

TRAC-Monterey FY16 Work Program Development and Report of Research Elicitation



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14. ABSTRACT This document provides a report of the impact of the fiscal year 2015 (FY15) TRAC-Monterey (TRAC-MTRY) work program, the plan, results, and recommendations for the FY16 research elicitation, and the proposed FY16 TRAC-MTRY work program. The methodology used to develop the FY16 TRAC-MTRY work program starts with analyzing the impacts of the FY15 work program using a topic, technology, methodology (TTM) framework that examines the effects of TRAC-MTRY projects in terms of five TRAC work categories. The FY16 research elicitation consists of both a formal elicitation of research ideas from across TRAC using interviews and a workforce survey, and an informal elicitation of research needs from organizations both within TRAC and across the Army. Finally, we develop the proposed FY16 work program, assess it against the TTM framework against our established TRAC work categories and present the impacts here. A full listing of FY15 projects completed can be found in \autoref{tab:fy15projlist}. A listing of FY16 projects which are currently in the beginning stages of research can be found in \autoref{tab:fy16projlist}. This is the FY16 work program that will be executed pending any changes to priorities or additional projects that require immediate research.					
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Executive Summary

Overview

This document provides a report of the impact of the fiscal year 2015 (FY15) TRAC-Monterey (TRAC-MTRY) work program, the plan, results, and recommendations for the FY16 research elicitation, and the proposed FY16 TRAC-MTRY work program. The methodology used to develop the FY16 TRAC-MTRY work program starts with analyzing the impacts of the FY15 work program using a topic, technology, methodology (TTM) framework that examines the effects of TRAC-MTRY projects in terms of five TRAC work categories. The FY16 research elicitation consists of both a formal elicitation of research ideas from across TRAC using interviews and a workforce survey, and an informal elicitation of research needs from organizations both within TRAC and across the Army. Finally, we develop the proposed FY16 work program, assess it against the TTM framework against our established TRAC work categories and present the impacts here. A full listing of FY15 projects completed can be found in Table 1. A listing of FY16 projects which are currently in the beginning stages of research can be found in Table 1. This is the FY16 work program that will be executed pending any changes to priorities or additional projects that require immediate research.

Results

The FY15 TRAC-MTRY work program involved impacts in the areas of method and data improvement, specifically in data analytics methodologies, human dimension analysis, measurement space analysis, technologies of the Person Data Event (PDE) system, GINA/Dragon Pulse, and the Executable Architecture Systems Engineering (EASE) system. The FY16 work program is planned to continue work with the PDE and GINA, and investigate more data analytics, wargaming, and data visualization methodologies. The work program remains flexible by not completely using the FY16 total analyst capacity up front. Instead, some room is left to conduct short-term or quick-turn analyses that may be required by TRAC, TRADOC, or the Army. Additionally, there is room if further funding becomes available for projects that fit TRAC research priorities and provide acceptable impact to TRAC. The FY16 TRAC-MTRY work program offers some great opportunities to expand knowledge sharing and to integrate into the analytic work being conducted by the rest of the TRAC centers through stakeholder interaction, continued TRAC-MTRY support for measurement space drills, and engagement with the TRAC centers on past research conducted to help improve OR analysis across the organization.

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TRAC-Monterey FY16 Work Program Development and Report of Research Elicitation Chapter 1 Introduction

Overview

This document provides a report of the impact of the fiscal year 2015 (FY15) TRAC-Monterey (TRAC-MTRY) work program, the plan, results, and recommendations for the FY16 research elicitation, and the proposed FY16 TRAC-MTRY work program.

Background

At the end of FY13, TRAC-MTRY conducted a research priorities elicitation from across TRAC in order to support development of the research council's FY14 research priorities.¹ In FY14, TRAC-MTRY conducted another research elicitation to capture the lessons learned from the elicitation conducted in FY13.² Through this process, it became apparent that the research elicitation is a very good opportunity for TRAC-MTRY to become familiar with the operations and studies of all the TRAC centers. Because TRAC-MTRY needs to ensure that its work program is relevant to TRAC as a whole, the research elicitation becomes another opportunity to synchronize TRAC-MTRY's operations into the missions that each of the TRAC centers face, as well as to communicate the research that TRAC-MTRY has conducted that would be useful to the TRAC centers if implemented.

Research Topics. Additionally, the research elicitation offers prospects of interesting research ideas that can be pursued to support not only TRAC, but the Army in general. TRAC-MTRY elicits these ideas, prioritizes them, and then develops a work program that incorporates those research ideas in a framework that potentially has the largest impact on TRAC capabilities to conduct analysis for the Army.

¹ Marks, Chris, Nesbitt, Peter. *TRAC FY14 Research Requirements Elicitation*. Technical Report TRAC-M-TM-13-059. 700 Dyer Road, Monterey, CA 93943-0692, 2013.

² Teter, Michael D., Smith, Christopher M. *TRAC FY15 Research Planning and Elicitation*. Technical Report TRAC-M-TM-13-059. 700 Dyer Road, Monterey, CA 93943-0692, 2013.

Problem Statement

TRAC-MTRY annually develops a work program consisting of research projects that provide high impact, relevant, and credible additions to TRAC's capability to conduct operational analyses.

Project Methodology and Timeline Overview

As stated, this is an annual effort that builds on the previous years work and is constantly analyzed to ensure the process remains appropriate to providing the most relevant research to TRAC. In general, research ideas are elicited from several sources, both inside TRAC using the formal annual research elicitation and from agencies across the Army and DOD. These ideas are analyzed for their relevance and ability to impact TRAC operations as well as the possibility that each idea will yield sponsors and have an appropriate amount of stakeholders to measure the worth of the research idea against the resources required to execute the research. Additionally, the analysis provides insights into TRAC's research objectives and priorities. Projects are formed from those ideas deemed of high value and sponsors secured. These projects are balanced against the amount of resources available, in terms of TRAC-MTRY analyst capacity and funding available to fund student and faculty research at the Naval Postgraduate School (NPS), the Air Force Institute of Technology (AFIT), and other graduate institutions. Once complete, the project schedule is developed and published, assigning analysts and resources to each project.

Methodology

The TRAC-MTRY research elicitation drives the TRAC-MTRY work program. We use the Topics, Technologies, and Methodologies Framework to choose projects that have the most impact in the areas of greatest interest to TRAC.

The Topics, Technologies, and Methodologies Framework for Measurement of Impact

Research ideas are considered on the basis of the type of topic the potential project would delve into, a specific technology that may be emerging as an important future analytical tool, or the methodology the potential project would. The extent of the impact in one or more of the areas of topic, technology, and methodology is measured by showing how the project contributes in each of these areas to the specific work areas in which TRAC engages. We have derived five categories, or main analysis areas, into which all work done within TRAC can fall. These categories are largely based on the TRAC's billable project codes. Definitions for the five categories are shown in Table 1.

Table 1. Five General Categories of Work Within TRAC Centers (FLVN, WSMR, LEE)

Category Number	TRAC Work Categories	Explanation
1	TRAC Analysis	Work in support of TRAC Studies and Analysis
2	External Support	Research and analysis for other organizations
3	Method & Data Improvement	Work in support of methods and data used for TRAC Analysis
4	Model Improvement	Work in support of models used for TRAC Analysis
5	Organizational Improvement	Research and activities to improve TRAC

A roll-up of all the TRAC-MTRY projects and their projected impact is shown in the topic, technology, methodology to work category grid. An blank example of the grid is given in Figure 1.

	Topic	Technology	Methodology
TRAC Analysis			
External Support			
Method & Data Improvement			
Model Improvement			
Organization Improvement			

Figure 1. Example Impact Grid showing how the impacts of Topics, Technologies, and Methodologies interrelate with TRAC work categories.

Report Organization

The remainder of this report is organized to first show the impact of the previous year’s project slate, the results of the current year’s research elicitation, and the projected slating for the next fiscal year’s project schedule at TRAC-MTRY. In chapter 2, we explain the impact, in terms of topic, technologies, and methodologies, that TRAC-MTRY’s projects have provided over the fiscal year 15 to TRAC in the main analysis areas listed in the methodology. Then chapter 3 develops the plan, methodology, and results of the FY16 research elicitation. The next chapter, chapter 4, shows the projects proposed as the FY16 TRAC-MTRY work program and the potential impact of these projects on TRAC’s main analysis areas or work categories. Finally, chapter 5 summarizes the TRAC-MTRY work program.

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Chapter 2

Impact of TRAC-Monterey FY15 Projects

Table 1. FY15 Project List

Project Code	Project Name	End Date	Tech Rep/Memo Number	Cost (Approx.)
060033	Behavior Validation Methodology for COMBATXXI	30MAR15	TRAC-M-TR-15-013	\$ 179,420.00
060111	Optimal Facility Location Tool for Logistics Battle Command (LBC)	31AUG15	TRAC-M-TM-15-025	\$ 21,000.00
060122	Measurement Space Drill Support	30JUN15	TRAC-M-TR-15-026	\$ 25,500.00
060128	Trade Space Analysis: Definition, Requirements, and Methodologies	30SEP15	TRAC-M-TR-15-028/ TRAC-M-TR-15-029	\$ 43,500.00
090089	TRAC Searchable Research Library	12DEC15	TBD	TBD
060118	Executable Architecture Systems Engineering (EASE) Integration Requirement Methodology for COMBATXXI	31DEC15	TRAC-M-TR-16-005	\$ 139,000.00
020306	Measuring Force 2025 Logistic Flow	31DEC15	TBD	TBD
040034	Innovative use of gameplay	31DEC15	TBD	TBD
060112	TRAC Knowledge Management Effectiveness Model	31DEC15	TRAC-M-TM-15-036	\$ 128,000.00
060121	Global Assessment Tool (GAT) 2.0 Exploratory Data Analysis	31DEC15	TBD	TBD
060123	Understanding Optimal Decision-making in War-gaming III	31DEC15	TRAC-M-TM-15-030	\$ 124,000.00
060114	Conflict Prediction Through Geo-Spatial Interpolation of Radicalization in Syrian Social Media	31DEC15	TRAC-M-TM-15-031	\$ 98,000.00
060113	Validating the FOCUS Model Through an Analysis of Identity Fragmentation in Nigerian Social Media	31DEC15	TRAC-M-TM-15-032	\$ 61,000.00
060119	The Logistics Battle Command (LBC) Attrition Model	13MAY16	TBD	TBD

Table 1 shows the list of TRAC-MTRY projects completed in FY15 along with technical report or memorandum numbers published in support of those projects. The matrix in Figure 1 shows the number of impacts in each analysis category for the categories of topic,

technology, and methodology contributed by the TRAC-MTRY work program. The impacts are counted by examining which topics, technologies, or methodologies each project researches. Each topic, technology, or methodology is then judged to contribute to one or more of the 5 TRAC analysis or work program categories.

	Topics	Technology	Methodology
TRAC Analysis	2	2	1
External Support	3	1	1
Method & Data Improvement	4	2	5
Model Improvement	0	1	2
Organization Improvement	2	1	2

Figure 1. Impacts of Topics, Technologies, and Methodologies of completed FY15 projects interrelated with TRAC work categories.

The chart found at Figure 1 summarizes the impacts of fourteen FY15 projects across the three focus areas effecting the five TRAC work categories. The FY15 work program included five total topics, three total technologies, and eight total methodologies. A complete listing of these topics, technologies, and methodologies cross walked with the project that produced it and the particular TRAC work categories that it impacted is given at Appendix A. The impacts to TRAC spread fairly evenly across the work categories, with a slightly higher impact to Method and Data Improvement, which can have a great impact on how TRAC conducts major studies.

Chapter 3

FY16 TRAC Research Elicitation

Methodology

Internal Research Elicitation. In July 2015, formal interviews were conducted at the directorate level at each TRAC center, to include the directors of each center and with the director of TRAC. These interviews consisted of asking leading questions to prompt the interviewees about what interesting research ideas they had in the areas of topics, technologies, and methodologies. An interview questionnaire was used to help guide the discussion. The questionnaire can be found at B In addition to these interviews with the leadership of TRAC, a survey was conducted, using an on-line survey on Sharepoint, of the entire workforce. Specifically, the survey asked respondents to provide any ideas they might have for research, how they would prioritize that research, and list of potential stakeholders for the research idea. The results of the interviews and survey responses are shown in the spreadsheet at C.

The formal portion of the elicitation helped determine whether the current TRAC FY15 Research Objectives should be modified to become TRAC FY16 Research Objectives. There is one recommended change to the TRAC Research Objectives suggested by the formal portion of the research elicitation. The recommended FY16 TRAC Research Objectives:

1. Tradespace
2. Analytics
3. TRAC Models and Simulations Improvement (changed from CXXI, AWARS, LBC)
4. OneTRAC
5. Human Dimensions
6. Cyber

Several topics, technologies, and methodologies were also identified as being important for TRAC and placed under consideration to become part of a TRAC-MTRY research project. These are listed below:

Topics:

1. Improvement of collaboration and sharing of study and research data, results, and methodologies.
2. Improved Mission Command modeling.

Technologies:

1. Technologies that improve collaboration and sharing of study and research data, results, and methodologies.

Methodologies:

1. Development of generalized tools based on TRAC-MTRY research that other centers can apply.
2. DOTMLPF analysis improvement.
3. TRAC-wide survey of routinely produced TRAC analyses and ways to improve.
4. Develop representation of robotic or unmanned systems in TRAC combat models.
5. Improved representation of risk to decision makers.
6. Development of a TRAC modeling and simulation strategy that provides a plan for development of new models and simulations over the next ten to twenty years.
7. Innovative visualization techniques and their application within TRAC.

External Research Elicitation. In addition to the formal elicitation internal to TRAC, TRAC-MTRY conducts a review of research project ideas proposed from various sources. Those sources include extensions of ongoing NPS faculty research that may align with TRAC research priorities, conferences such as the MORS symposium or the FA49 symposium, meetings with various DoD and Army agencies, and continuation of past TRAC-MTRY research efforts. From these sources, TRAC-MTRY is able to find potential external sponsors interested in results of the research whose topic, technology, or methodology will also benefit TRAC.

Chapter 4

FY16 Proposed TRAC-Monterey Work Program

Table 1 shows the currently proposed FY16 Project list. This list was developed using the topic, technology, methodology framework discussed throughout this paper.

Table 1. FY16 Proposed Project List including funding and sponsors.

Project Code	Project Name	End Date	Funding	Sponsor
090089	TRAC Searchable Research Library	12DEC15	\$200,000	TRAC
060119	The Logistics Battle Command (LBC) Attrition Model	13MAY16	\$130,000	TRAC-LEE
020309	Force 2025 and Beyond Strategic Quick-Turn Force Design Analytic Model	11AUG16	\$200,000	TRAC
060314	Crowd Behavior Algorithm Development	21JUL16	\$150,000	TRAC
060315	Cognitive Agility Measurement in a Complex Environment	19AUG16	\$200,000	TRAC
060311	GAT 2.0 Predictive Modeling Analysis III	30SEP16	\$75,000	Army Analytics Group
060312	Cross Service Cost Estimation Metrics	30SEP16	\$0	TRAC-WSMR
TBD	COMBATXXI Behavior Validation Implementation	30SEP16	\$96,000	ARL/HRED
TBD	Commander's Social Media Situational Awareness Model	30SEP16	\$100,000	AAG
060317	Precision Munition Effect Representation	30SEP16	\$150,000	DAMO-TRA
060318	TRAC Common Product Innovative Visualization Techniques	30SEP16	\$0	TRAC-FLVN
060313	Network Integration Exercise SMERT Analysis	01OCT16	\$100,000	TRAC
060316	Metrics for Systems Thinking in Irregular Warfare	01OCT16	\$100,000	TRAC

The impacts of this proposed work program are shown in Figure 1. The chart summarizes impacts of thirteen FY16 Projects across three focus areas effecting five categories. Within the thirteen projects, there are 6 total topics, 6 total technologies, and 17 total methodologies that each have an impact in the five TRAC work categories. The impact cross-walk spreadsheet can be found at Appendix D.

Refer to Impact Spreadsheet for FY16 projects - in appendix

	Topic	Technology	Methodology
TRAC Analysis	2	3	5
External Support	5	2	7
Method & Data Improvement	6	6	12
Model Improvement	1	2	5
Organization Improvement	1	2	3

Figure 1. Impacts of Topics, Technologies, and Methodologies of completed FY15 projects interrelated with TRAC work categories.

Chapter 5

Summary and Conclusions

Summary

TRAC-MTRY conducts an in-depth study annually to provide TRAC recommendations on the priorities of research and analysis and develop a research work program for TRAC-MTRY that delivers the greatest impact to TRAC, TRADOC, and the Army possible. This research elicitation takes place both formally and informally and results in the proposed following fiscal year work program. TRAC-MTRY's work program is then measured using the topics, technologies, and methodologies framework.

Conclusions

The FY15 TRAC-MTRY work program had impact in the areas of method and data improvement, specifically in data analytics methodologies, human dimension analysis, measurement space analysis, technologies of the Person Data Event (PDE) system, GINA/Dragon Pulse, and the Executable Architecture Systems Engineering (EASE) system. The FY16 work program is planned to continue work with the PDE and GINA, and investigate more data analytics, wargaming, and data visualization methodologies. The work program remains flexible by not completely using the FY16 total analyst capacity up front. Instead, some room is left to conduct short-term or quick-turn analyses that may be required by TRAC, TRADOC, or the Army. Additionally, there is room if further funding becomes available for projects that fit TRAC research priorities and provide acceptable impact to TRAC. That is not to say that TRAC-MTRY does not have a challenging work program lined up for FY16. Rather, the FY16 work program promises to provide a large future impact to TRAC analysis and will be challenging to complete given the timing and resources required of several of the projects. Further, the FY16 TRAC-MTRY work program offers some great opportunities to expand knowledge sharing and to integrate into the analytic work being conducted by the rest of the TRAC centers through stakeholder interaction, continued TRAC-MTRY support for measurement space drills, and engagement with the TRAC centers on past research conducted to help improve OR analysis across the organization.

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Appendix A

FY15 Work Program Impact Crosswalk

The tables below show the impact cross walk of topics, technologies, and methodologies for each FY15 project and the impact to the TRAC work categories for each.

Project Code	Status	Topics	Project	Contributes	
				To:	Remarks:
060112	Ongoing	Human Dimension	TRAC KM Culture Project	5	This project provides research into how organizations share information internally. These insights can help organizations improve their information sharing and mission effectiveness.
060121	Complete	Human Dimension	GAT 2.0 Exploratory Data Analysis	2,3	Project goal is to explore the underlying data structure of the GAT 2.0, gain insights into Soldier population, including resiliency, and analyze the structure of the GAT 2.0 versus the GAT as an instrument of Soldier assessment.
060123	Ongoing	Human Dimension	Optimal Decision Making In Wargaming III	1,2,3	This project examines the agility of individuals cognitive functions in an environment where the individual has to learn a pattern quickly in order to earn a reward or minimize consequences. This research is supportive of future research for testing and training Soldiers abilities to recognize patterns and implement optimal decision policies more quickly.
060122	Complete	Measurement Space	MS Drill Support	1,3,5	TRAC Study Leads conduct an in-depth examination of the measurement space prior to starting their study. This project researched methods to improve both the measurement space drills and conducted a proof of concept in which TRAC-MTRY sent analysts to provide expertise in cutting edge methodologies pertaining to the study of interest.
040034	Ongoing	Innovation	Innovative Use of Game Play	2,3	This research explores measurement of innovation within the conduct of wargames. Being able to measure innovation can help the Army train it's Soldiers to innovate and can measure innovation within Army organizations.

Project Code	Status	Technologies	Project	Contributes	
				To:	Remarks:
090089	Ongoing	GINA	TRAC Searchable Research Library	1,5	The goal of this project is an intuitive, searchable database of all TRAC technical reports in order to share information more effectively to within TRAC and to external Army organizations.
060121	Complete	PDE	GAT 2.0 Exploratory Data Analysis	3	The PDE is a web-based database and analysis tool containing secured and de-identified personal information from many different sources that can be used in research and analyses concerning such problems as Soldier resiliency.
060118	Complete	EASE	CXXI - EASE Integration	1,2,3,4	EASE is a web-based collaboration tool that allows analysts at any point in the systems research and development process to use tools, such as combat models, to provide analysis of the effectiveness of the systems under study.

1. TRAC Analysis 2. External Support 3. Method and Data Improvement 4. Model Improvement 5. Organizational Improvement

Project				Contributes	
Code	Status	Methodologies	Project	To:	Remarks:
060128	Complete	Quality Function Deployment	Trade Space Analysis Research Topic (Visiting Analyst)	1,3	Quality Function Deployment is a methodology for analyzing the various factors influencing system design and providing a framework for more fully describing the trade off space associated with a system for decision makers.
060121	Complete	Factor Analysis	GAT 2.0 Exploratory Data Analysis	3	Factor analysis allows an analyst to conduct exploratory analysis of underlying contributing factors within a data set. Applied to the GAT 2.0 data, this allows analysts to understand more fully what the GAT is measuring. This can be important to questions of predicting Soldier resiliency or Soldier decision making and health.
060121	Complete	Latent Class Analysis	GAT 2.0 Exploratory Data Analysis	3	Latent Class Analysis is a similar method to factor analysis, but allows the use of categorical data. It is also an effective method for examining data and dealing with messy data that has information missing from its structure (such as a survey question not answered by a respondent).
060113/114	Ongoing	Text Analytics	FOCUS Model/Conflict Prediction	2, 3	In this project, text analytics are used to manage a huge database of twitter data and discover relationships in the tweets that can help identify social and cultural patterns in an area of operations.
060112	Ongoing	Social Network Analysis	TRAC KM Culture Project	3,5	This project will provide new ways of discovering social networks and analyzing coordination within functional teams by analyzing email traffic patterns.
060112	Ongoing	KM Effectiveness Model	TRAC KM Culture Project	5	The KM effectiveness model will map out the organization: people, processes, organizations, and tools used in order to improve communication and collaboration.
060119	Ongoing	LBC Attrition Model	LBC Attrition Model	4	Improving the Logistics Battle Command model by dynamically incorporating the effects of attrition on convoys and distribution nodes helps improve sustainment analysis.
060111	Complete	Optimization Model	Optimal Facility Location Tool for LBC	3, 4	This project provided a tool that calculates an optimal location for distribution facilities. These locations can then be input into LBC to improve the information provided from the LBC model.
060033	Complete	Combat Model Behavior Validation	CXXI Behavior Validation Library	4	Provides a tool that can be used to validate, change, and share behaviors used for entities in COMBATXXI. This project helps increase the collaboration and information sharing across TRAC.

1. TRAC Analysis

2. External Support

3. Method and Data Improvement

4. Model Improvement

5. Organizational Improvement

Appendix B

Research Elicitation Questionnaire

NOTE: Below questionnaire was used as a guide to help keep the interview on track. If sufficient discussion was taking place without going beyond the scope of the interview, these questions were not needed.

FY16 TRAC Research Requirements Elicitation Interviews

Interview Guide:

1. Describe a research requirement in the areas of topics, techniques, and methodologies.
2. Which TRAC center(s)/ Directorate would most likely be a stakeholder?
3. With regards to OneTRAC, what is the priority of this research?
4. What are your top three priorities for this next FY?
5. Of the research requirements, what priority order would you assign this need?
6. How relevant are the current research objectives? What about in the context of 2025B?
7. What dates in the past year did you have a measurement space drill and what venue was used (onsite, VTC, DCO, etc.)?
8. Please make sure to complete the survey on-line.
9. Brief remarks on progress on research from FY15 to interviewee.

NOTES ON QUESTION: (Can mark note with number of question or mark other/misc):

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Appendix C
Research Elicitation Interview and Survey Response
Research Idea List

#	Topic	Short Title	Potential Stakeholders	Remarks/Clarifications	Type
1	Army Watercraft Strategy	Army Watercraft Strategy	CASCOM; TRAC-LEE	TCM-Trans is currently contracting out initial work to Patel; Additional funding may be coming to study this strategy.	Tradespace
2	Production of water from air humidity	Water from Air	CASCOM; TRAC-LEE	Possible Student Thesis; Need to examine the optimal use of fuel, power generation, and solar power to create water; in addition to the use of transportation assets to haul water	Analytics
3	Driverless Truck	Driverless Truck	TRAC-LEE	Possible Student Thesis; Need to examine the use of driverless trucks, survey techniques being researched, and provide description of benefits of driverless trucks; optimal use of driverless truck assets	Analytics
4	Using cognitive agility to find or develop good wargamers	Wargamer testing and training	TRAC-LEE; TRAC-FLVN		Human Dimensions
5	Real world reliability data for existing systems	Reliability Data	TRAC-LEE	Research to develop reliability data from real world use of existing systems	OneTRAC
6	Improvement to Dynamic Maintenance Model Repair parts arrival times distribution	DM Model Repair Parts arrival dist.	TRAC-LEE	Where do current distribution of times come from? How long do repair parts take in a deployed environment?	CXXI, AWARS, LBC
7	Professional Development Topic - Akake Information Criterion; What is the best model criteria to use?	What is best model fitting criteria to use? What is AIC?	TRAC		Analytics
8	Army Watercraft Strategy	Army Watercraft Strategy	TRAC-LEE	What are COCOM requirements? How many units/ supplies need to move over the shore and how far?	Tradespace
9	Army Trailer Study	Army Trailer Study	TRAC-LEE	What types of trailers the Army has? Where are they? Level of control?	Tradespace
10	Impact of Cyber attack on sustainment/ sustainment systems/ programs	Cyber attack on sustainment	TRAC-LEE		Cyber
11	LBC Model Improvements	LBC Model Improvements	TRAC-LEE	Various - Most are ongoing (Attrition Model, etc.) - Argonne National Laboratories conducting much of this work	CXXI, AWARS, LBC
12	Operational Energy - Representation of contingency basing	OE Contingency Basing Representation	TRAC-LEE	PEO CS & CSS - Working on a log planning tool to help set up contingency basing/ Need visualizations to help this tool/ May be some other gaps	Tradespace
13	Logistics Data Meta Model	Logistics Data Meta Model	TRAC-LEE	Model of data used in logistics/schema	OneTRAC
14	Link LBC with Dynamic Maintenance Module in real time	LBC link to DM module	TRAC-LEE	Possible Student Thesis; Need maintenance failures on distribution nodes and log convoys within LBC (This is included in ANL SOW, but may be open for some work from NPS/Student/TRAC-MTRY end)	CXXI, AWARS, LBC
15	Process to semi-automate scenario development	Scenario development process improvement	TRAC-FLVN; TRAC-WSMR	Automate development of TRAC-Standard scenario slides/ Tool to lead scenario writer thru process	CXXI, AWARS, LBC
16	Professional Development Topic - How to organize and conduct wargaming.	Wargaming	OneTRAC	Wargame standards for supporting AoA's; Organization of wargame; Format for wargame analysis - Standalone or to help modelers understand how to put a scenario in the model; wargaming classes;	Analytics
17	Standardize cost of operations at different echelons between services	Cost estimation across services	TRAC-WSMR	Cross service cost estimation breakdowns to consistent metrics for comparison of disparate capabilities; capture operational costs ("per engagement"); Total cost of delivering the effect/capability; Fair comparison value/consistent -- need to have service input into this.	Tradespace
18	Metrics for comparing human dimensions programs	Human Dimension program metrics	TRAC-WSMR; ASA-MP&RA	Challenge is that there are requirements from all echelons of government for human dimension type programs, from mental to spiritual to physical; How to compare them? Dr. Acchione-Noel will lead a year long effort to work on this problem.	Tradespace
19	Measurement Space Code of Best Practices	Measurement Space	OneTRAC		Tradespace

#	Topic	Short Title	Potential Stakeholders	Remarks/Clarifications	Type
20	Establish Sharepoint to share research/ other information developed across TRAC, but especially at TRAC-MTRY		OneTRAC		Research Program Tasks
21	Develop a reachback capability to get innovative techniques from TRAC-MTRY/Academia involved in current studies	Reachback capability	OneTRAC	Get TRAC-MTRY involved in each study conducted throughout TRAC from the measurement space drill/ early in planning process to the final AAR	Research Program Tasks
22	Develop common metrics to measure benefits across DOTMLPF	DOTMLPF analysis improvement	OneTRAC	Examine non-materiel solutions with defensible, consistent metrics in order to assign benefit to different solutions/compare "apple to apples"; Studies and Analysis 2 at TRAC-WSMR is currently developing an approach within the "Gator AoA" that could inform a more general approach.	Tradespace
23	Manned-Unmanned Teaming (MUM-T)		TRAC-WSMR; Army	Research on interactions/behavior to create models for handling MUM-T (within our combat models? - for instance)	Human Dimensions
24	Representation of Intel Fusion in COMBATXXI	Intel Fusion in CXXI	TRAC-WSMR	how to handle multiple sightings of a target at entity level in friendly representation of intel picture; Must work at runtime - not too CPU intensive;	CXXI, AWARS, LBC
25	Representation of Mission Command in COMBATXXI	Mission Command in CXXI	TRAC-WSMR	Similar to work done in the SAM-C Model (Studies and Analysis 3 developed a decision table based maneuver network model in R)	CXXI, AWARS, LBC
26	Capability degradation of individuals, weapons, and equipment in COMBATXXI	Capability Degradation in CXXI	TRAC-WSMR		CXXI, AWARS, LBC
27	"Feasible 4" future vehicle representation in COMBATXXI	Future vehicle representation in CXXI	OneTRAC; TRAC-WSMR	How to represent future systems/"pre-measurement space" measurement space/ Identify gaps in ability to represent new systems	CXXI, AWARS, LBC
28	Human Dimension Measures of Effectiveness	HD MOE's	OneTRAC	How to measure effectiveness of human dimension programs/ development; Should we grow organic capability to do HD research/analysis	Tradespace
29	Vertical Lift		TRAC-WSMR	Research into what helicopters/ etc. are supposed to do - MEDEVAC, Carry troops and supplies; Capability gaps, shortcomings for representing airlift in combat models.	CXXI, AWARS, LBC
30	Respresentation of Misidentification of targets within COMBATXXI	MisID of Targets in CXXI	TRAC-WSMR		CXXI, AWARS, LBC
31	Achieving approval/ buy-in for "new" analytic techniques from stakeholder senior decision makers/ study directors/ study leads		OneTRAC		Research Program Tasks
32	Bayesian Statistical Techniques and Applications		OneTRAC; TRAC-WSMR		Analytics
33	Complex Leadership Theories		OneTRAC; TRAC-WSMR		Human Dimensions
34	Big Data Statistical Learning Techniques		OneTRAC; TRAC-WSMR	Currently, Studies and Analysis 3 is conducting research into statistical learning techniques (Sarah Holden, Chris Mesic)	Analytics
35	Develop models that measure information flows and risk behavior of decision makers associated with information flows		OneTRAC; TRAC-WSMR	Need to build consensus on what behaviors are associated with what risk levels - what is the appropriate behavior for a certain risk level. -- Risk Management behaviors associated with information level; Use of "Design Methodology" rather than "MDMP" type management style.	Human Dimensions
36	Communication of current research/ student thesis work being conducted by/in conjunction with TRAC-MTRY/ NPS/ AFIT/ Academia		OneTRAC		Research Program Tasks
37	Access to TRAC Technical Reports by all the centers		OneTRAC		Research Program Tasks
38	Develop tools to help with TRAC analyses using Top 5 discoveries from TRAC-MTRY		OneTRAC		Study Support

#	Topic	Short Title	Potential Stakeholders	Remarks/Clarifications	Type
39	Get information about TRAC-MTRY Research out to study leads via action officers		OneTRAC		Research Program Tasks
40	Entity Cognition in Models - Intelligent Agents		TRAC-FLVN; TRAC-WSMR		Human Dimensions
41	Analysis of TRAC analytic operations		OneTRAC	TRAC - wide survey for methodologies currently being used	Research Program Tasks
42	Research on social sciences - specifically operational units		OneTRAC	Need research/ additional analysis on the disconnect between Senior Leaders and Soldiers; Need to challenge senior leader preconceived notions, hypotheses, assumptions	Human Dimensions
43	Ground Support Robotics		TRAC-FLVN	Unmanned Ground Systems - need development of methodologies, models, and tools to analyze UGS - How to deal with unmanned things and control of those things; Capability Gap Analysis; AoA - Robotic follow on;	CXXI, AWARS, LBC
44	Energy Weapons Representation in combat model		TRAC-FLVN		CXXI, AWARS, LBC
45	Metrics for comparing different types of sensors		OneTRAC	e.g. Radar vs. LIDAR/LADAR vs. Image vs. FLIR, etc. - No direct comparison	Tradespace
46	Code of Best practice for surveys based on purpose of survey		One TRAC; TRAC-FLVN; TRAC-LEE	Current COBP published by TRAC-LEE is focused on academic requirements, not on specifics for a particular study.	Analytics
47	Need a manned version of ASCU (Assignment Scheduling Capability - for UAV)		TRAC-FLVN	Will help analysis of unmanned versus manned systems; Possible student thesis to add threat into ASCU	CXXI, AWARS, LBC
48	Tool/Methodology to model Unmanned Ground vehicles mobility across terrain		TRAC-FLVN	NRMM tool used but problems - old terrain data; march rates unrealistic.	CXXI, AWARS, LBC
49	Risk prediction and visualization to make risk assessment more useful to decision makers		OneTRAC; TRAC-FLVN	Rand Study - Risk methodology was not specific enough to be useful. Primarily concerned with Schedule, performance, and technological/manufacturing risk for AoA's/ Need model to show relationship between schedule/ cost/ performance risk	Tradespace
50	Manipulation of large data sets to feed the various combat models (AWARS, CXXI,		OneTRAC; TRAC-FLVN		CXXI, AWARS, LBC
51	Automate/Partially Automate Scenario "operationalization" in combat models		OneTRAC; TRAC-FLVN; TRAC-WSMR	Need a way to take the output of scenario development and automate or partially automate input of the scenarios into TRAC's combat models	CXXI, AWARS, LBC
52	Development of scenarios with multiple layers of Red/Opposing Force integrated air defense or no air superiority for Blue forces.		TRAC-FLVN		Tradespace
53	Development of scenarios with long Lines of Communication (LOC) and/or long supply		TRAC-FLVN		Tradespace
54	Improved DOTMLPF Assessment, both pre-Milestone A and for DOTMLPF Assesment conducted during AoA		TRAC-FLVN	Are surveys of SMEs the best way? Can surveys be improved? Are there better survey methods? Are there better methods then surveys for conducting this type of analysis?	Analytics
55	Is taking a small vignette or scenario appropriate for representating whole environment or is there a better way?		OneTRAC		Analytics
56	How to make improvements to analysis methodologies for parts of analytic products that were not quite complete or correct?		OneTRAC	How to identify parts of analysis that need improvement; feedback from study leads, etc.	Analytics
57	Next Generation of TRAC Models		OneTRAC	What is the next generation of CXXI, AWARS, LBC or other models used by TRAC? RDECOM is working on the next generation simulation concepts now (STTC in Orlando); AMSO is also discussing it. There might be a TRAC AoA for Models and Sims? Need to answer: What are we doing now? What can't we do? What can we do better? Does it make sense to have two models? One big? Multiple small models?	CXXI, AWARS, LBC

#	Topic	Short Title	Potential Stakeholders	Remarks/Clarifications	Type
58	Conducting ISR in an aggregate, deterministic model		TRAC-FLVN	Sensing is difficult in a deterministic model - either see target or don't - no partial sensing; Need dynamic observables;	CXXI, AWARS, LBC
59	Measuring effects of military information operations (cyber and others)		OneTRAC; TRAC-FLVN; TRAC-WSMR	Cyber is just a new means by which to deliver information; Should we be doing more in cyber within TRAC? How better to look at cyber outside of operations that could benefit TRAC and Army? What are other means to influence activities globally? Applicable to: Engagement Warfighting Function (TRAC-WSMR); Cyber MOG; Army IO;	Cyber
60	Methodologies for conducting human dimension studies/ Institutional culture change		OneTRAC	How to assess risk measures; How to apply metrics to COAs - Suitability, Feasibility, Acceptability; How to change institutional culture.	Human Dimensions
61	Decision analysis pertaining to network modernization		OneTRAC; TRAC-FLVN	What does the Army need to invest in? What are requirements? Wholistic network analysis. Stakeholders: MCCOE, BMC, NIE	Tradespace
62	Innovative visualization techniques without using powerpoint		OneTRAC		Tradespace
63	Simulation of Autonomous Vehicles		OneTRAC; TRAC-WSMR	Unmanned Ground Vehicles	CXXI, AWARS, LBC
64	Next generation of Models and Sims/ Combat Models		OneTRAC	What is going to replace CXXI/AWARS? What is future direction? How to get models on the POM? Whole class of problems associated with how we build models and tools for analyzing problems; What do we need to do? How do we do it? Link in with Eric Johnson (WSD); Want to take a deliberate decision;	CXXI, AWARS, LBC
65	Expression of Operational and Strategic Risk		OneTRAC	How to talk to decision makers	Tradespace
66	Develop GCV meta-model using historical CXXI data		OneTRAC	Regression analysis - other methods/tools; Use for BCT design quick turn study; Scenario 6 gaming - establish baseline for F2025B; Engineering change proposals -- SWAP-C;	Analytics
67	Improved methodologies for differentiating between Army capabilities and demonstrating improvements that can be made to capabilities		OneTRAC	To improve arguments to congress defending POM	Tradespace
68	Visualization for non-analysts		OneTRAC	Are there ways to communicate academic work more effectively - not communicated effectively means not relevant; Weston Castleburg and sufficiency model visualization; Apply to common products across TRAC	Tradespace
69	Develop a sustainment/Logistics/Distribution Data Meta Model		TRAC-LEE	There are vast amounts of sustainment, logistics and dsitribution data that have yet to be organiazed in a comprehensive searchable linked fashion. This is a "big data" problem with a potential Social Networking Analysis (SNA) type outcome for analysis. These data are frequently required, but are only available in largely disparate db's, with little to no crossconnectivity between them, until an analysts consolidates selected data for an analysis	Analytics
70	Life cycle cost estimation		TRAC-FLVN; TRAC-LEE; TRAC-WSMR	Some centers need to maintain inherent knowledge and contacts to conduct lifecycle estimates of programs as acquisition studies come up. The current ad-hoc nature of cost estimation requires a steep learning curve and developing new contacts, usually with someone already familiar with TRAC, but not with the current study team at hand	Tradespace

#	Topic	Short Title	Potential Stakeholders	Remarks/Clarifications	Type
71	Explore the use of Cyber training scenarios to train Cyber Soldiers at the Cyber COE		OneTRAC; TRAC-FLVN; TRAC-LEE; TRAC-WSMR; TRAC-MTRY	Look at Wal-Mart, Google, Amazon and other large civilian organizations to glean insights into their MMT for fighting and defending their IT network.	Human Dimensions
72	Cyber Defense in M&S		OneTRAC; TRAC-FLVN; TRAC-WSMR	Need a greater focus on cyber defense in M&S. Manning and resourcing requirements to meet ongoing cyber defense roles.	Cyber
73	ARSOF Scenario Development		OneTRAC; TRAC-FLVN; TRAC-WSMR	Need for ARSOF specific research to feed into WSMR and FLVN's scenario development plans.	Tradespace
74	Probabilistic approach to operational benefit analysis		OneTRAC	The identified problem is, how do we assess operational benefit between alternatives when either we don't have the resources (time) to execute combat simulation, or when the nature of the differences in alternatives won't be revealed through combat simulation. Or if we survey SMEs about relative benefits of alternatives along some measurement scale, then the results are typically understood as an alternatives benefit relative to other alternatives. The idea was an approach to operational benefit akin to an expected value problem. If the study team could identify a 'use case' or situation in a vignette, identify the discrete events in that use case, gather probabilities of those events occurring, identify the outcomes associated with those events, then the team may be able to assess expected outcome of the use case/ vignette with different alternatives. The probabilities and outcomes would be specific to each alternative. Research areas for this idea would be: how to link a bunch of possible events into an expected outcome problem, especially if the probability of the next event occurring was conditional on the outcome of the previous event; what is the right data source to inform the probabilities of events and outcomes for each alternative (SME, AMSAA, simulation output, etc); and how could TRAC socialize this method to be a credible and accepted methodology among our customers.	CXXI, AWARS, LBC
75	Update to ASC-U		TRAC-FLVN; TRAC-MTRY	Update the Assignment and Scheduling of Capabilities - Unmanned (ASC-U) model to better represent manned aviation systems. Background: TRAC-FLVN used ASC-U for previous aviation-related studies (including an AoA). Current studies make continued use of this analytic tool, but require substantial modifications to adequately represent manned aircraft, rather than unmanned systems.	CXXI, AWARS, LBC
76	Evaluation of Formation performance		TRAC-WSMR	Much of our revolves around providing decision makers with a cost vs performance evaluation. Many times are results do not adequately account for how alternatives operationally impact the force especially when the alternatives are composed of various degrees of materiel and non-materiel solutions.	Tradespace

#	Topic	Short Title	Potential Stakeholders	Remarks/Clarifications	Type
77	Assessing the residuals in single variate and multivariate regression		OneTRAC	A systematic approach that describes the nature of the residuals when applying regression techniques. The research would provide specific steps needed to assess the residuals. The research would show examples of different distributions of residuals and describe 1) the effect on the regression equation fit/confidence, and 2) other techniques that may be applied to improve the fit/confidence of the regression equation	Analytics
78	Standard R Code for visualizing descriptive statistics		OneTRAC	This research would deliver R code that would produce best-practice data graphs describing the nature of a data set. The code would be created to run with minimal input labor, easily accept numeric and textual fields from a data set and then yield all the graphs/stats needed to understand every field of a dataset: histograms, box & whisker, relevant descriptive stats, outliers. The exact graphs/output would be ever evolving as analysts submit improvements.	Analytics
79	Data Munging Techniques		OneTRAC	I suspect this could be written in R or any programming language, or as part of a database. The code has an intuitive front end and easily accepts data. The code can assess each entry in a dataset and then offers techniques to apply to dispense with outliers or an error. In the simplest example, if an error is found in a single entry, the code offers to: 1) replace the error with median/mode and keep the rest of the data in that line, or 2) remove the entire line of data associated with the error entry	Analytics
80	Interactive Graphics		OneTRAC	Research that would yield some standard interactive graphics allowing a user to change values of one variable and see the corresponding change to multiple other variables. This research is pretty wide open. This research assumes that some TRAC analysis is best understood with an interactive graphic.	Analytics
81	Develop brain training games to facilitate leader development		OneTRAC; MEDOCM; Army Research Laboratories	The Army Operating Concept mentions that optimizing human performance is one of its most critical aspects. A key line of effort in the human dimension operational approach is cognitive dominance, which is the ability of a leader to gain an intellectual advantage over an adversary. The Army has spent an inordinate amount of time developing Soldiers physically, however there is little to no training support for cognitive development. In similar fashion to how Luminosity develops brain training games, the Army needs to modify these concepts to a military context.	Human Dimensions
82	TRADOC University Concept		TRAC-MTRY	How does TRAC-MTRY fit into this concept? Education vs. Training? What is TRAC-MTRY at MTRY and not at FLVN? Mr. Bauman's white paper on history of the TRAC centers and why at the locations they are at/ why there are 4 of them.	Other

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Appendix D

FY16 Work Program Impact Crosswalk

The following tables show the impact cross-walk of topics, technologies, and methodologies for each FY15 project and the impact to the TRAC work categories for each.

Project Code	Status	Topics	Project	Contributes	
				To:	Remarks:
060313	Planned	Support to NIE	NIE SMERT Analysis	2, 3	This project provides support to TRAC Analysts conducting analysis in support of NIE. The SMERT Tool can be used to support analysts across BMC conducting analysis on text data bases developed from O/A and survey feedback.
060315	Planned	Human Dimension	Cognitive Agility Project	2, 3, 4	This project aims to implement previous research by developing testing and training tools that assess and develop Soldiers' ability to adapt their thinking to different situations that are constantly changing.
060311	Planned	Human Dimension	GAT 2.0 Predictive Modeling Analysis III	2, 3	The goal of this project is to conduct a trend analysis on the data from the GAT 2.0 in order to externally validate and determine the predictive power of the GAT 2.0.
020309	Planned	F2025B Force Design Analysis	F2025B Force Design Analytic Model	1, 2, 3	Many practical problems can be represented in a network with nodes and connectors. Network type problems have very efficient algorithms for solving to obtain optimal conditions. In this project, the force design problem can be thought of as an assignment problem, where resources (forces) are assigned to requirements (missions).
TBD	Planned	Combat Situational Awareness	Commander's Twitter Situational Awareness	2, 3	This project will develop a tool using text analytics techniques that could potentially be used by analysts in an operational theater to discover the cultural, social, and political attitudes and opinions of different regions within the area of responsibility.
000052	Ongoing	Knowledge Management	KM System Implementation	1, 3, 5	To develop a OneTRAC Knowledge Management (KM) System in order to increase productivity, communication, and collaboration across the TRAC workforce.

Project Code	Status	Technologies	Project	Contributes	
				To:	Remarks:
TBD	Planned	GINA/ Dragon Pulse	CXXI Behavior Validation Library Implementation	3, 4	Provides a tool that can be used to validate, change, and share behaviors used for entities in COMBATXXI. This project helps increase the collaboration and information sharing across TRAC.
060311	Planned	Data Environment (PDE)	GAT 2.0 Predictive Modeling Analysis III	2, 3	The PDE is a web-based database and analysis tool containing secured and de-identified personal information from many different sources that can be used in research and analyses concerning such problems as Soldier resiliency.
060315	Planned	UrbanSim and Neurophysiological equipment	Cognitive Agility Project	2, 3, 4	This project aims to implement previous research by developing testing and training tools that assess and develop Soldiers' ability to adapt their thinking to different situations that are constantly changing.
060318	Planned	D3.js and R Shiny	TRAC Visualization Techniques	1, 3	To explore and organize methods to assist analysts in deciding on a data visualization technique to implement in a technical document or presentation.
000052	Ongoing	TEDS PeoplePages	KM System Implementation	1, 3, 5	To develop a OneTRAC Knowledge Management (KM) System in order to increase productivity, communication, and collaboration across the TRAC workforce.
000052	Ongoing	GINA	KM System Implementation	1, 3, 5	To develop a OneTRAC Knowledge Management (KM) System in order to increase productivity, communication, and collaboration across the TRAC workforce.

1. TRAC Analysis

2. External Support

3. Method and Data Improvement

4. Model Improvement

5. Organizational Improvement

Project			Contributes		
Code	Status	Methodologies	Project	To:	Remarks:
060311	Planned	Trend Analysis	GAT 2.0 Predictive Modeling Analysis III	2, 3	Using previous research into factor analysis, analyze the predictability of factors and use predictive tools (regression trees, neural networks, bootstrapping) to predict problem clusters for Army focus and improvement.
060311	Planned	External Survey Validation	GAT 2.0 Predictive Modeling Analysis III	2, 3	Use external sources to validate the GAT 2.0 to determine the accuracy and precision of the GAT 2.0 as a survey instrument.
020309	Planned	Network Optimization Approach	F2025B Force Design Analytic Model	1, 2, 3	Many practical problems can be represented in a network with nodes and connectors. Network type problems have very efficient algorithms for solving to obtain optimal conditions. In this project, the force design problem can be thought of as an assignment problem, where resources (forces) are assigned to requirements (missions).
060313	Planned	SMERT Text Analytics	NIE SMERT Analysis	1, 2, 3	The SMERT tool is a text analytic tool being developed at Ohio State University. The project takes advantage of the tool to analyze Observer/Analyst and survey feedback data from the NIE at Fort Bliss.
060316	Planned	Systems Thinking	Metrics for Systems Thinking	3, 5	This project uses a technique for text analysis developed at UVA for examining documents and discovering the degree to which systems thinking is being employed in the analysis. This method could potentially be used to help analysts learn to think in terms of how a particular new technology, tool, or concept effects a larger system.
060316	Planned	Text Analytics	Metrics for Systems Thinking	3	This project uses a technique for text analysis developed at UVA for examining documents and discovering the degree to which systems thinking is being employed in the analysis. This method could potentially be used to help analysts learn to think in terms of how a particular new technology, tool, or concept effects a larger system.
060312	Planned	Cross-service cost estimation	CS Cost Estimation Project	1, 3	The product of this project will be a methodology for comparing the costs of like capabilities across services.
060314	Planned	Improved urban combat model	CXXI Crowd Behavior Algorithm Development	4	This project will develop improved urban environment modeling by including people in the environment. The project will develop or improve existing algorithms and then integrate the algorithm into COMBATXXI.
060314	Planned	Agent-Based Modeling	CXXI Crowd Behavior Algorithm Development	4	This project will develop improved urban environment modeling by including people in the environment. The project will develop or improve existing algorithms and then integrate the algorithm into COMBATXXI.
TBD	Planned	Data Mining	Commander's Twitter Situational Awareness	2, 3	This project will develop a tool using text analytics techniques that could potentially be used by analysts in an operational theater to discover the cultural, social, and political attitudes and opinions of different regions within the area of responsibility.
TBD	Planned	Machine Learning	Commander's Twitter Situational Awareness	2, 3	This project will develop a tool using text analytics techniques that could potentially be used by analysts in an operational theater to discover the cultural, social, and political attitudes and opinions of different regions within the area of responsibility.
060317	Planned	Munitions Effects in combat models	Precision Munition Effect Representation	2, 4	This project improves the representation of precision munitions in JICM and potentially other combat models in order to allow analysts to provide improved risk analysis of different courses of action for munitions stockage levels.
060315	Planned	Wargaming using UrbanSim	Cognitive Agility Project	3	This project aims to implement previous research by developing testing and training tools that assess and develop Soldiers' ability to adapt their thinking to different situations that are constantly changing.
TBD	Planned	Network accessible CXXI Behavior Library	CXXI Behavior Validation Library Implementation	4, 5	Provides a tool that can be used to validate, change, and share behaviors used for entities in COMBATXXI. This project helps increase the collaboration and information sharing across TRAC.
060318	Planned	Data Visualization	TRAC Visualization Techniques	1, 3	To explore and organize methods to assist analysts in deciding on a data visualization technique to implement in a technical document or presentation.
060119	Ongoing	LBC Attrition Model	LBC Attrition Model	4	Improving the Logistics Battle Command model by dynamically incorporating the effects of attrition on convoys and distribution nodes helps improve sustainment analysis.
000052	Ongoing	KM Effectiveness Model	KM System Implementation	1, 3, 5	To develop a OneTRAC Knowledge Management (KM) System in order to increase productivity, communication, and collaboration across the TRAC workforce.

1. TRAC Analysis

2. External Support

3. Method and Data Improvement

4. Model Improvement

5. Organizational Improvement

Appendix E

References

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