, and in this example it is an acquisition career field. Moving over a few columns you see the REQ STR and AUTH STR. These two columns identify how many personnel is required to complete a mission (REQ STR) and how many of those positions have been funded (AUTH STR). The second to last column is the position is defined as a supervisory or non-supervisory. If it contains an S then it is supervisory, if it is empty it is not supervisory.

This example shows that in paragraph 150 there is a total required strength of eight and an authorized strength of seven. The second Executive Assistant was not funded and there for the organization is not permitted to fill the 8^{th} position.

Likewise in paragraph 150A, there are 18 personnel lines. The required strength for this paragraph is 37 people. The authorized strength is 33. This division did not receive funding for two program analysts, and two acquisition management specialists.

In paragraph 150B, there are eight personnel lines. The required strength for this paragraph is 18. The authorizations are also 18 so they will have a fully funded and staffed section in this paragraph.

This is just a subset of an organization TDA and is meant to familiarize the reader with what a TDA looks like, a brief description on how to read the TDA, along with how an organization uses a TDA to determine their permission to hire personnel. Each one of these positions has a detailed position description assigned to it to determine the minimum qualification and duties of the person filling that position.

The REQ STR is developed by the organization during the planning program of a project or effort. If any point the requirements change and a new skill set is required a request to change the TDA needs to be processed and approved prior to the organization being able to fill the requirement.

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