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DIFFUSION AND LARGE-SCALE ADOPTION OF COMPUTER-SUPPORTED TRAINING SIMULATIONS IN THE MILITARY DOMAIN

by

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LIST OF ACRONYMS AND ABBREVIATIONS

AAR	After Action Review
AAV	Assault Amphibious Vehicle
ACMC	Assistant Commandant of the Marine Corps
ACOGS	Advanced Combat Optical Gun Sights
AGTS	Advanced Gunnery Training System
AT&L	Acquisition, Technology, and Logistics
BFT	Blue Force Tracker
BSC	Battle Simulation Center
BZO	Battle Sight Zero
C2	Command and Control
C2PC	Command and Control Personal Computer
C4I	Command, Control, Communications, Computers, and Intelligence
C-TAM-TPB	Combined Technology Acceptance Model and Theory of Planned Behavior
CACCTUS	Combined Arms Command and Control Training Upgrade System
CAN	Combined Arms Network of Simulations
CBA	Capability Based Assessment
CBAM	Concerns-Based Adoption Model
CCS	Combat Convoy Simulator
CDD	Capability Development Document
CJCS	Chairman of the Joint Chiefs of Staff
CMC	Commandant of the Marine Corps
Co	Company
COCOM	Combatant Command
CPD	Capability Protection Document
DAGTS	Deployable Advanced Gunnery Training System
DAS	Defense Acquisition System
DoD	Department of Defense

DOTMLPF	Doctrine, Organization, Training, Materiel, Leadership and Education, Personnel, and Facilities
DPG	Defense Planning Guidance
DVTE	Deployable Virtual Training Environment
EFDS	Marine Corps Expeditionary Force Development System
EMD	Engineering and Manufacturing Development
EVM	Earned Value Management
FY	Fiscal Year
FYDP	Fiscal Years Defense Program
GSBBP	Graduate School of Business and Public Policy
HEAT	HMMWV Egress Assistance Trainer
HMMWV	High-Mobility Multipurpose Wheeled Vehicle
I-I	Instructor-Inspector
I/ITSEC	Inter-service/Industry Training, Simulation, and Education Conference
ICD	Initial Capability Document
IDT	Innovation Diffusion Theory
IED	Improvised Explosive Device
IP	Internet Protocol
IRB	Institutional Review Board
IS	Information Systems
ISMT	Indoor Simulated Marksmanship Trainer
IT	Information Technology
ITX	Integrated Training Exercise
JCIDS	Joint Capabilities Integration and Development System
JROC	Joint Requirements Oversight Council
JUONS	Joint Urgent Operational Need Statement
LRC	Learning Resource Center
LS	Logistics Support
LVC	Live, Virtual, Constructive
M&S	Modeling and Simulation

MAGTF	Marine Air Ground Task Force
MAGTFTC	Marine Air Ground Task Force Training Command
MARFORNORTH	Marine Forces North
MARFORRES	Marine Forces Reserve
MAWTS-1	Marine Aviation Weapons and Tactics Squadron One
MCAGCC	Marine Corps Air Ground Combat Center
MCCDC	Marine Corps Combat Development Command
MCLOG	Marine Corps Logistics Operations Group
MCSC	Marine Corps Systems Command
MCTOG	Marine Corps Tactics and Operations Group
MCWP	Marine Corps Warfighting Publication
MDA	Milestone Decision Authority
MDD	Materiel Development Decision
MEF	Marine Expeditionary Force
MET	Mine-Resistant Ambush Protected Egress Trainer
MEU	Marine Expeditionary Unit
MCIT	Mobile Counter IED Trainer
MM	Motivational Model
MOS	Military Occupational Specialty
MOUT	Military Operations on Urban Terrain
MOVES	Modeling, Virtual Environments, and Simulation
MP3	MPEG-1 or MPEG-2 Audio layer III
MPCU	Model of Personal Computer (PC) Utilization
MS	Milestone
MSA	Material Solution Analysis
MTWS	MAGTF Tactical Warfare Simulation
MWTC	Mountain Warfare Training Center
NDS	National Defense Strategy
NMCI	Navy Marine Corps Intranet
NMS	National Military Strategy

NPS	Naval Postgraduate School
NSS	National Security System
O&M	Operation and Maintenance
O&S	Operations and Support
ODS	Operator Driver Simulator
OMB	Office of Management and Budget
OSD	Office of the Secretary of Defense
OUSD	Office of the Under Secretary of Defense
P&D	Production and Deployment
PANMC	Procurement of Ammunition, Navy and Marine Corps
PC	Personal Computer
PDA	Personal Digital Assistant
PEU	Perceived Ease of Use
PhD	Doctor of Philosophy
PM	Program Manager
PM TRASYS	Program Manager for Training Systems
PMC	Procurement, Marine Corps
POM	Program Objective Memorandum
POR	Program of Record
PPBE	Planning, Programming, Budgeting, and Execution
PU	Perceived Usefulness
QUADCON	Quadruple Container
RDT&E	Research, Development, Test, and Evaluation
RMD	Resource Management Decision
ROC-IED	Recognition of Combatants-IED
ROI	Return on Investment
S&T	Science and Technology
SAVT	Supporting Arms Virtual Trainer
SCT	Social Cognitive Theory
SECNAVIST	Secretary of the Navy Instruction
SME	Subject Matter Expert

SNCO	Staff Non-Commissioned Officer
SNCOIC	Staff Non-Commissioned Officer-in-Charge
SPD	Solutions Planning Document
SVET	Submerged Vehicle Egress Trainer
SWET	Shallow Water Egress Trainer
TAM	Technology Acceptance Model
TCP	Transmission Control Protocol
TEEP	Training, Evaluation, and Employment Plans
TD	Technology Development
TLCM	Total Life Cycle Management
TLTS	Tactical Language Training System
TPB	Theory of Planned Behavior
TRA	Theory of Reasoned Action
TtT	Train-the-Trainer
UAV	Unmanned Aerial Vehicle
UNS	Universal Need Statement
USD	Under Secretary of Defense
USMC	United States Marine Corps
UTAUT	Universal Technology Adoption and Use Theory
UUNS	Urgent-Universal Need Statement
VBS2	Virtual Battlespace 2
VVA	Verification, Validation, and Accreditation

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I. INTRODUCTION

A. RESEARCH DOMAIN

The United States Marine Corps (USMC) has a tough mission of being America's expeditionary force, always ready to respond to all missions and with the best possible effectiveness in its performance. In order to be prepared for future battles and conflicts, the service has to continuously train its forces on numerous global scenarios consisting of many different environments. These concepts and overall ideas are captured in numerous doctrinal publications, orders, directives, mission statements, visions, strategic plans, and several other types of military correspondence throughout multiple research domains. A few examples of exhibiting determination and support for innovations, advancement and use of the results of Science and Technology (S&T), and endorsement of simulation technologies have been presented by senior Marine Corps officer leadership, such as General James T. Conway (34th Commandant of the Marine Corps), General James F. Amos (current and 35th Commandant of the Marine Corps) and Lieutenant General Richard P. Mills (current Commander of Marine Forces Reserve (MARFORRES) and Marine Forces North (MARFORNORTH)).

General Conway, in his "Marine Corps Vision and Strategy 2025" document, stated the following:

> Marines have distinguished themselves as an expeditionary, multicapable force able to respond and win battles for our Nation. We have been prepared in the past because we understood that a force in readiness must be **well-trained**, **broadly educated**, and properly equipped for employment

across all forms of warfare. To remain the Nation’s force in readiness, the Marine Corps must continuously **innovate**. This requires that we look across the entire institution and identify areas that need improvement and effect positive change. (United States Marine Corps (CMC), 2007a)

General Amos, the Keynote Speaker at the Naval Science and Technology Partnership Conference conducted on 23 October 2012, also stated,

> Since our earliest days, we have been known as the innovators. In modern Marine history and especially in the last decade plus of war, we have made significant gains in equipping our warfighters with cutting-edge technology…Science & Technology (S&T) efforts continue to save lives and make our warfighters more mission-capable. (United States Marine Corps (CMC), 2012)

While serving as the Deputy Commandant for Combat Development and Integration (CD&I) and Commanding General, Marine Corps Combat Development Command (MCCDC), Lieutenant General Mills, within his “2012 U.S. Marine Corps S&T Strategic Plan,” captured the Vision of the Marine Corps Training and Education Command (TECOM) as the following:

> The Marine Corps will leverage S&T enablers to provide the best trained and educated Marines as America’s Expeditionary Force in Readiness that is prepared to respond to any crisis. The need to develop and maintain readiness across the spectrum of Marine Corps missions, especially in a resource constrained environment, places a premium on using the most effective and efficient means available for Training and Education. To meet these demanding Training and Education requirements, the Marine Corps leverages scientific products and technologies, including simulation technologies. The desired end state is to leverage the range of S&T enablers to prepare Marines to succeed in distributed operations and

increasingly complex environments. (United States Marine Corps (CD&I), 2012)

The adoption and diffusion of technological innovations is an extremely important topic in various domains, and has been researched by numerous people within several different countries throughout the world. The topics of diffusion, innovations, and adoption have also been introduced and studied within the military domain. For example, in 2003, Emily O. Goldman and Leslie C. Eliason published a book titled, *The Diffusion of Military Technology and Ideas.* Some of the topics that are discussed are the mixed successes and challenges of promoting the diffusion of technology and knowledge throughout entire military organizations (e.g., Soviet and German ground force technology, nuclear weapons, the Fast Missile Attack Craft in Israel, Remotely Piloted Vehicles/Unmanned Aerial Vehicles (UAV) in Israel, etc.); diffusion during different periods of rapid military transformation (e.g., economic and societal changes, and the successful uses of combined arms warfare and air power at sea); and the diffusion of the information revolution in military affairs (Goldman & Eliason, 2003). Another example of this type of research was conducted by Michael C. Horowitz in his 2010 book titled, *The Diffusion of Military Power.* In his work, he discusses topics such as the spread of military power throughout the international system; financial and organizational changes required for adoption due to innovations; and military innovations (e.g., chapters on Carrier Warfare, The Nuclear Revolution, Battlefleet Warfare, and Suicide Terrorism); and the importance of the spread of military power (Horowitz, 2010). These two examples review diffusion at a very large scale, and serve as an inspiration to the researchers whose goal is to investigate and explore the diffusion of particular types of technical innovations within larger domains of science and technology.

1. Current Demands and Needs in Training of the Military

Some of the current training demands that the military needs to deal with relate to issues of constant changes in the overall mission objectives and doctrinal teachings; elevated operational tempo due to increased numbers of situations in which Department of Defense (DoD) services are engaged; and unsatisfactory retention rates of service members. Training demands in the military domain will always be changing and evolving; however, there is no room for failure or decreased performance as the mission must always be accomplished. These training demands will produce new training requirements for both instructors and students. For example, in the military domain, there is a requirement to train a large number of skills (including new skills) to a large number of people. Another training need is to utilize as minimal number of resources (instructors, role players, material and logistics) as possible for each training evolution. The need to train in numerous environments in several different conditions is an additional requirement that needs to be continuously addressed. Finally, as with almost any type of training requirement, it is important to achieve the desired training goals and overall mission objectives within the smallest amount of time possible. In order to meet all these training demands and requirements, it is highly likely that the military will not utilize only a live training solution, but rather a combination of Live, Virtual, and Constructive (LVC) training solutions.

2. Live, Virtual, Constructive Simulations

The DoD defines *Live Simulation* as "a simulation involving real people operating real systems" (Under Secretary of Defense (AT&L), 1998). An example of a live simulation is a pilot operating a jet or a Marine operating a tank. Live training exercises are still the most preferred and sought after methods; however, they are also the most expensive ones. The factors that drive up the costs of live training events are material costs ("Beans, Bullets, and Band-Aids," a typical metaphor for food and water, firearms and training, and medical supplies and first aid knowledge), logistical costs (transportation, fuel, and maintenance), and personnel costs (individuals hired to support training on physical ranges). Live training is the way the United States military has always trained and is most confident with when it needs to acquire and perfect knowledge and skills. It is commonly recognized that some elements of live training cannot be replaced, such as environmental conditions or physiological effects the human body experiences in a moving airplane cockpit. However, thanks to advances in technology over time, it was possible to introduce computer-supported training simulations as an approach that augmented and even replaced some elements of live training in the military domain. The DoD defines *Virtual Simulations* as, "a simulation involving real people operating simulated systems. Virtual systems inject human-in-the-loop in a central role by exercising motor control skills (e.g., flying an airplane in a flight simulator with a physical mockup of control instruments), decision skills (e.g., committing fire control resources to action), or communication skills (e.g., as members of a Command, Control, Communications, Computers, and Intelligence (C4I) team)" (Under Secretary of Defense [AT&L], 1998). *Constructive Simulations* are defined as, "simulations that involve simulated people operating simulated systems. Real people stimulate (make inputs) to such simulations, but are not involved in determining the outcomes" (Under Secretary of Defense (AT&L), 1998). In place of, and/or in conjunction with live exercises, virtual and constructive (computer-supported) simulations are now utilized by units as additional forms of training to accomplish personal, team, and unit training objectives.

3. Computer-Supported Training Simulations and Their Role in the Military Domain

a. The Value

Computer-supported training simulations have become important training tools for certain domains in the military domain. It is safe to say that these tools will not provide the complete training solution, but there are several reasons why they can and should be considered as viable training options. First of all, selected examples of training simulations have been proven to be very effective training tools (Baxter & Ross, 2004; Brown, 2010; Fitzpatrick, 2007; McDonough & Strom, 2005; and Proctor & Woodman, 2007). The computer-supported training simulations have demonstrated a potential to:

> (1) empower more effective learning (learn more, faster, longer retention of learned skills and knowledge), (2) motivate and encourage trainees, (3) Enable learning/training solutions not possible to be supported with traditional methods, (4) Provide the ability to easily play out a number of what-if scenarios, allowing for expert skill acquisition, (5) Engage users in active learning processes, which enhances experimental learning, and (6) immerse users in problem-solving events. (Sadagic, 2013)

Secondly, the systems are currently affordable — the costs of both hardware and software systems have gone down dramatically in recent years. Lastly, the technology they are built upon is advanced enough for several military applications, and is considered dependable and capable of performing with minimal failure.

b. Existing Solutions

Many of these characteristics play important roles as Marines and their units prepare themselves for the war in Afghanistan or other conflicts, as well as the exercises in stateside and overseas destinations. From computer-supported training simulations, Marines learn specific skills in (1) marksmanship (e.g., Indoor Simulated Marksmanship Trainer (ISMT)), (2) Call For Fire (CFF) (e.g., Forward Observer Personal Computer Simulation (FOPCSIM)) and Close Air Support (CAS) (e.g., Combined Arms Network of Simulations (CAN) or Supporting Arms Virtual Trainer (SAVT)), (3) tactical vehicle driving and convoy training (e.g., Combat Convoy Simulator (CCS) or Operator Driver Simulator (ODS)), (4) vehicle egress (e.g., High-Mobility Multipurpose Vehicle (HMMWV) Egress Assistance Trainer (HEAT) or Mine-Resistant Ambush Protected Egress

Trainer (MET)), (5) Improvised Explosive Device (IED) recognition (e.g., Eagle Eye, Deployable Virtual Training Environment (DVTE) simulation Recognition of Combatants (ROC-IED) (For more details about DVTE, refer to Appendix A.), or Mobile Counter IED Trainer (MCIT)), (6) cultural awareness (e.g., DVTE simulation Tactical Language Training System (TLTS)), (7) tactical use of Unmanned Aerial Vehicle (UAV) platforms (e.g., DVTE simulation Virtual Battlespace 2 (VBS2)), (8) Military Operations on Urban Terrain (MOUT) (e.g., DVTE simulation VBS2), and several others throughout the military domain (PM TRASYS, 2013a). The list is quite extensive as it covers numerous other military topics in military training environments. As technology advances, these systems will improve their effectiveness and efficiency in delivering training results. They will be easier to use, and will have a better chance to become common everyday training tools for not only the Marine Corps, but for other DoD and Joint military services.

c. The Process

Training in the military domain constantly revolves around the DoD mission, which is to provide military forces needed to deter war and to protect the security of our country ("U.S. Department of Defense," n.d., Mission section, para. 1). The military has experienced timeframes where it was continuously training while at war, and during these times, the primary focus for each unit was to complete and master its *Pre-Deployment Training Package* (PTP). PTP requirements consist of a set schedule of events and are broken down into specific training blocks, such as Block I (Military Occupational

Specialty (MOS) Proficiency), Block II (Individual Tasks), and Blocks III (Combat Service Support Element (CSSE) Tasks) and IV (Ground Combat Element (GCE) Tasks) are conducted and evaluated during mission rehearsal exercises such as the Integrated Training Exercise (ITX), formerly known as Enhanced Mojave Viper (EMV) (United States Marine Corps(CMC), 2007b). For example, the Tactical Training Exercise Control Group (TTECG) plans, orchestrates, and evaluates the ITX for all units prior to their deployment to a war zone such as Afghanistan. The TTECG utilizes the Combined Arms Command and Control Training Upgrade System (CACCTUS) (see Figure 1), an entity level simulation in order to create battlefield forces (for more details about CACCTUS, refer to Appendix B.) for three main training events (Mechanized Assault Course, Aviation Assault Course, and a small-scale Regimental live fire) during the ITX.

Figure 1. Marines working with CACCTUS (From PM TRASYS, 2006, 2013b)

Prior to each event, each unit will prepare its own fire support and air control plans. From there, the plans are loaded into CACCTUS, where the units utilize them in order to conduct rehearsal exercises in preparation for the live events. The Marine Corps also uses computer-supported training simulations in preparation for Marine Expeditionary Unit (MEU) deployment readiness. For example, on July 25, 2013, 1st and 2nd Anti-Armor Team, 2nd Battalion, 5th Marine Regiment conducted convoy operations through virtual simulations inside the Combat Convoy Simulator (CCS) (see Figure 2; for more details about CCS, refer to Appendix C) aboard Camp Las Pulgas, Camp Pendleton, CA, in preparations for their deployment with the 31st MEU (Scanlan, 2013).

Figure 2. MEU Readiness-simulated convoy using CCS (From Scanlan, 2013)

One very promising and potentially very effective approach of using computer-supported training simulations in the military domain is the idea of a combined training solution, where virtual or constructive simulations are used to train skills, such as strategic planning or mission planning, and live simulations are used to train motor skills, full body exertion as in the operational environment, exposure to full environmental conditions (e.g., excessive heat, humidity), and full skill integration including team communication, cohesion, and esprit de corps. An example would be the service-level assessed Marine Air Ground Task Force (MAGTF) exercises (Large Scale Exercise (LSE)) conducted aboard Marine Corps Air Ground Combat Center (MCAGCC), Twentynine Palms, CA. The LSEs are structured and focused at the Marine

Expeditionary Brigade (MEB) and Marine Expeditionary Force (MEF) level, and are designed to enable LVC training for the MEB command element, where the shift to simulation plays an important part in preparing for and conducting the exercise (United States Marine Corps(TECOM), 2013).

d. An Example of LVC System

An illustration and possibly a future solution of LVC segments working together is the example of CCS and/or a VBS2 and MAGTF Tactical Warfare Simulation (MTWS) acting in unison (for more details about MTWS, refer to Appendix D). The live portion of the simulation can be described as the physical people operating the actual aircrafts and/or tanks in the real environment. If using CCS or VBS2, then the virtual portion of the simulation can be implemented by a platoon utilizing the CCS or VBS2 in order to conduct a virtual convoy from one location to another. The constructive portion of the simulation can be achieved through MTWS, where the live and virtual elements of each simulation are tracked via command and control systems, such as Command and Control Personal Computer (C2PC) and Blue Force Tracker (BFT), and represented and updated on MTWS display screens. It is now commonly accepted that computer-supported training simulations are and will continue to be a valuable part of the overall training solution.

4. Large-Scale Adoption of Technical Solutions

”Large-Scale adoption” refers to the adoption of a technology throughout an entire organization (e.g., Marine Expeditionary Force (MEF) level or higher). Adoption is defined as, "a decision to make full use of an innovation as the best course of action available" (Rogers, 2003), and will be utilized throughout this research.

As technology advances and service needs for training grow, it is extremely important that the Marine Corps maintains its technological edge in both the operational and training domains. Those advances will involve the future LVC training simulation environments, among other innovations. With these types of technological advances, it is also important that the Marine Corps, as a community, accepts and adopts technical innovations as an integral part of their training plans and environments. Complete change relating to the adoption of a technological innovation throughout an entire organization or unit can be challenging and it is something that takes time, especially when it involves multiple people, resources, and processes. Large-Scale adoption across an organization is a very important process for the military to understand, and there can be many elements that will have a role in shaping this process. The adoption and diffusion of innovations process and its characteristics will be defined and explained in more details in Chapter IV.

a. A Paradigm Shift in the Training Domain

A paradigm shift can be defined as a complete change from the way we think, organize, and conduct certain activities within an organization. Thomas Kuhn, an American physicist, historian, and philosopher of science, defined and popularized the term "paradigm shift," and stated: "It's a revolution, a transformation, a sort of metamorphosis. It just does not happen, but rather it is driven by agents of change" (Kuhn, 2013). Throughout history, numerous types of paradigm shifts have occurred all over the world. The examples of paradigm shifts on a large scale were the following innovations: printing press, motor operated vehicles and/or aircraft, calculators, computers, the Internet, and smart phones.

The contemporary world has already seen paradigm shifts pertaining to technology throughout the civilian and military domain. For example, the introduction of e-mail has eliminated numerous meetings and the use of Read Boards has allowed information to easily be published to a large group of users almost instantaneously with minimal resources. Another example of a paradigm shift is the training of pilots in both the civilian and military domains. The utilization of flight simulators has increased over the years and has completely changed this community's training plans and practices. Today, for example, the flight simulators are the only tool utilized to train pilots and crew on emergency procedures, as these types of events cannot be learned while operating a real aircraft due to the safety issues. Based upon tested and confirmed training benefits and overall value, the air communities have mandated the shift of actual flight hours to hours in flight simulators. This shift also introduced conducting mandatory training procedures and pilot certifications over to the flight simulators. A brief overview of flight simulators is discussed in Chapter V.

b. Mandatory versus Optional Mode of Use

There are two different modes of use of training solutions in the military domain: mandatory and optional.

Mandatory mode of use is defined as, “authoritatively ordered; obligatory; compulsory” (“mandatory,” n.d.). What this implies is that some person in the leadership chain has deemed the utilization of a specific training tool as an official requirement for that event. This decision can be made service-wide (Commandant of the Marine Corps (CMC)), or it can exist on a level encompassing a MEF (MEF Commander), unit of a different size (Battalion Commander, Company or Platoon Commander), or on a level of Military Occupation Specialty - MOS (e.g., Flight Simulators in the Aviation community).

Optional mode of use is defined as, “left to one’s choice, not required or mandatory” (“optional,” n.d.). Optional use of computer-supported training simulations is when a unit owns or has access to a tool, and they make the effort and overall decision to use the tool for that training event.

Both modes of use have their advantages and disadvantages in the overall process of large-scale adoption of computer-supported training simulations in the military domain.

B. RESEARCH PROBLEM AND MOTIVATION

Today, the military community has affordable computer-supported training simulations in many of its training environments. It has invested valuable time and resources in order to improve, upgrade, and maintain those systems, and it has also shown that training with these systems has merit for future use and expansion across different domains. Nevertheless, there is still no firm proof of large-scale adoption of computer-supported training simulations for education and training purposes throughout the DoD community (Sadagic, 2013).

The DoD invests a substantial amount of time and effort on solutions in the Modeling and Simulation (M&S) domain, and it spends billions of dollars on M&S per year. According to the 2008, 2009, and 2010 Reports on DoD M&S Management, the DoD spent an estimated $1,529,190,000 in Fiscal Year (FY) 2006 (Citizen 2008), $1,811,855,000 in FY 2007 (Citizen, 2008), and $1,611,186,000 in FY 2008 (Citizen, 2008), $2,191,903,549 in FY 2009 (Citizen 2009), and $2.2B in FY 2010 (Citizen, 2010). Over these five years, the numbers represent over 200 Program Elements (PE) with dedicated funding for M&S activities; however, to our knowledge, they do not provide a complete snapshot of all DoD M&S activities as some of the activities are embedded in over-arching programs. "Where M&S funding is not identified in budget documents with a separate line item, a detailed analysis of each individual acquisition and sustainment program would need to be conducted to fully address the specific funding for all M&S efforts" (Citizen, 2008). During our research, we found other figures that were referenced by different entities. For example, in the M&S Journal Fall 2012 Edition, Alan Shaffer, Principal Deputy, Assistant Secretary of Defense for Research and Engineering states, "The DoD spends more than $3 billion per year on M&S…" (Shaffer, 2012), and according to a reference (Cuda and Frieders, 2005) within the M&S Journal Winter 2012–2013 edition, the DoD spends up to an estimated $10B on M&S annually (Henninger, Lopez, Lutz, & Saunders, 2012). Although unattainable, the reference to Cuda and Frieders has been used in other reports as well, such as the Metrics for Modeling and Simulation (M&S) Investments, Scientific and Technical Report No. TJ-042608-RP013, and several other LVC papers written by Henninger. One final report that will be referenced is one published by the Old Dominion University. In its 2012 Hampton Roads State of the Region Report, the DoD is estimated to spend approximately $9 billion per year on M&S ("Modeling and Simulation In Hampton Roads," 2012). Interestingly, this report also estimated that Americans spend approximately $16 billion on games and simulations per year, and business firms, state and local governments, universities, medical schools and nonprofit organizations spend almost $25 billion per year on M&S activities. This total came fairly close to the estimated $50 billion that the United States spends on M&S activities per year. These figures are a good illustration of the depth of the investment made towards M&S domain in support of meeting today's challenging training missions throughout the DoD.

Due to budget constraints, drawdown of wartime activities in Afghanistan and other overseas locations, computer-supported training simulations became frequently requested training options—retaining combat proficiency in continuously changing operational environments by DoD units is of paramount significance, and simulations are seen as tools capable to support that goal. In an interview with Lauren Biron, Matt Lynaugh, a Director of Insitu Inc. specialized in the development of Unmanned Aircraft Systems, was quoted in a web article dated 22 May, 2013, as saying that DoD requested $3.7 billion for its overall UAV programs in 2014, which is a decrease compared to 2012 and 2013 (Biron, 2013). In Mr. Lynaugh's opinion, fewer UAVs will be purchased; however, he felt that this should not change the training demand for these systems. It is conceivable that with the continuing budget reductions, people will rely more and more on simulations. A very likely scenario is one in which military services start reviewing what computer-supported training simulations they currently own, and identifying the most effective ways in which they can utilize these systems to effectively train their units. In today's budget challenged society, the return on investment (ROI) is crucial to any technology's survival and future existence. As Oswalt et al. suggests, this is why the M&S investment methodology must contain the structure, persistence, and common valuation for effective execution (Oswalt et al., 2011).

The ever-changing economic fluctuations in our society, evolving military missions and performance demands, and advances in technology, force the military to evaluate its current and future training plans. Having all that in mind, it will be extremely important to focus the effort on making sure the community gets the best value from the initial technology investment, and that it does it in the most effective way. Once the technology solution is designed, developed and acquired, the remaining segment that needs to be carefully planned is the way the military will employ, disseminate, utilize, and/or circulate that same solution among its users. Investments on computer-supported training simulations (constructive and virtual) are already being made by the DoD and Marine Corps; however, evaluating the ROI becomes an inevitable part of the overall accountability. If the ROI is investigated and proven to be an unsatisfactory level, then the burden is on the community to investigate the reasons for that specific situation. There could be multiple reasons for that to happen: ineffective employment methods of the system, training audience not confident in training value, throughput issues and many others that will be commented and investigated in more details in the remainder of this thesis.

These issues pose a difficult question and challenge the notions of employment, dissemination, utilization, and adoption of computer-supported training simulations in a military training environment. As previously stated, considerable amounts of resources are invested to successfully design, develop, test, procure, implement, and maintain such simulation training systems. Nevertheless, the resources and support made available to the unit in the final distribution and diffusion phase of any new solution can have drastic effects on the actual acceptance of the simulation system by military units. It is this phenomenon — the importance of that *last step* in the diffusion process — that serves as a core motivation for this work.

C. RESEARCH QUESTIONS

The following sets of questions are central for the work in this thesis:

- What are the main aspects of technology adoption and diffusion?
- What type of supportive environment (physical infrastructure, domain conditions and attitudes, training approaches) are understood as needed for the most effective deployment of computer-supported training solutions?

- How do the computer-supported simulations get distributed and employed in the military training domain?
- Once the computer-supported training solutions get acquired, how do MCAGCC / Marine Air Ground Task Force Training Command (MAGTFTC) units utilize them in their training evolutions?
- What trends appear to be most significant for the adoption process?
- What common trends favorably and/or adversely affect computer-supported training simulations introduced into a MCAGCC/MAGTFTC military training environment?
- What is a profile of a young Marine and unit leaders with regard to their familiarity with and uses of technology?
- What are the attitudes of different groups of users of training simulations?

D. SCOPE

The primary focus of this thesis will be to study global trends on technology adoption, and collect data related to the current state of employment, dissemination, utilization, and adoption of computer-supported training simulations aboard MCAGCC, Twentynine Palms, CA.

Although a complete service-wide study would be the recommended approach for these topics, we chose MCAGCC as it encompasses a huge military training domain, contains a Battle Simulation Center with numerous simulations and simulation subject matter experts (SME) available to the units for their daily use, and active units that have a need to use simulations in their training environments. It is also believed that the data collected for MCAGCC is a good representation of the same issues in other Marine

Corps bases, and have a great level of applicability and rationale for other DoD services.

E. THESIS CONTRIBUTIONS

The main contributions within this thesis is a set of understandings acquired on the topic of diffusion, and the specific applications of that process with computer-supported training simulations (the innovation) that was considered within the military training domain. A thorough research and literature review will be conducted, data will be collected and analyzed, and recommendations will be provided.

From the data analysis, new insight will be gained on the users' attitudes, usage, knowledge, advertising, leadership endorsement, and overall adoption of Marine Corps computer-simulated training systems in the military training domain. These results are expected to make a contribution to the M&S community's knowledge about this process; having this type of data will empower the M&S community and support its decision making within several different phases of the acquisitions process, including the actual adoption of novel systems among intended users.

The study will also have the opportunity to identify areas where additional (or different) approaches may be needed. The surveyed trends and guidance produced at the end of the study will be equally applicable to other USMC bases, and they will have a universal value applicable to the adoption of computer-supported training solutions by other Department of Defense (DoD) services.

F. THESIS STRUCTURE

Chapter I provides the introduction of the research domain and explains the problems and motivation for the efforts. This chapter details current demands and needs in the training domain, and comments on the role of computer-supported training simulations in military training. The text introduces the term large-scale adoption of technical solutions, and it lists research questions, scope, and thesis contributions.

Chapter II contains the background of the research domain, including the general domain of diffusion of innovations, issues identified with the adoption of technical solutions, and attitudes towards technical solutions. A set of service data found available in official documents accessible to the public are presented as an illustration of the environment and situation in which the service has been at the time of our data collection.

Chapter III details the elements of methodology—the steps and approaches used to conduct the research work in this domain.

Chapter IV provides a detailed understanding about the diffusion of innovations process and its main characteristics. These types of understandings and definitions form the main framework for data collected in the case study and are used as a lens through which the data were analyzed in the end.

Chapter V elaborates on the elements of adoption and diffusion of computer-supported training simulations. The text briefly reviews examples of past technology innovations in the civilian and military domains, the parameters that influenced their adoption rate, and opportunities that can affect the adoption rate.

Chapter VI consists of a high-level account and commentary of the DoD and USMC acquisition processes.

Chapter VII contains the details of the case study and data being collected in MCAGCC. This chapter reviews research goals and study design, preliminary and final data collection efforts including the tools used to collect the data, the Institutional Review Board (IRB) process and piloting done before official (final) data collection.

Chapter VIII provides the qualitative and quantitative analyses of the survey and focus group data sets. Coding and themes for each data set are discussed, and the overall practical implications for the results are introduced.

Chapter IX offers a detailed conclusion and overall understandings gained with this work. The main contributions made with this thesis are discussed and the directions for future work are summarized.

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II. BACKGROUND

A. DIFFUSION OF INNOVATIONS

This section contains a background of the research domain, including a general domain of diffusion of innovations, the importance of diffusion of innovations in the military domain, and other purposeful definitions in its field.

1. Definitions of Diffusion of Innovations

There are numerous definitions for the diffusion of innovation theory. One of the most recognized researchers in this domain, Everett Rogers, developed the diffusion of innovations theory—he presented it in his seminal work "Diffusion of Innovations" that was first published in 1962, and re-published in several editions, with the last one being the 5th edition printed in 2003 (Rogers, 2003). In this book, Rogers introduces diffusion as a process which has the following four major characteristics:

> (1) an innovation (an idea, practice, or object that is perceived as new by an individual or other unit of adoption), (2) is communicated through certain channels (the means by which messages get from one individual to another), (3) over time (included as a variable is its strength, but the measurement of the time dimension can be criticized), (4) among the members of a social system (a set of interrelated units that are engaged in joint problem solving to accomplish a common goal).

Richerson, Mulder, and Vila (2001) provide an alternative definition of diffusion of innovations theory in their book *Principles of Human Ecology*. In that work they give the following characterization, “the Diffusion of Innovation concept usually refers to the spread of ideas from one society to another or form a focus or institution within a society to other parts of that society.” They further define the diffusion of innovations as something being hard to invent, but which develops over a long period of time, and which may require special types of environments to make the first steps possible.

Each author defines the diffusion of innovations in respect to their research fields and for the specific purpose of their own research domain. These two definitions are similar in the fact that they both agree the diffusion of innovations start as an idea or practice that spread over time within a society. The only true difference between the two definitions is that Rogers explains each step in greater detail, where Richerson et al captures it at a higher level.

2. Origin and History of Diffusion of Innovations

Origins of Diffusion of Innovations work are not connected to more recent years and associated with the use of technology only. A very good review of the history of diffusion work was given by Everett Rogers in his book “Diffusion of Innovations.” Rogers’ research resulted with the understanding that research on diffusion of innovations theory originated in 19th Century European studies of cultural change. This review lists David Emile Durkheim (1858–1917) as an author who studied suicide epidemics; French sociologist, Gabriel Tarde (1843–1904) studied imitation; German sociologists, George Simmel (1858–1918) focused on social individuality and fragmentation; and the

British and German-Austrian anthropologists, Friedrich Ratzel (1844–1904) focused on the "living space"—human groups to the spatial units where they develop, and Leo Frobenius (1873–1938) who advocated the ideas of cultural diffusion. Later in the 1930s, H. Earl Pemberton utilized the concepts of diffusion (spread of ideas and diffusion adoption rates) and provided the first examples of institutional diffusion: postage stamps and standardized school ethic codes (Pemberton, 1936). Finally, in 1962, Rogers (1931–2004) introduced the first use of the term "Diffusion of Innovations", "summarized diffusion research findings (over 508) to date, organized around a general diffusion model, and argued for more standardized ways of adopter categorization and for conceptualizing the diffusion process" (Rogers, 2003). Rogers also stated that the diffusion of innovations was the most researched of all behavioral sciences, and that it has involved the utmost effort by the greatest number of researchers in more disciplines and nations around the world. (The years of birth and death for each scientist were derived from Wikipedia and cross checked with other academic sources.)

3. The Importance of Diffusion of Innovations in the Military Domain

So, why is the diffusion of innovations so important to understand in our society and the military domain? As new innovations are developed and introduced to the military domain, there is a multitude of processes that need to be reviewed, understood, and agreed upon (e.g., acquisition, employment of innovation to users, initial training packages, support infrastructure, maintenance support, etc.) by the entire community. These processes can impact large numbers of individuals or groups within the organization, making this effort inevitably a group or social process. Rogers also states that "the diffusion of innovations explains social change, one of the most fundamental of human processes. These social changes and problems facing the world will affect the diffusion of innovations (e.g., the Internet (technology), AIDS epidemic, and world terrorism)" (Rogers, 2003). Given this understanding, it will be important for the military domain to have a complete understanding of the process and changes that may follow.

It is important that military personnel understand the issues that can arise throughout the entire diffusion of innovations process. The military is built upon organizations, units, and teams and it is extremely important that they are all capable of successfully adopting the technological innovations as they have to train, work, and fight together with an ultimate goal of achieving the level of unit performance desired for mission success. It is also important that the entire organization is able to see and experience the return on investment (ROI) derived from innovation technologies after they are introduced in their training environments, as it is the ultimate test of both the financial investment made and the valuable time and resources the domain users pull together to prepare for future battles or conflicts.

4. Other Definitions of Relevance

This section introduces several other definitions that are important for this chapter; they are all derived from

Rogers' book (Rogers, 2003). The terms we deem important to get familiar with are: adoption, rejection, communication, and technology. In Rogers' work, a*doption* is defined as a decision to make full use of an innovation as the best course of action available*; rejection* is a decision not to adopt an innovation*;* and *communication* is the process in which participants create and share information with one another in order to reach a mutual understanding. The work defines *technology* as a design for instrumental action in achieving a desired outcome, and usually consists of two components: (1) a hardware aspect, consisting of the tool that embodies the technology as a material or physical object, and (2) a software aspect, consisting of the information base for the tool.

B. ISSUES IDENTIFIED WITH ADOPTION AND DIFFUSION OF NOVEL TECHNICAL SOLUTIONS

This section focuses on some technological innovations and the issues that have occurred throughout the 20th and 21st Centuries. Some of these issues will be captured in key focus areas that pertain to this research: (1) use during working hours versus free time hours, (2) roles and responsibilities in the diffusion process, and (3) adoption by an entire group versus adoption by an individual.

1. Novel Technical Solutions throughout History

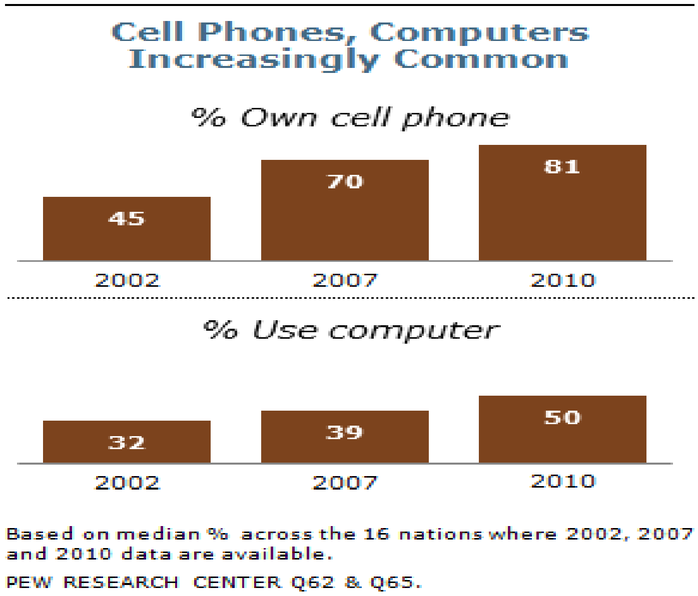
Over the past century different types of technology have been introduced into numerous societies and industries, such as farming, computer software/hardware, medical, transportation, education, engineering, biology, space, military, etc. The airplane, automobile, radio, computer, Internet, satellite, e-mail, social networking, and cellular/smart phone are some notable examples of technological innovations that were successfully adopted over time by a number of societies and industries throughout the world. Because the focus of our research is on computer supported training simulations, this section reviews the adoption of technologies most closely related to the domain of our focus, such as the Internet, computers, e-mail, and cellular phones.

A good example to start with is the innovation and diffusion of the Internet. The most significant element of the Internet communication system was developed in the early 1980s (Internet Protocol Suite; Transmission Control Protocol / Internet Protocol (TCP/IP)). In his book (Rogers, 2003), Rogers lists that by 1995 there were 20 million computers connected through billions of network paths. The same work finds that in early 2002, there were an estimated 544 million users (9% of the world's population), which is probably one of the fastest rates of adoption of any technology in the history of humankind. According to a report published on 30 June 2012 by the Internet World Stats, the estimated number of Internet users around the world was 2.4 billion (Miniwatts Marketing Group, 2013), which is an increase of over 1.85 billion users over a ten year period.

Another great and powerful example is diffusion and adoption of a cellular phone. This device was first offered to American consumers in 1983, and after 10 years, there were 1.1 billion worldwide (Rogers, 2003). In this work it has been commented that the first U.S. adopters of cellular phones were businessmen; however, after the price and size of the phones decreased and the service improved, the adoption of these devices spread throughout the world. As a result, cellular phones drastically changed the way individuals and organizations conducted business in work and home environments—users were no longer tied to their desks or homes for communicating. Cellular phones also allowed users to perform work activities while they were travelling in their vehicles, on a train, or at any other location where the cellular phone received service, ultimately causing numerous changes in the users' behavior.

A fairly recent study conducted by Pew Research Center titled 'Computer and Cell Phone Usage Up Around the World' was released on December 15, 2010, and its primary areas of study were on the usages of social networking, the Internet, computers, e-mail, and cellular phones across 22 different countries (Pew Research Center, 2010). It was reported that cellular phone ownership and computer usage had drastically increased since 2002. Table 1 shows the median percentages of cellular phone ownership and computer usage from 2002, 2007, and 2010.

Table 1. Cell Phone Usage and Computer Ownership for 16 countries between 2002, 2007, and 2010 (From Pew Research Center, 2010)



Cell Phone Ownership Trends

	% Saying they own a cell phone			*Pct point change*	
	2002	**2007**	**2010**	***02-10***	***07-10***
	%	%	%		
Jordan	35	57	94	*+59*	*+37*
Kenya	9	33	65	*+56*	*+32*
China	50	67	90	*+40*	*+23*
Indonesia	8	27	46	*+38*	*+19*
Russia	8	65	82	*+74*	*+17*
Argentina	28	63	77	*+49*	*+14*

Only the six countries with double-digit increases in cell phone ownership between 2007 and 2010 shown.

PEW RESEARCH CENTER Q65.

From 2002 to 2010, the adoption of cellular phone ownership increased by 36%, and the adoption of computer usage increased by 18%. Table 1 also reveals the six countries (Jordan, Kenya, China, Indonesia, Russia, and Argentina) that had enormous increases (double digits) in cellular phone ownership trends. The study concluded that as more and more people owned cellular phones and used computers, their uses of the Internet and e-mail also increased. Figure 3 shows the 2007 to 2010 comparison of Internet and e-mail usage. The adoption of Internet usage

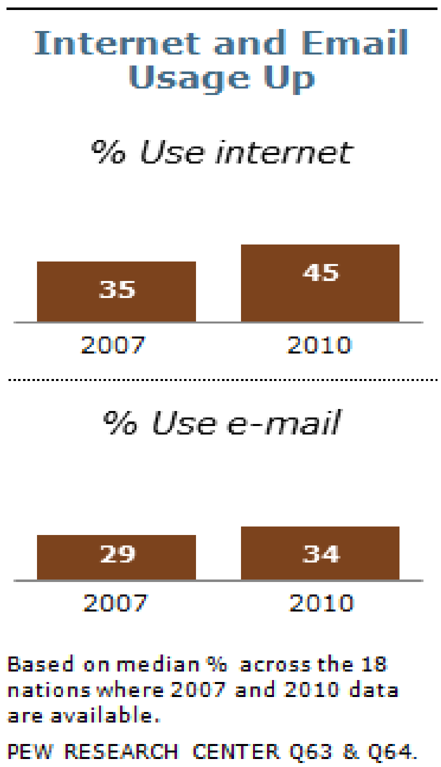


Figure 3. Internet and e-mail usage comparisons across 18 countries (From Pew Research Center, 2010)

increased by 10%, and the adoption of e-mail usage increased by 5%. The final outcome of the surveys showed that the adoptions of these technologies were more common in the younger (ages less than 30) and the better educated (college education) populations.

Over time, each and every one of these innovations were successfully adopted by civilian and military domains; however, it still remains to be investigated what were the issues these organizations had to deal with throughout the diffusion and adoption process.

2. Major Focus Areas

There are many aspects that can be discussed in connection with the adoption of technological innovations. We concentrate on three key focus areas that pertain to our research interest and research domain: (1) working hours versus free time hours, (2) roles and responsibilities in diffusion process, and (3) adoption by an entire group versus adoption by an individual.

a. Working Hours Versus Free Time

Knowing that the military members, especially younger generations, have been growing up in fairly sophisticated contemporary environments, where game-based systems and advanced technology solutions were the norm in their free time, one can imagine the level of overall expectations they may have from their work training environments.

Adoption of a technology innovation at work can be completely different than adopting the same type of technology during off-duty or free time. When comparing these two factors, there are completely different freedoms, environments, duties, and risks that are taken while working with these technological innovations. For example, individual users have different concerns and different criteria regarding the adoption of solutions in their free time as opposed to working hours. Working hours assume a bigger level of responsibility for their performance, which is why the adoption of technology will be carefully scrutinized if adopters' performance depends heavily on technology they decided to use (or not use). The level of risk is therefore treated differently when comparing these factors in two dissimilar environments.

While conducting our research, we did not find many studies that directly compared the adoption of technology within a work environment as opposed to adoption of technology used in off duty or free time hours. However, we did find individual studies that capture some of the issues that organizations and individuals have to manage throughout the introduction of new technology during work time and, separately, during free time. One article in this area of research, titled "Workforce Attitude on Technology Adoption and Diffusion," was conducted by Mohammad Abukhzam and Dr. Angela Lee at the University of Salford, United Kingdom (Abukhzam, Lee, 2010). The primary focus of their work was to gain an understanding on why the workforce adopts or rejects new technologies in the workplace. Their study suggested that the workforce's primary reasons for approving the adoption of a new technology in their work environment was if the new technology decreased the overall work time or work processes, and/or if it did not impact their current job positions. In other words, the workforce's primary reason for disapproving the adoption of a new technology in their work environment was if the new technology was perceived as a threat to their future jobs.

Another example of the introduction and use of technological innovations and their issues within an organization in the education domain was captured by Kotrlik & Redmann (2009) in their technical journal titled, “Technology Adoption for Use in Instruction by Secondary Technology Education Teachers”. This work provided an example of the successful adoption of technological innovations within the Saugus Union of California school system in 2006. At that time, the school had successfully integrated Personal Digital Assistants (PDA) and interactive whiteboards, podcast lessons reviews via students’ MPEG-1 or MPEG-2 Audio layer III (MP3) players, and broadcasts streamed via the Internet. This meant that the teachers as a group and the students as a classroom and/or as individuals had successfully adopted technological innovations within their work environments at school and/or at home. The authors emphasized that the primary reason for the success of this effort was work of IT specialists who continued to provide quality instruction to the teachers, but it can also be suggested that the teachers passed along this knowledge to their students via Train-the-Trainer (TtT) types of instruction. The work pointed out that “Unfortunately, this is not the norm. Not all school systems are operating with this innovative use of technology even though 99% of full-time teachers had access to computers or the Internet somewhere in their schools by 1999” (Kotrlik & Redmann, 2009). This example can be directly applied to the military domain and the experience we witnessed first-hand; much like in a diverse school system, the military community has units that are very successful at promoting and utilizing innovative technologies, such as computer-supported training simulations, within their training regimes; however, there are also segments of military organizations that shy away from the uses of technology and fail to adopt them into their training plans and exercises. The study conducted and reported in this work also attempted to collect the evidence to test this experiential understanding on the level of one military base.

Kortrlik and Redmann’s work also illustrated some of the issues that can be related to technology adoption among teachers. The first issues were technology adoption barriers, meaning teachers did not utilize the technology to its fullest potential due to the following obstacles: (1) lack of support from the organization’s leadership, (2) lack of training and experience, (3) personality or attitudinal reasons, (4) lack of self-confidence in the technology, and (5) lack of resources. The second issue was due to technology anxiety, where the teachers were provided with the technology, but were not provided with any training. The third issue was due to an inappropriate training package or the lack of availability of the technology. The last issue was due to the overall age and teaching experience of the teacher, where the older and less experienced the teacher, the less likely they were to adopt and use the technology. This list of issues and/or trends is just a sample of what impacts the adoption of technology in a complex system like education.

The trends of technology adoption will be covered in greater detail in Chapter IV.

b. Roles and Responsibilities in the Diffusion Process

There are several different roles and responsibilities that need to be established in order to ease the difficulties that can arise throughout the diffusion process. The roles and responsibilities that will be captured for this thesis are derived from Rogers (2003); (1) opinion leaders, (2) change agents, and (3) change agent aides. Due to the focus of military hierarchies and the responsibilities within that structure, we are also adding (4) top-level leaders. *Top-level leaders* are defined as senior leaders within an organization who make critical, important, and final decisions that can deeply influence or severely impact the entire organization as a whole. Rogers (2003) defines *opinion leadership* as "the degree to which an individual is able to influence other individual's attitudes or overt behavior informally in a desired way with relative frequency." In his work, he stresses that this informal type of leadership is not a direct reflection of the individual's position or rank in the organization, but is achieved and preserved by the individual's technical proficiency, social approachability, and adaptability to the system's standards. Opinion leaders exert their influence in persuading others within the organization to adopt innovations, and in our case, technological innovations. In his work, Rogers defines *change agent* as "an individual who influences clients' innovation-decisions in a direction deemed desirable by a change agency." He says change agents usually have university degrees in a technical field, seek to obtain the adoption of innovations, interact a great deal with end-users and adopters (usually a lot more with innovators and early adopters), diagnose problems within the diffusion process, and prevent the termination of adoption. Rogers defines change agent aides as "a less than fully professional change agent who intensively contacts clients to influence their innovation-decisions." Aides usually have a lower level of technical expertise than change agents, but their strength is in their personal contact and relationship building efforts with the lower ranking members within an organization. These two forms of leaders, change agents and change agent aides, exist within the military domain. The change agents, in terms of computer-supported training simulations, are the Modeling and Simulation (M&S) professionals, and their change agent aides could be understood to be individuals that the change agent recruits within each unit to assist with the technology diffusion process. As an example, the best suited change agents for the M&S field within the DoD, are those military members that have received a degree in the M&S or related fields.

For the innovations of technology adoption to be successful within an organization, especially in the military domain, leadership will be required to play an important role as they are the ones that make the final decisions. When military leaders make decisions about any issue, including the use of technology by their units, they want to be sure they are making the right training choices for their units—it is their responsibility to ensure they are always mission ready. It is possible that some leaders were trained utilizing only live exercises, and it is conceivable that they might have doubts about adopting new technology innovations into their training environments. Other leaders might have a technical background or have experience with using computer-supported training simulations, and their views regarding the adoption of new technology may be different—they may better understand the value and overall benefits the technology can bring to their training environments. Individuals in leadership positions will inevitably need to understand the overall strengths and weaknesses of technical innovations that they consider adopting, as they will be required to make the ultimate decision of its implementation, use, and acceptance within their unit. Leadership also needs to be involved with the culture change that will need to occur within its organization's processes as it will impact its workforce (e.g., new curriculums, labs, teaching styles, learning curves and overall time and planning efforts required, etc.).

There are several types of references that mention different forms of leadership as being a key element in the decision of adopting a technological innovation. One study found that was particularly interesting was conducted by Jogiyanto Hartono (2012) titled "Adoption of Information Technology on Small Businesses: The Role of Environment, Organizational and Leader Determinant". The author focused on leader, organizational, and environmental determinant roles in IT adoption, and concentrated on the small business environment, which would be very similar to a company or platoon sized unit within the military. He pointed out that the smaller organizations were not as influential as the larger organizations were, but "its leaders play a major role in the survival of the business" (Hartono, 2012). The work states that at a smaller level, the leader has a more personal working relationship with the workforce and is deeply involved with the business processes of the organization. Within the leader determinant, he focuses on leader innovativeness and leader IT knowledge, and concludes that it is very important to have a knowledgeable IT leader as the business progresses through the diffusion process of adopting technology within its working environment. When we make a parallel with the military domain, we know that at the company and platoon levels there are several IT leaders who plan, install, operate, and maintain technology systems. These IT leaders are also change agents within their communities, and can be leaned upon to serve as change agent aides in support of the M&S related activities.

c. Adoption of an Entire Group Versus an Individual

The adoption of a technology innovation in any environment can be challenging; however, it can be much easier to influence an individual or a small group rather than an entire organization. When adopting new technological innovations within an organization, new internal and external processes have to be reviewed, tested, and documented by its leadership and workforce. It is very much certain that some stages within that process could be very difficult to execute, especially if there is extreme resistance of the new technology by individuals or groups within the organization.

During our research, we did not find studies that specifically compared the adoption of technology by an entire group versus an individual; however, we found several studies that were focused on the adoption of technology within groups of public schools or specifically amongst individuals within certain age groups.

An early example where the adoption of technology for an entire group and individuals (teachers and students) was considered successful was during a 1993 study known as the Peakview project. It was conducted at the Colorado's Peakview Elementary School by Brent Wilson, a professor at the University of Colorado at Denver (Wilson, Sherry, Dobrovolny, Batty, and Ryder, 2001). The school introduced students to computers and software instead of textbooks, and from there they used these tools and were able to successfully integrate technology into a newly created curriculum (Wilson, et al., 2001). Wilson stated the primary reasons for this success were supportive leadership, a full-time IT coordinator, plenty of technology resources, and extensive teacher training (Wilson et al., 2001).

A similar study in the education domain was conducted by Bussey, Dormody, and VanLeeuwen (2000) titled "Some Factors Predicting the Adoption of Technology Education in New Mexico Public Schools". This work briefly summarizes the initial transition, and the reasons for the slow rate of technology adoption in New Mexico public schools from industrial arts to technology education. A powerful statement that was introduced in this work was related to the overall effects that adoption of the innovation had, "With this came a change in focus from learning 'hands-on' skills to understanding technological systems and their impact on society" (Bussey et al., 2000). This is true for the majority of organizations in numerous domains that have had to transition from an older style of conducting business or teaching to a newer style revolving around the introduction of innovative technologies.

Computer-supported training simulations are a perfect example of tools that may enable such a transition in learning MOS and other job related skills in the military domain. This work also suggests that leaders in the education field feel that learning with technological tools is an innovation that needs to be spread throughout the current educational environment. This is also highly relevant for the military domain as the need of conducting training exercises with computer-supported simulations is increasing as budgets decrease; given the technology advances over time those solutions become a viable option in military training. Another significant topic suggested in this work was related to the importance of continuously training teachers on innovative technologies throughout the diffusion and technology transition processes. This is true in today's educational and training environments—the need for such continuous effort by all organizations is even more pronounced given the constant advances in the technology domain and a need to introduce innovations that will be adopted by the new workforce.

d. Section Summary

This section explored and discussed the three key focus areas that pertain to our research interest and research domain: (1) working hours versus free time hours, (2) roles and responsibilities in the diffusion process, and (3) adoption by an entire group versus adoption by an individual. Several aspects in connection with the adoption of technological innovations were also commented. A key reason that can be contributed to the adoption or rejection of technology in reference to these focus areas and aspects can be related to user’s attitudes.

C. USER’S ATTITUDES TOWARD THE ADOPTION OF TECHNICAL SOLUTONS

This section focuses on the key influential factors that affect user’s attitude towards adopting a new technological innovation.

In his work, Evert Rogers (Rogers, 2003) defines attitude as a “relatively enduring organization of an individual’s beliefs about an object that predisposes his or her actions.” Ajzen (1988) defines attitude as “a complex conundrum of feelings, desires and fears that create a state of readiness to act within a person.” Fishbein and Ajzen (1975) define attitude as “a learned predisposition to respond in a consistently favourable or unfavourable manner with respect to a given object.”

According to Rogers (2003), Davis et al. (1989), Yang and Yoo (2003), and Kim, Chun, Song, (2009), user attitude is the key determinant of technology adoption. Attitude is influential and can affect the adoption of numerous types of technology, such as the Internet, cellular phones, e-mail, computers, computer-supported training simulations, etc., in several different civilian and military domains. There are also a number of factors that can affect a person’s attitude towards adopting technology. According to Abukhzam and Lee (2010), the following factors can affect the decision of a user to adopt new technologies: absence of user involvement, lack of an understanding, technical difficulties, lack of training, insufficient support from top management, perceived complexity, and not compatible with the values, beliefs, and past experiences of their social system. They also stated that these factors can have the same negative effects on user's attitude toward adopting new technologies. Some other important factors that have been reported as affecting user's attitude towards the adoption of technological innovations were:

1. Innovation characteristics

- perceived ease of use (PEU) and perceived usefulness (PU)) (Yang & Yoo, 2003; Abukhzam & Lee, 2010; and Phua, Wong, Abu, 2012)
- compatibility (Abukhzam & Lee, 2010)
- reliability (Abukhzam & Lee, 2010; Kim, Chun, Song, 2009)
- security (Abukhzam & Lee, 2010)

2. Organizational and managerial characteristics

- leadership characteristics (Abukhzam & Lee, 2010)
- fear of loss of autonomy (Abukhzam & Lee, 2010)
- fear of security breach (Abukhzam & Lee, 2010)

3. Facilitating conditions

- availability of government support and availability of top management support) (Abukhzam & Lee, 2010)

Many authors have developed or utilized technology adoption and/or diffusion models or theories (frameworks) with a goal to evaluate user's attitudes and/or acceptance toward technology adoption (e.g., Rogers, 2003; Ajzen and Fishbein, 1975; Kim et al., 2009; Abukhzam & Lee, 2010; Phua et al., 2012). Some of these technology adoption frameworks are briefly summarized in the next section.

D. TECHNOLOGY ADOPTION FRAMEWORKS

Although developing a novel technology adoption framework in the military domain is listed as future work (this thesis will not attempt to develop an adoption framework), it is important to briefly explain the intent behind such efforts and introduce the ideas and concepts proposed in that type of work.

Venkatesh (2003) explains that technology adoption models are used to describe user acceptance of and intention to use new technology; such investigations have origins in areas such as information systems, psychology, and sociology. Venkatesh compares eight technology adoption models (Theory of Reasoned Action (TRA), Technology Acceptance Model (TAM), Motivational Model (MM), Theory of Planned Behavior (TPB), Combined TAM and TPB (C-TAM-TPB), Model of PC Utilization (MPCU), Innovation Diffusion Theory (IDT), and Social Cognitive Theory (SCT)). The work provides several highly valuable classifications: (1) models and theories of individual acceptance (here he introduces the model or theory, its core constructs, and the definitions of each construct), (2) role of moderators in existing models (summary of eight models in reference to experience, voluntariness, gender, and age), and (3) a review of prior model comparisons. For full details and a better understanding on all classifications presented in this work, it is highly recommended that this paper be read.

Several other frameworks have been developed over the years, such as the Concerns-Based Adoption Model (CBAM) and Universal Technology Adoption and Use Theory (UTAUT). In his work, Straub (2009) mentions CBAM and UTAUT and suggest that they have been used to understand changes and specific questions about technology in the computer science and education domains.

Among all models mentioned so far, the two models most relevant to our research domain are reviewed in greater detail: Innovation Diffusion Theory (IDT) and the Technology Acceptance Model (TAM).

Rogers built and introduced the Innovation Diffusion Theory (IDT) in the first edition of his book, *Diffusion of Innovations,* in 1962. The IDT provides this research domain with a general understanding of adoption and diffusion theory. Scientists who worked in many different domains referenced and utilized this theory when their goal was to understand and forecast social change. A detailed description of IDT will be covered in Chapter IV.

The TAM was introduced in 1986 by Fred P. Davis (Davis, Bagozzi, & Warshaw, 1989), and within this work, they define Perceived Usefulness (PU) as "the prospective user's subjective probability that using a specific application system will increase his or her job performance within an organizational context," and define Perceived Ease of Use (PEU) as "the degree to which the prospective user expects the target system to be free of effort." Figure 4 displays the TAM.

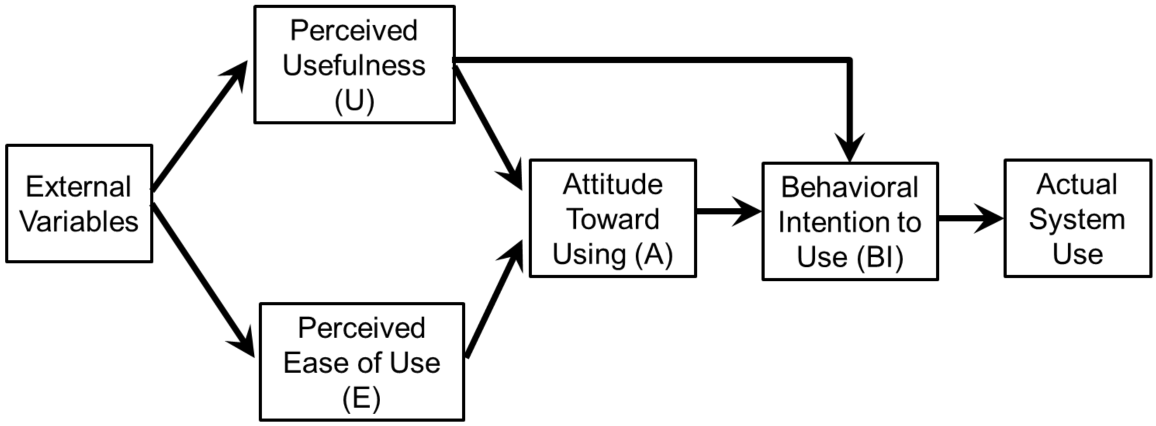


Figure 4. Technology Acceptance Model (Figure reproduced from Davis et al. (1989))

Davis et al. (1989) state the TAM computer usage is

> jointly determined by the user's attitude toward using a system (A) and perceived usefulness (U); BI = A + U. Subjective Norm was not included in TAM, but was later introduced in TAM2. Subjective Norm is defined as a person's perception that most people who are important to him think he should or should not perform the behavior in question. (Fishbein and Ajzen, 1975)

Technology adoption frameworks have evolved over time and seek out information in numerous domains throughout the world. As Venkatesh and Davis (2000) eloquently state, "Understanding and creating the conditions under which information systems will be embraced by the human organization remains a high-priority research issue." This is the reason why future studies focused on M&S and the military domain should be conducted—the community needs to understand and own the process if it desires to instrument and derive domain-wide benefits from the same technologies.

E. SERVICE AND GENERAL POPULATION DATA SETS

The goal of this research was to conduct a thorough search and compare the usages of several key technological innovations throughout the military and civilian domain. The primary focus areas commented in this sections are: (1) type of technology used (e.g., cellphones, smartphones, tablets, game consoles, etc.), (2) type of Internet connection used (e.g., broadband services at home, through a smartphone, etc.), (3) the purposes of adopted technology (e.g., access Internet, play games, social media, e-mail, etc.), and (4) the frequency with which the technology is used over a certain timeframe.

1. Service Data Sets

An intensive search was conducted in order to gather usage data from past surveys or studies on any form of technology utilized within any DoD service. It is apparent that the DoD uses technologies, such as the Internet, computers, cell phones, networks, satellites, etc.; and that investments in this domain were considerable and executed by many levels of the DoD community. To the best of our knowledge the information provided in this thesis illustrates that investment.

The next area of interest that this research wanted to capture was the annual investment the DoD devotes to the M&S efforts in support of its mission. The significance of this type of technology was mentioned in Chapter I; however, the details regarding the types of funds and their purposes were not discussed. Per the 2008 M&S Congressional Report, which covers FY 2006–2008, the following disclaimer is mentioned:

DISCLAIMER: The data reflected within Part II identifies planned Department of Defense (DoD) Research, Development, Test, and Evaluation (RDT&E) expenditures for modeling and simulation (M&S) as reflected in the 'Department of Defense Fiscal Year 2008 Budget Request.' RDT&E budget accounts provide the only reliable source for identifying M&S activity and associated funding, as procurement and O&M have embedded M&S funding — that is, M&S activity supported in these two budget categories are embedded in larger funding streams and are not readily severable. (Citizen, 2008)

In respect to this disclaimer, the M&S RDT&E efforts for the DoD for FY 2006-2010 are reflected in Table 2.

Table 2. DoD RDT&E associated funding (FY 2006-2010) (From Citizen, 2008, 2009, 2010)

Fiscal Year (FY)	**Associated Funding**	**Difference (+/-)**
2006	**$1,529,190,000**	**N/A**
2007	**$1,811,855,000**	**+ $282,665,000**
2008	**$1,611,186,000**	**- $200,669,000**
2009	**$2,191,903,549**	**+ $580,717,549**
2010	**$2,200,000,000**	**+ $8,096,451**

Table 2 shows a grand total of $9.3B invested over the past five FYs, and an average of $167M increase over the past 4 years. Of note, FY 2008 was the only FY to have a decrease in spending, FY 2009 had the largest increase of about $580M, and FY2010 showed a slight change compared to FY 2009.

Our major case study was conducted in MCAGCC Twentynine Palms, CA; it is beneficial to present the initial Life Cycle Cost estimates for the DVTE — those are summarized in Table 3. The following terms will assist with reading the table: Procurement, Marine Corps (PMC); Procurement of Ammunition, Navy and Marine Corps (PANMC), Operation and Maintenance (O&M).

Table 3. DVTE Life Cycle Cost estimates (From USMC(TECOM), 2004)

AMOUNTS (Millions)		
Type of Cost	**Threshold**	**Objective**
RDT&E	**$4.5**	**$0.0**
PMC	**$6.9**	**$5.0**
PANMC	**$0.0**	**$0.0**
O&M	**$12.0**	**$8.0**
TOTALS	**$23.4**	**$13.0**

2. General Population Data Sets

The primary reference utilized throughout this section was the Pew Research Center. The Pew Research Center is a "nonpartisan fact tank that informs the public about the issues, attitudes and trends shaping America and the world." The Center collects data through public opinion polling, demographic research, media content analysis, including other forms of empirical social science research. It is highly regarded and frequently referenced by numerous professionals in different domains.

According to Pew Research Center (2010b), “66% of American adults (ages 18 and older) have a broadband connection, little changed from the 63% who did so in 2009.” Table 4 displays this information and divides the data into Gender, Age, and Race/Ethnicity.

Table 4. Broadband adoption trends, 2009-2010 (From Pew Research Center, 2010b)

Broadband adoption trends within demographic groups, 2009-2010

% of all adults with broadband at home, 2009-2010

	2009	2010	Percentage point change, 2009-2010	Percent change, 2009-2010
All adults	63%	66%	3	5%
Gender				
Male	64	66	2	3%
Female	63	65	2	3%
Age				
18-29	77	80	3	4%
30-49	72	75	3	4%
50-64	61	63	2	3%
65+	30	31	1	3%
Race/Ethnicity				
White (non-Hispanic)	65	67	2	3%
Black (non-Hispanic)	46	56	10	22%
Hispanic (English-speaking)	68	66	-2	-3%

Source: Pew Research Center's Internet & American Life Project, April 29-May 30, 2010 Tracking Survey. N=2,252 adults 18 and older.

According to Pew Research Center (2013), “approximately 70% of American adults have a high-speed broadband connection at home,” and of that group, 80% have either a high-speed broadband connection, own a smartphone, or both (46% have both, 24% have a high-speed broadband connection, but no smartphone, and 10% have a smartphone, but no high-speed broadband connection); see Table 5 for more details. This is an increase of 7% compared to 2009, and an increase of only 4% compared to 2010. This work also states that 80% of young adults (ages 18–29) have a home broadband connection at home, and an estimated 56% of American adults own a smartphone.

Table 5. Broadband and Smartphone Adoption (From Pew Research Center, 2013)

Broadband and smartphone adoption

Among all American adults ages 18 and older, the % in each group who...

		Have broadband at home	Have home broadband or smartphone	Difference
All adults		**70%**	**80%**	**+10**
a	Men (n=1029)	71	81	+10
b	Women (n=1223)	69	78	+9
Race/ethnicity				
a	White, Non-Hispanic (n=1571)	74[bc]	80	+6
b	Black, Non-Hispanic (n=252)	64[c]	79	+15
c	Hispanic (n=249)	53	75	+22
Age				
a	18-29 (n=404)	80[cd]	95[bcd]	+15
b	30-49 (n=577)	78[cd]	89[cd]	+11
c	50-64 (n=641)	69[d]	77[d]	+8
d	65+ (n=570)	43	46	+3
Education attainment				
a	No high school diploma (n=168)	37	52	+15
b	High school grad (n=630)	57[a]	70[a]	+13
c	Some College (n=588)	78[ab]	87[ab]	+9
d	College + (n=834)	89[abc]	93[abc]	+4
Household income				
a	Less than $30,000/yr (n=580)	54	67	+13
b	$30,000-$49,999 (n=374)	70[a]	79[b]	+9
c	$50,000-$74,999 (n=298)	84[ab]	91[ab]	+7
d	$75,000+ (n=582)	88[ab]	95[ab]	+7
Urbanity				
a	Urban (n=763)	70[c]	80[c]	+10
b	Suburban (n=1037)	73[c]	83[c]	+10
c	Rural (n=450)	62	70	+8

Source: Pew Research Center's Internet & American Life Project Spring Tracking Survey, April 17 – May 19, 2013. N=2,252 adults ages 18+. Interviews were conducted in English and Spanish and on landline and cell phones. The margin of error for results based on all adults is +/- 2.3 percentage points.

Note: Percentages marked with a superscript letter (e.g., [a]) indicate a statistically significant difference between that row and the row designated by that superscript letter, among categories of each demographic characteristic (e.g. age).

According to Pew Research Center (2012), approximately, "88% of U.S. adults own a cell phone of some kind as of April 2012, and more than half of these cell owners (55%) use their phone to go online."; see Figure 5 for 2009-2012 comparisons.

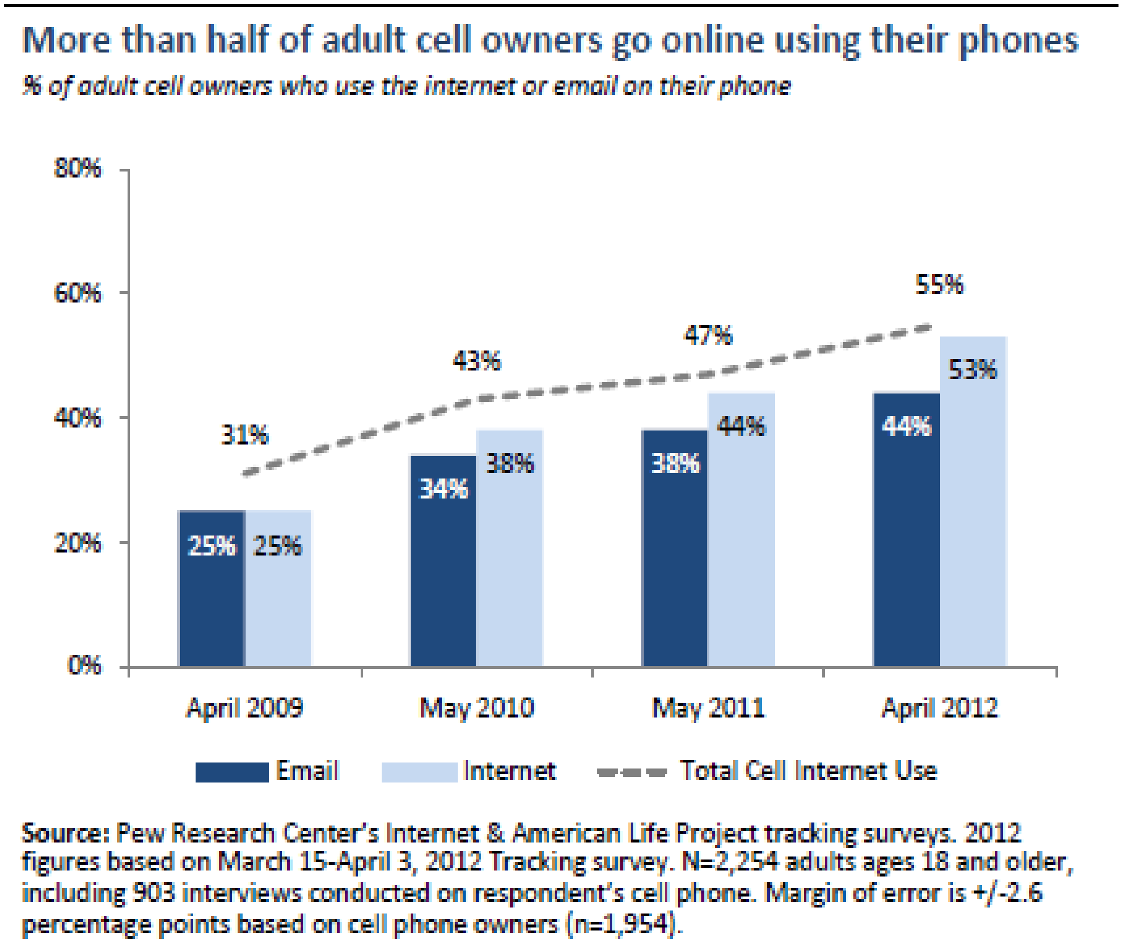


Figure 5. Cell phone owners and Internet use (From Pew Research Center, 2012)

Interestingly, this work reports that 31% of the individuals that own cell phones use it to go online versus using another type of technology (e.g., laptop, desktop, or tablet); see Table 6 for more details.

Table 6. Percentage of cell phone Internet users and device online access comparisons (From Pew Research Center, 2012)

The size of the cell-mostly internet population

Based on U.S. adults within each group

	% of cell internet users who...	% of all cell owners who...
Go online *mostly* on cell phone	31%	17%
Use internet on cell phone, but go online mostly using other device	60	33
Use both equally / It depends	9	5
Don't go online using cell phone	n/a	45

Source: Pew Research Center's Internet & American Life Project, March 15-April 3, 2012 Tracking survey. N=2,254 adults ages 18 and older, including 903 interviews conducted on respondent's cell phone. Margin of error is +/-3.7 percentage points based on those who use the internet or email on their cell phone (n=929).

This report also indicates that from 2009-2012, the 25-34 year old age group increased the most for using their smartphone to go online. In 2009, 43% of this group used their cell phone to go online, and in 2012, 80% of this group use their cell phone to go online; see Table 7 for more details.

Table 7. Cell phone owner Internet and e-mail usage from 2009–2102 (From Pew Research Center, 2012)

Changes in cell phone internet use by demographic, 2009-2012

% of cell owners within each group who use the internet or email on their cell phone

	April 2009	April 2012	Change
All cell owners	31%	55%	+24 percentage points
Gender			
Men	35	57	+22
Women	27	54	+28
Age			
18-24	45	75	+30
25-34	43	80	+37
35-44	38	68	+30
45-54	28	53	+25
55-64	17	30	+13
65+	7	16	+9
Race/Ethnicity			
White, non-Hispanic	27	52	+25
Black, non-Hispanic	44	64	+20
Hispanic	44	63	+19
Household Income			
Less than $30,000	26	50	+24
$30,000-$49,999	31	52	+21
$50,000-$74,999	29	60	+31
$75,000+	43	69	+26
Education Level			
Less than High School	28	45	+17
High School Grad	24	49	+25
Some College	35	57	+22
College+	36	64	+28
Geographic Location			
Urban	30	62	+32
Suburban	25	56	+31
Rural	17	44	+27

Source: Pew Research Center's Internet & American Life Project, March 15-April 3, 2012 Tracking survey. N=2,254 adults ages 18 and older, including 903 interviews conducted on respondent's cell phone. Margin of error is +/-2.6 percentage points based on cell phone owners (n=1,954). 2009 data based on March 26-April 19, 2009 tracking survey. N=2,253 adults ages 18 and older, including 561 interviews conducted on respondent's cell phone.

When it comes to Internet usage, the report states that it is highest among those cell phone owners with smartphone technology. One final review that this work provides is a summary of the technology usage and ownership of "All" adults, "Cell-mostly" Internet users, and "Cell-occasionally" Internet users. As shown in Table 8, the users who own cell phones and use it to go online occasionally have the highest rates of technology adoption for broadband ownership at home, desktops, laptops, tablets, and e-book readers.

Table 8. Cellphone Owners with online usage and technology ownership comparison (From Pew Research Center, 2012)

How the "cell-mostly" population compares when it comes to technology usage and ownership

% within each group who...

	All adults	"Cell-mostly" internet users	"Cell-occasionally" internet users
Own desktop computer	58%	48%	71%*
Own laptop computer	61	72	81*
Own tablet computer	18	26	32
Own e-book reader	18	20	27*
Have broadband at home	66	70	89*

Source: Pew Research Center's Internet & American Life Project, March 15-April 3, 2012 Tracking survey. N=2,254 adults ages 18 and older, including 903 interviews conducted on respondent's cell phone. Margin of error is +/-2.4 percentage points based on all adults, +/-7.6 percentage points based on cell-mostly users (n=228) and +/-4.6 percentage points based on cell-occasionally users (n=621). *Represents statistically significant differences between cell-occasionally and cell-mostly groups.

3. Session Summary

As shown, working hours versus free time, level of responsibility, and adoption by an entire group versus an individual have many challenges throughout the introduction and overall process of technology adoption in numerous domains. One common aspect of them all is people. People have different experiences and opinions, which leads to some form of attitude towards the technology being adopted. An explanation of several different types of data sets for the military and civilian domains were also introduced.

F. CHAPTER SUMMARY

Chapter II presented a review of research literature done in domain, including the general domain of diffusion of innovations, adoption of technical solutions, attitudes towards technical solutions and issues identified with the adoption of technical solutions. A set of service data found available in official documents available to the public, were presented as an illustration of the environment and situation in which the service has been at the time of our data collection. A set of data resources corresponding to the general population were also added for comparison.

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III. METHODOLOGY

A. INTRODUCTION

Chapter III details the elements of methodology — the steps and approaches used to conduct the research work in this domain. They were selected with a purpose of providing the best basis for addressing research questions established for this thesis, and ultimately accomplishing thesis research goals. The steps include the following set: define the goals and overall expectations of the research, conduct a literature review, identify trends that positively or negatively affect the diffusion of novel technical solutions, and conduct data collection efforts.

B. RESEARCH GOALS AND EXPECTATIONS

In the military training domain, technology is important, but it is not the only aspect used when providing successful training solutions. Complete training packages, train-the-trainer (TtT), instructor certifications, training environments, and other important factors need to be considered as well. The reason this is important is because all of these factors involve people and processes, which, we believe, can significantly impact the success of the large scale adoption of technological solutions within an organization.

In order to achieve the goals, global trends on "large scale" technology adoption will be researched and studied, and data related to current state of employment, dissemination, utilization, and adoption of computer-supported simulations will be collected in MCAGCC, Twentynine Palms, CA.

Much like with any other research effort, the expectation is that data collected in this study and their subsequent analysis will provide us with a firm basis for summarizing the main characteristics of the current situation in the research domain of our interest. It will also provide guidance and recommendations for future effective diffusion and large scale adoption of computer supported training systems in the military domain.

C. LITERATURE REVIEW

A detailed literature review will be conducted in order to investigate the most current and published work in the following areas: general domain of diffusion of innovations, issues identified with the adoption of technical solutions, and attitudes towards technical solutions. Inquiries on the most current service data sets will be requested in order to present an illustration of the environment and situation in which the service has been at the time of our data collection.

D. FACTORS THAT POSITIVELY AND NEGATIVELY AFFECT THE DIFFUSION PROCESS AND SUPPORTING DATA COLLECTION EFFORTS

There are many factors that can positively or negatively affect the diffusion process—this is why it is very important to understand what those factors are and how they influence the diffusion process in military domain.

In an effort to identify a superset of these factors throughout the military domain, various resources will be used as our starting point: (1) past studies and published papers, (2) a series of small investigative focus group discussions organized with Naval Postgraduate School (NPS) Master and doctoral students and service members of the U.S. Marine Corps and U.S. Army, and (3) telephone conversations and correspondence via e-mail with other M&S professionals from the Marine Corps, Army, and Navy. All these activities will be aimed at helping us identify a starting list of factors and issues that are needed to collect data on, and serve as the best guidance in informing the final data collection effort. The questions that will appear as a part of the survey will be created, tested, and implemented using an online survey tool known as LimeSurvey. Other questions more suitable for face-to-face live dialog will be created in order to support our data collection in face-to-face focus groups.

E. FINAL DATA COLLECTION EFFORTS

Service-wide data collection efforts would be the ideal choice for this type of research. Having a good understanding about all segments of service populations would be the best basis for well-funded service-wide conclusions. It has been estimated that the time needed for the effort of that scale could take more than what can be afforded for Master’s degree thesis work, so scoping down of the overall data collection effort will be necessary. MCAGCC was chosen as the site for our data collection efforts for the following reasons: (1) this USMC facility encompasses a diverse military training domain, (2) it houses a Battle Simulation Center (BSC) with numerous simulations and subject matter experts (SME) available to the units, and (3) it houses a number of active units that have a need to use simulations in their training environments. It is also believed that issues identified through data collected at MCAGCC are a good representation of the issues present in other Marine Corps bases, and therefore the results have a great level of applicability to other USMC military bases. Some conclusions that will be completed on a segment of data sets collected in this study are believed to have applicability to other DoD services.

For the purposes of capturing different military experiences, responsibilities and overall roles in the diffusion process, the data collection efforts (online surveys and focus groups) will be divided into four main groups: Base Leadership, Unit Leadership, Trainers, Trainees.

In order to prepare the data collection effort plan in MCAGCC, an initial visit to MCAGGCC will be coordinated and conducted. The final data collection plan using online surveys and focus groups will be conducted over a period of two weeks with a researcher being personally available to the participants in the survey.

F. DATA ANALYSIS

The data analysis will be completed in order to extract as much information as possible that was pertinent to this research.

For the purposes of capturing all information, the focus groups that will be conducted in MCAGCC, Twentynine Palms, CA will be video recorded. The videos will be watched and the important data will be captured and summarized.

The online survey data will be downloaded from LimeSurvey in all available forms so that the data can be categorized into qualitative and quantitative results. The data will be prepared for analysis and carefully formatted utilizing Microsoft Excel, and will be summarized and visualized utilizing Microsoft PowerPoint and Word. The data will be analyzed for the purposes of answering the research questions and goals using coding and themes, and will be summarized via written report in Chapter VIII.

G. SUMMARY

Chapter III summarized the methodology adopted for the research effort described in this thesis. This included all steps and approaches utilized to accomplish the research goals and answer the Thesis questions, as well as necessary rational on why certain approaches have been selected.

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IV. ADOPTION AND DIFFUSION OF INNOVATION

A. INTRODUCTION

This chapter provides a detailed understanding about the diffusion of innovations process and its main characteristics. These types of understandings and definitions form the main framework for data collected in the case study and are used as a lens through which the data were analyzed in the end.

B. DIFFUSION PROCESS AND ITS MAIN CHARACTERISTICS

This section reviews the diffusion process and its main characteristics as described by Rogers in his work titled *Diffusion of Innovations*.

1. Definition of Diffusion of Innovations

The definition of diffusion that will be applied and used throughout our work, is the one presented in Chapter II by Everett Rogers (2003). He defines it as "the process in which (1) an innovation (2) is communicated through certain channels (3) over time (4) among the members of a social system." In this work, he explains that diffusion is a "kind of social change, even more than a technical matter, and can be further defined as the process by which alteration occurs in the structure and function of a social system." For this research, the goal of a diffusion process is to understand *how* and *why* different groups of people adopt a new technology, *what* impacts their decisions to accept or reject the technology, and *how* these groups implement the new technology into their organizational processes. Figure 6 illustrates Roger's depiction of the diffusion process.

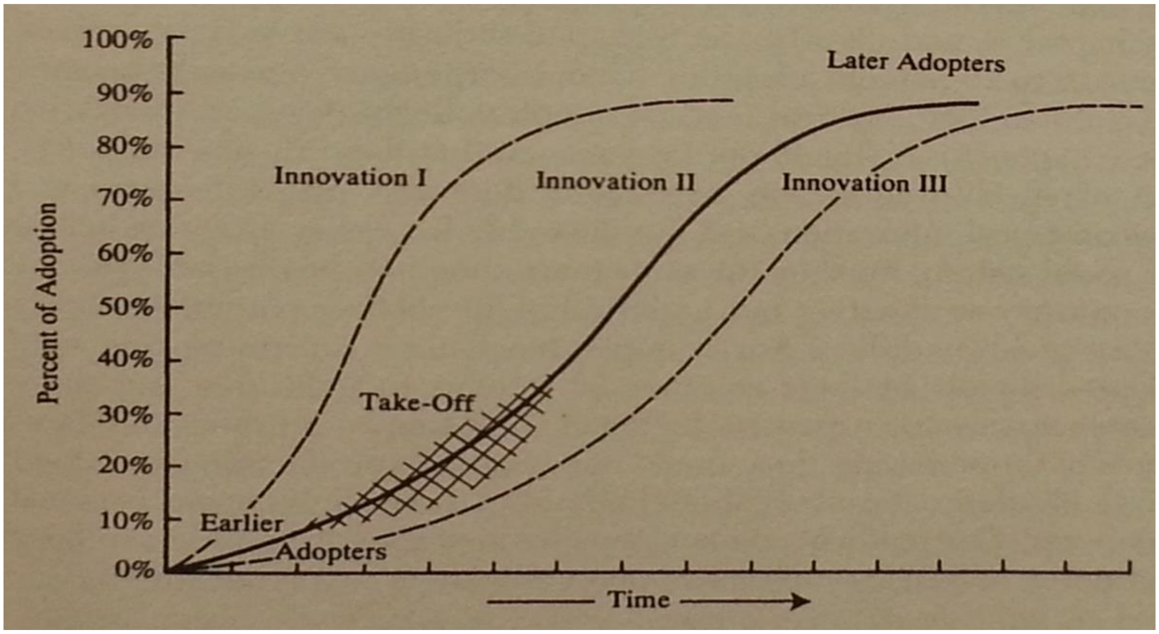


Figure 6. The diffusion process (From Rogers, 2003)

According to Rogers, this diffusion process can be recognized within every diffusion research project that has ever been conducted; accordingly, one could expect the diffusion of computer-supported training simulations in the military domain to have similar behaviors.

2. Innovation and Its Attributes

Innovation is the first element of the diffusion process and is defined by Rogers (2003) as "an idea practice, or object that is perceived as new by an individual or other unit of adoption." He also defines technology as

> a design for instrumental action in achieving a desired outcome, and usually consists of two

> components: (1) a hardware aspect, consisting of the tool that embodies the technology as a material or physical object, and (2) a software aspect, consisting of the information base for the tool. (Rogers, 2003)

As it happened in the past, new technological innovations will continue to be developed, introduced, and possibly integrated on a larger scale into the civilian and military education, training, and working environments for many generations to come. A current example of such an innovation is the Glass™ wearable computing device also known as Google Glass (Glass™ is a trademark of Google Inc.), which contains a processing unit within the eyewear frames, and a small see-through display that gets positioned in front of one of the observer's eyes.

Rogers characterizes innovations into five perceived attributes: relative advantage, compatibility, complexity, trialability, and observability.

Relative advantage is defined as "the degree to which an innovation is perceived as better than an idea it supersedes" (Rogers, 2003). He explains that financial, social stature, convenience, and satisfaction are all elements that can be measured in terms of relative advantage; however, the most important aspect is based upon the individual's perception of the innovation being helpful. Of importance, he further argues that "the greater the perceived relative advantage of an innovation, the more rapid its rate of adoption will be."

Compatibility is defined as "the degree to which an innovation is perceived as being consistent with the existing values, past experiences, and needs of potential adopters" (Rogers, 2003). As civilian and military domains are introduced to technological innovations, their work and training environmental cultures and processes will be challenged. If the innovation is not well-suited with their current practices, then the innovation is more likely to take longer to adopt or fail to get adopted altogether.

Complexity is defined as "the degree to which an innovation is perceived as difficult to understand and use" (Rogers, 2003). Examples of technological innovations that might be considered complex are computer networks, airplanes, firewalls, digital washing machines (numerous buttons and features), and applications focused on the needs of experts and specially trained workforce in any domain (e.g., Photoshop, flight simulators, command decks of submarines or nuclear power plants).

Trialability is defined as "the degree to which an innovation may be experimented with on a limited basis (Rogers, 2003). Rogers explains that an innovation that is offered as an experiment or a sample is often adopted more quickly than those innovations that do not offer trialability. He adds that the innovation that offers a trial in its introduction is perceived as having less uncertainty by the individual adopting the innovation, as it provides them with the opportunity to learn the technology before it is actually implemented within their social processes.

Observability is defined as "the degree to which the results of an innovation are visible to others" (Rogers, 2003). Individuals and groups want to see the end results (overall value and benefits) that it will provide to them and/or their organization within their working and/or training environments. If they are able to physically see this occur, then they will be more likely to adopt the innovation at a quicker rate. Rogers explains that this occurrence causes group discussions, which then helps spread the innovation's significance throughout a community.

When examining a global process of adopting an innovation, Rogers suggested that "innovations that are perceived by individuals as having greater relative advantage, compatibility, trialability, and observability and less complexity will be adopted more rapidly than other innovations."

3. Communication Channels

The second element of the diffusion process is *Communication Channels*. Communication was defined as "the process in which participants create and share information with one another in order to reach a mutual understanding" (Rogers, 2003). The communication channel is the link between people or organizations where the positive or negative information about the innovation is delivered. Rogers outlines three main forms of media channels; mass media, interpersonal media, and interactive media. Examples of mass media channels are e-mail, radio, television, newspapers, magazines, etc. Interpersonal media channels are face-to-face conversations as well as in person and telephone conversations. Rogers considers interactive media channels as those that occur via the Internet. Interestingly, Rogers claims that "the heart of the diffusion process consists of the modeling and imitation by potential adopters, where most people depend mainly upon a subjective evaluation of an innovation that is conveyed to them from other individuals like themselves who have already adopted the innovation.” Within an organization, some people might perceive this as peer pressure to adopt the innovation, where others might distinguish this type of decision as a way of being accepting into the social system.

4. Time and Innovative-Decision Process

The third element of the diffusion process is Time. Rogers (2003) states “the inclusion of time as a variable in diffusion research is one of its strengths, but the measurement of the time dimension can be criticized.” In this work, he specifies that time is involved throughout diffusion process, and he captures it in his discussion of five step innovation-decision process. The innovation-decision process consists of the following: (1) knowledge, (2) persuasion, (3) decision, (4) implementation, and (5) confirmation.

Knowledge occurs when an individual or group learns about the innovation and how it operates. *Persuasion* happens when the individual or group forms positive or negative attitudes regarding the innovation. *Decision* occurs when the individual or group utilizes the innovation and makes the final decision of adopting or rejecting the innovation. *Implementation* follows as the individual or group implements the innovation onto their social and work processes. *Confirmation* is the final stage where the individual or group seeks out guidance and support from others about the decision to use the innovation.

5. Social System

The fourth and final element of the diffusion process is the *Social System*. A social system is defined as "a set of interrelated units (individuals, informal groups, organizations, and/or subsystems) that are engaged in joint problem solving to accomplish a common goal" (Rogers, 2003). Rogers explains that the structure of the social system can have positive or negative effects on the diffusion of an innovation. Each organization will have a different social system revolving around its own values, beliefs, traditions, and overall culture. Rogers suggests that there needs to be a very good working relationship built among the organizations' leadership, opinion leaders, and change agents in order to manage the issues that might occur with the social system's structure throughout the diffusion process. This definition of a social system relates directly to the military domain, as the teamwork and overall unit structure (fire team, squad, platoon, company, battalion, etc.) within each organization has to be in synch and working together in order to accomplish its overall mission.

C. CATEGORIES OF ADOPTERS

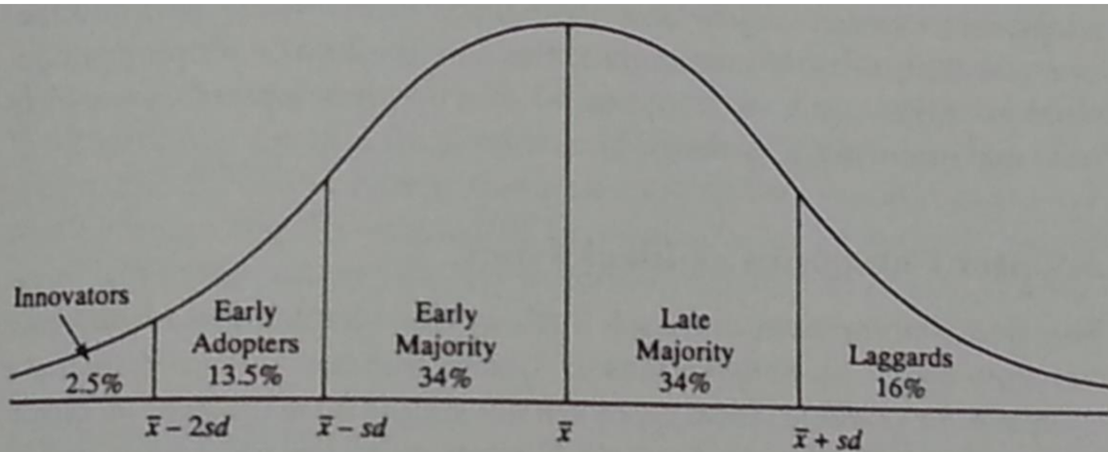
The diffusion process can be challenging and very overwhelming for some individuals or organizations, and each one of their technological innovation adoption rates throughout the diffusion process will be different. Rogers explains these differences in adoption through the categorization and division of five types of adopters.

Adoption was defined as "a decision to make full use of an innovation as the best course of action available"

(Rogers, 2003). In his work, he divided the five categories of adopters around the definition of adoption and on the basis of innovativeness. He defined Innovativeness as, “the degree to which an individual or other unit of adoption is relatively earlier in adopting new ideas than the other members of a system” (Rogers, 2003). The five adopter categories are:

- innovators
- early adopters
- early majority
- late majority
- laggards

Rogers illustrates the adopter categories and the approximate percentage of individuals in Figure 7.



The innovativeness dimension, as measured by the time at which an individual adopts an innovation or innovations, is continuous. The innovativeness variable is partitioned into five adopter categories by laying off standard deviations (sd) from the average time of adoption ($\bar{x}$).

Figure 7. Adopter categorization on the basis of innovativeness (From Rogers, 2003)

Innovators are the people that are very interested in using new innovations. They are risk takers, are very adventurous, and are comfortable with handling issues and delays that might arise during the innovation’s first use. The innovator is important to the diffusion process as they are the users that first introduce the innovation to a group or organization within their work or training environment. These individuals are among the first 2.5% of the users within an organization to adopt an innovation.

The next adopter category is the *Early Adopters*. Early adopters have the largest group of opinion leaders, and are heavily relied upon by other adopters for advice and information about an innovation. Due to their positions within the organization, they serve as role models, are very respected within the organization, and can positively influence and assist with speeding up the adoption process. The early adopter is relied upon within the organization to provide the endorsement for the innovation. These individuals are the next 13.5% of the users within an organization to adopt an innovation.

Next on the adopter category list is the *Early Majority*, who represent approximately one third of their organization. The early majority rarely holds positions of leadership, but do adopt innovations before the average users within their organizations. Due to the unique position of these users, they also provide a valuable link within the diffusion process. This group is very cautious, and usually needs to see some form of the innovation’s successes before they are agreeable to adopt. Due to their carefulness, their rate of adoption period is longer than the innovators and early adopters. These individuals are the next 34% of the users within an organization to adopt an innovation.

The fourth adopter category is the *Late Majority*, and they also make up one third of their organization. The Late Majority is skeptical and is usually uncertain about the decision to adopt an innovation. This group must see the innovation's results, and will only adopt after the majority within their organization has accepted the adoption and is using the innovation. When they finally do decide to adopt an innovation, it is usually due to peer pressure or a financial requirement within the organization. These individuals are the next 34% of the users within an organization to adopt an innovation.

Finally, the last adopter category is the *Laggards*, who are the last 16% of the users to adopt an innovation within their organization. The laggards enjoy the past, are very conservative and cautious, and like to keep processes the way they have always been. This group is doubtful about innovations, and their rate of adoption can be very prolonged.

D. PARAMETERS INFLUENCING ADOPTION RATE

This section introduces some of the positive and negative trends that can affect the adoption of an innovation.

The introduction of new technologies can have progressive or undesirable impacts on the internal and external processes of an organization, and if they are not introduced properly, then they can have devastating effects on its overall mission success. As technology advances, the information technology requirements for the commercial and military domains will be required to adapt and change in their training and operational arenas. There will be many ways that these societies manage these changes, and the decisions that are made will have positive or negative impacts on the adoption of the technology being introduced.

What is the rate of adoption? Rogers (2003) defines *rate of adoption* as "the relative speed with which an innovation is adopted by members of a social system." So, what are some of the parameters or issues that might be encountered throughout the diffusion process that can affect the adoption rate of a technological innovation?

Over the years, multiple trends have been captured by scientists who had been working in different domains in the civilian community. As explained in Section A, Rogers suggests that his five attributes (relative advantage, compatibility, complexity, trialability, and observability) explain "49 to 87 percent of the variance in the rate of adoption of innovations." In his work, he also mentions other variables such as

> (1) the type of innovation-decision, (2) the nature of communication channels diffusing the innovation at various states in the innovation-decision process, (3) the nature of the social system in which the innovation is diffusing, and (4) the extent of change agent's promotion efforts in diffusing the innovation, affect an innovation's rate of adoption. (Roger, 2003).

Rogers also mentions that the rate of adoption for an organization is generally adopted at a slower pace versus an individual or very small group decision.

Manross and Rice (1986) state the factors that affect the adoption rate of a technological innovation as being:

- Internal process decision making (politics)
- Technical complications (perceived complexity of the system or the system malfunctions due to environmental conditions (lack of air conditioner and system over heats))
- Professional norms and organizational change (culture; do not want to change business processes)
- Lack of user training
- User's attitudes
- Insufficient support from top management
- User's needs versus mandatory use
- The absence of user involvement

Similarly, Abukhzam and Lee (2010) find that one key element of adopting a technological innovation into the work environment is based upon user's attitude, meaning that if the work force perceives the technology as a threat to their future job, then they will reject the innovation. In their work, they also report that

> (1) innovation characteristics (e.g., perceived usefulness and ease of use, compatibility, reliability, security), (2) organizational and managerial characteristics (e.g., leadership characteristics, fear of loss of autonomy, fear of security breach), and (3) facilitating conditions (e.g., availability of government support and availability of top management support) are also key factors that can affect the adoption rate of a technological innovation. (Abukhzam & Lee, 2010)

Kotrlik and Redmann (2009) summarized the trends that affect the rate of adoption for technological innovation as

> (1) institutional and administrative (lack of access to equipment, availability of up-to-date software, and institutional support), (2) training and experience (lack of time, lack of necessary knowledge, and (3) lack of self-confidence), attitudinal or personality factors, and resources. (Kotrlik and Redmann, 2009)

Finally, in their survey paper, Aguila-Obra & Padilla-Melendez (2006) summarize the factors that were reported in past literature as affecting the adoption rate of technological innovations within an organization.

They classified all factors into three major groups:

- Organizational factors
- External factors
- Technological factors (for full details, we recommend readers refer to the text of this survey paper.)

E. CHAPTER SUMMARY

Chapter IV provided a detailed understanding about the diffusion of innovation process and its main characteristics, five major adopter categories, and the trends that can affect the rate of adoption for technological innovations. All definitions and constructs presented in this chapter have been used in preparation and execution of our study, including the data collection and final analysis.

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V. ADOPTION AND DIFFUSION OF COMPUTER-SUPPORTED TRAINING SIMULATIONS

This chapter lists the theories and understandings used to execute our research, and a rationale on why they were selected as guidance for our case study focused on the large-scale adoption of computer-supported training simulations in MCAGCC. This chapter also assists in a review and discussion of the data sets presented in Chapter VIII.

A. ADOPTION AND DIFFUSION OF COMPUTER-SUPPORTED TRAINING SIMULATIONS THROUGH THE LENS OF THE MILITARY ACQUISITION PROCESS

As it has been discussed before, some trends can positively affect the adoption rate of technological innovations and some trends affect it in a negative way. Being that the acquisition process is an official mechanism through which military organizations introduce and manage newly developed Program of Record (POR) technology projects/systems, it is important to have a better understanding of that process—the way it acquires, disseminates, distributes, and maintains innovations that are accepted within military organizations. It is critical to know how technology systems are purchased and for what reasons, what organizations are involved throughout that process and their specific roles. It is also of special interest to actively follow up and acquire a complete understanding of what happens to these systems in terms of their survival within the first 2–4 years of their implementation into an organization.

Due to its overall importance to the M&S community, the DoD acquisition process is an area that has been accepted as guidance for this study; the text in Chapters VIII and IX discuss some steps of the DoD acquisition process that could be augmented. More detailed understanding about the DoD acquisition process is presented in Chapter VI.

B. PARAMETERS INFLUENCING THE ADOPTION RATE OF COMPUTER-SUPPORTED TRAINING SIMULATIONS

There are different types of parameters identified as significant in terms of the extent to which they affect adoption of computer-supported training simulations. This section focuses on a select set of parameters deemed important to our study, and on the training domain in particular. Some elements of this list have been derived from (Sadagic, 2007).

1. Technical and Human Factors Issues

a. Technical Issues

Technical issues with any system can affect the use and/or adoption within an organization. We will mention several issues that directly affect the quality of user experience.

The overall robustness and reliability of the software and hardware are crucial starting characteristics of a system that can affect how users react and treat the system in a training event. The processing power of a computer system used to run a simulation is a starting critical factor in user experience. The system should be capable of performing to the tested specifications and within the user's training environments. If the system is slow and does not respond quickly enough, the users could become irritated and form negative attitudes towards the system. If the simulation involves network connectivity of any kind, then there could be performance issues, such as latency and improper timing, which causes system synchronization issues and deterioration of quality of the overall user experience. It is important that the simulation owner (Simulation Center or Unit) has the right *technical support staff* on hand in order to plan, install, operate, and maintain the simulation systems. It is also important that the instructors are very proficient with creating *realistic scenarios* that pertain to current U.S. military situations (battles, conflicts, and other foreign aid events).

b. Human Factors Issues

(1) Technology / Tools related

- ***User interface***: The design of user interfaces is extremely important as these are the elements of the system directly visible to the user when they interact with the system; Examples – screen layout with a combination of menus, icons, images, shortcut keys.
- ***Perceived ease of use***: Complexity of user interface and interactive modalities supported via that user interface; Example - navigation through three dimensional (3D) space with a mouse and keyboard versus a joystick.
- ***Maintainability***: The system needs to be easily maintainable; module concepts could apply.
- ***Level of realism***: The system should be made real enough so that the users learn the appropriate skills from its environment, but not so

unrealistic that it looks and feels like an untrue environment.

- ***Fidelity of simulation*** (visual, audio, olfactory sensory stimuli): These features enhance the learning experience of users and can have a profound effect on perceived quality of user experience; they can also act as enablers of skill acquisition.

-

(2) Not technology related

- ***User acceptance***: The introduction of the simulation, negative rumors, lack of confidence in the systems purpose, and lack of use, can all seriously affect user acceptance.

- ***Organizational culture***: Values, beliefs, and traditions are all aspects that support the organization's existence and overall business processes; introducing a new technology within an organization needs to be well thought out and planned with the individuals that will be required to maintain and use the system.

2. Issues "Outside of Technology"

Computer-supported training simulations are a tool that can aid learning and perfecting particular skills practiced by individuals, groups, or entire units; however, within the military training domain, much like in any other learning and training practice, the full training package includes more than only a tool used to accomplish training objectives. There are other elements of learning and training experience that exist outside the tool itself; they all contribute to success of the training event.

a. Leadership Endorsement

The process of adopting a new solution as the solution of choice for a unit's daily use incorporates top-down support and endorsement. This can have strongly encouraging or discouraging effects on the overall community's attitude and acceptance. Adoption—complete trust and confidence, and regular use—starts at the top. Therefore, it is imperative that leadership fully supports the overall concepts and purposes of use of the computer-supported training simulation the unit currently has access to or even owns. A few examples of simulation systems that are fully supported by higher leadership and that have been adopted by units within their training plans are the MAGTF Tactical Warfare Simulation (MTWS) (see to Appendix D for more details), HMMWV Egress Assistance Trainer (HEAT) (Appendix E), and Combined Arms Command and Control Training Upgrade System (CACCTUS) (Appendix B). The elements of leadership endorsement are therefore included in our data collection in multiple survey questions.

b. Issues Specific to Execution of Training Event

A partial list of parameters that can affect the quality of training experience, and ultimately the use and adoption of simulations within the training domain are:

- ***Instructor certification***: This includes having proper knowledge about simulation technical specifications (maintenance, operation, technical aspects, configuration of hardware and software, and system performance details), its most effective uses in different domains, applications towards specific MOS related skills, and employment of the system in different environments and for different scenarios. To support an effective training event, an instructor needs to be a true expert on the system (tool).

- ***Lack of full training package***: This assumes existence of tested advice on how to use certain training systems most effectively. Incomplete or no advice of this nature becomes an obstacle for the use and adoption of any training simulation. Our experience suggests that this full package should be written into the contract for each fielded system; its delivery should be reviewed and accepted by a military member of the unit.

- ***Dissemination awareness and process***: Sometimes, technology systems can arrive on the doorsteps of units without their knowledge. If this occurs, the unit might not know too much about the system, so it could be acquired, inventoried, and then locked up in a Quadruple Container (QUADCON; a steel storage container) until the next quarterly inventory. The disseminator of the system needs to ensure the unit is fully aware of the system they are receiving, and the dates of delivery.

- ***Train-the-Trainer***: Training passed on from SMEs to other members within the unit is a constant battle that every unit deals with, but it is something that the military needs to follow through on so that valuable knowledge on these expensive technology resources can be passed along and used within the unit.

- ***Access to Simulation***: Not being able to access systems when they are needed for training purposes can impact the adoption of technology.

- ***Scheduling and Throughput Issues***: Scheduling training sessions on any type of range or with any provider of training event can be complicated, or the process might not even be known to the unit. Advertising the scheduling process is a must, and needs to be known by all operations and training sections. Once the simulation training or exercise is scheduled, then the next aspect to manage is the issue with throughput. Having to wait around for training or told that training has to be rescheduled due to a limited number of assets can affect the adoption long term.

- ***Leadership Involvement in Training Session***: Leadership at all levels is heavily involved with planning, decisions, and execution of live exercises. This involvement should not be any different when conducting a simulation exercise or using a simulation in place of a live portion of the exercise.

- ***Preparation for Exercises***: Units prepare for live exercises as if they were planning for battle; a real mission. This same level of effort should also be invested for simulation exercises, as these events are truly testing and building the unit's knowledge and teamwork.

- ***Conduct of AAR***: After Action Reviews are always requirements and are conducted as soon as live exercises have concluded. There should be no difference between the steps taken for a live training event versus a training event that uses simulations. If it is treated differently, then a full benefit from the training event may not be achieved and a negative attitude towards the simulation could be formed.

- ***Users Attitude*** (not taking the training event seriously): Although some simulations appear to look and feel like games, the true purposes of these technologies are to train military members. It is important that these users are instructed to be prepared, engaged, and ready to fully commit to the simulation exercise; otherwise, these user's and instructor's time are being wasted.

- ***Reflecting current Tactics, Techniques, and Procedures (TTP)***: It is important that units understand, use, and practice their TTPs while participating in or using simulations to train.

c. Training Approaches and Pedagogies

Another element outside of the training tool is the way the training sessions are organized—training approaches and pedagogies. There are many different approaches that can be used to effectively design, develop, implement, and conduct training curriculums. Each approach will have different successes, but it is imperative that the approach that ends up utilized is one that has been proven to be effective with the respect to the training objectives set up by the instructors.

With technology systems, such as computer-supported training simulations, very similarly to training on physical ranges, a crawl, walk, run approach may be used as there can be numerous aspects of a complex skill set that need to be taught and learned. As an example of this type of training approach, the process might start in a small classroom and hands on session with only a few individuals, where specific simulation tool functionality can be learned along with the learning objectives. The session could then move on to the introduction of a small scripted scenario with a small team and/or group, where multiple individual and group decisions will be required in order to successfully handle the scenario problem or issue (team building). This event could then lead into an actual exercise scenario where the unit moves into a field or range environment and conducts the scripted scenario utilizing those skills and concepts learned from the computer-supported simulations in a live setting. This approach, like any other, should first be tested for its efficacy. Another example of an approach that offers good results is the introduction of peer competition.

As stated, there are numerous ways to approach and train with technology tools, but there needs to be a well understood and proven method of achieving training objectives most effectively. Gradually the instructors will become more proficient with their instruction and some may even try to fine-tune those approaches to meet the specific needs of their training audience. On the other hand, the students need to understand the technical aspects and purposes of the tool, so that they are confident using it and learning the skills required to succeed in their jobs.

C. EXPERIENCES WITHIN THE AIR COMMUNITY

The air community is a great example of a community that recognized the value of large-scale adoption of computer-supported training simulations early on, and continued to use it extensively in their training domain. Over the years, the air community was able to successfully develop the right tools (simulators) with the right goals (training objectives, training approaches/pedagogies) for the right audience (aviators) at different stages in their skill development.

It is well known that the adoption of flight simulators throughout the civilian and military domains were necessary decisions based upon a well-defined need to train the aviators on administrative (procedural), tactics and decision-making, and emergency procedures. The reason for their adoption is obvious—the primary one is saving lives. It can be quite difficult and very unsafe to conduct administrative and/or emergency training procedures while operating an aircraft at several hundred miles per hour. Based upon high relative advantage perceived by the user community and with no other training option to support the same training objectives, it was clear that this community had to adopt flight simulators to train their aviators.

After conducting guided discussions with Marine Corps aviators (NPS MOVES Master’s students), it is understood that flight simulators are utilized throughout their community for the purposes of training and qualification/certification. Marine Corps aviators are introduced to flight simulators in flight school and are required to utilize them in order to gain proficiency in general procedures, tactics and decision-making situations, and skills in emergency procedures. These skills are then utilized on their very first flight in a real aircraft and have benefited this community in its training domain enormously.

The use of flight simulators is required if one wants to gain or maintain certain statuses as an aviator. In some military air communities, if aviators have not had physical exposure to an aircraft within 30 days, then the flight simulators are used as a mandatory requirement to maintain an instructor status (familiarization training). It is also a requirement to utilize flight simulators every 30 days in order to practice emergency procedures.

It is important to mention that not everything went smoothly in this domain: the air community had to deal with different types of learning curves or technology issues. They have also been challenged with throughput issues due to a limited number of flight simulators. As a result, the aviators had to schedule training sessions at all times of day and night, and make sure the flight requirements were maintained. Flight simulators cannot replicate the true atmospherics and overall impacts felt in an actual aircraft (simulation versus real environment;

noise, smell, rolling and stalling effects, etc.), so there is always a feeling of having an unrealistic and "incomplete" experience. Additional technical challenges occur when it is necessary to connect different types of flight simulators (helicopter and jet, or jet and jet) to conduct different types of scenarios.

It can be said that the air community is well versed and knowledgeable about the capabilities and limitations (strengths and weaknesses) of its flight simulators. They are also cognizant of the process of adoption of these types of training tools, and the support that needs to exist to execute that process effectively. Their experiences are extremely important and should be referenced by other segments of the military community when they plan to add computer-supported training simulations to their set of training tools and use in training practice.

D. OPPORTUNITIES TO AFFECT THE ADOPTION RATE

Throughout this chapter, we mentioned several elements that can affect the adoption and diffusion of computer-supported training simulations in the military domain. This section focuses on illuminating several opportunities that could be explored to affect adoption rate. This includes a need to demystify misconceptions related to the use of computer-supported training simulations that might exist within a training environment.

A frequent comment heard within the military community includes a fear that simulation systems will replace all live training. A good starting point in that discussion is a reminder that, in general cases, simulation systems are meant to augment live training rather than completely replace it; that is all. They are not meant to be a cure-all or final solution to all military training needs; there is no proof that they have such power. They are however likely to be a good part of the solution—they provide immediate feedback to user's actions including the account of user's performance, support role-playing situations, enhance experimental learning, and enable problem-solving activities. It is beyond dispute that some skills are best trained on live training ranges (camaraderie, elements of teamwork, full skill integration, physical exertion, and some understandings uniquely learned throughout the planning and execution of live training events); however, computer-supported training simulations can replace portions of live training events and assist in perfecting certain skills. When using training simulations, users are still required to plan and execute all elements of the training event that need to be learned and performed in order to succeed and prepare a unit for future conflicts (convoys, attacks, call for fire, coordination to higher and adjacent units, resupply, fire plan sketches, etc.).

The question of realism is another issue frequently raised by adopters. The use of computer-supported training simulations can only be as real as technology allows it in given configurations and training situations. The question one may ask is, "How real does the training audience need these systems to be so the users can achieve all training objectives set by the instructors?" This balance between what is needed and what is actually offered is a long lasting subject of investigation for the research community. For training situations and training systems that have resolved this question—the military can already start making decisions on how to successfully employ them within their training environments and curriculums.

The existence of unrealistic expectations is not new when one considers any training intervention. For example, the expectation that far less training time will be needed to perfect some skills if one is using simulations versus live training, and a promise of huge savings of resources when conducting training with simulations versus live training — those are only two examples of such unfunded and unrealistic expectations. Understandings like this can be greatly misleading; they should be addressed and the correct information shared with all users.

From research and discussions with different M&S professionals, we identified several areas and ways in which the adoption rate of a technological innovation could be affected positively:

- ***Expectations Management***: Make sure the training audience has a clear understanding on what to expect from the training event. Contractors / Instructors—up front, provide a clear understanding of the training evolution for the unit; spell out the requirements and ensure the unit complies; the instructors and the users need to treat the simulated training evolutions as if they were in the field or on the range.
- ***Influence users' attitude***: Make the training fun, but keep the training serious and enable a productive training event. What the user puts into the exercise is what the user will take away.
- ***Engage unit leader*** *during all training events* (the entire process). Provide the unit leaders with necessary instruction so they understand what will occur and what their overall role should be.

- **Advertise and conduct briefs to small groups** so that they are aware of the simulation capabilities and facilities that are available for them to use. Explain each system in depth and the strengths and weaknesses of each.
- ***Provide full training packages***: Basic and advanced setup, operations, maintenance, upgrades, user's and maintenance manuals are a great start; however, the curriculum for these packages needs to be well developed so that the users get the best understanding about the tool and the best way it can be used in the training event.

E. CHAPTER SUMMARY

Chapter V reviewed a set of parameters that are likely factors affecting the adoption rate of computer-supported training simulations in the military domain. Positive experience of the air community in using flight simulators is briefly described, and a list of possible ways in which the adoption rate of computer-supported training simulations could be affected is outlined.

VI. DOD AND USMC ACQUISITION PROCESS

A. DOD ACQUISITION PROCESS

The acquisition process within any community is very essential to the organization’s culture and overall business successes. The environment in which that community purchases new or remodeled products and services is extremely important to understand as the processes and the people who govern them can influence the procurement of a system in many ways. For the purposes of this study, the DoD acquisition process will be covered at a high level so that the important terms and basic understandings are captured.

DoD defines *acquisition* as

> the conceptualization, initiation, design, development, test, contracting, production, deployment, logistics support (LS), modification, and disposal of weapons and other systems, supplies, or services (including construction) to satisfy DoD needs, intended for use in, or in support of, military missions. (Under Secretary of Defense (Office of the Under Secretary of Defense (OUSD)), 2012)

According to the 2013 Defense Acquisition Guidebook, the DoD utilizes three major decision support systems to procure materiel and services: (1) Planning, Programming, Budgeting and Execution (PPBE) Process, (2) Joint Capabilities Integration and Development System (JCIDS), and (3) Defense Acquisition System (DAS) (Under Secretary of Defense (OUSD), 2013); see Figure 8.

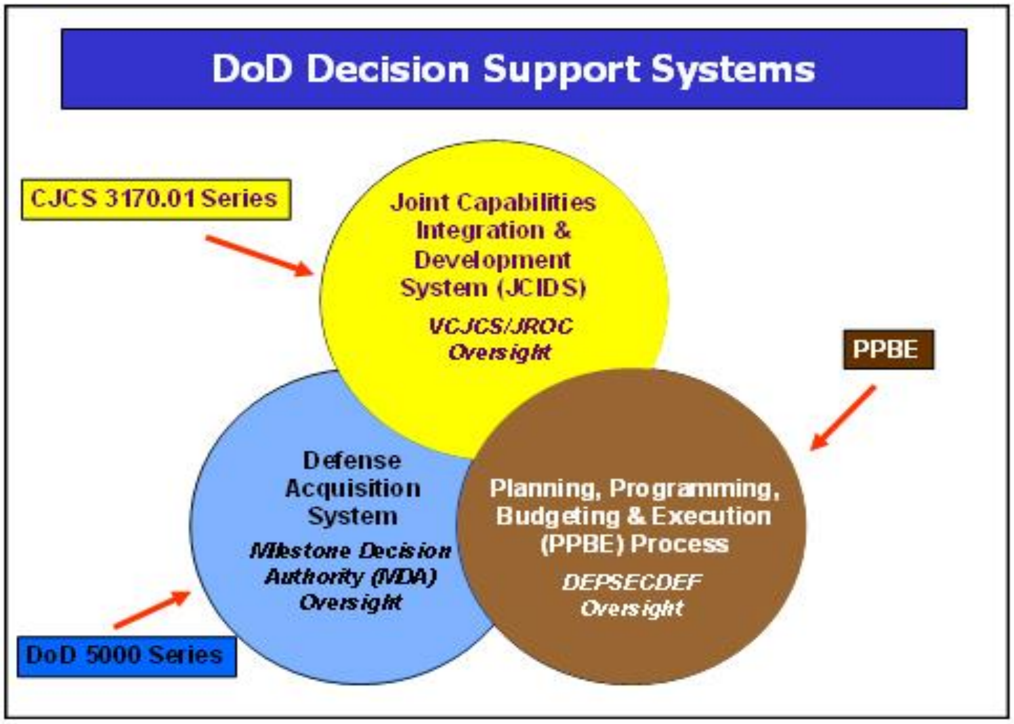


Figure 8. DoD Decision Support Systems (From Under Secretary of Defense (OUSD), 2013)

Detailed considerations of those three major support systems and how they relate to the initiation, design, development, test, procurement, implementation, maintenance, and sustainment of computer-supported training simulations, will be recommended as topics of studies for future work.

Together, JCIDS (capability requirements and non-material solutions), DAS (material solutions), and PPBE (resources), they provide a means to determine, validate, and prioritize capability requirements and associated capability gaps and risks, and then fund, develop, and field non-material and material capability solutions for the Warfighter in a timely manner. (Under Secretary of Defense (Chairman of the Joint Chiefs of Staff (CJCS)), 2012)

The Integrated Defense Acquisition, Technology, and Logistics Life Cycle Management System, developed by the Defense Acquisition University, shows the integration of all three processes, which consists of major milestones, documents, and phases (more details are provided in Appendix F). The milestones, documents, and phases will be briefly covered in the next few sections.

1. Planning, Programming, Budgeting and Execution (PPBE) Process — "Annual-Calendar-Driven"

The authority for many elements of this process is positioned with the Secretary of Defense. "In the PPBE process, the Secretary of Defense establishes policies, strategy, and prioritized goals for the Department, which are subsequently used to guide resource allocation decisions that balance the guidance with fiscal constraints" (Under Secretary of Defense (OUSD), 2013).

The overall purpose of the PPBE process is to manage and allocate the DOD's resources. Throughout the PPBE process, it is extremely important for program managers (PM) and their staffs to pay attention to each processes' timeline, as their input is essential for the success of their program and budget (Defense Acquisition University, n.d.).

The PPBE process consists of four distinct but overlapping phases: Planning, Programming, Budgeting, and Execution (an overview of the PPBE Process is shown in Figure 9). For the purposes of this study, each phase will be explained in general terms without introducing too many details. For a detailed discussion of each phase, refer to the Defense Acquisition Guidebook (Under Secretary of Defense (OUSD), 2013).

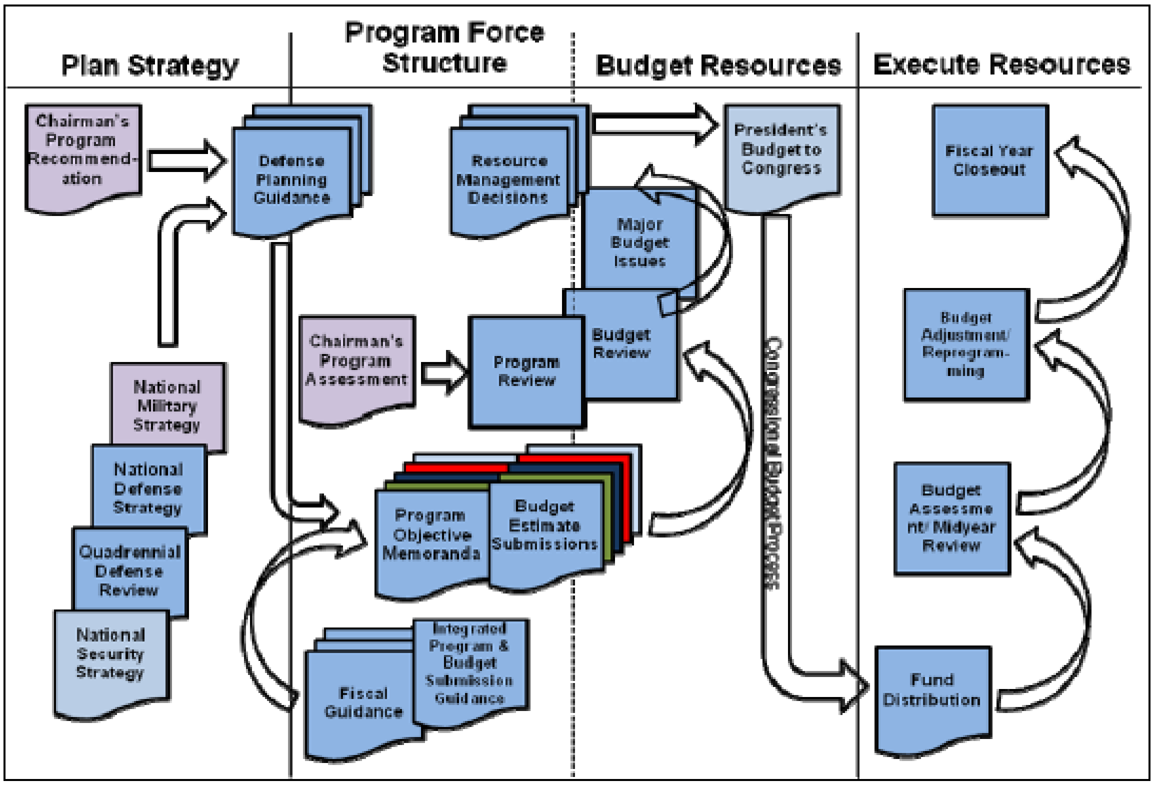


Figure 9. PPBE Process (From Under Secretary of Defense (CJCS), 2012)

a. Planning

The planning phase consists of official reviews of national defense and military strategies (referred to as the Defense Planning Guidance (DPG)) by the Office of the Secretary of Defense (OSD), CJCS, and other military services and Combatant Commands (COCOM) (Under Secretary of Defense (OUSD), 2013). "The DPG, along with fiscal guidance form the Office of Management and Budget (OMB), informs the Services, COCOMs, and other DoD Components in the development of their Program Objective Memoranda (POM)" (Under Secretary of Defense (CJCS), 2012).

b. Programming

The goal of the programming phase is to use the DPG and develop a POM for each DoD Component. The POM includes a complete description of the DoD Component's programs, with five year projections of forces, funding, and manpower (Under Secretary of Defense (OUSD), 2013). The final review and approval of all programs is then captured in the Resource Management Decision (RMD) document, and from there the DoD Components update their final POMs. The final POMs are "incorporated into the Departments Budget and Future Years Defense Program (FYDP) and submitted to the OMB as part of the President's budget request" (Under Secretary of Defense (OUSD), 2013).

c. Budgeting

This process occurs in parallel with the planning phase; each DoD component, along with their POM, submits an estimated budget known as the Budget Estimate Submission (Under Secretary of Defense (OUSD), 2013). The BES focuses on a detailed estimate of one full year, and is thoroughly reviewed by the Under Secretary of Defense (Comptroller) and OMB.

d. Execution

This phase also parallels the programming and budgeting phases. It consists of final program reviews of prior and current programs; if performance goals of any program are not being met, then resources could be reallocated to other programs.

2. Joint Capabilities Integration and Development System (JCIDS) — "Need Driven"

"JCIDS plays a key role in identifying the capabilities required by the warfighters to support the National Defense Strategy (NDS), the National Military Strategy (NMS), and the National Strategy for Homeland Defense" (Under Secretary of Defense (OUSD), 2013). The JCIDS is used to identify, evaluate, and prioritize joint military capability needs for the CJCS and the Joint Requirements Oversight Council (JROC); JROC consists of the Vice CJCS, and the Vice Chiefs of each military service (Defense Acquisition University, 2010).

As shown in Figure 10, the joint military capability needs are reflected in a sequence of three primary documents (Initial Capabilities Document (ICD), Capability Development Document (CDD), and the Capability Protection Document (CPD)) that guides five main acquisition phases (Material Solution Analysis (MSA) Phase, Technology Development (TD) Phase, Engineering and Manufacturing Development (EMD) Phase, Production and Deployment (P&D) Phase, and the Operations and Support (O&S) Phase). The timeline in Figure 10 illustrates what document is the primary requirement to enter into each phase. The transition between phases is captured via three key Milestones (MS); MS A, MS B, and MS C.

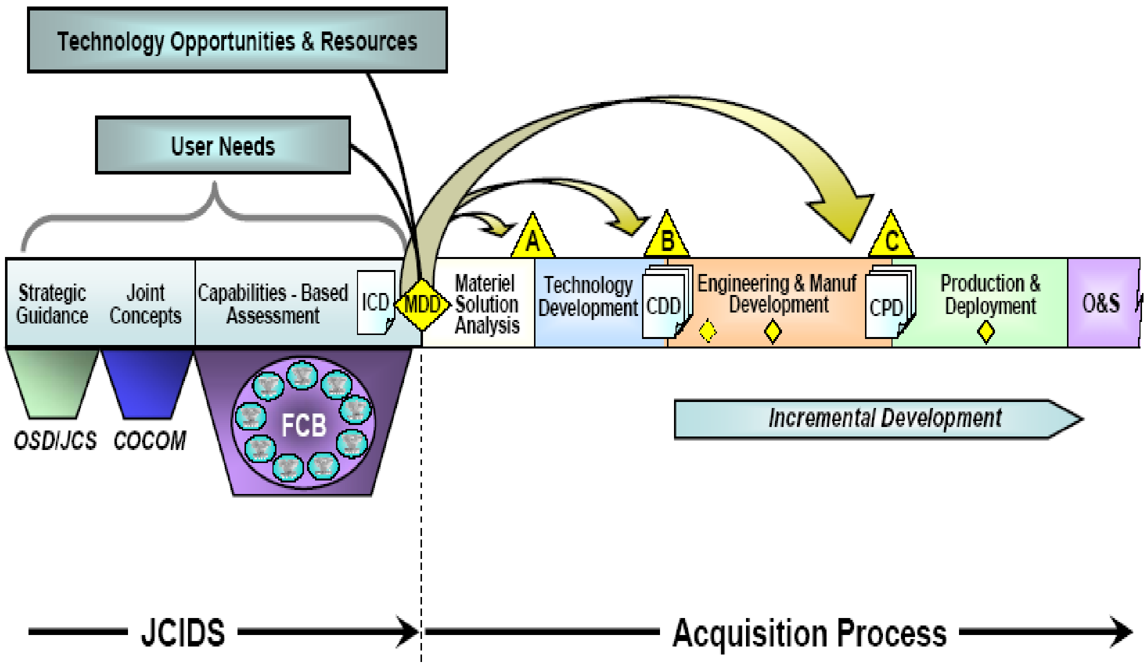


Figure 10. JCIDS documents, phases, and milestones (From Naval Postgraduate School (GSBPP), 2012)

As displayed in Figure 10 (image approved by Lieutenant Commander Brian Lundgren, Professor of the NPS MN3331 Principles of Acquisition and Program Management course; conducted in the Fall Quarter of 2012), the JCIDS process feeds the DAS process. Of note, the Capabilities Based Assessment (CBA) is the "analysis part of the JCIDS that defines capability gaps, capability needs, and approaches to provide those capabilities within a specified functional or operational area" (Defense Acquisition University, 2010).

a. Initial Capabilities Document (ICD)

The ICD defines the capability gap in terms of the functional area, the relevant range of military operations, desired effects, and time. It summarizes the results of the Doctrine, Organization, Training, Materiel, Leadership and Education, Personnel, and Facilities (DOTMLPF) analysis and describes why non-materiel changes alone are not adequate to fully provide the capability. Defense Acquisition University, 2010)

As shown in Figure 10, the ICD is utilized as a reference in the Materiel Development Decision (MDD) (decision to enter the MSA Phase) and Milestone A; transition from the JCIDS process (CBA) and into the MSA Phase. Of note, the Milestone Decision Authority (MDA) is ultimately responsible for the acquisition program (cost, schedule, performance), and makes the decision for the program to move from one phase to the next phase.

b. Capability Development Document (CDD)

The CDD "captures the information necessary to develop a proposed program, normally using an evolutionary acquisition strategy. It outlines an affordable increment of militarily useful, logistically supportable and technically mature capability" (Defense Acquisition University, 2010). As shown in Figure 10, the CDD is used as a reference to support the decision to enter Milestone B; transition from the TD Phase to the EMD Phase.

c. Capability Production Document (CPD)

The CPD "addresses the production elements specific to a single increment of an acquisition program" (Defense Acquisition University, 2010). As shown in Figure 10, the CPD is used as a reference to support the decision to enter Milestone C; transition from the EMD Phase to the P&D Phase.

There are numerous other documents, assessments, requirements, policies, architectures, change recommendations, and several other items that are related to this process and can be found in the Defense Acquisition University (2010) reference.

3. Defense Acquisition System (DAS) — "Event-Driven"

The DAS, the DoD's acquisition process, is managed by the Under Secretary of Defense (USD) for Acquisition, Technology, & Logistics (AT&L) or USD (AT&L), and is defined as

> the management process by which the Department acquires weapons systems, *automated information systems*, and services. Although the system is based on centralized policies and principles, it allows for decentralized and streamlined execution of activities. This approach provides flexibility and encourages innovation, while maintaining strict emphasis on discipline and accountability. (Under Secretary of Defense (OUSD), 2013)

Within the DAS, one of the key individuals is the Program Manager (PM). Every DoD acquisition program is assigned a PM. The PM is ultimately responsible for accomplishing "program objectives for development, production, and sustainment (from design to disposal) to meet the Warfighter's needs" (Under Secretary of Defense (AT&L), 2007). According to DoD Directive 5000.01, the following policies govern the DAS: Flexibility, Responsiveness, Innovation, Discipline, and Streamlined and Effective Management (Under Secretary of Defense (AT&L), 2007). A reader is advised to refer to the Under Secretary of Defense (AT&L) (2007) reference for the complete details of each policy.

As previously mentioned, the JCIDS documents (ICD, CDD, and CPD) "provide the critical link between validated capability requirements and the acquisition of materiel capability solutions through the five major phases (MSA, TD, EMD, P&D, and O&S)" (Under Secretary of Defense (CJCS), 2012).

There are several other acquisition topics (Information Technology (IT) and National Security System (NSS), Earned Value Management (EVM), Contracting, Cost Estimating and Funding, Technical Activities, Life Cycle Logistics, etc.) that will not be covered in this study. For additional details on these topics, a reader is advised to refer to the Defense Acquisition University (2010) document and information provided in the Defense Acquisition Portal.

B. USMC ACQUISITION PROCESS

The Marine Corps Systems Command (MCSC) is responsible for the management of the Marine Corps' acquisition process, and for the sustainment of systems and equipment. MCSC's mission is to "serve as the Department of the Navy's systems command for Marine Corps ground weapon and information technology system programs in order to equip and sustain Marine forces with full-spectrum, current and future expeditionary and crisis response capabilities" (United States Marine Corps (MCSC), n.d.).

The Marine Corps follows the DoD acquisition process, and uses other tools that it has developed, such as the Total Life Cycle Management (TLCM) Framework and the Marine Corps Expeditionary Force Development System (EFDS); a full set is used to assist with the research, development, acquisition, and other life-cycle management processes.

TLCM is utilized heavily by the Logistics community to manage ground systems, equipment, and materiel. Figure 11 shows a small portion of the TLCM, in which the phases (MSA (2.0 Materiel Solution Determination), TD (3.0 Technology Development, and EMD (4.0 Develop and Demonstrate (Program Initiative)), documents (the Marine Corps added the Solutions Planning Document (SPD), which is comparable to the MDD, ICD, CDD, CPD), and milestones (A, B, and C) are captured.

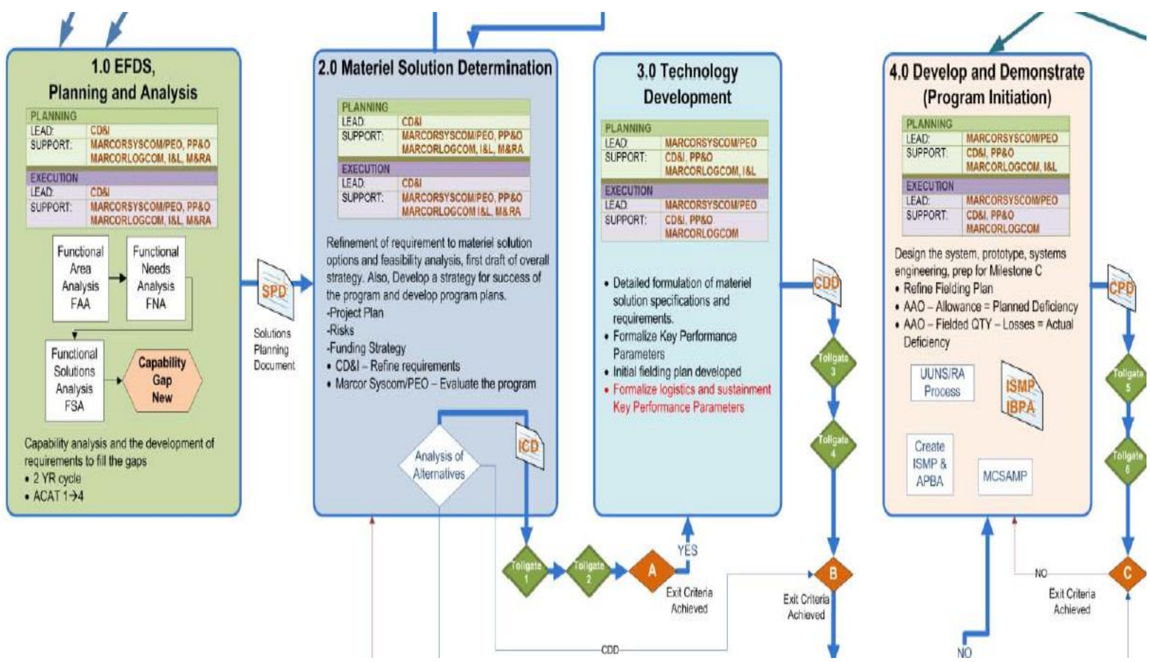


Figure 11. Total Life Cycle Management (From Defense Acquisition University, 2009)

The full version of the TLCM chart can be found in Appendix G. For additional information about the TLCM, a reader is advised to refer to the following documents:

United States Marine Corps (I&L), 2005 and Defense Acquisition University, 2009.

According to Marine Corps Order 3900.15A, “the EFDS will be used to develop future Warfighting capabilities to meet the national security objectives. The system will guide the identification, development, and integration of Warfighting and associated support and infrastructure capabilities for the MAGTF” (United Stated Marine Corps (Assistant Commandant of the Marine Corps (ACMC)), 2008).

C. CHAPTER SUMMARY

For the purposes of this study, the DoD and Marine Corps acquisition processes were introduced in global details. These processes are very important to the diffusion and large scale adoption of new and existing technologies, especially in the military domain—the same technologies will have to use DoD acquisition mechanisms and support infrastructure to become adopted by the military community. Our study will be able to provide an initial set of advices on how this process could be augmented; however, future research will need to investigate what specific areas within the acquisition process should be improved to make DoD-wide positive influences on the adoption of technologies and more specifically computer-supported training simulations.

VII. CASE STUDY: MAGTFTC, TWENTYNINE PALMS, CA

A. INTRODUCTION

This chapter contains the details of the case study and data that were collected in MCAGCC, Twentynine Palms, CA, during the month of July 2013. We review research goals and study design, preliminary and final data collection efforts including the tools used to collect the data, the Institutional Review Board (IRB) process, and piloting efforts that were completed prior to collecting the final data set.

B. RESEARCH GOALS AND EXPECTATIONS FOR THE EMPIRICAL STUDY

As previously stated, the primary focus of this thesis is to study global trends on technology adoption, and collect the data related to the current state of employment, dissemination, utilization, and adoption of computer-supported training simulations aboard MCAGCC, Twentynine Palms, CA.

Although a complete service-wide study would be the recommended approach for a thorough study of this domain, we chose a case study in MCAGCC as an effort best suited for master thesis engagement (scoping down was necessary due to the time limit imposed of the work on the thesis). The base encompasses a huge military training domain; it contains a Battle Simulation Center (BSC) with numerous simulations and simulation subject matter experts (SME) available to the units for their daily use. The base also houses numerous active units that have a need to use simulations in their training environments.

It is our belief that the data collected from MCAGCC are a good representation of the same issues in other Marine Corps bases, and has a great level of applicability and rationale for other DoD services.

C. PRELIMINARY DATA COLLECTION EFFORTS

This section consists of the initial preparatory work that was conducted prior to collecting the actual data in MCAGCC.

Our goal was to capture a wide range of issues affecting the adoption of computer-supported training simulations throughout the M&S and military training communities, and to identify the trends. In addition to understandings gained through a review of literature published in this domain, the strategy for building a knowledge base for the study included conducting guided discussions with service members, or those that work in the M&S community for the DoD. This knowledge would serve as the best basis for assembling a superset of all questions to be presented in the main survey. The individuals targeted in those interviews had extensive past simulation experience, exposure to, or management of computer-supported training simulation tools. The venue for the guided discussions consisted of three major data collection efforts:

- Initial site visit
- Telephone calls
- Local group discussions

The rest of this section provides details on each data collection effort.

1. Initial Visit to Twentynine Palms, CA

The initial discussion of the case study was introduced to the MCAGCC / MAGTFTC BSC Director. After this discussion, the BSC Director agreed to coordinate and establish initial meetings with several MCAGCC units. Several units were contacted and briefed on the goals of the initial meetings with their leadership; the information planned to be presented was the introduction of the thesis topic, the requirements of the study (online surveys and focus groups), and expected results. The units capable of supporting the study provided the researcher with their notification and official agreement about participation in the study.

From there, we confirmed the initial meeting times and dates with each unit, coordinated all travel arrangements, and created thesis recruitment material that would be utilized during the initial visits (Appendix H provides full details about recruitment material). We traveled to MCAGCC and conducted initial meetings with the scheduled units and also visited several other units that we wanted to include in the study. During the meetings, we used a prepared set of questions and had conversations with unit leadership on the topic of our study (Appendix I provides a list of the initial meeting questions.) The data collected in those interviews were added to our knowledge base.

2. Semi-structured Individual and Group Interviews (Telephone Calls and Local Group Discussions)

A second activity organized in support of gaining a better understanding about the domain, included four local group discussions with Modeling and Simulation (M&S)

professionals (all Modeling, Virtual Environments, and Simulation (MOVES) Master's graduates from the US Army), MOVES Master's students with experience in aviation (US Marine Corps Aviators and Army), and MOVES Doctorate students with expertise in the M&S domain (US Army). We also coordinated six telephone conferences with other more senior and experienced M&S professionals within the US Marine Corps, Army, and Navy. The discussions helped us devise a consolidated list of parameters and trends that positively or negatively affect the adoption of a technological innovation throughout the diffusion process:

- Leadership endorsement plays an important role in the adoption process. Some Commanders lack exposure and knowledge about simulation technologies, while others are very knowledgeable on the same subject.
- Mandatory or directed use from a higher command versus optional use within a unit produces different results in the adoption process.
- Differences in culture (experience, knowledge, and traditionalist) should also be investigated—Train as we fight and overall resistance to change may influence the process.
- A lack of a full training package during the fielding plan has been identified in many cases.
- No technical staff on hand during implementation stage; the technical staff not being very familiar with the simulation system.
- Training simulation is not a Program of Record (POR); possibly purchased through an urgent need (Universal Need Statement (UNS), Urgent-Universal Need Statement (UUNS), or (Joint Urgent Operational Need Statement (JUONS)) and fear of losing the system due to a lack of funding after its adoption.
- Lack of infrastructure and/or technical staff to conduct LVC training events.

- Units not aware they are receiving a new simulation system; no initial knowledge on how to use or employ it, or its capabilities and limitations.
- Failure to maintain Train-the-Trainer (TtT) personnel within the unit, or a lack of TtT personnel at the simulation centers.
- Units do not know that simulations exist; lack of advertising.
- Training equipment for computer supported training is treated as second grade to live training equipment; not taken seriously.
- Simulation tools are continuously locked up or units have with minimal access to those systems.
- Lack of a proof of concept and/or clear understanding about the return on investment (ROI).
- Scheduling and throughput issues.
- Overall physical location for larger simulations.
- Skepticism: Individual communities do not have faith in the system as they (1) do not see the connection between the technology and the real requirements for the training audience; failure to capture the real requirements of the system, and (2) do not see the evidence of Verification, Validation, and Accreditation (VVA) process being done before deployment of the system. The system must include the needs of the training audience so that it meets their training objectives.
- Commanders and Units do not have a logical progressive road map for the uses of simulation systems.
- Initial attitude of the unit receiving the simulation system; some units immediately established labs and/or learned the system and implemented it into their training plans, while others locked it up in Quadruple Containers (QUADCON) and never powered the system on.

- Units feel the preparatory work to enable this type of training is too extensive for a simulation exercise; the number of other supporting players acting as a higher command, adjacent friendly units, or enemy units can also be an issue.
- Simulation system lacks fidelity and it is antiquated.
- A lack of realistic scenarios.
- Poor terrain models.
- Misconceptions – using a simulation system means that something significant is being lost from the overall training effects.
- The idea that the simulation environment will train or that it will do everything for trainees with no effort on trainees/instructors part. The elements of expectation management needs to be explained by the instructors and understood by the unit prior to using the simulation system.
- Simulation is not realistic compared to the operational environment (e.g., flight simulator).
- New systems are not upgraded with the same capabilities as the operational environment (modifications in software and/or hardware not available or not included).
- Lack of leadership supervision during training event with simulation system.
- Training event with simulation is not as organized as traditional (live) training; no mission planning and no After Action Review (AAR) conducted.
- Lack of vision and/or strategic plan when positioning simulation systems within larger context of unit training.

When comparing these trends from the military community to the trends that were captured throughout our literature review amongst the civilian community, it is clear that they share some commonalities, such as leadership support, attitude, lack of access, availability, skepticism, culture and resistance to change, lack of funding, lack of technical support/staff, lack of infrastructure, lack of full training packages, etc. Any of those parameters can affect the overall adoption rate of technological innovations in the work and/or training environments. A few trends that were not found in the literature review are related to (1) training domain (the existence of a valid training curriculum and tested advice on how to use and employ the computer-supported training simulation within specific training environments), and (2) the level of realism required in computer-supported training simulations to correspond to needs of the military domain (e.g., correct terrain models, weapons models, etc.)

D. FINAL STUDY DESIGN

The decision for the final data collection effort was to conduct (1) online surveys and (2) organize several small focus groups (no more than 8 Marines per session).

The targeted audiences in MCAGCC was primarily active duty Marine Corps service members, government employees, and contractors (within the M&S community); they were all divided into four (4) major groups: (1) Base Leadership, (2) Unit leadership, (3) Trainers and (4) Trainees (more details about each group can be found in Section G in this Chapter.)

The online surveys were scheduled to be conducted aboard MCAGCC at the Learning Resource Center (LRC) over an eight day period in July 2013, and were designed so that the average participant would spend no longer than 45 minutes throughout the survey process. Survey participants were required to complete a Consent Form prior to taking the online survey, which was an absolute prerequisite for their participation in the study. All individuals in the group were asked to volunteer in the follow-on focus group discussions; a maximum of eight volunteers could participate in one focus group session. All online survey volunteers received a blank hard copy of the survey Consent Form (their acceptance of conditions of the study was completed online). All volunteers for the focus group discussion were required to sign an additional Consent Form for the focus group (hard copy only); all volunteers received signed copies of this form. Detailed information regarding the survey and focus group procedures is covered in Section H in this Chapter.

E. INSTITUTIONAL REVIEW BOARD (IRB) PROCESS

After a detailed discussion with the IRB staff, it was determined that this study would require an IRB review (the reader is advised to check SECNAVINST 3900.39D. for additional information regarding US Navy IRB requirements.)

The overall requirements of the NPS IRB package are summarized in the IRB Initial Review Application Package Checklist and they include following:

- Initial Review Application
- Recruitment materials (e-mails, flyers, presentations, etc.; see Appendix H).
- Consent forms (surveys and focus groups; see Appendix J)
- Consent waiver forms
- Scientific Review Form signed by Department Chair

- Conflict of Interest Disclosure Form signed by each member of the research team
- Data collection tools (completed surveys, focus group questions); refer to Appendices K, L and M.
- Copy of approved thesis proposal
- Initial Review Checklist Form
- Copy of CITI Ethics training certificates for each member of the research team

F. DEVELOPMENT OF ONLINE QUESTIONNAIRE FORMS

1. White Board Prototyping

A collected set of parameters captured in the literature review, the initial MCAGCC site visit, and semi-structured individual and group interviews (local focus group discussions and telephone conferences), served as a starting point in the development of the survey and focus group questions. The beginning survey and focus group question creation efforts began in a form of a white board prototype list; Figure 12 displays an example of the results of the initial brainstorming meeting, where general categories were captured for Unit Leadership and the Simulation Center.

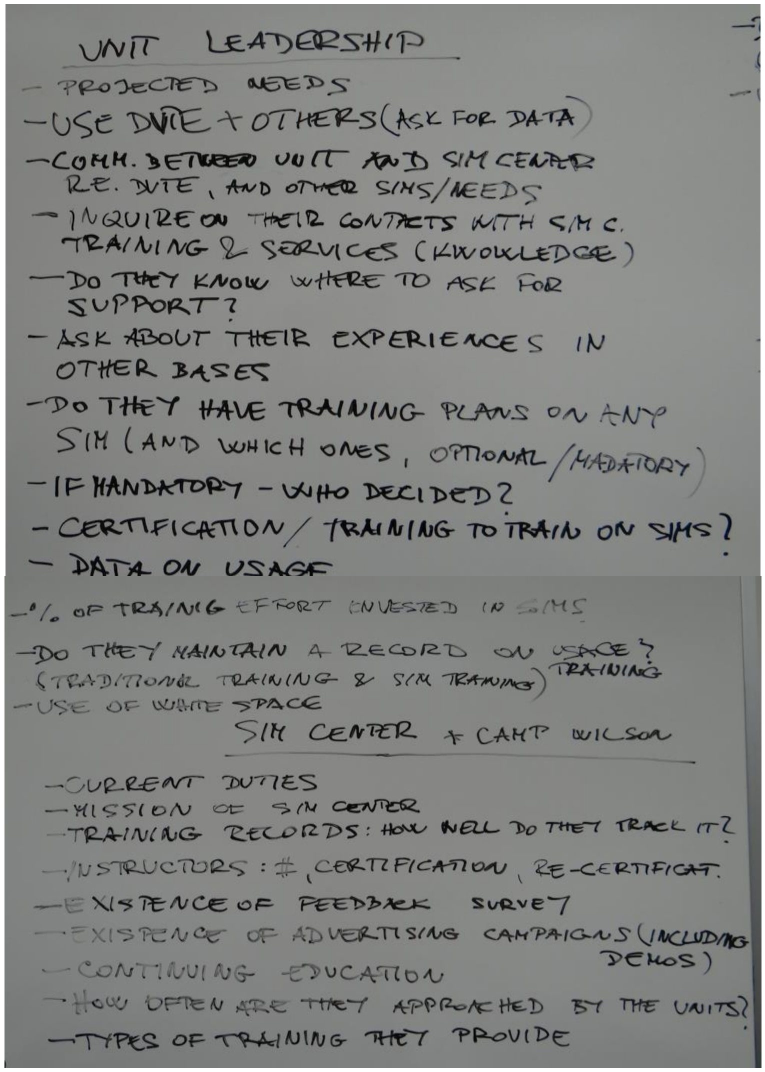
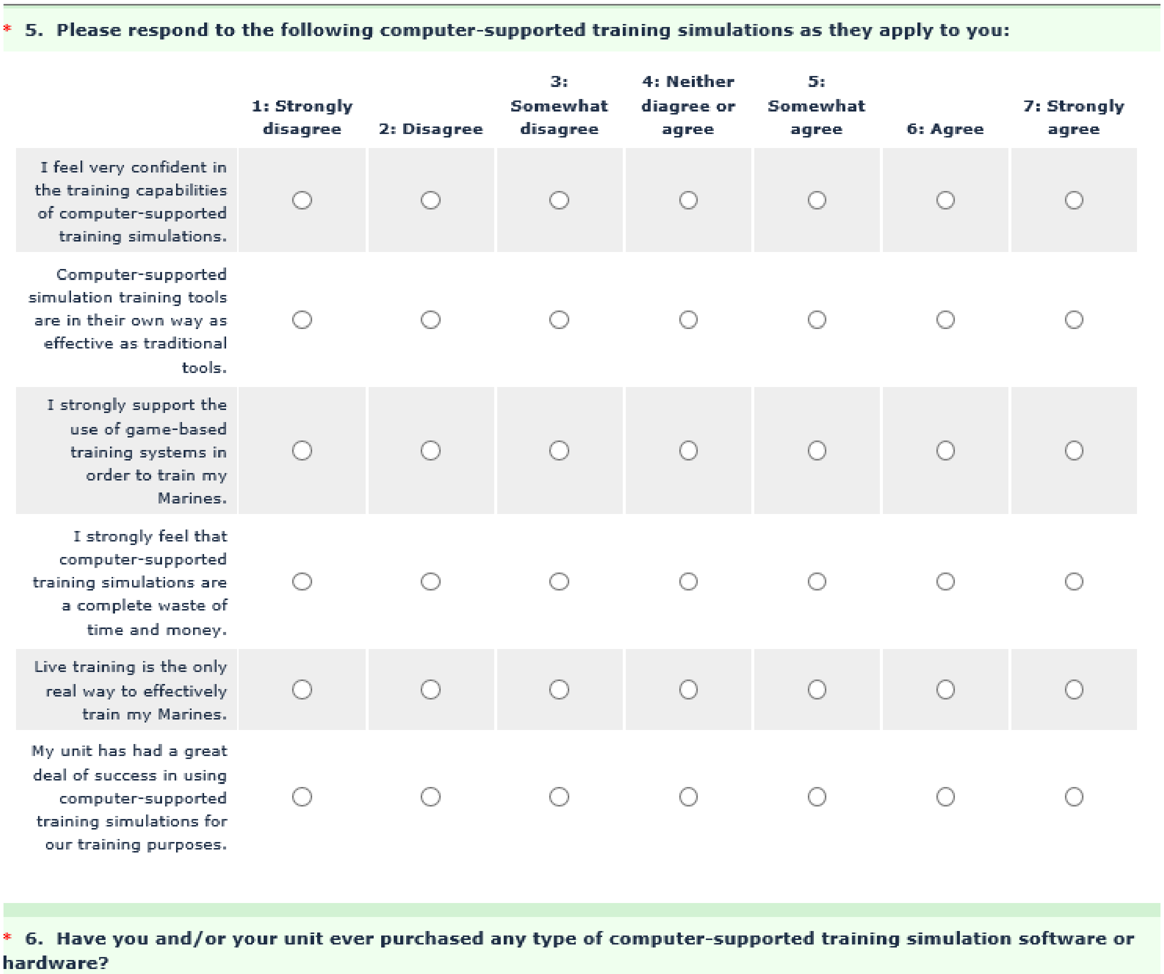


Figure 12. Development of survey questions

The whiteboard prototype was used to develop the themes of questions for each category of study subjects; this led to the creation of a full set of questions for both survey and focus groups. The hard copy version of four surveys and focus group questions were developed and used as a part of the IRB package (Microsoft Word application was used to depict the format of all questions).

2. LimeSurvey Tool

The hard copy version of the survey was transitioned into the online LimeSurvey tool; a total of four surveys were created. Figure 13 shows a sample of questions in the LimeSurvey tool for Base Leadership; Figure 14 for Unit leadership; Figure 15 for Trainers; and Figure 16 for Trainees. These four figures represent only a very small sample of a complete set of questions that were devised. An advantage of using the LimeSurvey tool versus a hard copy survey is that it provided us with the ability to automate our data collection efforts; this allowed for the data to be exported in several different formats ready for further analysis. The use of this tool saved a lot of time as it removed a need to manually enter the data from the surveys after they were completed.

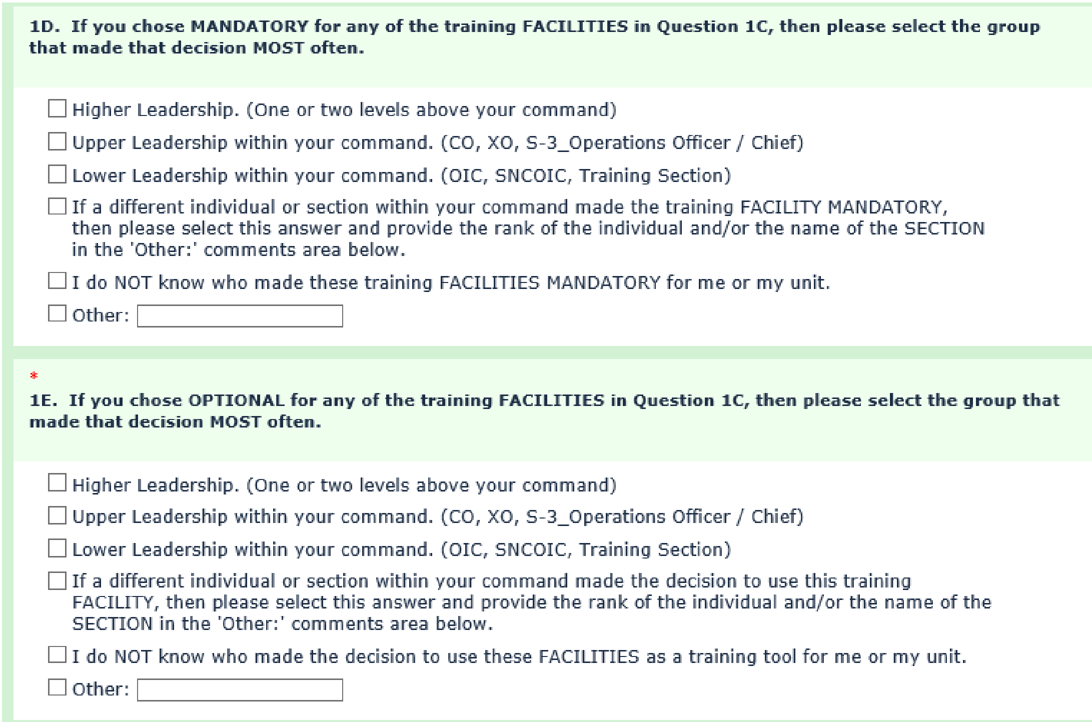


* 5. Please respond to the following computer-supported training simulations as they apply to you:

	1: Strongly disagree	2: Disagree	3: Somewhat disagree	4: Neither diagree or agree	5: Somewhat agree	6: Agree	7: Strongly agree
I feel very confident in the training capabilities of computer-supported training simulations.	○	○	○	○	○	○	○
Computer-supported simulation training tools are in their own way as effective as traditional tools.	○	○	○	○	○	○	○
I strongly support the use of game-based training systems in order to train my Marines.	○	○	○	○	○	○	○
I strongly feel that computer-supported training simulations are a complete waste of time and money.	○	○	○	○	○	○	○
Live training is the only real way to effectively train my Marines.	○	○	○	○	○	○	○
My unit has had a great deal of success in using computer-supported training simulations for our training purposes.	○	○	○	○	○	○	○

* 6. Have you and/or your unit ever purchased any type of computer-supported training simulation software or hardware?

Figure 13. Base Leadership LimeSurvey example question



*

1D. If you chose MANDATORY for any of the training FACILITIES in Question 1C, then please select the group that made that decision MOST often.

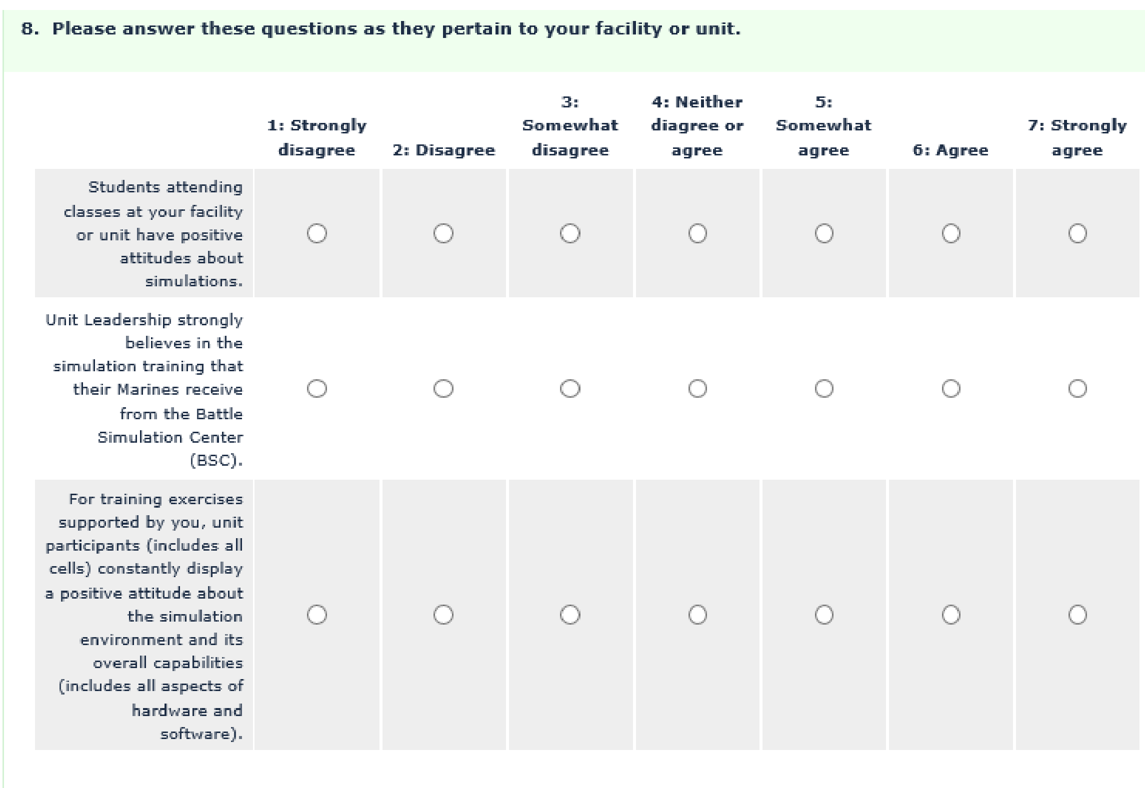
- ☐ Higher Leadership. (One or two levels above your command)
- ☐ Upper Leadership within your command. (CO, XO, S-3_Operations Officer / Chief)
- ☐ Lower Leadership within your command. (OIC, SNCOIC, Training Section)
- ☐ If a different individual or section within your command made the training FACILITY MANDATORY, then please select this answer and provide the rank of the individual and/or the name of the SECTION in the 'Other:' comments area below.
- ☐ I do NOT know who made these training FACILITIES MANDATORY for me or my unit.
- ☐ Other:

*

1E. If you chose OPTIONAL for any of the training FACILITIES in Question 1C, then please select the group that made that decision MOST often.

- ☐ Higher Leadership. (One or two levels above your command)
- ☐ Upper Leadership within your command. (CO, XO, S-3_Operations Officer / Chief)
- ☐ Lower Leadership within your command. (OIC, SNCOIC, Training Section)
- ☐ If a different individual or section within your command made the decision to use this training FACILITY, then please select this answer and provide the rank of the individual and/or the name of the SECTION in the 'Other:' comments area below.
- ☐ I do NOT know who made the decision to use these FACILITIES as a training tool for me or my unit.
- ☐ Other:

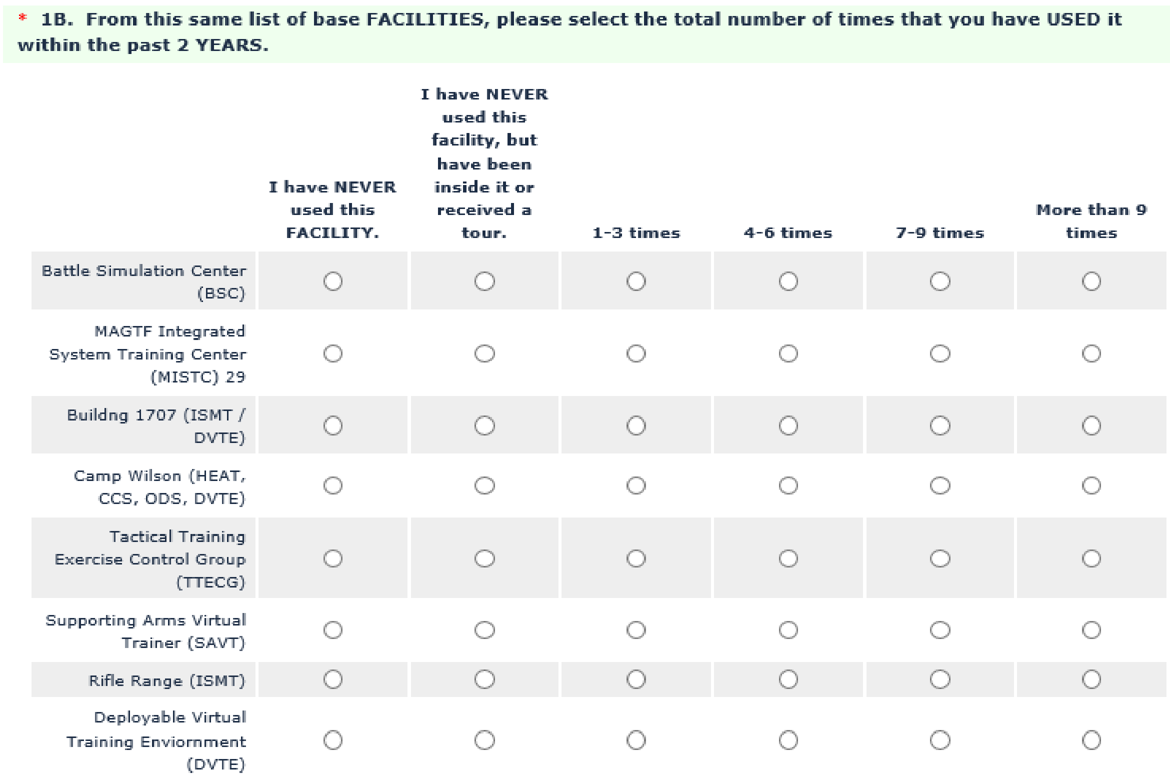
Figure 14. Unit Leadership LimeSurvey example question



8. Please answer these questions as they pertain to your facility or unit.

	1: Strongly disagree	2: Disagree	3: Somewhat disagree	4: Neither diagree or agree	5: Somewhat agree	6: Agree	7: Strongly agree
Students attending classes at your facility or unit have positive attitudes about simulations.	○	○	○	○	○	○	○
Unit Leadership strongly believes in the simulation training that their Marines receive from the Battle Simulation Center (BSC).	○	○	○	○	○	○	○
For training exercises supported by you, unit participants (includes all cells) constantly display a positive attitude about the simulation environment and its overall capabilities (includes all aspects of hardware and software).	○	○	○	○	○	○	○

Figure 15. Trainers LimeSurvey example question



* 1B. From this same list of base FACILITIES, please select the total number of times that you have USED it within the past 2 YEARS.

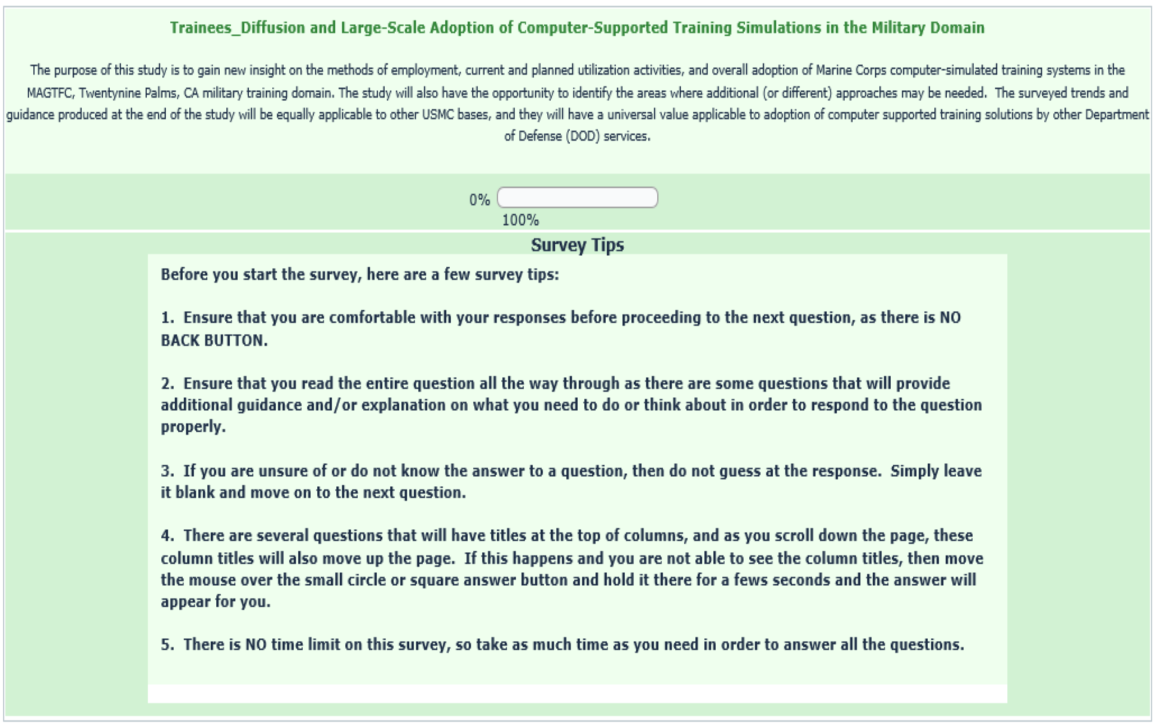
	I have NEVER used this FACILITY.	I have NEVER used this facility, but have been inside it or received a tour.	1-3 times	4-6 times	7-9 times	More than 9 times
Battle Simulation Center (BSC)						
MAGTF Integrated System Training Center (MISTC) 29						
Buildng 1707 (ISMT / DVTE)						
Camp Wilson (HEAT, CCS, ODS, DVTE)						
Tactical Training Exercise Control Group (TTECG)						
Supporting Arms Virtual Trainer (SAVT)						
Rifle Range (ISMT)						
Deployable Virtual Training Enviornment (DVTE)						

Figure 16. Trainees LimeSurvey example question

After the development of each survey was completed, we proceeded with the tests of the overall quality, understanding of the text used in each question, flow and functionality of online form, and test of total time of survey completion.

3. Piloting

A total of three MOVES Master's students (all military service members) and one NPS civilian participated in testing of our newly developed online surveys. Each individual was provided with minimal guidance in order to test if minimal instruction was all that was required to complete the surveys. The only directions that were provided to them consisted of a request to read the instructions at the beginning of the online survey, and to keep track of their total time. The users provided valuable feedback on the layout of several questions—this was corrected as suggested by the test subjects. The average amount of time it took to complete each survey was approximately 28 minutes, which was well under our targeted window of 45 minutes. It was also decided to add "Survey Tips" at the beginning of each survey (Figure 17.)



Trainees_Diffusion and Large-Scale Adoption of Computer-Supported Training Simulations in the Military Domain

The purpose of this study is to gain new insight on the methods of employment, current and planned utilization activities, and overall adoption of Marine Corps computer-simulated training systems in the MAGTFC, Twentynine Palms, CA military training domain. The study will also have the opportunity to identify the areas where additional (or different) approaches may be needed. The surveyed trends and guidance produced at the end of the study will be equally applicable to other USMC bases, and they will have a universal value applicable to adoption of computer supported training solutions by other Department of Defense (DOD) services.

0% 100%

Survey Tips

Before you start the survey, here are a few survey tips:

1. Ensure that you are comfortable with your responses before proceeding to the next question, as there is NO BACK BUTTON.

2. Ensure that you read the entire question all the way through as there are some questions that will provide additional guidance and/or explanation on what you need to do or think about in order to respond to the question properly.

3. If you are unsure of or do not know the answer to a question, then do not guess at the response. Simply leave it blank and move on to the next question.

4. There are several questions that will have titles at the top of columns, and as you scroll down the page, these column titles will also move up the page. If this happens and you are not able to see the column titles, then move the mouse over the small circle or square answer button and hold it there for a fews seconds and the answer will appear for you.

5. There is NO time limit on this survey, so take as much time as you need in order to answer all the questions.

Figure 17. Survey Tips, LimeSurvey tool

G. GROUPS OF STUDY SUBJECTS

The acquired knowledge base about the diffusion of innovations was used to create four special survey groups; Base Leadership, Unit Leadership, Trainers, and Trainees. Within the diffusion of innovations process, there are different roles and responsibilities that each individual takes so that an innovation is effectively communicated over time within a given social system. This also applies to the military domain, and by its nature this domain has a great deal of structure. Additionally, different groups and individuals in that structure have specific roles and responsibilities with regard to their participation in the training domain. In order to capture the differences (attitudes, experience, and knowledge about technology) among these groups and units, the decision was to create the previously mentioned four distinct groups of subjects. They consisted of following groups and personnel:

- **Base Leadership** — individuals who have power to endorse the use of training simulations across the base. They included the following personnel: Regimental and Battalion Staff (Primary Officer and senior Staff Non-Commissioned Officers (SNCOS)/Chiefs); MAGTFTC Staff (Primary Officers, Civilians, and Senior SNCOs/Chiefs/Deputies).
- **Unit Leadership** — individuals in charge of establishing training requirements and overall supervision; individuals who also endorse the use of simulations in their units. They include the following personnel: Company (Co) Commander, Co XO, Co Operations Officer (OPSO), Co First Sergeant, Platoon Commander, Platoon Staff Non-Commissioned Officer-in-Charge (SNCOIC).
- **Trainers** — the planners and executors of actual training events. They include the following personnel: BSC, TTECG, MCTOG, MCLOG, Marine Aviation Weapons and Tactics Squadron One (MAWTS-1), Mountain Warfare Training Center (MWTC), individual Unit training providers.
- **Trainees** — the recipients of training. They include the following personnel: Platoon level: Enlisted - E6 and below; Company level: Officers (First and Second Lieutenant) and Enlisted (E7 and below); Battalion level: Officers (Major, Captain, First Lieutenant, and Second Lieutenant) and Enlisted (E7 and below); Regimental level: Officers (Major, Captain, First

Lieutenant, Second Lieutenant) and Enlisted (E7 and below).

H. EXPERIMENTAL PROCEDURE

The coordination effort and scheduling prior to the actual data collection consisted of two major steps:

- Four weeks prior, we coordinated the scheduling efforts with each unit and the LRC. Each unit was be allotted one hour sessions for the surveys; prior to each survey, volunteers were requested to participate in the focus groups.
- Two weeks prior, one week prior, and one day prior to the actual data collection, the schedule was confirmed with each unit and the LRC.

The online survey completion evolution consisted of the following steps:

- Per the schedule, each unit’s volunteers reported to the LRC and were assigned to a computer.
- After all volunteers arrived, a thesis brief was conducted, which included a “Thank You” speech for volunteering, the intent, expected results, and estimated length of time for the survey (all elements of the Informed Consent form). At this time, focus group volunteers were requested and hard copies of the consent forms were handed out.
- All users confirmed a successful start of the LimeSurvey online form, and from there, the Consent Form and Survey Tips were explained to the participants.
- After all participants read the Survey Tips, they were asked to begin the survey, and were reminded that they could stop the survey at any time if they desired to do so. The participants were provided the opportunity to depart at their leisure.

Due to the current operational tempo, the Base Leadership and Unit Leadership groups were given the opportunity to take the online surveys within their workspaces at their leisure. Additionaly, we decided to extend the initial eight day scheduled timeframe to allow other units the opportunity to participate in the survey. Once we departed MCAGCC, we monitored and collected data in the LimeSurvey tool for an additional two weeks after the onsite survey data collection was officially closed. A total of three focus groups were conducted on site; the volunteers (trainers and trainees) were combined into those three groups.

I. FINAL DATA COLLECTON

The final data collection consisted of conducting the surveys and focus groups aboard MCAGCC.

1. Surveys

a. Themes

As was previously mentioned, the surveys were developed from a set of high-level categories and grouped into different sets of questions. All questions were then structured into themes for survey purposes.

The first set of survey questions was titled, “Demographics” (Appendix K), and it included the following groups of information:

- Today’s Date, Current Unit, Year of Birth, Gender, MOS number (e.g., 0602), MOS Field (e.g., Communications), Rank, Years of Service (civilians and contractors also added military service years and total years working with the DoD), the hand they use to operate a mouse.
- Ownership and frequency of use of digital devices; frequency of use of social media and/or games and on what devices.
- Attitude – (purchases technology early on versus waits until people have used it, perceived value of

technology, seeks out information about technology, leadership endorsement

- Training simulation usage and knowledge – (Mandatory use versus optional use, skills learned, date of last use, usage time with simulation, LIKES and DISLIKES)

The next section/theme was slightly different depending on the group. The following themes were developed for specific groups of questions:

- **Base Leadership**: MCAGCC Base Simulation Facilities and Capabilities knowledge; DVTE specific knowledge; attitudes towards simulations, game-based systems, and the Simulation Center; purchasing knowledge and overall experiences with simulations.
- **Unit Leadership**: MCAGCC Base Simulation Facilities, Capabilities, and Packages knowledge; DVTE specific knowledge; attitudes towards simulations, game-based systems, and the Simulation Center; Mandatory versus Optional simulations tools, purchasing knowledge and overall experiences with simulations; amount of time simulations are used for training; simulations and their documented use within training plans and training jackets; Instructor/SME certifications; attitudes on their Marines' simulation knowledge; their endorsement of simulations within their unit; knowledge on simulation advertisements on base.
- **Trainers**: Top five simulations used, top three simulations that are most challenging for developing scenarios, designing terrain, to install, setup, and/or operate, most useful that apply to Marines jobs; the simulations that are most difficult to teach, major problems with the current simulations in terms of hardware, software, and overall maintenance, student's attitudes towards simulations, attitudes on unit preparedness for exercises (live versus simulation); attitude towards leadership involvement for exercises (live versus simulation); attitude towards the conduct of After Action Review (AAR) for exercises (live versus simulation); three major complaints from students and unit leadership in regards to training exercises; three major advantages and disadvantages for training (live versus simulations); top three factors that will make the

training exercises successful (live versus simulation) versus top three elements to avoid (live versus simulation); attitudes on the uses of AAR tools that are built into the simulation tool; other simulations that are suggested that MCAGCC does not own; attitudes towards using a new simulation purchased by the Marine Corps; attitude towards the Simulation Center in terms of the planning/preparation phase, execution phase, and AAR phase.

- **Trainees:** MCAGCC Base Simulation Facilities and Capabilities knowledge; DVTE, VBS2, and CAN specific knowledge; attitudes towards simulations, game-based systems, and the Simulation Center; amount of time simulations are used for training; attitudes towards unit's acceptance or rejection of simulations; preparation and planning efforts towards exercises (live versus simulation; knowledge on simulation advertisements on base.

The last section/theme pertained only to the Trainees; the goal was to collect their understanding, and overall knowledge and use of the following three simulations: (1) Deployable Virtual Training Environment (DVTE), (2) Virtual Battlespace 2 (VBS2), and (3) Combined Arms Network of Simulations (CAN).

2. Focus Groups

a. Video Recording and Transcription of Data

The number of individuals who volunteered for focus groups was fairly low due to the current operational tempo of each unit, so we decided to combine the Trainers and Trainees into the same session.

Prior to everyone's participation in the survey, all subjects were asked to volunteer for the focus group; those who volunteered were asked to stay until all participants in that session had completed their surveys. From there, the group transitioned into a reserved space for the purposes of video recording the session without being disturbed. Prior to the video recorder being turned on, the participants were asked for the permission to record the session so that important information that was discussed by the group was not missed. After that, each participant and the Interviewer signed the Consent Forms (Appendix J). After the video recorder was turned on, the original questions were asked as a starting point. The discussions were allowed to develop in other directions if that reflected the user's interest, and if that supported gaining additional information relevant for the study; (examples: uses, issues, challenges, knowledge, and overall attitudes towards computer-supported training simulations in the military domain).

A total of three focus groups were conducted; two were video recorded and due to timing issues and scheduling conflicts, one was left as a quick question and answer session. The transcription of the two focus groups that were video recorded can be found in Appendix N.

J. CHAPTER SUMMARY

This chapter reviewed the details about the case study and data sets that were collected at MCAGCC, Twentynine Palms, CA. The text introduced details of preliminary data collection, final study design, study subjects and procedure, the Institutional Review Board (IRB) process, tools used to collect the data, piloting efforts completed prior to collecting the final data sets, and a detailed description of the final data collection efforts.

VIII. RESULTS AND DISCUSSION

This chapter provides the quantitative and qualitative analyses of the survey and focus group data sets. Coding and themes for each data set are discussed, and the overall practical implications for the results are commented.

A. QUANTITATIVE ANALYSIS OF SURVEY DATA SETS

1. Analysis and Discussion of Demographic Section

The demographic section of each survey was designed and organized into themes: (a) basic demographics, (b) technology ownership and usage, (c) social media and technology usage, (d) games played and technology usage, (e) adoption characteristics, (f) attitude toward technology, and (g) knowledge of simulation advertising.

a. Basic Demographics

The basic demographics that were captured are Age, Years of Service, Gender, MOS, Rank/Grade, and what hand the participant uses to operate a mouse (Use of Hand (Mouse)). Table 9 displays the basic demographics for Age, Years of Service, Gender, and Use of Hand (Mouse).

Table 9. Basic survey demographics

Demographics		Trainees	Unit Leadership	Trainers	Simulation Instructors
Sample Size		**220**	**35**	**28**	**11**
AGE	**Average**	**22.11**	**32.51**	**26.64**	**49.27**
	Maximum	29	58	37	68
	Minimum	19	25	21	30
	STD DEV	2.22	7.80	4.04	10.46
YEARS OF SERVICE	**Average**	**2.55**	**10.46**	**6.54**	**19.73**
	Maximum	10	29	16	29
	Minimum	0	1	2	0
	STD DEV	1.86	7.91	3.40	9.52
GENDER	**Male**	218	35	27	11
	%	**99.09**	**100**	**96.43**	**100**
	Female	2	0	1	0
	%	0.91	0.00	3.57	0.00
USE OF HAND (MOUSE)	**Right %**	**94.55**	**97.14**	**100**	**90.91**
	Left %	0.45	0.00	0.00	0.00
	Both %	5.00	2.86	0.00	9.09

The Trainees’ average age is about 22, which is about 10 years younger than their Unit Leaders. The Unit Trainers’ age averaged about 27, which is about 20 years younger than the Simulation Instructors; five years older than the Trainees (more years of service and experience) and five years younger than their Unit Leaders. Each group was dominated by male participants who use a mouse with their right hand. The Latter suggests that the same input device would be functional for the entire population i.e., there would be no need to devise or purchase an input device that fits the needs of left-handed users.

b. Technology Ownership and Usage

The next set of data illustrates several different types of technology (digital devices) and the participants’ usages of each device. Table 10 contains ten different digital devices, and illustrates the total number and percentage of population that owns each device, and the percentage of individuals who use it on daily basis.

Table 10. Technology owned and percentage of daily use — "#" is the number of self-declared users, "%" is the % of full sample size, and "% of daily users" is the % of individuals (of full sample) who use device on daily basis

Technology Owned and % of daily Use		**Trainees**	**Unit Leadership**	**Trainers**	**Simulation Instructors**
Sample Size		**220**	**35**	**28**	**11**
LAPTOP / DESKTOP	**#**	173	35	27	10
	%	**78.64**	**100**	**96.43**	**90.91**
	% of daily users	**51.36**	**85.71**	**71.43**	**90.91**
TABLET	**#**	47	20	14	3
	%	**21.36**	**57.14**	**50**	**27.27**
	% of daily users	14.55	34.29	35.71	18.18
SMARTPHONE	**#**	200	34	24	6
	%	**90.91**	**97.14**	**85.71**	**54.55**
	% of daily users	89.09	97.14	85.71	54.55
CELLPHONE	**#**	19	1	5	4
	%	**8.64**	**2.86**	**17.86**	**36.36**
	% of daily users	10.45	0.00	14.29	36.36
GAME CONSOLE	**#**	161	23	18	4
	%	**73.18**	**65.71**	**64.29**	**36.36**
	% of daily users	40.45	2.86	21.43	0.00
E-READER	**#**	32	18	11	3
	%	**14.55**	**51.43**	**39.29**	**27.27**
	% of daily users	5.45	11.43	7.14	9.09
DIGITAL MEDIA	**#**	107	26	21	6
	%	**48.64**	**74.29**	**75**	**54.55**

PLAYER	**% of daily users**	32.73	31.43	39.29	9.09
DIGITAL CAMERA	**#**	83	20	21	8
	%	**37.73**	**57.14**	**75**	**72.73**
	% of daily users	5.00	2.86	3.57	0.00
VIDEO CAMERA	**#**	28	13	11	5
	%	**12.73**	**37.14**	**39.29**	**45.45**
	% of daily users	3.64	0.00	0.00	0.00
DOES NOT OWN ANY DEVICE	**#**	1	1	0	1
	%	**0.45**	**2.86**	**0.00**	**9.09**
INTERNET CONNECTION AT HOME (HOUSE, APARTMENT, BARRACKS)	**#**	179	34	26	10
	%	**81.36**	**97.14**	**92.86**	**90.91**
	% of daily users	70.45	97.14	89.29	81.82

The analysis suggests that the laptop, smartphone, game console, and Internet connection are the highest owned and used by all four groups of subjects. The age groups reflect that the younger participants (Trainees) are more likely to own game consoles and play games on a daily basis than the other groups, and the Simulation Instructors are more likely to own and use a cellphone, while the other three groups are more likely to own and use a smartphone.

Table 11 contains similar data as Table 10; however, it provides more details on usage (daily, weekly, monthly, rarely, does not use).

Table 11. Technology owned and categories of use — the values represent the percentage (%) of the full

sample size

Technology Owned and Categories of Usage		Trainees	Unit Leadership	Trainers	Simulation Instructors
Sample Size		220	35	28	11
LAPTOP / DESKTOP	Daily	**51.36**	**85.71**	**71.43**	**90.91**
	Weekly	22.27	14.29	21.43	0.00
	Monthly	5.00	0.00	3.57	0.00
	Rarely	8.18	0.00	3.57	9.09
	Does NOT use	13.18	0.00	0.00	0.00
TABLET	Daily	**14.55**	**34.29**	**35.71**	**18.18**
	Weekly	7.27	11.43	10.71	9.09
	Monthly	2.27	5.71	7.14	9.09
	Rarely	10.45	2.86	10.71	0.00
	Does NOT use	65.45	45.71	35.71	63.64
SMARTPHONE	Daily	**89.09**	**97.14**	**85.71**	**54.55**
	Weekly	1.36	0.00	0.00	0.00
	Monthly	0.00	0.00	0.00	0.00
	Rarely	2.73	0.00	7.14	0.00
	Does NOT use	6.82	2.86	7.14	45.45
CELLPHONE	Daily	**10.45**	**0.00**	**14.29**	**36.36**
	Weekly	0.00	0.00	0.00	0.00
	Monthly	0.00	0.00	0.00	0.00
	Rarely	6.82	11.43	7.14	18.18
	Does NOT use	82.73	88.57	78.57	45.45
GAME CONSOLE	Daily	**40.45**	**2.86**	**21.43**	**0.00**
	Weekly	21.82	22.86	35.71	0.00
	Monthly	7.27	17.14	7.14	18.18
	Rarely	11.36	25.71	7.14	18.18
	Does NOT use	19.09	31.43	28.57	63.64
E-READER	Daily	**5.45**	**11.43**	**7.14**	**9.09**
	Weekly	5.45	17.14	17.86	18.18
	Monthly	3.18	8.57	0.00	0.00
	Rarely	8.64	17.14	10.71	0.00
	Does NOT use	77.27	45.71	64.29	72.73
DIGITAL MEDIA PLAYER	Daily	**32.73**	**31.43**	**39.29**	**9.09**
	Weekly	10.00	22.86	17.86	27.27
	Monthly	2.27	11.43	0.00	0.00
	Rarely	11.82	8.57	7.14	9.09
	Does	43.18	25.71	35.71	54.55

	NOT use				
DIGITAL CAMERA	**Daily**	**5.00**	**2.86**	**3.57**	**0.00**
	Weekly	5.91	5.71	14.29	0.00
	Monthly	10.45	31.43	25.00	45.45
	Rarely	25.45	17.14	32.14	36.36
	Does NOT use	53.18	42.86	25.00	18.18
VIDEO CAMERA	**Daily**	**3.64**	**0.00**	**0.00**	**0.00**
	Weekly	4.09	2.86	3.57	0.00
	Monthly	2.73	11.43	21.43	9.09
	Rarely	15.45	25.71	17.86	36.36
	Does NOT use	74.09	60.00	57.14	54.55
INTERNET CONNECTION AT HOME (HOUSE, APARTMENT, BARRACKS)	**Daily**	**70.45**	**97.14**	**89.29**	**81.82**
	Weekly	5.91	0.00	3.57	0.00
	Monthly	0.00	0.00	0.00	0.00
	Rarely	5.00	0.00	0.00	9.09
	Does NOT use	18.64	2.86	7.14	9.09

c. Social Media Usages on Technology

The usage percentages of social media (Facebook, MySpace, Twitter, YouTube, Blogs, and E-mail) on three different types of technology devices (laptop/desktop, smartphone, and tablet) are summarized in Table 12. Facebook, YouTube, and email dominate the chart for overall usage. The Trainees used Twitter more than the three other groups (20.45%), and the Unit Leaders were more likely to use Blogs than the other three groups (11.43%).

Table 12. Social Media use with three different technology devices — "#" is the number of self-declared users, "%" is the % of full sample size, and "% Use on (device)" is the % of full sample size that uses the device for that type of media

Social Media Use For Three Top Devices		Trainees	Unit Leadership	Trainers	Simulation Instructors
Sample Size		**220**	**35**	**28**	**11**
FACEBOOK	**#**	198	28	24	8

	%	**90.00**	**80.00**	**85.71**	**72.73**
	% Use on laptop / desktop	61.36	62.86	67.86	63.64
	% Use on smartphone	81.82	74.29	67.86	18.18
	% Use on tablet	15.00	34.29	28.57	0.00
MYSPACE	#	6	0	1	0
	%	**2.73**	**0.00**	**3.57**	**0.00**
	% Use on laptop / desktop	2.73	0.00	3.57	0.00
	% Use on smartphone	2.27	0.00	0.00	0.00
	% Use on tablet	0.45	0.00	0.00	0.00
TWITTER	#	45	1	2	0
	%	**20.45**	**2.86**	**7.14**	**0.00**
	% Use on laptop / desktop	5.91	0.00	3.57	0.00
	% Use on smartphone	19.55	2.86	7.14	0.00
	% Use on tablet	2.27	0.00	3.57	0.00
YOUTUBE	#	200	25	26	6
	%	**90.91**	**71.43**	**92.86**	**54.55**
	% Use on laptop / desktop	64.55	68.57	82.14	63.64
	% Use on smartphone	71.36	60.00	78.57	27.27
	% Use on tablet	16.36	31.43	35.71	9.09
BLOGS	#	13	4	3	1
	%	**5.91**	**11.43**	**10.71**	**9.09**
	% Use on laptop / desktop	4.55	11.43	10.71	9.09
	% Use on smartphone	4.09	5.71	7.14	0.00
	% Use on tablet	0.45	2.86	10.71	0.00
E-MAIL	#	189	34	26	11
	%	**85.91**	**97.14**	**92.86**	**100.00**
	% Use on laptop /	62.73	94.29	82.14	100.00

	desktop				
	% Use on smartphone	70.00	82.86	67.86	45.45
	% Use on tablet	13.18	45.71	35.71	9.09

d. Games Played and Usages on Technology

The usage percentages of games (First Person Shooter; Flight Simulation; Racing; Sports; Puzzles, Strategy, Cards, or Board Games; Online Multi-player; Adventure, Fantast, or Role Playing; and Arcade) played on the three different types of technology devices (laptop/desktop, smartphone, and tablet) are summarized in Table 13. First Person Shooter; Racing; Puzzles, Strategy, Cards, or Board; and Online Multi-player games were the top played games by all groups.

Table 13. Games played on four different technology devices — "#" is the number of self-declared users, "%" is the % of full sample size, and "'%' Use on (device) is the % of full sample size that plays games using that type of device"

Games Played For Three Top Devices and Game Consoles		**Trainees**	**Unit Leadership**	**Trainers**	**Simulation Instructors**
Sample Size		220	35	28	11
FIRST PERSON SHOOTER	**#**	170	18	17	3
	%	**77.27**	**51.43**	**60.71**	**27.27**
	% Use on laptop / desktop	17.27	11.43	14.29	36.36
	% Use on smartphone	11.36	5.71	7.14	0.00
	% Use on tablet	3.18	5.71	7.14	0.00
	% Use on Game Consoles	72.27	54.29	53.57	0.00
FLIGHT	**#**	47	6	7	3

SIMULATION GAMES	%	**21.36**	**17.14**	**25.00**	**27.27**
	% Use on laptop / desktop	7.27	8.57	3.57	27.27
	% Use on smartphone	5.45	2.86	7.14	0.00
	% Use on tablet	0.45	2.86	3.57	0.00
	% Use on Game Consoles	16.36	2.86	21.43	0.00
RACING GAMES	**#**	101	8	9	2
	%	**45.91**	**22.86**	**32.14**	**18.18**
	% Use on laptop / desktop	6.36	8.57	0.00	0.00
	% Use on smartphone	12.73	0.00	10.71	0.00
	% Use on tablet	1.36	8.57	10.71	0.00
	% Use on Game Consoles	40.00	20.00	32.14	18.18
SPORTS GAMES	**#**	96	12	12	0
	%	**43.64**	**34.29**	**42.86**	**0.00**
	% Use on laptop / desktop	4.55	2.86	3.57	0.00
	% Use on smartphone	6.36	5.71	7.14	0.00
	% Use on tablet	0.45	5.71	3.57	0.00
	% Use on Game Consoles	40.00	31.43	42.86	0.00
PUZZLES, STRATEGY, CARDS, BOARD GAMES	**#**	90	17	14	7
	%	**40.91**	**48.57**	**50.00**	**63.64**
	% Use on laptop / desktop	16.36	20.00	25.00	63.64
	% Use on smartphone	27.27	28.57	32.14	9.09
	% Use on tablet	5.00	11.43	21.43	9.09
	% Use on Game Consoles	11.82	8.57	17.86	0.00
ONLINE	**#**	138	16	13	2

MULTI-PLAYER GAMES	**%**	**62.73**	**45.71**	**46.43**	**18.18**
	% Use on laptop / desktop	19.09	14.29	21.43	18.18
	% Use on smartphone	10.00	5.71	0.00	0.00
	% Use on tablet	0.91	8.57	0.00	0.00
	% Use on Game Consoles	52.73	37.14	35.71	0.00
ADVENTURE, FANTASY, ROLE PLAYING GAMES	**#**	91	6	11	1
	%	**41.36**	**17.14**	**39.29**	**9.09**
	% Use on laptop / desktop	15.00	11.43	14.29	9.09
	% Use on smartphone	6.36	5.71	3.57	0.00
	% Use on tablet	0.45	5.71	3.57	0.00
	% Use on Game Consoles	35.00	14.29	39.29	9.09
ARCADE GAMES	**#**	79	4	10	3
	%	**35.91**	**11.43**	**35.71**	**27.27**
	% Use on laptop / desktop	12.27	2.86	17.86	18.18
	% Use on smartphone	19.09	11.43	17.86	0.00
	% Use on tablet	3.18	8.57	14.29	9.09
	% Use on Game Consoles	20.91	8.57	21.43	9.09

Trainees (youngest group) were the majority that played Online Multi-player games (77.27%), and Simulation Instructors (Oldest group) were the majority that played Puzzles, Strategy, Cards, or Board games. The game console dominated as the technology used to play games, excluding the Puzzles, Strategy, Cards, or Board game category (63.64%).

e. Adoption Characteristics

As discussed in Chapter IV (Section C, Figure 7), the diffusion of innovations consists of five different categories of adopters; Innovators, Early Adopters, Early Majority, Late Majority, and Laggards. Tables 14 and 15 were designed to identify these types of individuals throughout our sample size. In order to compare the types of participants, we categorized each number as such: 7. and 6. (Innovators); 5. (Early Adopter); 4. (Early Majority); 3. (Late Majority); and 2. and 1. (Laggards).

Table 14. Among the first to buy technology — "%" is the % of full sample size

Among the First to Buy Technology		**Trainees**	**Unit Leadership**	**Trainers**	**Simulation Instructors**
Sample Size		**220**	**35**	**28**	**11**
I am among the first people to buy new tech-nology devices.	**7. Strongly Agree**	0	1	0	0
	%	0.00	2.86	0.00	0.00
	6. Agree	10	1	3	1
	%	4.55	2.86	10.71	9.09
	5. Somewhat Agree	32	7	4	1
	%	14.55	20.00	14.29	9.09
	4. Neither Agree or Disagree	50	5	5	2
	%	22.73	14.29	17.86	18.18
	3. Somewhat Disagree	24	4	1	1
	%	10.91	11.43	3.57	9.09
	2. Disagree	51	11	7	3
	%	23.18	31.43	25.00	27.27
	1. Strongly	53	6	8	3

	Disagree				
	%	24.09	17.14	28.57	27.27
	AGREE (7.+6.+5.)	42	9	7	2
	%	**19.10**	**25.72**	**25.00**	**18.18**
	DISAGREE (3.+2.+1.)	128	21	16	7
	%	**58.18**	**60.00**	**57.14**	**63.63**

Out of the 294 participants, the results showed only sixteen Innovators (5.44%) amongst the population, which is fairly accurate as this group was approximated as 3% of the population. The other percentages were: Early Adopters (14.97%), Early Majority (21.09%), Late Majority (10.20%), and Laggards (48.30%). These numbers are similar to Rogers' adopter category percentages (within 10-20%); however, this group reflects a high degree of Laggards. Table 14 also summarizes the total number of participants that "Agreed" and "Disagreed", with the results showing that the majority (58.5%) were not among the first to buy new technology devices. Within this community, this could mean that the adoption of computer-supported simulations on a large-scale (entire base) might be an issue; however, this was just a small sample of the MCAGCC's population.

Table 15 is very similar to Table 14 in terms of the question design; however, these results show more Innovators (16.67%); all other percentages were within twelve percent of each other.

Table 15. Always look for technology information — "%" is the % of full sample size

Always Look For Technology Information		**Trainees**	**Unit Leadership**	**Trainers**	**Simulation Instructors**
Sample Size		**220**	**35**	**28**	**11**
I always	**7.**	11	1	4	1

look for information about the latest tech-nological devices.	**Strongly Agree**				
	%	5.00	2.86	14.29	9.09
	6. Agree	25	3	1	3
	%	11.36	8.57	3.57	27.27
	5. Somewhat Agree	32	9	5	2
	%	14.55	25.71	17.86	18.18
	4. Neither Agree or Disagree	45	8	8	1
	%	20.45	22.86	28.57	9.09
	3. Somewhat Disagree	25	0	2	0
	%	11.36	0.00	7.14	0.00
	2. Disagree	34	10	5	1
	%	15.45	28.57	17.86	9.09
	1. Strongly Disagree	48	4	3	3
	%	21.82	11.43	10.71	27.27
	AGREE (7.+6.+5.)	68	13	10	6
	%	**30.91**	**37.14**	**35.72**	**54.54**
	DISAGREE (3.+2.+1.)	107	14	10	4
	%	**48.63**	**40.00**	**35.71**	**36.36**

f. Attitude Toward Technology

Attitude was identified in Chapter II as being a "key determinant" of technology adoption (Rogers, 2003; Davis et al., 1989; Yang and Yoo, 2003; and Kim, Chun, Song, 2009), which is why we designed several questions revolving around this theme; Tables 16 and 17.

Table 16 focuses on the participants' (Trainees and Unit Leadership) attitudes and their confidence in the training capabilities that are provided by computer-supported training simulations.

Table 16. Attitude toward computer-supported training simulations — "%" is the % of full sample size

Attitude toward Computer-Supported Training Simulations		Trainees	Unit Leadership
Sample Size		220	35
I feel very confident in the training capabilities of computer-supported training simulations.	7. Strongly Agree	15	3
	%	6.82	8.57
	6. Agree	43	12
	%	19.55	34.29
	5. Somewhat Agree	37	7
	%	16.82	20.00
	4. Neither Agree or Disagree	81	12
	%	36.82	34.29
	3. Somewhat Disagree	11	0
	%	5.00	0.00
	2. Disagree	10	1
	%	4.55	2.86
	1. Strongly Disagree	23	0
	%	10.45	0.00
	AGREE (7.+6.+5.)	95	22
	%	**43.19**	**62.86**
	DISAGREE (3.+2.+1.)	44	1
	%	**20.00**	**2.86**

Unit Leadership is roughly 19% more positive on their attitudes toward the training capabilities provided by computer-supported training simulations, and of the two groups, have the lowest percentage of disagreement.

Table 17 moves on to the notion of using game-based training to train Marines. The results for Unit Leadership is very high (71.43%) in this category, contrary to the stereotype that the term "game-based" might result in a negative attitude from this group for training their Marines.

Table 17. Attitude toward game-based training simulations — "%" is the % of full sample size

Attitude toward Game-Based Training Simulations		**Trainees**	**Unit Leadership**
Sample Size		**220**	**35**
I strongly support the use of game-based training systems in order to train my Marines.	**7. Strongly Agree**	17	5
	%	7.73	14.29
	6. Agree	34	7
	%	15.45	20.00
	5. Somewhat Agree	46	13
	%	20.91	37.14
	4. Neither Agree or Disagree	83	7
	%	37.73	20.00
	3. Somewhat Disagree	9	0
	%	4.09	0.00
	2. Disagree	10	1
	%	4.55	2.86
	1. Strongly Disagree	21	2
	%	9.55	5.71
	AGREE (7.+6.+5.)	97	25
	%	**44.09**	**71.43**
	DISAGREE (3.+2.+1.)	40	3
	%	**18.19**	**8.57**

g. Knowledge of Simulation Advertising

Advertising by a business-oriented institution, such as a simulation center, is a common way to acquire the interest of prospective users within a technology driven training environment. One of the objectives the simulation center has is to ensure the training audience recognizes and understands the different types of simulation tools that it has to offer, and that can be utilized by the units to effectively train their Marines.

Table 18 summarizes the results of the participants' awareness about the existence of several different types of advertising venues that might have been used on MCAGCC.

Table 18. Knowledge of simulation advertising — "#" is the number of self-declared users, "%" is the % of full sample size

Knowledge of Simulation Advertising on Base		**Trainees**	**Unit Leadership**
Sample Size:		**220**	**35**
Have heard or seen on base	**#**	37	11
	%	**16.82**	**31.43**
Have seen on Unit webpage	**#**	10	1
	%	**4.55**	**2.86**
Have seen on work e-mail	**#**	5	8
	%	**2.27**	**22.86**
Have seen on electronic bulletin boards	**#**	10	1
	%	**4.55**	**2.86**
Have seen on bulletin boards in the Exchange, gym, barbershop, food court, of Officer/SNCO/NCO/Enlisted Clubs7	**#**	14	4
	%	**6.36**	**11.43**
Have seen on Base TV.	**#**	7	0
	%	**3.18**	**0.00**
Have heard on Base	**#**	12	0

radio.	%	**5.45**	**0.00**
Have been briefed by BSC or unit SME	#	1	6
	%	**0.45**	**17.14**
Have seen on flyers or pamphlets	#	14	3
	%	**6.36**	**8.57**
Have seen on DVDs or CDs	#	7	1
	%	**3.18**	**2.86**

These results show that the Unit Leaders have the higher percentages of knowledge about advertising efforts. Unit Leaders are always looking for training opportunities, so it is understandable they are the prime target for such advertising methods.

h. DVTE, VBS2, and CAN Familiarity

The primary reason for asking questions about these three simulation technologies is due to the fact that our case study was centered on the DVTE. We wanted to know what the MCAGCC training audience (primarily the Trainees and Unit Leadership) knew about these simulation systems; heard about, usages, familiarity with its capabilities, and its overall purposes. Table 19 summarizes the results.

Table 19. DVTE, VBS2, and CAN familiarity — "#" is the number of self-declared users, "%" is the % of full sample size

Have heard of, used, and/or familiar with the simulation.		**Trainees**	**Unit Leadership**
Sample Size		**220**	**35**
DVTE	#	35	9
	%	**15.91**	**25.71**

VBS2	**#**	21	
	%	**9.59**	
CAN	**#**	10	
	%	**4.55**	

The data suggest that the Unit Leadership heard of, used, and/or was slightly more familiar with the DVTE than the Trainees. The biggest concern is that 84.09% of the Trainees and 74.29% of the Unit Leaders have never heard of, used, and/or are not familiar with this computer-supported training environment. The CAN (component) and VBS2 (simulation) are technologies that exist within the DVTE, and their results are even lower than the DVTE itself.

i. Other Quantitative Data Tables

The following data tables can be located in Appendix O; this list provides a brief commentary for each table:

- "Technology Owned and Frequency of Use Per Day and Week" (Table 25) — A summary of the ten technology devices and their daily and weekly usage is summarized. Laptops, smartphones, game consoles, Internet connection at home dominate overall ownership and daily usage. 40.45% of Trainees own a game console and 50.00% of them use it daily. None of Simulation Instructors own a game console, which results in 0.00% daily use.
- "Buy technology only after hearing from peers" (Table 26) — The majority (71.43%) of Unit Leaders wait to buy technology after hearing from their peers; Trainees - 43.63%. 45.45% of the Simulation

Instructors wait to buy new technology until after hearing from their peers.

- "Among the First to Buy new games / applications" (Table 27) — 0.00% of the Simulation Instructors are among the first to buy new applications or games, where the other three groups are about equal at ~17%. Over half of each group report that they are not among the first people to buy applications or games.

- "Buy games / applications only after hearing from peers" (Table 28) — 57.15% of the Unit Leaders report that they wait until they hear from their peers before they buy a new application or game.

- "Always look for information on new applications or games" (Table 29) — Over half of the Unit Leaders and Trainers (Trainees 46.37%) look for new information on new applications and games, compared to only 36.36% of the Simulation Instructors.

- "Easily influenced by advertising" (Table 30) — Over 70% of all four groups report that they are not easily influenced by advertising.

- "Leadership Endorsement for Adoption of Innovation" (Table 31) — Unit Leaders (91.43%) and Simulation Instructors (9.90%) strongly feel that leadership endorsement is important to the existence and survival of an existing or new innovation (idea or concept). Trainees (72.27%) and Trainers (75.00%) also strongly agree with this statement.

- "Knowledge of Base Training Facilities (w/ simulations) and Usage - TRAINEES" (Table 32) — The top three facilities that were heard about or that were visited were ISMT (68.18%), Building 1707 (ISMT and DVTE) (50.91%), and Camp Wilson (49.09%). The words ISMT and Camp Wilson are commonly known, which might be the reason for their higher percentages. Other simulations identified were SAVT (18.64%) and the BSC (10.91%). The highest usages (used at least once) were the ISMT (49.09%) and Building 1707 (ISMT and DVTE) (45.91%). A key note is that the percentages of the participants who have never used any of the eight base capabilities that were asked about range from 47.27% to 94.09%, which equates to more than half of the participants in this sample population.

- “Knowledge of Base Training Facilities (w/ simulations) and Usage - UNIT LEADERSHIP” (Table 33) – As expected, the Unit Leadership numbers were higher in respect to hearing about or visiting these base capabilities. The BSC was the lowest (42.86) and both ISMT facilities lead the way with over 74%. The percentages for “Have NEVER used” reflect that over half of the Unit Leaders have never used these base facilities.

- “Simulation training tools can be as effective as traditional training tools” (Table 34) – 40.91% of Trainees and 65.72% of Unit Leaders feel that simulation training tools can be as effective as traditional training tools.

- “Attitude toward simulations as being cost effective” (Table 35) – 51.82% of Trainees and 71.43% of Unit Leaders feel that simulation training tools are cost effective.

- “Attitude toward live training as the only effective tool” (Table 36) – 37.27% of Trainees and 22.86% of Unit Leaders agree that live training is the only real way to effectively train Marines.

- “Attitude on unit success with using simulations for training” (Table 37) – Interesting! 60.00% of Unit Leaders agree compared to only 30.91% of Trainees.

- “The amount of time simulations are used is appropriate” (Table 38) – 48.57% of Unit Leaders agree compared to 24.09% of Trainees.

- “Attitudes towards MORE investing in simulations” (Table 39) – 48.58% of Unit Leaders agree compared to 37.73% of Trainees.

- “User endorsement of simulations” (Table 40) – As expected; Unit Leaders are 40% more likely to endorse the use of simulations; Unit Leaders (79.99%), Trainees (38.17%).

- “Attitude toward unit completely supporting the use of simulations” (Table 41) – This question is unique and says a lot about different levels of leadership and their acceptance of using computer-supported training simulations as training tools. 80% of Unit Leaders disagree, meaning that their unit does not fully support the use of simulations; 30.63% of the Trainees do agree.

- "Attitude and effort towards completing simulation versus live exercises" (Table 42) — 28.57% of Unit Leaders do NOT agree that their unit's attitude and overall level of effort is the same when training with simulations versus live training; however, 45.71% do agree. 25% of Trainees agree.
- "Attitude on planning and executing simulation versus live exercises" (Table 43) — 34.28% of Unit Leaders agree compared to 28.18% of Trainees.

B. QUALITATIVE ANALYSIS OF SURVEY DATA SETS

This section captures three qualitative data sets from the developed survey questions for each group.

1. Analysis and Discussion of Developed Questions

a. Top Simulations Identified as Being Used

In order to capture the participants' specific simulation usages, simulation "LIKES", and simulation "DISLIKES", the following three questions in Tables 20, 21, and 22 were developed.

Table 20 lists the top simulations that the Trainees, Unit Leaders, and Trainers reported as using most often. It also captures information about a set of simulations that the Simulation Instructors identified as using most often to train Marines.

Table 20. Top Simulations Identified as Being Used — "#" is the number of self-declared users, "%" is the % of full sample size (three simulations most frequently used in each category appear in boldface fort)

Top Simulations that were identified as	**Trainees**	**Unit Leadership**	**Trainers**	**Simulation Instructors**

being used. (Simulation Instructor #s – most frequently used to train Marines)					
Sample Size		**220**	**35**	**28**	**28**
ISMT	**#**	90	11	3	1
	%	**40.91**	**20.75**	**9.09**	4.55
AGTS	**#**	23	14	11	1
	%	**10.45**	**26.42**	**33.00**	4.55
HEAT or MET	**#**	17	2	5	0
	%	**7.73**	3.77	**15.15**	0.00
ODS	**#**	16	0	1	0
	%	7.27	0.00	3.03	0.00
SAVT	**#**	12	5	1	0
	%	5.45	**9.43**	3.03	0.00
CCS	**#**	12	5	0	1
	%	5.45	**9.43**	0.00	4.55
FOPCSIM	**#**	0	3	2	0
	%	0.00	5.66	6.06	0.00
VBS2	**#**	4	3	1	2
	%	1.82	5.66	3.03	**9.09**
AAV Turret Trainer	**#**	9	1	2	0
	%	4.09	1.89	6.06	0.00
MTWS	**#**	0	2	0	3
	%	0.00	3.77	0.00	**13.64**
CACCTUS	**#**	0	0	0	2
	%	0.00	0.00	0.00	**9.09**
DVTE	**#**	11	1	1	2
	%	5.00	1.89	3.03	**9.09**
CAN	**#**	0	0	0	2
	%	0.00	0.00	0.00	**9.09**

The ISMT was identified as being used the most by the Trainees, which would be as expected. The AGTS was popular with the Unit Leaders (26.42%) and Trainers (33.00%). The Trainers also identified HEAT / MET as being used (15.15%). Also as expected, the Simulation Instructors reported MTWS as being the tool they used most often to train Marines.

b. Top Identified Items "MOST LIKED" for Simulations

These data sets ("MOST LIKED" and "MOST DISLIKED") were the most interesting; however, it was also the most difficult to categorize. A data set of over 300 shows the top twelve items liked by the participants for each group.

Table 21. "MOST LIKED" Items Identified for Simulations — "#" is the number of self-declared users, "%" is the % of full sample size

Top items identified as MOST LIKED for Simulations		Trainees	Unit Leadership	Trainers	Simulation Instructors
Sample Size		**220**	**35**	**28**	**11**
Realistic aspects	**#**	70	7	4	4
	%	**19.34**	**8.33**	**8.16**	**15.38**
Ability to improve MOS skills	**#**	32	6	10	5
	%	**8.84**	**7.14**	**20.41**	**19.23**
Fun, cool, game-like environment	**#**	30	0	0	1
	%	**8.29**	**0.00**	**0.00**	**3.85**
Prepares you better for the real exercise	**#**	22	5	5	0
	%	**6.08**	**5.95**	**10.20**	**0.00**
Effective / Good training	**#**	18	0	0	0
	%	**4.97**	**0.00**	**0.00**	**0.00**
Capability to run multiple scenarios; ability to practice on events	**#**	18	12	5	2
	%	**4.97**	**14.29**	**10.20**	**7.69**

numerous times					
Easy to use; easy to understand; easy to train with	#	17	3	1	1
	%	**4.70**	**3.57**	**2.04**	**3.85**
Ability to train in a safe environment	#	17	3	6	2
	%	**4.70**	**3.57**	**12.24**	**7.69**
Good to test competency	#	16	0	0	0
	%	**4.42**	**0.00**	**0.00**	**0.00**
Hands On training	#	15	1	1	0
	%	**4.14**	**1.19**	**2.04**	**0.00**
Save valuable resources	#	6	15	5	1
	%	**1.66**	**17.86**	**10.20**	**3.85**
Ease of access	#	0	7	3	2
	%	**0.00**	**8.33**	**6.12**	**7.69**

Trainees liked the realistic aspects, their ability to improve MOS skills, and the fun, cool game-like environment of the simulations that they have been exposed to and use in their training environment. Unit Leadership liked the fact that the simulations saved valuable resources (time and money), and that they provided the capability to run multiple scenarios several times on a continuous basis (practice numerous times). The Trainers also like the fact that simulations provide the ability to improve on MOS skills, but they also liked the ability of being able to train in a safe environment. Simulation Instructors liked the realistic aspects as well, and favored the concept that simulations provide the ability to improve MOS skills.

c. Top Identified Items "MOST DISLIKED" for Simulations

Although the Trainees favored the realistic aspects in Table 21 (19.34%), 26.67% of the Trainees felt the simulations had unrealistic aspects. The Trainees also did not like the technical issues (e.g., bugs in the software, glitches, automatic restarts, and other system malfunctions) that would occur with the simulations; see Table 22.

Table 22. "MOST DISLIKED" Items Identified for Simulations

Top items identified as DISLIKED for Simulations		Trainees	Unit Leadership	Trainers	Simulation Instructors
Sample Size		**220**	**35**	**28**	**11**
Did not feel realistic; too accurate for realism	**#**	80	20	7	3
	%	**26.67**	**28.99**	**15.22**	**17.65**
Technical issues; malfunctioned buggy; froze; restart; glitches	**#**	47	6	8	1
	%	**15.67**	**8.70**	**17.39**	**5.88**
Throughput Issues	**#**	22	1	0	0
	%	**7.33**	**1.45**	**0.00**	**0.00**
Boring; lose interest; too repetitive	**#**	20	1	0	0
	%	**6.67**	**1.45**	**0.00**	**0.00**
Not enough time provided	**#**	17	0	1	0
	%	**5.67**	**0.00**	**2.17**	**0.00**

when using simulation tools					
Too difficult to use, learn, or understand	#	12	0	0	0
	%	**4.00**	**0.00**	**0.00**	**0.00**
Can be inaccurate	#	12	0	2	0
	%	**4.00**	**0.00**	**4.35**	**0.00**
Poor graphics	#	11	4	2	1
	%	**3.67**	**5.80**	**4.35**	**5.88**
Marines not taking them seriously	#	9	2	4	4
	%	**3.00**	**2.90**	**8.70**	**23.53**
Being forced to use the simulations	#	8	0	0	0
	%	**2.67**	**0.00**	**0.00**	**0.00**
Cannot learn certain skills	#	8	0	0	1
	%	**2.67**	**0.00**	**0.00**	**5.88**
Inability to train as a team	#	2	4	2	0
	%	**0.67**	**5.80**	**4.35**	**0.00**
Outdated systems; too old	#	1	4	7	0
	%	**0.33**	**5.80**	**15.22**	**0.00**
Lack of real world scenarios; takes too long to build new scenarios	#	6	3	4	0
	%	**2.00**	**4.35**	**8.70**	**0.00**
Lack of availabilit y when needed	#	0	4	0	0
	%	**0.00**	**5.80**	**0.00**	**0.00**
No prior training on simulations prior to first use	#	2	3	0	0
	%	**0.67**	**4.35**	**0.00**	**0.00**

Field of view, depth perception issues	**#**	0	3	0	1
	%	**0.00**	**4.35**	**0.00**	**5.88**

The Unit Leadership disliked the nonrealistic aspects (28.99%), technical issues, poor graphics, inability to train as a team, outdated systems, no prior training on the simulations prior to using them, and the field of view and overall depth perception issues.

The Unit Trainers also disliked the nonrealistic aspects (15.22%), technical issues (17.39%), outdated systems (15.22%), but their other concerns were on the inaccuracies and poor graphics of the simulations. They also felt that the simulations they were exposed to needed more realistic scenarios (8.70%).

The Simulation Instructors' primary concern was with Marines not taking the training serious (23.53%). They also disliked the nonrealistic aspects (17.65%), technical issues, poor graphics, inability to learn certain skills, and the field of view and overall depth perception issues.

C. QUALITATIVE ANALYSIS OF FOCUS GROUP DATA SETS

1. Coding

The focus group questions were specifically designed in order to capture the answers to our research questions. Two sessions were video recorded, and based upon limited time due to a current simulation exercise that was being conducted, the third was conducted as a quick question and answer session. The videos and question and answer session were transcribed and are contained in Appendix N.

2. Themes

The focus group questions were designed slightly different for each group (Trainees, Unit Leadership Trainers, and Simulation Instructors); however, the themes were common across the groups. The themes contained the following: attitudes toward simulations and game-based training tools, simulation knowledge, good and bad experiences with simulations, future reactions to budget cuts and the uses of simulations, DVTE specific, leadership involvement in the planning and AAR review for simulation exercises, employment strategies within their unit, and several others (a reader should refer to Appendix M to review the questions in further detail.)

3. Analysis and Discussion

Qualitative and quantitative analyses were conducted on numerous data sets, which resulted in some very interesting findings within this group of participants.

It is clear that the majority of the participants use some form of technology on a daily basis, whether it be for work or personal use. Each group of participants have chosen to adopt different technologies, and use them daily for accessing applications, using social media, and/or playing games. Overall, approximately half of the participants have positive attitudes towards the capabilities and uses of computer-supported training simulations in their training environments; however, as it was discussed in Section A.1.i, they appear to have some tendencies of being in the “laggards” group of adopters. In order to confirm if this is a common theme in the military, more data should be collected. Knowing the structure of the military domain, one could say that the use of different types of technologies is treated differently within numerous domains per the unit leader's direction and endorsement. The majority of these participants (75.5%) acknowledged that if an innovation is to succeed within a unit, then it needs full support and endorsement from their unit leadership. The overall awareness and usage of the MCAGCC's simulation facilities and/or capabilities appear to be low across the board, which can be based upon several different reasons: operational tempo due to deployments (lack of time to explore other training options), lack of awareness, lack of trust and confidence in these types of technologies, lack of training on simulation systems and packages, lack of simulation capability understanding, lack of leadership endorsement, misconceptions about the training potential and real characteristics of training simulations, technical system difficulties, etc.

Based upon the findings of this study, a set of recommendations could be made; the goal is to positively affect the diffusion and adoption of computer-supported training simulations in the military domain and effectively increase ROI for these types of technical solutions.

D. PRACTICAL IMPLICATIONS

Practical implications refer to all kinds of actions, changes, and/or practical steps that units, simulation centers, acquisition offices, and other leaders/managers involved with the initiation, design, development, test, production, distribution, and maintenance processes could introduce to remedy the situation i.e., to make global diffusion and adoption successful.

For example, the data and results related to past advertising suggest that more aggressive advertising campaigns should be conducted at numerous levels and throughout different types of venues (MOS schools, PME schools, simulation centers, etc.). The best type is where successes of peers are advertised, as a large number of users look for the opinion of their peers; the data acquired in this study suggests that number is approximately 47%. On the advertising theme, simulation centers could engage in a campaign aimed at addressing a score of misconceptions that were reported within the qualitative (Table 22, "DISLIKES") section.

As discussed in Chapter II Section 2b, change agents and change agent aides are critical to the successes of the diffusion and adoption of a technological innovation within a social system. It is imperative to increase the numbers of change agents and change agent aides within the military training community, as these are the individuals who will empower the training audience with simulation knowledge and advice (strengths and weaknesses of simulations, simulation capabilities, and what simulations should be used for specific types of training). Adding an additional M&S MOS (SNCO) is the recommended approach for achieving better results. The idea of introducing change agent aides within units is also something that we recommend, as these individuals would be the continuity between the training audience and the M&S community. This role would be best suited for an NCO covering a one year commitment by the unit. This term would allow the change agent aide to gain the required simulation knowledge in order to assist the unit with choosing the simulation tools that would best augment and benefit its training requirements.

Although the idea of a “full training package” is understood and is usually included in the contract for technologies that are fielded to units, it is recommended that the acquisition professionals include the requirement of not only how to use and maintain the simulation system, but also include proven and tested advice within the training curriculum on how to use the simulation systems and employ them effectively within the unit’s training environment.

E. CHAPTER SUMMARY

This chapter provided the quantitative and qualitative analyses of the survey and focus group data sets. Coding and themes for each data set were discussed, and the overall practical implications for the results were introduced.

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IX. CONCLUSION AND RECOMMENDATIONS

A. CONCLUSIONS AND RECOMMENDATIONS

1. Conclusion

The diffusion and large-scale adoption of computer-supported training simulations contains a large number of research topics that need to be explored and further understood by the military community. The technology currently exists, and the military possesses a great deal of computer-supported simulations within its training domains; however, the data collected in our case study suggest that these assets are highly underutilized.

The notion of optional versus mandatory use of computer-supported simulations can be the influencing factor of a unit's adoption of a technology; if this happens it should be done with a full understanding and support from the community. Leadership endorsement has been discussed throughout this study, which is why it is so important that leaders at all levels are familiar with the simulation systems available to them, know how to employ them, and understand system strengths and weaknesses. The same leaders should be cognizant about the training value of those systems, including the fact that in most cases simulation tools are not meant to replace live training, but to enhance and/or to augment their current training practices.

The study uncovered some positive results and lessons: well-known simulation systems that have existed for longer periods of time within the military community, such as the ISMT, MTWS, and flight simulators, are tools that have been adopted and are used regularly to train military members. Systems such as these are important to the M&S community as they are the "models to emulate"—they represent the computer-supported training simulations that have survived and continue to be utilized as training tools within the military domain. This group of simulations support the training of procedural skills, provide immediate visual feedback about the trainee's skill acquisition (example: ISMT), and represent a class of technologies that are easily identified as being beneficial within the military community. If the benefits are immediate and can be demonstrated to the training audience, then they are more likely to adopt the simulation within their training curriculum ("relative advantage" and "observability" discussed in Chapter IV). The tactical decision-making simulations such as VBS2, are much harder to sell to the training audience as the tool's overall usefulness and effectiveness are not so easily identified and perceived by the users. This category of computer-supported training simulations need a lot more attention in the areas of advertising, dissemination, and during any types of actual training instruction for the systems i.e., Initial, Refresher, Train-the-Trainer, etc.

Some institutions report the figures representing resources being saved by using computer-supported training simulations or conducting simulation exercises, vice live exercises; however, those numbers are questioned throughout the military community as a straightforward comparison. For example, ammunition use may not be most appropriate assessment for those two very different training environments. The military community is currently working on capturing and assessing the cost savings resulted from the use of computer-supported training simulations, and is introducing software that is capable of acquiring such understanding. Until this segment is implemented, proven/validated, and accepted, the M&S community, along with those units that have adopted and accepted these simulations within their training regimes, need to continue capturing these savings to the best of their knowledge and capabilities.

2. Recommendations

The results of the data analysis and the knowledge of both the military domain and training segment of military activity, provide us with a good basis for recommendations on how to improve the process of diffusion of computer-supported training systems within the same community.

For a start, a well thought out advertising campaign should be developed throughout the M&S community; the goal is to explain the purposes, strengths and weaknesses, and objectives of computer-supported training simulations in the military domain. The same simulation tools need to be introduced to military members early in their careers, so that they at least acknowledge an awareness of the training capabilities that will be available to them. A prime venue for this introduction is in Boot Camp (enlisted and officer), MOS schools, and PME schools. These simulation tools will be upgraded and/or changed over time, so the continuous education of these systems will need to be provided to leaders throughout their careers. Other prime venues are advanced MOS schools, senior leader symposiums/conferences, and Commander’s courses.

It is recommended that “full training packages” are prepared for every computer-supported training simulation disseminated and used by the military training audiences. Without this full package, the training audiences will not really know the full value, purpose, goal, overall strengths and weaknesses of their acquired simulation training tools; the way to organize the most effective training sessions with such systems; and will not know the best way of incorporating them in their training regimen.

The number of change agents and change agent aides needs to increase within the military domain. M&S officers are currently being trained and the overall numbers within the military community are growing; however, these individuals can only do so much. M&S is not a primary MOS in the Marine Corps, and as the community both grows and shrinks at the same time due to one-time NPS payback tours, this leaves the number of officers with M&S expertise and actual fleet experience at extremely low levels. There are also M&S billets that are single threaded, which can lead to a lack of continuity with this key billet within a training command. Their presence within military units is minimal and being such small resources, they can only make minimal impacts on the military training domain on a large-scale. It is recommended that an MOS be created for change agents (recommending a SNCO), and the introduction of change agent aides within units. This continuity and overall concept is very similar to the Information Systems Coordinator (ISC) billets that were implemented with the introduction of Navy Marine Corps Intranet (NMCI).

B. MAIN CONTRIBUTIONS

The main contributions within this thesis is a set of understandings acquired on the topic of diffusion, and the specific applications of that process with computer-supported training simulations (the innovation) that was considered within the military training domain. As our research, collected data sets, and its demonstrated analysis shows, it is a complex, multilayered problem. If one wants to make a change for the better, then many aspects of this domain should be addressed simultaneously.

The results of analysis completed on the data sets make a contribution to the M&S community's knowledge about this process. The data sets can be further analyzed in a lot greater detail than was completed during this evolution. In the end, having this type of data is powerful for the M&S community and can be utilized to make decisions within several different phases of the acquisitions process; a section dedicated to practical considerations drawn from the data set (Chapter VIII) details several other actions and improvements for this process.

The study has also identified areas where additional (or different) approaches are needed. The surveyed trends and guidance that were produced will be equally applicable to other USMC bases, and they will have a universal value applicable to the adoption of computer-supported training solutions by other Department of Defense (DoD) services.

C. DIRECTIONS FOR FUTURE WORK

There are two major groups of directions for future work—the one directed towards improving the theoretical basis in this domain, and another one aimed at improving the practice in the same domain.

1. Theoretical Work

Adoption frameworks were briefly introduced in Section D of Chapter II, and are the primary models or theories used to evaluate user's attitudes and/or acceptance toward technology adoption. This area of research is very important within any community that utilizes technology, as the processes within a social system are the "heart, health, and soul" of the evolution of any company, business or military unit.

It is enthusiastically recommended that future Service-wide studies be conducted using adoption frameworks most suited for contemporary M&S communities, and the military domain.

2. Practical Work

The data collected in our study suggest that a set of misconceptions about computer-supported simulations represent a burning issue that needs to be addressed promptly throughout the military community. For example, the fear of replacing live training with simulations is just one instance of a misconception that needs to be discussed, understood, and alleviated throughout all levels of leadership within the military domain; leaving it unresolved would only further aggravate the situation and delay adoption of training simulations. The areas of advertising, attitudes, and acquisition are primary targets for future work regarding the uses and acceptance of technology in the M&S military domain.

It is also enthusiastically recommended that a wider Case Study be conducted on the entire process of the inception, design, development, test, implementation, dissemination (training packages), maintenance, and on the responses from the users (acceptance, planned usage within their training environment, LIKES/DISLIKES, recommendations for upgrades/changes, etc.).

In the end, we hope that these suggestions will help improve the current technology adoption and usage situation within the M&S community, and will be a source of positive change for future returns on investment.

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APPENDIX A. DEPLOYABLE VIRTUAL TRAINING ENVIRONMENT

The text in Appendix A has been provided by the MCAGCC/MAGTFTC Battle Simulation Center (BSC) located in Twentynine Palms, CA.

Description:

The DVTE is a suite that is resident in most fleet units. The suite contains 32 laptop computers with each containing a mouse, cables, switches, and headsets needed to set up and network the hardware. All of the gear is packed in nine Pelican cases for easy transport and deployment. Each computer contains a suite of tactical simulations capable of training audiences from the individual Marine through battalion staffs. Using DVTE, a unit can set up its own simulation center in a classroom, barracks, berthing space, firm base, or other location. Having this resource, a unit does not need a simulation center to accomplish the same training; it can use its own. The unit can get select Marines trained on how to operate the simulations, through the MAGTFTC Battle Simulation Center (BSC), or the unit can request BSC staff to run the simulations on site. However, the unit chooses to use its DVTE, the simulation staff at MCAGCC stands ready to help Marines get the most out of this valuable toolbox.

Simulation Systems:

- Virtual Battlespace 2 (VBS2)
- Combined Arms Network (CAN)
- Tactical Language Training System (TLTS), includes Arabic, Dahri, Pashto, Indonesian, and Creole French

- Recognition of Combatants (ROC), includes Vehicle, IED, and Suicide Bomber
- Combat Decision Range (CDR)
- MAGTF XXI
- Tactical Operations (TACOPS)
- Close Combat Marine (CCM)
- Logistics Tactical Decision Simulation (TDS)
- Joint Virtual Tactical Radio (JVTR)

Support:

The DVTE may seem somewhat overwhelming to the inexperienced user, but the simulation staff is ready to help in the following ways:

- Conduct a train-the-trainer course to teach Marines to operate each simulation in DVTE. The course can be tailored to the unit's needs. The standard course lasts two weeks and covers all simulations in the suite.
- Operate the simulations at the unit's site
- Assist in setting up the suite in unit spaces
- Develop scenarios for simulation applications for the unit to use
- Serve as a help desk for problems encountered in setting up DVTE or in using its simulation applications
- Disseminating updates to the software or hardware from Headquarters Marine Corps
- Collecting suggestions for system improvement

APPENDIX B. COMBINED ARMS COMMAND AND CONTROL TRAINING UPGRADE SYSTEM

The text in Appendix B has been provided by the MCAGCC/MAGTFTC Battle Simulation Center (BSC) located in Twentynine Palms, CA.

Description:

Once Fire Support Teams (FiST) teams have their basic internal procedures practiced, company level units and higher must integrate the fire support and air control planning together. Combined Arms Command and Control Training Upgrade System (CACCTUS) is the venue for combined arms training at the staff level. CACCTUS uses an entity level simulation called OneSAF to generate battlefield forces. Marines are able to train using a three dimensional viewer that allows them to train in a virtual environment just as they would in the field. In CACCTUS, Marines can build complex fire and maneuver packages and submit them to battalion and regimental staffs for approval. Thus, the unit FSCC and DASC train in clearance of missions, coordination of air and fire planning, and control of maneuver in conjunction with supporting arms. Often associated only with Enhanced Mojave Viper preparation, CACCTUS is open to tenant and visiting units to challenge staffs in the art of combined arms.

Training Applications:

- FiST Supporting Arms Training
- Staff control and coordination of combined arms
- FSCC and DASC integration

- Integration of supporting arms packages with maneuver
-

Training Time Recommendation:

Units should plan to spend at least one day in CACCTUS, allowing time for preparation, exercise conduct, and debriefing.

APPENDIX C. COMBAT CONVOY SIMULATOR

The text in Appendix C has been provided by the MCAGCC/MAGTFTC Battle Simulation Center (BSC) located in Twentynine Palms, CA.

Description:

The Combat Convoy Simulator (CCS) is a convoy trainer consisting of six tactical vehicle mockups inside a 360 degree wrap around screen. Since the CCS vehicles are all inserted into the same virtual environment, the actions of the HMMWV driver in one CCS unit will be reflected onto the screens in the other units. This provides a much richer/realistic experience for all students. The CCS uses the Firearms Training System (FATS) Indoor Simulated Marksmanship Trainer (ISMT) weapon systems. The trainer provides opportunities to practice physical vehicle maneuvering in and around the roads/intersections during convoy movement and allows for opportunities to exercise quick reaction drills to simulated IED events as well as the exercise of convoy command and control. This simulation compliments other simulations such as VBS2, but provides for a more immersive experience than similar training conducted on flat screen computer monitors. Users should bring their Flak, Kevlar, 782 gear and anything else that they would normally wear during convoys.

Training Applications:

- Marines who plan to participate in convoy operations
- Teaches command and control as well as verbal coordination between convoy vehicles during stressful situations

- Teaches immediate action drills when a unit in the convoy encounters an IED or other adverse conditions such as sniper or RPG attack

Training Time Recommendation:

Scenarios typically run 1 to 2 hours, depending on mission type.

APPENDIX D. MAGTF TACTICAL WARFARE SIMULATION

The text in Appendix D has been provided by the MCAGCC/MAGTFTC Battle Simulation Center (BSC) located in Twentynine Palms, CA.

Description:

The Marine Air Ground Task Force Tactical Warfare Simulation (MTWS) is a "Top Down" constructive simulation designed to exercise the commander and his staff. Either using MTWS as a stand-alone system or as a driver for C2 devices, the commander can use MTWS to exercise command and control functions and practice standard operating procedures. MTWS provides real time engagement and movement, plus event recording for after-action review. The unit requesting training works with the BSC staff to design scenarios. During the actual training scenario, BSC operators can act as the OPFOR, the Direct Air Support Center (DASC), pilots, and artillery batteries in response to tactical traffic on the organic unit communication nets. MTWS provides timely and realistic combat information to controllers, who in turn, use doctrinal C4 networks to communicate information to the appropriate Combat Operation Center (COC). Controllers also receive orders from the COC for their respective units and direct terminal operators to execute those orders within the simulation. With the ability to produce terrain databases for any geographic location, MTWS is a fully capable simulation designed specifically to support the MAGTF.

Training Applications:

- Company, battalion, and up to regimental staff operations
- Familiarity with C2 concepts and visualizations
- Staff exercises train the following skills:
- fire support
- offensive
- defensive
- ACM
- Close Air Support (CAS
- ship to shore movement
- logistics
- naval surface warfare
- carrier operations
- opposing force
-

Training Time Recommendation:

The recommended training time for a typical MTWS exercise is:

- 1 Day — Exercise planning/Scenario Development
- 2 Days – Operator Training
- 2 Days – Exercise

APPENDIX E. HMMWV EGRESS ASSISTANCE TRAINER

Description:

HEAT is a vehicle trainer that simulates a HMMWV in the rollover condition. Marines are presented with various scenarios that increase in difficulty. The initial scenario teaches Marines to safely exit the vehicle when it is upside down. As the difficulty of the training increases, Marines are required to help injured Marines get out as well. They are required to transport the Marine to a safe location and set up security around the simulated rollover site.

Training Applications:

- Teach Marines how to egress an up-armored HMMWV under various tactical conditions
- Teaches teamwork and presence of mind; trains up to four Marines at a time per session

Training Time Recommendation:

Scenarios typically run about 10 minutes.

Notes:

Most major U.S. Marine Corps bases have HEAT's on site for use in Block 1 and Block 2 Pre-deployment training.

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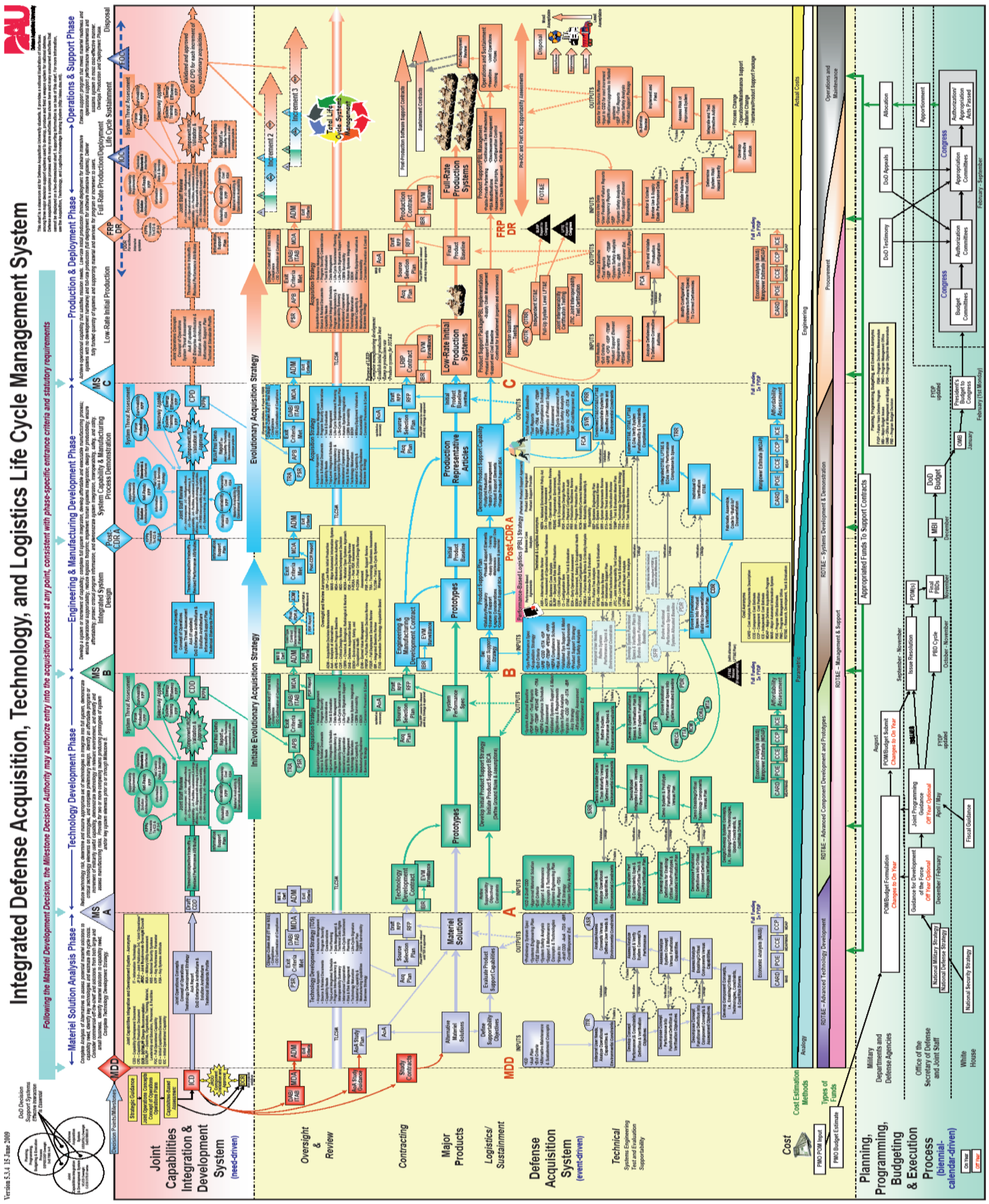
APPENDIX F. INTEGRATED DEFENSE ACQUISITION AT&L LIFE CYCLE MANAGEMENT SYSTEM

Table 23. Integrated Defense AT&L Life Cycle Management System (From Defense Acquisition University, 2010)



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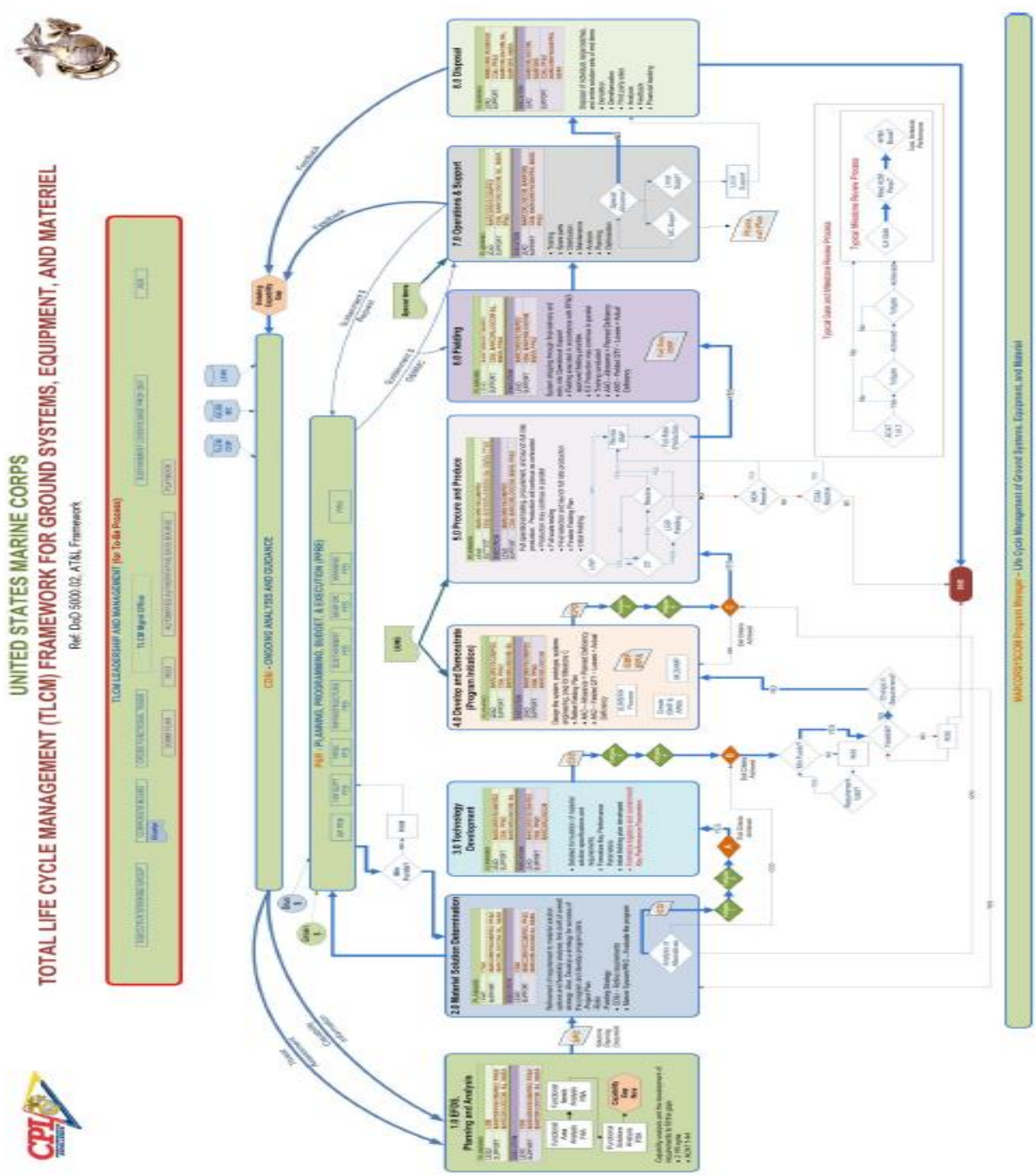
APPENDIX G. USMC TOTAL LIFE CYCLE MANAGEMENT

Table 24. USMC Total Life Cycle Management (From Defense Acquisition University, 2009)



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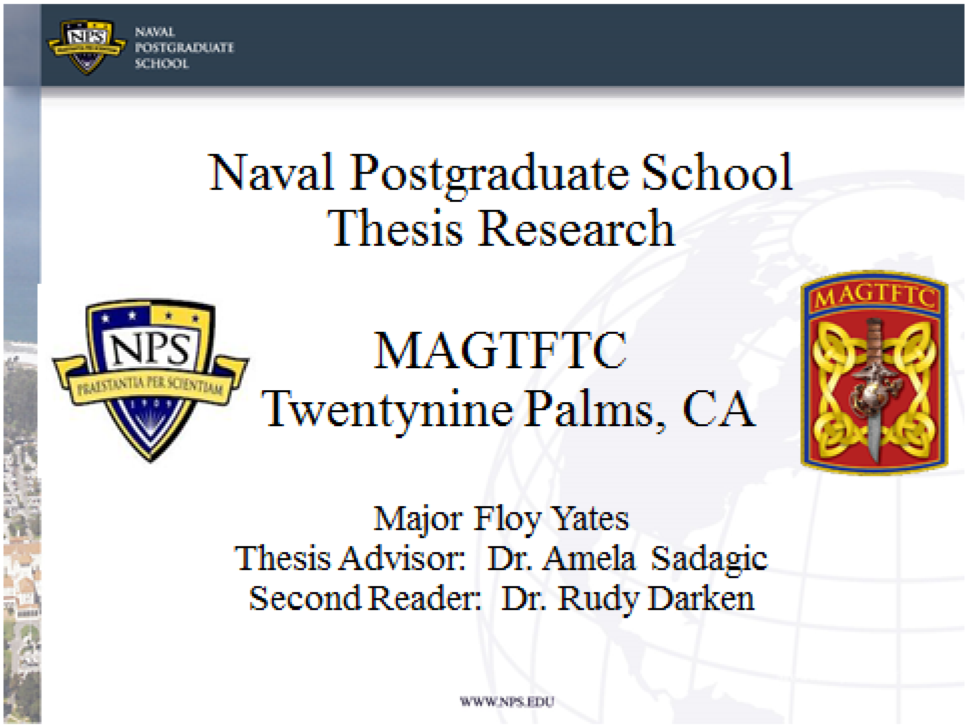
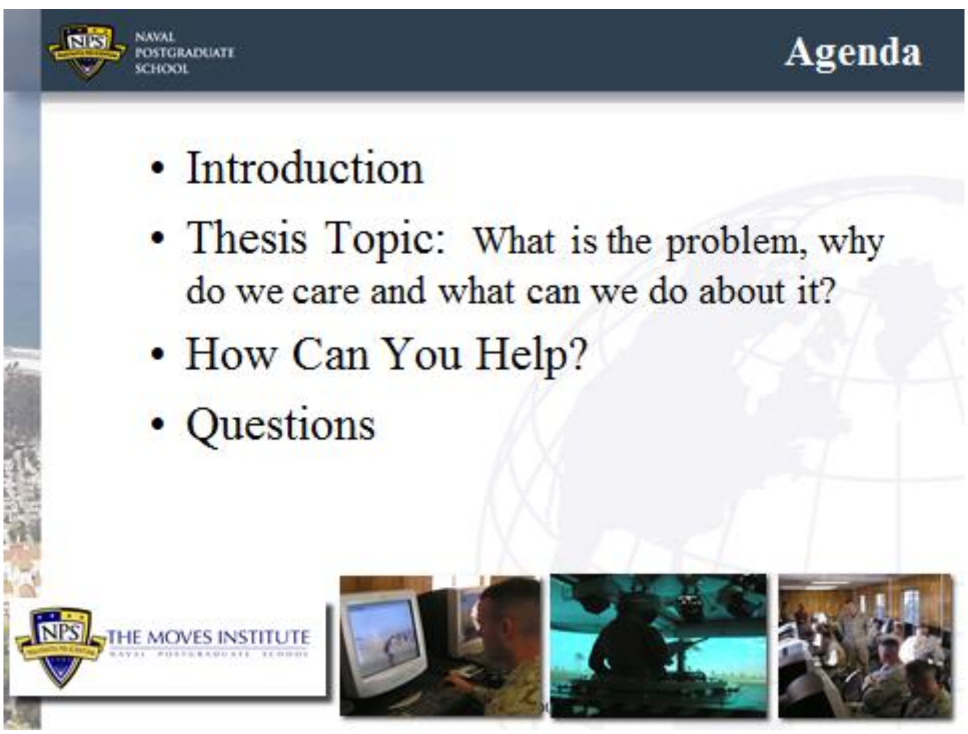
APPENDIX H. THESIS RECRUITMENT





NAVAL POSTGRADUATE SCHOOL

Thesis Topic

- Title: **Diffusion and Large-Scale Adoption of Computer-supported Training Simulations in the Military Domain**
- **Problem Statement** – What is the problem and why do we care?
  - Save resources, Training scenarios/conditions, #s trained and throughput
  - Huge investments and resources have been committed to computer-supported training simulations, but we have not seen 'large scale' deployment and adoption throughout the military domain (DoD wide). The question we ask is: What are the reasons for this?
- **Our approach in studying this situation** – How do we plan to study that situation?
  - Talk to users and collect data.
  - Test the issues identified from our contacts and experience, and identify new issues we did not know about.
- **End State / Goal of my Thesis**:
  1. Identify issues that positively or negatively influence the adoption process.
  2. Suggest/Recommend new approaches about the methods of diffusion, and overall large scale adoption within MAGTFTC and ultimately USMC.

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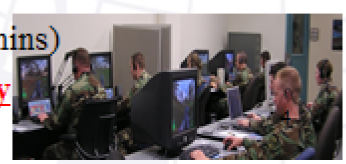
NAVAL POSTGRADUATE SCHOOL

How Can You Help?

Your Help is Needed!

1. **Provide Advice and Consultation**: need Fleet experience, recommendations, guidance, ideas, suggestions about technology adoption (primarily computer-supported training simulations) in the military domain
2. **Support Data Collection Effort**
   - Units and leadership are the data source
   - Voluntary Surveys (~45 mins)
   - Voluntary Focus Groups (~30 mins)
   - **Schedule: 1-3 July & 8-12 July**



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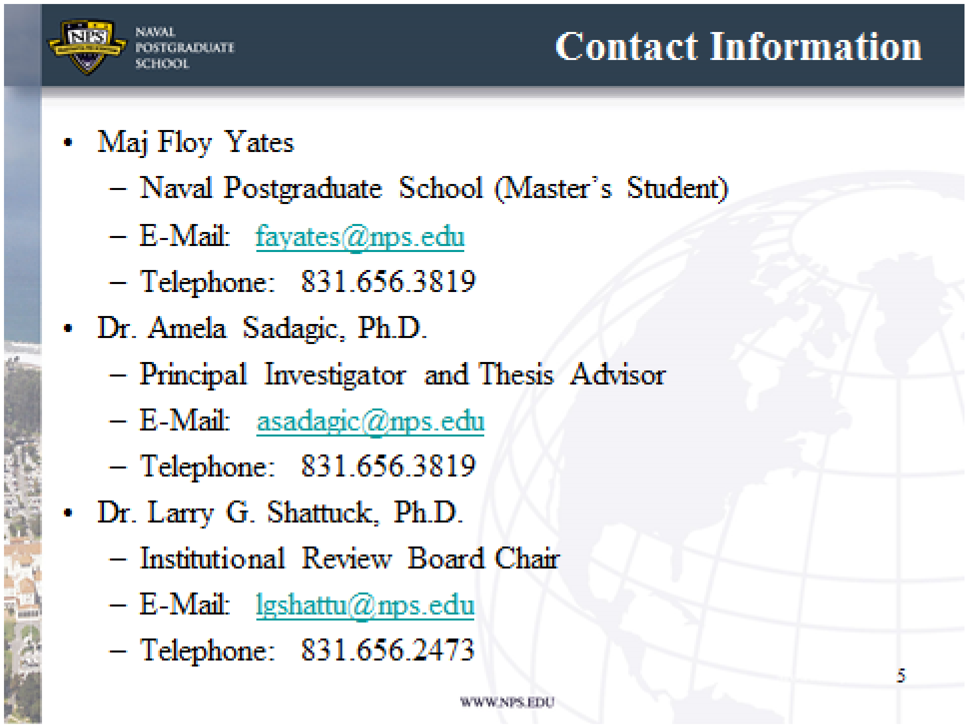
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Subject: Call for participants in a Naval Postgraduate School Thesis research study

Join us as a volunteer in a research study organized by the Modeling, Virtual Environments and Simulations (MOVES) Institute located at NPS in Monterey, CA

We are looking for **VOLUNTEERS** who would like to participate in a new research study – the purpose of the study is to investigate the global trends on technology adoption, and to collect the data related to the current state of employment, utilization, and adoption of computer-supported simulations within Marine Corps units aboard Twentynine Palms, CA. You will:

(1) Participate in a survey
(2) If randomly selected, then participate in a small focus group discussion

WHERE:	Learning Resource Center (Building 1612)
HOW LONG:	Survey – 45 minutes; Focus Group – 30 minutes
WHEN:	**24 June – 3 July (0830-1130, 1330-1600)**

Each participating unit will be given a set schedule, so please contact your S-3 or Operations / Training Section in order to confirm your unit's schedule.

Please contact Major Floy A. Yates Jr. <fayates@nps.edu> to confirm your participation. Feel free to pass this information on to other Marines in your unit who you feel would be interested to participate.

Thesis Advisor
Dr. Amela Sadagic, asadagic@nps.edu

NPS Institutional Review Board Chair
Dr. Larry Shattuck, lgshattu@nps.edu

APPENDIX I. FIRST MCAGCC TRIP, INITIAL MEETING QUESTIONS

Thesis Discussion – MCAGCC / MAGTFTC 29 Palms, CA

Base Leadership:

1. Is the Staff familiar with the Simulation Center and its capabilities? Have they toured the Simulation Center?

2. Has the Staff utilized the Simulation Center as a Team, individually? If yes, then for what purpose and on what simulations?

3. Does the Staff fully support the Simulation Center's existence? Its overall mission?

4. If used, what was your overall experience with the Simulation Center?

5. When the term "game-based" system and training are used in the same sentence, what are your initial reactions?

6. What are your overall experiences with computer-supported training simulations?

Unit Leadership / Trainers / Trainees:

1. Deployable Virtual Training Environment (DVTE)
    a. Does the unit own a DVTE?
        i. No
            1. Are they familiar with its capabilities?
            2. Have they used it and where?
            3. Overall experience (Pros and Cons)

        ii. Yes
            1. When did you receive it?

2. Did the unit receive training? If yes, then from who?
    a. Who attended the training (#s), and how many Trainers were there (#s)?
    b. How long was the training?
    c. Training package? Manuals provided (Training, Operation, Maintenance)?
    d. Was this written in the contract, and did they meet the contract deliverables?
    e. Are the DVTE laptops utilized for any other purposes? If yes, then what for?
    f. See the location of the suite; take photos if allowed.

3. Maintain proficiency - Does the unit have SMEs that know how to operate it, and do they conduct Train-the-Trainer classes? If yes, then how often?

4. Where is it located? Easily accessible?

5. How often do they use it and what are the main systems they use?

6. Have there been any maintenance (hardware/software) issues with it? If yes, then how long did it take to fix it?

2. What has been your overall experience when receiving technology packages such as the DVTE or any other computer-supported system? Ex: Does it just show up on your door step? Was it well coordinated? What are the issues? Were your overall expectations met?

3. Simulation Center

a. Do you know where the Simulation Center is located?
b. How often do you use it, what systems do you use, and for what purposes?
c. What has your experience been with the Simulation Center?
d. Are there simulations that are a MANDATORY training requirement? If yes, then what are they?

   Compared to a traditional training evolution, when using the Simulation Center, does the unit plan utilizing the same approaches, processes, and overall requirements?

   After using the Simulation Center, how is the completion of training recorded and reported?

   Are there AARs completed, and if yes, then how do they differ from the traditional training AARs?

e. If the unit has chosen the training as an OPTIONAL training venue, then what were the reasons for choosing this approach? All the same questions compared to the traditional training venue will be asked.

4. Does the unit have any personally developed in-house simulations? If yes, then who developed it and what do they use it for? Would like to see a demo of system.

5. What would you say are the overall attitudes and habits of your Marines (in general, towards technology)?

Simulation Center:

1. How many Trainers are on Staff? (Contractor / Military)

   a. Do they have to be certified? If yes, then how?

Do they have to be recertified? If yes, then how often?

Are they current? If no, then how long overdue?

2. Does the Simulation Center have training usage logs (By unit/individual)?

3. Does the Simulation Center have any throughput issues? If yes, then during what timeframe and on what simulations? Look at MANDATORY training requirement.

4. What are the names of each simulation?

    a. What was there experience been with the delivery and receipt of these simulations? Ask the same training questions as the DVTE?

5. Does the Simulation Center operate 24/7 if required for a training evolution? If yes, then how often does this occur?

6. In the past 3 years, has anyone attended conferences and/or training on Simulation Center systems, simulations, and/or any other type of technology? If yes, then how do the individuals bring this knowledge back into the Simulation Center? DVDs, handouts, online training, etc.?

7. In the past 2 years, has a unit approached the Simulation Center requesting assistance for a specific type of training? If yes, then what was the outcome/end result?

Tactical Training Exercise Control Group (TTECG):
Marine Corps Tactics and Operations Group (MCTOG):
Marine Corps Logistics Operations Group (MCLOG):

1. What are your procedures for conducting training?

2. Are there prerequisites before a unit can attend training? If yes, then what is it?

3. Is unit performance captured, and if yes, then how, and who receives the final results? AAR? Final report?

4. Do you use computer-supported simulations in your training evolutions? If yes, then what systems?

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APPENDIX J. CONSENT FORMS (SURVEY AND FOCUS GROUPS)

1. LimeSurvey online tool consent form

Naval Postgraduate School
Consent to Participate in Research

Introduction. You are invited to participate in a research study entitled "Diffusion and Large-Scale Adoption of Computer-Supported Training Simulations in the Military Domain". The purpose of this research study is to investigate the global trends on technology adoption, and to collect the data related to the current state of employment, utilization, and adoption of computer-supported simulations within Marine Corps units aboard Twentynine Palms, CA.

Procedures. You will be asked to answer several questions utilizing an online survey tool called LimeSurvey. The survey is focused on your experiences with computer-supported training simulations. The survey will take about 45 minutes. After the survey, randomly selected Marines (4-8) will be asked to participate in small focus group discussions. The discussion will ask several in depth questions from the survey that was just completed. Focus groups will be video recorded for purposes of capturing spoken information, as it will be hard to write down all comments during the session.

Location. The survey and interview will take place in the Learning Resource Center (Building 1612) aboard Marine Corps Air Ground Combat Center (MCAGCC), Marine Air Ground Task Force Training Command (MAGTFTC) located in Twentynine Palms, CA.

Cost. There is no cost to participate in this research study.

Voluntary Nature of the Study. Your participation in this study is strictly voluntary. It is important to know that if you choose to participate, then you can change your mind at any time and withdraw from the study. You will not be penalized in any way or lose any benefits to which you would otherwise be entitled if you choose not to participate in this study or to withdraw. The alternative to participating in the research is to not participate in the research.

Potential Risks and Discomforts. The potential risks of participating in this study are: You understand that the survey / focus group process does not involve greater than minimal risk. There is a minimal risk of breach of confidentiality, which is a possible loss of your responses.

Anticipated Benefits. New insight will be gained on the use of computer-supported training simulations in military training domain. The study will also have the opportunity to identify the areas where additional (or different) approaches for simulations may be needed. The surveyed trends and guidance produced at the end of the study will be equally applicable to other USMC bases, and they will have a universal value applicable to adoption of computer supported training solutions by other DOD services. You will not directly benefit from your participation in this research.

Compensation for Participation. No tangible compensation will be given.

Confidentiality & Privacy Act. Any information that is obtained during this study will be kept confidential to the full extent permitted by law. All efforts, within reason, will be made to keep your personal information in your research record confidential, but total confidentiality cannot be guaranteed. No information will be publicly accessible that could identify me as a participant. You will be identified only as a code number on all research forms/data bases; your name on any signed document will not be paired with my code number in order to protect your identity. You understand that records of your participation will be maintained by NPS for ten years.

Points of Contact. If you have any questions or comments about the research, or you experience an injury or have questions about any discomforts that you experience while taking part in this study please contact the Principal Investigator, Dr. Amela Sadagic, (831) 656-3819, asadagic@nps.edu. Questions about your rights as a research subject or any other concerns may be addressed to the Navy Postgraduate School IRB Chair, Dr. Larry Shattuck, lgshattu@nps.edu.

Statement of Consent. I have read the information provided above. I have been given the opportunity to ask questions and all the questions have been answered to my satisfaction. I have been provided a copy of this form for my records and I agree to participate in this study. I understand that by agreeing to participate in this research and signing this form, I do not waive any of my legal rights.

____________________________________ ________________

Participant's Signature Date

____________________________________ ________________

Researcher's Signature Date

2. Focus Group consent form

Naval Postgraduate School
Consent to Participate in Research

Introduction. You are invited to participate in a research study entitled "Diffusion and Large-Scale Adoption of Computer-Supported Training Simulations in the Military Domain". The purpose of this research study is to investigate the global trends on technology adoption, and to collect the data related to the current state of employment, utilization, and adoption of computer-supported simulations within Marine Corps units aboard Twentynine Palms, CA.

Procedures. Randomly selected Marines (4-8) will be asked to participate in small focus group discussions. The discussion will ask three to four in depth questions about technology adoption and computer-supported training simulations in the military domain. The discussion is expected to last no more than 30 minutes. Focus groups will be video recorded for purposes of capturing spoken information, as it will be hard to write done all comments during the session. **All participants are requested to be respectful of each other. Please do not divulge the participation of individuals in this research or their responses.**

Location. The focus group will take place in the Learning Resource Center (Building 1612) aboard Marine Corps Air Ground Combat Center (MCAGCC), Marine Air Ground Task Force Training Command (MAGTFTC) located in Twentynine Palms, CA.

Cost. There is no cost to participate in this research study.

Voluntary Nature of the Study. Your participation in this study is strictly voluntary. It is important to know that if you choose to participate, then you can change your mind at any time and withdraw from the study. You will not be penalized in any way or lose any benefits to which you would otherwise be entitled if you choose not to participate in this study or to withdraw. The alternative to participating in the research is to not participate in the research.

Potential Risks and Discomforts. The potential risks of participating in this study are: You understand that the focus group process does not involve greater than minimal risk. There is a minimal risk of breach of confidentiality, which is a possible loss of your responses. The researcher will safeguard your information but cannot guarantee other focus group participants will keep your responses and participation confidential.

Anticipated Benefits. New insight will be gained on the use of computer-supported training simulations in military training domain. The study will also have the opportunity to identify the areas where additional (or different) approaches for simulations may be needed. The surveyed trends and guidance produced at the end of the study will be equally applicable to other USMC bases, and they will have a universal value applicable to adoption of computer supported training solutions by other DOD services. You will not directly benefit from your participation in this research.

Compensation for Participation. No tangible compensation will be given.

Confidentiality & Privacy Act. Any information that is obtained during this study will be kept confidential to the full extent permitted by law. All efforts, within reason, will be made to keep your personal information in your research record confidential, but total confidentiality cannot be guaranteed. No information will be publicly accessible that could identify me as a participant. You will be identified only as a code number on all research forms/data bases; your name on any signed document will not be paired with my code number in order to protect your identity. You understand that records of your participation will be maintained by NPS for ten years.

Points of Contact. If you have any questions or comments about the research, or you experience an injury or have questions about any discomforts that you experience while taking part in this study please contact the Principal Investigator, Dr. Amela Sadagic, (831) 656-3819, asadagic@nps.edu. Questions about your rights as a research subject or any other concerns may be addressed to the Navy Postgraduate School IRB Chair, Dr. Larry Shattuck, lgshattu@nps.edu.

Statement of Consent. I have read the information provided above. I have been given the opportunity to ask questions and all the questions have been answered to my satisfaction. I have been provided a copy of this form for my records and I agree to participate in this study. I understand that by agreeing to participate in this research and signing this form, I do not waive any of my legal rights.

______________________________________ __________________
Participant’s Signature Date

______________________________________ __________________
Researcher’s Signature Date

APPENDIX K. DATA COLLECTION (DEMOGRAPHICS SURVEY QUESTIONS)

Please fill in the following questionnaire – answer all questions as objectively as you can. All information will be held confidential.

1. Date of completing questionnaire: **(Insert Calendar)**
2. Year of birth: **(Drop down)**
3. Sex: (Select one):

Male	Female
○	○

4. Military Occupational Specialty (i.e. 0311): **(Drop down)** and MOS Field (i.e. 03-infantry) (Standard lists (Infantry, Intelligence, Communications, etc.)
5. Your Current Rank/Civilian Grade/Contractor: **(Drop down)**
6. How long have you served in the military (If retired, then please answer this question as well as question 7 or 8)? Please enter your total time in service (TIS): ______________ years
7. If you are a Civilian, then how long have you worked for the Department of Defense? __________ years
8. If you are a Contractor, then how long have you worked with the Department of Defense? __________ years
9. What type of technology do you own, how long have you used it, and how often do you use it? (Check all that apply)

Type of Technology Device (Check **all** that apply and answer the questions to the right of each device.)	**How long have you used this technology?**	**How often do you use this device/service?** (Check **one** and then enter your usage hours).			
I do NOT own any of these devices ○					
Computer (Laptop or Desktop) ○	____ years	Hours per day ○ Enter # of hours_____	Hours per week ○ Enter # of hours_____	Hours per month ○ Enter # of hours_____	Rarely ○
Tablet (examples: iPad, ○ iPad mini, Google Nexus, Samsung Galaxy Note)	____ years	Hours per day ○ Enter # of hours_____	Hours per week ○ Enter # of hours_____	Hours per month ○ Enter # of hours_____	Rarely ○

Smartphone (examples: iPhone, ○ Samsung Galaxy S4, Galaxy Nexus, HTC One, HTC EVO, Nokia Lumia, Blackberry)	____ years	Hours per day ○ Enter # of hours_____	Hours per week ○ Enter # of hours_____	Hours per month ○ Enter # of hours_____	Rarely ○
Other cellphone ○	____ years	Hours per day ○ Enter # of hours_____	Hours per week ○ Enter # of hours_____	Hours per month ○ Enter # of hours_____	Rarely ○
Game console: (examples: Wii, ○ Xbox, PlayStation, etc.)	____ years	Hours per day ○ Enter # of hours_____	Hours per week ○ Enter # of hours_____	Hours per month ○ Enter # of hours_____	Rarely ○
E-Reader (examples: Kindle ○ Fire, Nook, Kobo)	____ years	Hours per day ○ Enter # of hours_____	Hours per week ○ Enter # of hours_____	Hours per month ○ Enter # of hours_____	Rarely ○
Digital media player (example: ○ Ipod, Zune)	____ years	Hours per day ○ Enter # of hours_____	Hours per week ○ Enter # of hours_____	Hours per month ○ Enter # of hours_____	Rarely ○
Digital camera (still camera) ○	____ years	Hours per day ○ Enter # of hours_____	Hours per week ○ Enter # of hours_____	Hours per month ○ Enter # of hours_____	Rarely ○
Video camera ○	____ years	Hours per day ○ Enter # of hours_____	Hours per week ○ Enter # of hours_____	Hours per month ○ Enter # of hours_____	Rarely ○
Internet connection at home (house, apartment, barracks) ○	____ years	Hours per day ○	Hours per week ○	Hours per month ○	Rarely ○

		Enter # of hours_____ Enter # of hours_____ Enter # of hours_____

10. What type of Social Media and applications do you use, what actions do you perform, what type of devices do you use for them, and how often do you use them? (Check all that apply)

Do you use any social media?

- ○ NO – go to question #11
- ○ YES – answer the following questions:

Type of Social Media (Select if you have an account or you use that web site – check all that apply, and answer the questions to the right of each media type)	**Actions** **(**Check **all** that apply)	**Device** (Check **all** that apply)**.**	**How often** (Check **one** and then enter your usage hours**).**
Facebook ○	I respond to other people's ○ statuses I use Facebook Messenger ○ I upload pictures ○ I create and upload videos ○	I access Facebook on: Computer ○ Smartphone ○ Tablet, iPad ○ Game Console ○ Other Cellphone ○ E-Reader ○ Ipod, Zune ○	Hours per day ○ Enter # of hours_____ Hours per week ○ Enter # of hours_____ Hours per month ○ Enter # of hours_____ Rarely ○
MySpace ○	I respond to other people's ○ statuses I upload pictures ○ I create and upload videos ○	I access MySpace on: Computer ○ Smartphone ○ Tablet, iPad ○ Game Console ○ Other Cellphone ○ E-Reader ○ Ipod, Zune ○	Hours per day ○ Enter # of hours_____ Hours per week ○ Enter # of hours_____ Hours per month ○ Enter # of hours_____ Rarely ○
Twitter ○	I follow people (other Twitter ○ accounts) I upload pictures ○ I create and upload videos ○	I access Twitter on: Computer ○ Smartphone ○ Tablet, iPad ○ Game Console ○ Other Cellphone ○ E-Reader ○ Ipod, Zune ○	Hours per day ○ Enter # of hours_____ Hours per week ○ Enter # of hours_____ Hours per month ○ Enter # of hours_____ Rarely ○

YouTube ○	I comment on other people's ○ videos I watch videos ○ I create and upload videos ○	I access You Tube on: Computer ○ Smartphone ○ Tablet, iPad ○ Game Console ○ Other Cellphone ○ E-Reader ○ Ipod, Zune ○	Hours per day ○ Enter # of hours_____ Hours per week ○ Enter # of hours_____ Hours per month ○ Enter # of hours_____ Rarely ○
Blogs ○	I publish my information ○ I respond to other people's ○ statuses I upload pictures ○ I create and upload videos ○	I access Blogs on: Computer ○ Smartphone ○ Tablet, iPad ○ Game Console ○ Other Cellphone ○ E-Reader ○ Ipod, Zune ○	Hours per day ○ Enter # of hours_____ Hours per week ○ Enter # of hours_____ Hours per month ○ Enter # of hours_____ Rarely ○
E-Mail ○		I access email on: Computer ○ Smartphone ○ Tablet, iPad ○ Game Console ○ Other Cellphone ○ E-Reader ○ Ipod, Zune ○	Hours per day ○ Enter # of hours_____ Hours per week ○ Enter # of hours_____ Hours per month ○ Enter # of hours_____ Rarely ○
Other: ○ Enter name of Social Media: _____________	I respond to other people's ○ statuses I watch videos ○ I upload pictures ○ I create and upload videos ○	I access it on: Computer ○ Smartphone ○ Tablet, iPad ○ Game Console ○ Other Cellphone ○ E-Reader ○ Ipod, Zune ○	Hours per day ○ Enter # of hours_____ Hours per week ○ Enter # of hours_____ Hours per month ○ Enter # of hours_____ Rarely ○

11. What types of games do you play? What device do you use to play the games, and how often do you play them?

Do you play games at all?

○ NO – go to question #12
○ YES – answer the following questions:

Type of Game (check all that	**Devices** (Check **all** that apply).	**How often?** (Check **one** and then enter your usage hours.)

apply)		
First Person Shooter ○	I play them on (check all that apply): Computer ○ Smartphone ○ Tablet, Ipad ○ Game Console ○ Other Cellphone ○ E-Reader ○ Ipod, Zune ○	Hours per day ○ Enter # of hours_____ Hours per week ○ Enter # of hours_____ Hours per month ○ Enter # of hours_____ Rarely ○
Flight Simulations ○	I play them on (check all that apply): Computer ○ Smartphone ○ Tablet, Ipad ○ Game Console ○ Other Cellphone ○ E-Reader ○ Ipod, Zune ○	Hours per day ○ Enter # of hours_____ Hours per week ○ Enter # of hours_____ Hours per month ○ Enter # of hours_____ Rarely ○
Racing ○	I play them on (check all that apply): Computer ○ Smartphone ○ Tablet, Ipad ○ Game Console ○ Other Cellphone ○ E-Reader ○ Ipod, Zune ○	Hours per day ○ Enter # of hours_____ Hours per week ○ Enter # of hours_____ Hours per month ○ Enter # of hours_____ Rarely ○
Other Sports ○	I play them on (check all that apply): Computer ○ Smartphone ○ Tablet, Ipad ○ Game Console ○ Other Cellphone ○ E-Reader ○ Ipod, Zune ○	Hours per day ○ Enter # of hours_____ Hours per week ○ Enter # of hours_____ Hours per month ○ Enter # of hours_____ Rarely ○
Social ○ Networking games	I play them on (check all that apply): Computer ○ Smartphone ○ Tablet, Ipad ○ Game Console ○ Other Cellphone ○ E-Reader ○ Ipod, Zune ○	Hours per day ○ Enter # of hours_____ Hours per week ○ Enter # of hours_____ Hours per month ○ Enter # of hours_____ Rarely ○
Puzzles, ○ Strategy, Cards, Board games	I play them on (check all that apply): Computer ○ Smartphone ○ Tablet, Ipad ○ Game Console ○ Other Cellphone ○ E-Reader ○ Ipod, Zune ○	Hours per day ○ Enter # of hours_____ Hours per week ○ Enter # of hours_____ Hours per month ○ Enter # of hours_____ Rarely ○
	I play them on (check all that apply): Computer ○	Hours per day Hours per week Hours per month Rarely

Online ○ Multiplayer games	Smartphone ○ Tablet, Ipad ○ Game Console ○ Other Cellphone ○ E-Reader ○ Ipod, Zune ○	○ Enter # of hours_____ ○ Enter # of hours_____ ○ Enter # of hours_____ ○
Adventure, ○ Fantasy, Role Playing games	I play them on (check all that apply): Computer ○ Smartphone ○ Tablet, Ipad ○ Game Console ○ Other Cellphone ○ E-Reader ○ Ipod, Zune ○	Hours per day ○ Enter # of hours_____ Hours per week ○ Enter # of hours_____ Hours per month ○ Enter # of hours_____ Rarely ○
Arcade ○ games	I play them on (check all that apply): Computer ○ Smartphone ○ Tablet, Ipad ○ Game Console ○ Other Cellphone ○ E-Reader ○ Ipod, Zune ○	Hours per day ○ Enter # of hours_____ Hours per week ○ Enter # of hours_____ Hours per month ○ Enter # of hours_____ Rarely ○
Other ○ games Enter the game's name: -----------------	I play them on (check all that apply): Computer ○ Smartphone ○ Tablet, Ipad ○ Game Console ○ Other Cellphone ○ E-Reader ○ Ipod, Zune ○	Hours per day ○ Enter # of hours_____ Hours per week ○ Enter # of hours_____ Hours per month ○ Enter # of hours_____ Rarely ○

12. What hand do you use to operate a computer mouse?

Left Hand	Right Hand	I'm good with either
○	○	○

13. Please respond to each question as it applies to you (check **one** number that matches a degree to which the statement is a characteristic or true of you):

I am among the first people to buy new technology devices.	1: Very untrue of me ○	2: Untrue of me ○	3: Somewhat untrue of me ○	4: Neutral ○	5: Somewhat true of me ○	6: Very true of me ○	7: Extremely true of me ○
I am among the last people to buy new technology devices.	1: Very untrue of me	2: Untrue of me	3: Somewhat untrue of me	4: Neutral	5: Somewhat true of me	6: Very true of me	7: Extremely true of me

	○	○	○	○	○	○	○
I always look for information about latest technical devices.	1: Very untrue characteristic of me ○	2: Untrue characteristic of me ○	3: Somewhat untrue characteristic of me ○	4: Neutral ○	5: Somewhat true characteristic of me ○	6: Very true characteristic of me ○	7: Extremely true characteristic of me ○
I wait until I hear about the technology devices from the experts before I buy them.	1: Very untrue characteristic of me ○	2: Untrue characteristic of me ○	3: Somewhat untrue characteristic of me ○	4: Neutral ○	5: Somewhat true characteristic of me ○	6: Very true characteristic of me ○	7: Extremely true characteristic of me ○
I wait until I hear about the technology devices from my peers before I buy them.	1: Very untrue of me ○	2: Untrue of me ○	3: Somewhat untrue of me ○	4: Neutral ○	5: Somewhat true of me ○	6: Very true of me ○	7: Extremely true of me ○
I am one of the first people to buy new applications or games.	1: Very untrue of me ○	2: Untrue of me ○	3: Somewhat untrue of me ○	4: Neutral ○	5: Somewhat true of me ○	6: Very true of me ○	7: Extremely true of me ○
I am among the last people to buy new applications or games.	1: Very untrue of me ○	2: Untrue of me ○	3: Somewhat untrue of me ○	4: Neutral ○	5: Somewhat true of me ○	6: Very true of me ○	7: Extremely true of me ○
I wait until I hear about the new applications and games from the experts before I buy them.	1: Very untrue of me ○	2: Untrue of me ○	3: Somewhat untrue of me ○	4: Neutral ○	5: Somewhat true of me ○	6: Very true of me ○	7: Extremely true of me ○
I wait until I hear about the new applications and games from my	1: Very untrue of me	2: Untrue of me	3: Somewhat untrue of me	4: Neutral	5: Somewhat true of me	6: Very true of me	7: Extremely true of me

peers before I buy them.	○ ○ ○ ○ ○ ○ ○
I always look for information about the latest applications and games.	1: Very untrue characteristic of me ○ / 2: Untrue characteristic of me ○ / 3: Somewhat untrue characteristic of me ○ / 4: Neutral ○ / 5: Somewhat true characteristic of me ○ / 6: Very true characteristic of me ○ / 7: Extremely true characteristic of me ○
I am easily influenced by the advertising information in the media.	1: Very untrue characteristic of me ○ / 2: Untrue characteristic of me ○ / 3: Somewhat untrue characteristic of me ○ / 4: Neutral ○ / 5: Somewhat true characteristic of me ○ / 6: Very true characteristic of me ○ / 7: Extremely true characteristic of me ○

14. Were you **required** to use training simulations or simulators at any point in your career? (examples: DVTE, ISMT, HEAT, VBS2, MTWS, CACCTUS, FOPCSIM, flight simulator)

Yes	No
○	○

- ○ NO – go to question #15
- ○ YES – answer the following questions:

a. Enter the names of those simulations, what skills were they used to train, how many hours of training in total, and the date of last usage? Note*** If you do not remember the name of the simulation, then please enter its closest description instead.

1. Simulation #1: ______________________________________
   Skills: ____
   Total number of hours (approximate): ________________
   Date of last use (approximate): ______________________

2. Simulation #2: ______________________________________
   Skills: ____
   Total number of hours (approximate): ________________
   Date of last use (approximate): ______________________

3. Simulation #3: ______________________________________
   Skills: ____
   Total number of hours (approximate): ________________
   Date of last use (approximate): ______________________

4. Simulation #4: ______________________________________
   Skills: ____
   Total number of hours (approximate): ________________
   Date of last use (approximate): ______________________

a) To gain a competency on those simulations (ability to learn MOS skills and perform them well), the total amount of time spent was: (Check **one**)

1: Completely insufficient	2: Not sufficient	3: Almost sufficient	4: Sufficient	5: Little more than sufficient	6: More than sufficient	7: Too much
○	○	○	○	○	○	○

15. What are the three things that you **liked most** about your experience with computer-supported training simulations?

(1) I liked ______________________________

(2) I liked ______________________________

(3) I liked ______________________________

16. What are the three things that you **disliked most** about your experience with computer-supported training simulations?

(1) I did NOT like______________________________

(2) I did NOT like______________________________

(3) I did NOT like______________________________

17. When you think about different forms of learning and training new MOS skills, what are **<u>your</u>** preferred choices? Rate them on the scale from 1 to 7, where 1 means 'least useful to me', and 7 being 'extremely useful to me':

a. classroom-type lectures: (least useful) **1 2 3 4 5 6 7** (extremely useful)
b. individual preparation/rehearsal: (least useful) **1 2 3 4 5 6 7** (extremely useful)
c. team preparation/rehearsal: (least useful) **1 2 3 4 5 6 7** (extremely useful)
d. computer supported training simulations: (least useful) **1 2 3 4 5 6 7** (extremely useful)
e. any other: ______________________________ (least useful) **1 2 3 4 5 6 7** (extremely useful)
f. any other: ______________________________ (least useful) **1 2 3 4 5 6 7** (extremely useful)
g. any other: ______________________________ (least useful) **1 2 3 4 5 6 7** (extremely useful)

18. In order to learn knowledge and conduct training on new MOS skills, my current unit allocates the following percentages to each of these events: (Please input the total % of time spent on each action; the total should be **100%**)

classroom-type lectures:	______%
individual / team preparation/rehearsal:	______%
physical training ranges:	______%
computer-supported training simulations:	______%
any other: ___________________________:	______%
any other: ___________________________:	______%
any other: ___________________________:	______%
Total Percentage:	100 %

19. If you had the opportunity to choose the percentages for your unit to learn knowledge and conduct training on new MOS skills, then what %s would you use for each event? (Please input the total % of time spent on each action; the total should be **100%**)

classroom-type lectures:	______%
individual / team preparation/rehearsal:	______%
physical training ranges:	______%
computer supported / training simulations:	______%
any other: ___________________________:	______%
any other: ___________________________:	______%
any other: ___________________________:	______%
Total Percentage:	100 %

20.

Endorsement and full support from leadership of a new and/or existing concept/idea, or form of technology is instrumental in its survival and overall existence within the unit. (check **one** option only).	1: Strongly disagree	2: Disagree	3: Somewhat disagree	4: Neithe agree or disagree	5: Somewhat agree	6: Agree	7: Strongly Agree
	○	○	○	○	○	○	○

THANK YOU FOR COMPLETING THIS PORTION OF THE SURVEY! PLEASE PROCEED ON TO THE NEXT SECTION.

APPENDIX L. DATA COLLECTION (SURVEY QUESTIONS)

<u>Base Leadership</u>: MAGTFTC Staff (Primary Officers, Civilians, and Senior SNCOs/Chiefs/Deputies)

1) If you and/or your unit use computer-supported training simulations, then please answer the following questions.

a.	I feel very confident in the training capabilities of computer-supported training simulations (check **one** option only).	1: Strongly disagree ○	2: Disagree ○	3: Somewhat disagree ○	4: Neither agree or disagree ○	5: Somewhat agree ○	6: Agree ○	7: Strongly Agree ○
b.	Computer-supported simulation training tools are in their own way as effective as traditional training tools (check **one** option only).	1: Strongly disagree ○	2: Disagree ○	3: Somewhat disagree ○	4: Neither agree or disagree ○	5: Somewhat agree ○	6: Agree ○	7: Strongly Agree ○
c.	I strongly support the use of game-based training systems in order to train my Marines (check **one** option only).	1: Strongly disagree ○	2: Disagree ○	3: Somewhat disagree ○	4: Neither agree or disagree ○	5: Somewhat agree ○	6: Agree ○	7: Strongly Agree ○
d.	I strongly feel that these types of systems are a waste of time and a waste of money (check **one** option only).	1: Strongly disagree ○	2: Disagree ○	3: Somewhat disagree ○	4: Neither agree or disagree ○	5: Somewhat agree ○	6: Agree ○	7: Strongly Agree ○
e.	Live training is the only real way to effectively train my Marines (check **one** option only).	Strongly agree ○	Agree ○	Somewhat agree ○	Neither agree or disagree ○	Somewhat disagree ○	Disagree ○	Strongly disagree ○
f.	My unit has had a great deal of success in using computer-supported simulations for our training purposes (check **one** option only).	1: Strongly disagree ○	2: Disagree ○	3: Somewhat disagree ○	4: Neither agree or disagree ○	5: Somewhat agree ○	6: Agree ○	7: Strongly Agree ○

g.	Within your career, have you ever been exposed to computer-supported training simulations? If you did please list two and state where did the exposure take place (example: during a training exercise, classroom instruction, what unit and where)?	○ NO: I have not been exposed to any other computer-supported training simulations in my career. ○ YES: Please fill in information bellow: Simulation #1:_______________ Unit you were with:________________________ Name of exercise or class:______________________ Simulation #2:_______________ Unit you were with:________________________ Name of exercise or class:______________________
h.	Have you and/or your unit ever purchased any type of computer-supported training simulation (software or hardware)? If yes, please list the details on the right.	○ NO: I have NEVER purchased any type of computer-supported training simulations. ○ YES: Please fill in the information bellow: Simulation #1:_______________ Unit you were with:________________________ Total $$$ amount of software and hardware (approximately):______________________ Simulation #2:_______________ Unit you were with:________________________ Total $$$ amount of software and hardware (approximately):______________________
i.	Have you and/or your unit ever heard or seen any type of advertisement for a computer-supported training simulation on base (Twentynine Palms)? (check **all** that apply)	see below

	Was that advertising methods are VERY effective. (check for each type if it applies)	Was that advertising methods are VERY ineffective. (check for each type if it applies)
○ No, I have never heard or seen any type of advertisement for a computer-supported training simulation on base.		
I have seen advertisements on computer-supported training simulations on the following media:		
○ Unit webpage	○	○
○ Work E-mail	○	○
○ Electronic bulletin boards	○	○
○ Bulletin boards posted at the MCX, Gym, Barbershop, Food Court, Officer/SNCO/NCO/E-Clubs, etc.	○	○
○ Base TV	○	○
○ Base Radio	○	○
○ Unit briefed by the Battle Simulation Center Officer / BSC Staff or simulation Subject Matter Expert	○	○
○ Flyers, Pamphlets	○	○

	○ DVDs

2) What do you deem as the most pressing projected needs of your unit and/or the base in terms of computer-supported training simulation systems? Please list all areas that may apply and be as specific and detailed as you can. (Administrative, Intelligence, Operations, Logistics, Communications, etc.) Example: A Communications simulation that does XYZ…

____

3) If you have seen, witnessed, and/or used a computer-supported training simulation system that you know to be very effective and Twentynine Palms does not own it as of yet, please list what those are and state their intended purposes.

____

4) Are you familiar with any of the simulation training '**facilities'** on base (Twentynine Palms, CA)?
○ NO, I'm not familiar with any of these base facilities. Proceed to Question 5 (Base capabilities)
○ YES, I'm familiar with some of these base facilities. Answer the following questions.

a. I am familiar with the following training <u>facilities</u> on base. (If you selected this option, please check **all** that apply)	<u>Twentynine Palms Simulation and/or Physical Training Facilities (not all inclusive)</u>:	In the past **2 years**, estimate the total **#** of times that you've seen or heard about the selected simulation training facilities.
	○ Battle Simulation Center (BSC)	
	○ MAGTF Integrated System Training Center (MISTC) 29	_______ _______
	- Command and Control Systems (AFATDS, BCS3, BAT, C2PC, CPOF, CLC2S, etc.)	
	○ Building 1707 (ISMT / DVTE)	
	○ Camp Wilson (HEAT, CCS, ODS, DVTE)	_______
	○ Tactical Training Exercise Control Group (TTECG)	_______
	- CACCTUS	_______
	○ Supporting Arms Virtual Trainer (SAVT)	
	○ Rifle Range (ISMT)	_______

	○ Deployable Virtual Training Environment (DVTE)	_______ _______

5) Are you familiar with any of the simulation training capabilities on base (Twentynine Palms, CA)?

○ NO, I'm not familiar with any of these base capabilities. Proceed to Question 6(BSC)

○ YES, I'm familiar with some of these base capabilities. Answer the following questions.

a. I am familiar with the following training <u>capabilities</u> on base. (If you selected this option, please **check all** capabilities that apply)	<u>Twentynine Palms Simulation Training Capabilities (not all inclusive)</u>:	In the past **2 years**, estimate the total **#** of times that you've seen or heard about the selected simulation training capabilities.
	Staff Training	
	○ MAGTF Tactical Warfare Simulation (MTWS)	_______
	○ Joint Conflict and Tactical Simulation (JCATS)	_______
	Combined Arms Training	
	○ Forward Observer Personal Computer Simulation (FOPCSIM)	_______
	○ Combined Arms Planning Tool (CAPT)	_______
	○ Combined Arms Network (CAN) of Simulations	_______
	○ Supporting Arms Virtual Trainer (SAVT)	_______
	○ Virtual Battle Space 2 (VBS2)	_______
	○ Combined Arms Command and Control Training Upgrade System (CACCTUS)	_______
	Small Unit Training	
	○ Virtual Battle Space 2 (VBS2)	_______
	○ Combat Convoy Simulator (CCS)	_______
	○ Mobile Counter IED Trainer (MCIT)	_______
	○ Recognition of Combatants (ROC)	
	○ ROC-IED	_______
	○ ROC-Suicide Bomber (ROC-SB)	_______
	○ ROC-Vehicles (ROC-V)	_______
	○ EagleEye	_______
	○ Insurgent Methods Training – Network Enhanced Training (IMT-NET)	_______
	Task Trainers	
	○ Tactical Language Training System (TLTS)	_______

	○ Indoor Simulated Marksmanship Trainer (ISMT)	________
	○ Operator Driver Simulator (ODS)	________
	○ HMMWV Egress Assistance Trainer (HEAT)	________
	Simulation Training Packages	
	○ Staff Training	
	○ Kinetic Operations	
	○ Amphibious Roots Training	________
	○ Mountain Exercise Transition Training	________
	○ Spartan Preparation	________
	○ Small Unit Tactics	________
	○ Enhanced Mojave Viper (EMV) Motorized Operations Course (MOC) Rehearsal	________
	○ Enhanced Mojave Viper (EMV) Range 410 Rehearsal	________
	○ Afghan Convoy Patrol	
	○ Afghan Dismounted Patrolling	________
	○ Fire Support Team	________
	○ Enhanced Mojave Viper (EMV) Fire Support Coordination Exercise (FSCEX) Rehearsal	________
	○ Basic Call For Fire (CFF) and Close Air Support (CAS) Request	________
	○ Basic FiST Procedures	
	○ Combined Arms Maneuver Package	________
	○ Counter IED	________
	○ Understanding the IED Threat	
	○ Recognizing the IED Threat	________
	○ Finding the IED Threat	________
	○ The IED Threat in the Big Picture	________
	○ Vehicle	________
	○ Driver Training	
	○ Vehicle Rollover Training	________
	○ Off-Road Training	________
	○ Crew Reaction Drills	________
	○ Deployable Virtual Training Environment (DVTE)	________
	○ Your unit trained with your own DVTE	________
	○ DVTE Setup Course	________
	○ Train the Operator Course	________
	○ Train the Trainer Course	________

6) One of the Training Facilities that Twentynine Palms offers is the Battle Simulation Center (BSC). Are you familiar with the BSC?

○ No, I am not familiar with it: Proceed to question #7.
○ Yes, I am familiar with it: answer the following questions:

a.	Where is the BSC located?	The BSC is located ______________________________ ______________________________ __________ ______________________________ __________
b.	I have personally toured the BSC facilities.	TRUE ○ FALSE ○
c. d.	I feel very confident that I know what the BSC's training mission is in respect to supporting the base (check **one** option only).	Strongly agree ○ / Agree ○ / Somewhat agree ○ / Neither agree or disagree ○ / Somewhat disagree ○ / Disagree ○ / Strongly disagree ○
e.	I personally interacted with the BSC Simulation Officer or the BSC Staff.	TRUE ○ FALSE ○
f.	Other people in my unit interacted with the BSC Simulation Officer or the BSC Staff.	TRUE ○ FALSE ○
g.	I personally coordinated and scheduled training through the BSC for myself or my unit.	TRUE ○ FALSE ○
h.	Other people in my unit coordinated and scheduled training through the BSC for myself or my unit.	TRUE ○ FALSE ○
i.	What course/class did you attend and/or what exercise did you participate in at the BSC?	The 3 courses/classes that I attended most recently in the BSC were: Class #1:______________________ Class #2:______________________ Class #3:______________________ The 3 exercises I participated in most recently in the BSC were: Exercise #1:______________________ Exercise #2:______________________ Exercise #3:______________________

j. The training that I received and/or the exercise I participated in at the BSC met my expectations (check **one** option only)	1: Strongly disagree ○	2: Disagree ○	3: Somewhat disagree ○	4: Neither agree or disagree ○	5: Somewhat agree ○	6: Agree ○	7: Strongly Agree ○
k. My overall experiences in the BSC were positive (check **one** option only).	1: Strongl Disagree ○	2: Disagree ○	3: Somewha disagree ○	4: Neither agree or disagree ○	5: Somewhat agree ○	6: Agree ○	7: Strongly Agree ○
l. Learning skills with simulations in the BSC is a very effective training approach (check **one** option only).	Strongly agree ○	Agree ○	Somewhat agree ○	Neither agree or disagree ○	Somewhat disagree ○	Disagree ○	Strongly disagree ○
m. I would recommend the BSC as a training tool/environment to other Marines in my unit and/or to other units (check **one** option only).	Strongly agree ○	Agree ○	Somewhat agree ○	Neither agree or disagree ○	Somewhat disagree ○	Disagree ○	Strongly disagree ○

7) Are you familiar with (have you ever heard of the name or acronym) the Deployable Virtual Training Environment (DVTE)? If your answer is no, then please proceed to Question 9.

Yes	No
○	○

8) Have you ever used the DVTE?

○ I have **never** used the DVTE: Proceed to the end of the survey and submit your answers.
○ I have used the DVTE: Please answer the following questions:

a. ○ I have used the DVTE in the past, but I do **NOT** currently use it. (If you selected this option, answer the questions to the right.)	When was the last time you used the DVTE? ___________ (YEAR) What unit(s) or school(s) were you with when you used the DVTE? _______________________________

b. Our unit currently owns or ○ has access to a DVTE, but we do **NOT** use it. (check **all** that apply.)	What are the reasons you do not use the DVTE? (check all that apply) ○ The DVTE is too difficult to set up. ○ I do NOT have confidence in its training capabilities. ○ Our unit has experienced throughput issues (we are not able to train everyone at the same time and when we needed to) ○ There was never anyone in our unit who knew how to set it up or operate it. ○ The Marine that knew how to use the DVTE has PCS'd, and no one else knows how to set it up or operate it. ○ I would use the DVTE if leadership allowed us to use it. ○ The DVTE is NOT easily accessible to me (computers are locked up). ○ The DVTE use is NOT integrated into our training schedule. ○ The DVTE is just a bunch of simulations that no one really cares about. ○ The DVTE provides no real training value to my unit.
c. I currently use the DVTE. ○ (If this is correct, answer the questions about DVTE below.	
d. If the DVTE is a **MANDATORY** ○ training tool for you or your unit, check **one** answer on the right.	Who made the decision to make the DVTE a MANDATORY training system for you or your unit? ○ Higher Leadership. (One or two levels above your command.) ○ Upper Leadership within your command. (CO, XO, S-3_Operations Officer/Chief) ○ Lower Leadership within your command. (OIC, SNCOIC, Training Section) ○ If a different individual or section within your command made DVTE MANDATORY, then please provide the rank of the individual and the name of this person's section here:____________ ○ I do not know who made the DVTE a MANDATORY training system for my unit.
e. If the DVTE is an **OPTIONAL** ○ training tool for you or your Unit, check **one** answer on the right	Why do you think the DVTE was chosen as an OPTIONAL training system for you or your unit? ○ The DVTE is a very valuable training tool. ○ Several other units are using the DVTE, so we decided to use it as well. ○ We heard the DVTE was a good training tool, so we decided to use it. ○ The DVTE is used only during white space training and/or downtime. ○ I do NOT know why we use the DVTE in our unit. ○ Other reasons:____
f. Select all aspects of the DVTE that you feel define the overall	○ Consists of 9 pelican cases. ○ Contains 32 laptop computers. ○ Each laptop contains a suite of tactical simulations.

capabilities of the system. (check **all** that apply)	○ The DVTE suites serve as unit simulation centers and can be setup in any location (classroom, barracks, office spaces, etc.). ○ The DVTE is capable of training individual Marines. ○ The DVTE is capable of training Fire Teams. ○ The DVTE is capable of training Platoons. ○ The DVTE is capable of training Battalion Staffs. ○ Units can get DVTE training from the Battle Simulation Center located on base. ○ The Battle Simulation Center will train units on the DVTE at the unit's work space. ○ I have received training on the DVTE from the Battle Simulation Center.

g. Select all the DVTE tactical simulations that you currently utilize. (check **all** that apply)	DVTE tactical simulations:	In the past year, estimate the total # of times that you've used the selected simulations.	Check if it was a MANDATORY training tool or OPTIONAL?
	○ Virtual Battle Space 2 (VBS2)	________	○ Mandatory ○ Optional
	○ Combines Arms Network (CAN)	________	○ Mandatory ○ Optional
	○ Tactical Language Training System (TLTS)	________	○ Mandatory ○ Optional
	○ Recognition of Combatants (ROC), includes Vehicle, IED, and Suicide Bomber	________	○ Mandatory ○ Optional
	○ Combat Decision Range (CDR)	________	○ Mandatory ○ Optional
	○ MAGTF XXI	________	○ Mandatory ○ Optional
	○ Tactical Operations (TACOPS)	________	○ Mandatory ○ Optional
	○ Close Combat Marine (CCM)	________	○ Mandatory ○ Optional
	○ Logistics Tactical Decision Simulation (TDS)	________	○ Mandatory ○ Optional
	○ Joint Virtual Tactical Radio (JVTR)	________	○ Mandatory ○ Optional
	○ Other simulation: Please enter here: ____________________		○ Mandatory ○ Optional

h. Where did you first learn about the DVTE (check **one** option only)?	Bootcamp, MCT, TBS, IOC	MOS School	Other PME schools (NCO, SNCO Course, etc.)	From your current unit.	From a unit outside your current unit.	While on a field exercise or while deployed.	Local advertising on base (Radio, TV, Internet, E-mail, etc.)
	○	○	○	○	○	○	○

i. What do you **like** about the DVTE most? (check **all** that apply)	Easy to use	Easy to learn	Easy to set up	Easy to maintain	I have confidence in its training capabilities	It is capable of being deployed	The variety of training simulations that it offers (VBS2, CAN,TLTS etc.)

	○	○	○	○	○	○	○
j. What do you **dislike** about the DVTE most (check **all** that apply)?	Not easy to use ○	Not easy to learn ○	Not easy to set up ○	Not easy to maintain ○	I do not have confidence in its training capabilities ○	Although deployabl e, it is not used as a training system when my unit is deployed. ○	Throughput issues (to many people and not enough systems to train with) ○
k. I am very confident in the DVTE's overall training value. (check **one** option only)	1: Strongly disagree ○	2: Disagree ○	3: Somewhat disagree ○	4: Neither agree or disagree ○	5: Somewha agree ○	6: Agre ○	7: Strongly Agree ○
l. The DVTE is always accessible for me whenever I need it (check **one** option only).	1: Strongly disagree ○	2: Disagree ○	3: Somewhat disagree ○	4: Neither agree or disagree ○	5: Somewhat agree ○	6: Agree ○	7: Strongly Agree ○
m. There are enough DVTE assets in my unit for all of us to train, and we have never experienced throughput issues. (check **one** option only).	1: Strongly disagree ○	2: Disagree ○	3: Somewha disagree ○	4: Neithe agree or disagree ○	5: Somewha agree ○	6: Agree ○	7: Strongly Agree ○
n. How much time on average do you spend preparing / planning for a training session prior to using the DVTE? (check **one** option only)	No time is ever spent preparing / planning. ○	< 30 min ○	1 hour ○	1-3 hours ○	> 3 hours ○		

THANK YOU FOR PARTICIPATING IN THIS SURVEY!!! HAVE A GREAT DAY!!!

<u>Unit Leadership</u>: Regimental and Battalion Staff (Primary Officer and Senior SNCOs/Chiefs) Co Cmdr, Co XO, Co OPSO, Co 1stSgt, Platoon Cmdr, Plt SNCOIC)

a. The amount of time our unit currently uses training simulations is appropriate. (check **one** option only).	1: Strongly disagree ○	2: Disagree ○	3: Somewhat disagree ○	4: Neither agree or disagree ○	5: Somewhat agree ○	6: Agree ○	7: Strongly Agree ○
b. The use of simulations in our unit's training practice should be more extensive. (check **one** option only).	1: Strongly disagree ○	2: Disagree ○	3: Somewhat disagree ○	4: Neither agree or disagree ○	5: Somewhat agree ○	6: Agree ○	7: Strongly Agree ○
c. The use of simulations in our unit's training practice should be reduced. (check **one** option only).	1: Strongly disagree ○	2: Disagree ○	3: Somewhat disagree ○	4: Neither agree or disagree ○	5: Somewhat agree ○	6: Agree ○	7: Strongly Agree ○
d. I would personally like to see **less** time invested in using simulations in training. (check **one** option only).	1: Strongly disagree ○	2: Disagree ○	3: Somewhat disagree ○	4: Neither agree or disagree ○	5: Somewhat agree ○	6: Agree ○	7: Strongly Agree ○
e. I would personally like to see **more** time invested in using simulations in training. (check **one** option only).	1: Strongly disagree ○	2: Disagree ○	3: Somewhat disagree ○	4: Neither agree or disagree ○	5: Somewhat agree ○	6: Agree ○	7: Strongly Agree ○
f. Our young Marines would like to see **less** time invested in using simulations in our training. (check one option only).	1: Strongly disagree ○	2: Disagree ○	3: Somewhat disagree ○	4: Neither agree or disagree ○	5: Somewhat agree ○	6: Agree ○	7: Strongly Agree ○
g. Our young Marines would like to see **more** time invested in using simulations in our training. (check one option only).	1: Strongly disagree ○	2: Disagree ○	3: Somewhat disagree ○	4: Neither agree or disagree ○	5: Somewhat agree ○	6: Agree ○	7: Strongly Agree ○
h. I actively endorse the use of simulations in our training regimen. (check one option only).	1: Very untrue of me	2: Untrue of me	3: Somewhat untrue of me	4: Neither true or untrue	5: Somewhat true of me	6: True of me	7: Very true of me

	○	○	○	○	○	○	○
i. I am very reluctant to endorse the use of simulations in our training regimen (check one option only).	1: Very untrue of me ○	2: Untrue of me ○	3: Somewhat untrue of me ○	4: Neither true or untrue ○	5: Somewhat true of me ○	6: True of me ○	7: Very true of me ○
j. Other people invest considerable effort in endorsing the use of simulations in our training regimen. (check one option only).	1: Very untrue of me ○	2: Untrue of me ○	3: Somewhat untrue of me ○	4: Neither true or untrue ○	5: Somewhat true of me ○	6: True of me ○	7: Very true of me ○
k. You feel strongly that your current unit is completely against the idea of computer-supported training simulations? (check one option only).	1: Strongly disagree ○	2: Disagree ○	3: Somewhat disagree ○	4: Neither agree or disagree ○	5: Somewhat agree ○	6: Agree ○	7: Strongly Agree ○
l. You feel strongly that your current unit is completely supportive of the idea of computer-supported training simulations? (check one option only).	1: Strongly disagree ○	2: Disagree ○	3: Somewhat disagree ○	4: Neither agree or disagree ○	5: Somewhat agree ○	6: Agree ○	7: Strongly Agree ○

- If you've been stationed on another base, then what was your experience with computer-supported training simulations there? Answer the following questions:

a. List **three (3)** simulations that you used most frequently there and for what purposes?	Simulation #1:_________________________ Purpose:________________________________ Simulation #2:_________________________ Purpose:________________________________ Simulation #3:_________________________ Purpose:________________________________ ○ I have no experiences with simulations on other bases.
b. Have you ever heard or seen advertisements for simulations there?	○ NO, I never heard of advertisements about simulations there. ○ YES If yes, then list the simulation(s) that was being advertised and on what media type: Simulation #1_______________________ Media Type:____________________________ Simulation #2_______________________ Media Type:____________________________ Simulation #3_______________________ Media Type:____________________________

- If you currently use computer-supported training simulations, then are they also documented in your unit's training plan?

  ○ No ○ Yes ○ I don't know

- If you currently use computer-supported training simulations,
  Are the skills and total hours (usage and skillsets) that the Marines are learning while using these simulations captured in their individual training jackets?

  ○ No ○ Yes ○ I don't know

- Is your Subject Matter Expert (the person who trains others or operates the simulation system) certified? Certification can mean that your SME (Instructor) has attended training at the BSC and/or has received Train-the-Trainer training from another SME in your unit.

  ○ No ○ Yes ○ I don't know

- If your SME has attended a course or received Train-the-Trainer, then is this documented in his/her individual training jacket?

  ○ No ○ Yes ○ I don't know

- Does your unit's training Section know that this individual is the unit SME on this simulation?

  ○ No ○ Yes ○ I don't know

- If you currently do NOT use computer-supported training simulations:
  ○ Do you consider training with simulations any different than training on physical training ranges, such as the rifle range?

    ○ No ○ Yes ○ I don't know

  If yes, then WHY? ______________________________

1) If you and/or your unit use computer-supported training simulations, then please answer the following questions.

a. I feel very confident in the training capabilities of computer-supported	1: Strongly disagree	2: Disagree	3: Somewhat disagree	4: Neither agree or disagree	5: Somewhat agree	6: Agree	7: Strongly Agree

	training simulations (check **one** option only).	○	○	○	○	○	○	○
b.	Computer-supported simulation training tools are in their own way as effective as traditional training tools (check **one** option only).	1: Strongly disagree ○	2: Disagree ○	3: Somewhat disagree ○	4: Neither agree or disagree ○	5: Somewhat agree ○	6: Agree ○	7: Strongly Agree ○
c.	I strongly support the use of game-based training systems in order to train my Marines (check **one** option only).	1: Strongly disagree ○	2: Disagree ○	3: Somewhat disagree ○	4: Neither agree or disagree ○	5: Somewhat agree ○	6: Agree ○	7: Strongly Agree ○
d.	I strongly feel that these types of systems are a waste of time and a waste of money (check **one** option only).	1: Strongly disagree ○	2: Disagree ○	3: Somewhat disagree ○	4: Neither agree or disagree ○	5: Somewhat agree ○	6: Agree ○	7: Strongly Agree ○
e.	Live training is the only real way to effectively train my Marines (check **one** option only).	Strongly agree ○	Agree ○	Somewhat agree ○	Neither agree or disagree ○	Somewhat disagree ○	Disagree ○	Strongly disagree ○
f.	When conducting an exercise with training simulations, my unit plans and executes all tasks in the same manner that we would as if we were conducting a traditional exercise like on a training range (i.e. we prepare planning documents, do rehearsals, TTPs, conduct AARs, etc.) (check **one** option only)	1: Strongly disagree ○	2: Disagree ○	3: Somewhat disagree ○	4: Neither agree or disagree ○	5: Somewhat agree ○	6: Agree ○	7: Strongly Agree ○
g.	When conducting an exercise with training simulations, my unit's attitude and overall	1: Strongly disagree	2: Disagree	3: Somewhat disagree	4: Neither agree or disagree	5: Somewhat agree	6: Agree	7: Strongly Agree

	level of effort towards completing the mission are no different than when we conduct traditional exercises like on a training range (check **one** option only).	○ ○ ○ ○ ○ ○ ○
h.	My unit has had a great deal of success in using computer-supported simulations for our training purposes (check **one** option only).	1: Strongly disagree ○ / 2: Disagree ○ / 3: Somewhat disagree ○ / 4: Neither agree or disagree ○ / 5: Somewhat agree ○ / 6: Agree ○ / 7: Strongly Agree ○
i.	Computer-supported training simulations are utilized in my unit, and they are documented in our unit's training plan (check **one** option only).	TRUE ○ / FALSE ○ / I do NOT know ○
j.	Computer-supported training simulations are also documented within our individual training jackets (check **one** option only).	TRUE ○ / FALS E ○ / I do NOT know ○
k.	Within your career, have you ever been exposed to computer-supported training simulations? If you did please list two and state where did the exposure take place (example: during a training exercise, classroom instruction, what unit and where)?	○ NO: I have not been exposed to any other computer-supported training simulations in my career. ○ YES: Please fill in information bellow: Simulation #1:_______________ Unit you were with:________________________ Name of exercise or class:______________________ Simulation #2:_______________ Unit you were with:________________________ Name of exercise or class:______________________
l.	Have you and/or your unit ever purchased any type of computer-supported training simulation (software or hardware)? If yes,	○ NO: I have NEVER purchased any type of computer-supported training simulations. ○ YES: Please fill in the information bellow: Simulation #1:_______________ Unit you were with:________________________

please list the details on the right.	Total $$$ amount of software and hardware (approximately):______________________ Simulation #2:_______________ Unit you were with:________________________ Total $$$ amount of software and hardware (approximately):______________________
m. Have you and/or your unit ever heard or seen any type of advertisement for a computer-supported training simulation on base (Twentynine Palms)? (check **all** that apply)	○ No, I have never heard or seen any type of advertisement for a computer-supported training simulation on base. I have seen advertisements on computer-supported training simulations on the following media: ○ Unit webpage ○ Work E-mail ○ Electronic bulletin boards ○ Bulletin boards posted at the MCX, Gym, Barbershop, Food Court, Officer/SNCO/NCO/E-Clubs, etc. ○ Base TV ○ Base Radio ○ Unit briefed by the Battle Simulation Center Officer / BSC Staff or simulation Subject Matter Expert ○ Flyers, Pamphlets ○ DVDs Was that advertising methods are VERY effective. (check for each type if it applies) ○ ○ ○ ○ ○ ○ ○ ○ ○ Was that advertising methods are VERY ineffective. (check for each type if it applies) ○ ○ ○ ○ ○ ○ ○ ○ ○

7) What do you deem as the most pressing projected needs of your unit and/or the base in terms of computer-supported training simulation systems? Please list all areas that may apply and be as specific and detailed as you can. (Administrative, Intelligence, Operations, Logistics, Communications, etc.) Example: A Communications simulation that does XYZ…

____

8) If you have seen, witnessed, and/or used a computer-supported training simulation system that you know to be very effective and Twentynine Palms does not own it as of yet, please list what those are and state their intended purposes.

____

9) In the past 2 years, what simulation training '**facilities'** have you used on base (Twentynine Palms, CA)?

a. ○ I have used base training facilities listed in Question 1b: Proceed to question 1b. ○ I have **not** used any of the base training facilities listed in Question 1b: Proceed on to Question 2 (Base training capabilities).			
b. I have used the following training facilities on base. (If you selected this option, please check **all** that apply)	Twentynine Palms Simulation and/or Physical Training Facilities (not all inclusive):	In the past 2 years, estimate the total # of times that you've used the selected simulation training capabilities.	Check if it was a MANDATORY training tool or OPTIONAL:
	○ Battle Simulation Center (BSC)	_______	○ Mandatory ○ Optional
	○ MAGTF Integrated System Training Center (MISTC) 29 - Command and Control Systems (AFATDS, BCS3, BAT, C2PC, CPOF, CLC2S, etc.)	_______ _______	○ Mandatory ○ Optional ○ Mandatory ○ Optional
	○ Building 1707 (ISMT / DVTE)	_______ _______	○ Mandatory ○ Optional
	○ Camp Wilson (HEAT, CCS, ODS, DVTE)		○ Mandatory ○ Optional
	○ Tactical Training Exercise Control Group (TTECG) - CACCTUS	_______ _______ _______	○ Mandatory ○ Optional
	○ Supporting Arms Virtual Trainer (SAVT)		○ Mandatory ○ Optional
	○ Rifle Range (ISMT)		○ Mandatory ○ Optional
	○ Deployable Virtual Training Environment (DVTE)		
c. If you chose MANDATORY to any of the training facilities in Question 2c, please select the group that made that decision most often and answer in your own words why you think this decision was made.	○ Higher Leadership. (One or two levels above your command.) ○ Upper Leadership within your command. (CO, XO, S-3_Operations Officer/Chief) ○ Lower Leadership within your command. (OIC, SNCOIC, Training Section) ○ If a different individual or section within your command made these facilities MANDATORY, then please provide the rank of the individual and the name of this person's section here:____________ ○ I do not know who made these facilities MANDATORY for my unit. I think that decision was because:____ ____		

d. If you chose OPTIONAL to any of the training facilities in Question 1c, then in the space to the right, select the group that made that decision. After that, answer in your own words why you think they chose to utilize this specific capability.	○ Higher Leadership. (One or two levels above your command.) ○ Upper Leadership within your command. (CO, XO, S-3_Operations Officer/Chief) ○ Lower Leadership within your command. (OIC, SNCOIC, Training Section) ○ If a different individual or section within your command chose these facilities for your unit, then please provide the rank of the individual and the name of this person's section here:____________ ○ I do not know who chose these facilities to train my unit. I think this capability was chosen because:____ ____ ________________

10) In the past 2 years, what simulation training capabilities have you personally used on base (Twentynine Palms, CA)?

a. ○ I have used base training capabilities listed in Question 2b: Proceed to question 2b. ○ I have **not** used any of the base training capabilities listed in Question 2b: Proceed on to question 3.			
b. I have used the following training capabilities on base. (If you selected this option, please **check all** capabilities that apply)	Twentynine Palms Simulation Training Capabilities (not all inclusive):	In the past 2 years, estimate the total # of times that you've used it:	Check if it was a MANDATORY training tool or OPTIONAL:
	Staff Training		
	○ MAGTF Tactical Warfare Simulation (MTWS)	_______	○ Mandatory ○ Optional
	○ Joint Conflict and Tactical Simulation (JCATS)	_______	○ Mandatory ○ Optional
	Combined Arms Training		
	○ Forward Observer Personal Computer Simulation (FOPCSIM)	_______	○ Mandatory ○ Optional
	○ Combined Arms Planning Tool (CAPT)	_______	○ Mandatory ○ Optional
	○ Combined Arms Network (CAN) of Simulations	_______	○ Mandatory ○ Optional
	○ Supporting Arms Virtual Trainer (SAVT)	_______	○ Mandatory ○ Optional
	○ Virtual Battle Space 2 (VBS2)	_______	○ Mandatory ○ Optional
	○ Combined Arms Command and Control Training Upgrade System (CACCTUS)	_______	○ Mandatory ○ Optional
		_______	○ Mandatory ○ Optional
		_______	○ Mandatory ○ Optional
		_______	○ Mandatory ○ Optional
		_______	○ Mandatory ○ Optional
	Small Unit Training	_______	○ Mandatory ○ Optional
	○ Virtual Battle Space 2 (VBS2)	_______	

○ Combat Convoy Simulator (CCS) ________ ○ Mandatory ○ Optional
○ Mobile Counter IED Trainer (MCIT) ________ ○ Mandatory ○ Optional
○ Recognition of Combatants (ROC) ○ Mandatory ○ Optional
○ ROC-IED
○ ROC-Suicide Bomber (ROC-SB) ________
○ ROC-Vehicles (ROC-V) ________ ○ Mandatory ○ Optional
○ EagleEye ________ ○ Mandatory ○ Optional
○ Insurgent Methods Training – ________ ○ Mandatory ○ Optional
Network
○ Mandatory ○ Optional
Enhanced Training (IMT-NET)

Task Trainers

○ Tactical Language Training System ________
(TLTS)
○ Mandatory ○ Optional
○ Indoor Simulated Marksmanship ________
Trainer (ISMT) ○ Mandatory ○ Optional ________
○ Operator Driver Simulator (ODS) ○ Mandatory ○ Optional ________
○ HMMWV Egress Assistance ○ Mandatory ○ Optional
Trainer (HEAT)
____

Simulation Training Packages

○ Mandatory ○ Optional
○ Staff Training
____
○ Kinetic Operations
○ Mandatory ○ Optional
○ Amphibious Roots Training
____
○ Mountain Exercise Transition ○ Mandatory ○ Optional ________
Training
○ Mandatory ○ Optional
○ Spartan Preparation
____
○ Small Unit Tactics
○ Mandatory ○ Optional
○ Enhanced Mojave Viper (EMV)
Motorized
____
○ Mandatory ○ Optional
Operations Course (MOC)
Rehearsal
____
○ Enhanced Mojave Viper (EMV) ○ Mandatory ○ Optional ________
Range 410
○ Mandatory ○ Optional
Rehearsal
____
○ Afghan Convoy Patrol
○ Mandatory ○ Optional
____
○ Afghan Dismounted Patrolling
○ Mandatory ○ Optional
____
○ Fire Support Team
○ Mandatory ○ Optional
____
○ Enhanced Mojave Viper (EMV)
○ Mandatory ○ Optional
Fire Support
Coordination Exercise (FSCEX) ________
Rehearsal
○ Mandatory ○ Optional
____
○ Basic Call For Fire (CFF) and ○ Mandatory ○ Optional ________
Close Air
○ Mandatory ○ Optional
____
Support (CAS) Request
○ Mandatory ○ Optional
○ Basic FiST Procedures
____
○ Combined Arms Maneuver
○ Mandatory ○ Optional
Package
____
○ Mandatory ○ Optional
○ Counter IED ________
○ Mandatory ○ Optional
○ Understanding the IED Threat ________
○ Mandatory ○ Optional
○ Recognizing the IED Threat
○ Finding the IED Threat

	○ The IED Threat in the Big Picture ○ Vehicle ○ Driver Training ○ Vehicle Rollover Training ○ Off-Road Training ○ Crew Reaction Drills ○ Deployable Virtual Training Environment (DVTE) ○ Your unit trained with your own DVTE ○ DVTE Setup Course ○ Train the Operator Course ○ Train the Trainer Course
c. If you chose MANDATORY to any of the <u>training capabilities</u> in Question 1c, please select the group that made that decision most often, and answer in your own words why you think this decision was made.	○ Higher Leadership. (One or two levels above your command.) ○ Upper Leadership within your command. (CO, XO, S-3_Operations Officer/Chief) ○ Lower Leadership within your command. (OIC, SNCOIC, Training Section) ○ If a different individual or section within your command made these capabilities MANDATORY, then please provide the rank of the individual and the name of this person's section here: Rank:____________________ Name of Section: ____________________ ○ I do not know who made these capabilities MANDATORY training systems for my unit. I think that decision was because:____ ____ __________________
d. If you chose OPTIONAL to any of the training <u>capabilities</u> in Question 1c, please select the group that made that decision most often and answer in your own words why you think they chose to utilize this specific capability.	○ Higher Leadership. (One or two levels above your command.) ○ Upper Leadership within your command. (CO, XO, S-3_Operations Officer/Chief) ○ Lower Leadership within your command. (OIC, SNCOIC, Training Section) ○ If a different individual or section within your command chose these capabilities for your unit, then please provide the rank of the individual and the name of this person's section here:____________ ○ I do not know who made these capabilities MANDATORY training systems for my unit. I think this capability was chosen because:____ ____ __________________

11) One of the Training Facilities that Twentynine Palms offers is the Battle Simulation Center (BSC). Are familiar with and/or have used the BSC?

○ No, I am not familiar with it: Proceed to question #7.
○ Yes, I am familiar with it: answer the following questions:

a. Where is the BSC located?	The BSC is located ______________________________ ______________________________ __________ ______________________________ __________
b. I have personally toured the BSC facilities.	TRUE ○ FALSE ○
c. I feel very confident that I know what the BSC's training mission is in respect to supporting the base (check **one** option only).	Strongly agree ○ Agree ○ Somewhat agree ○ Neither agree or disagree ○ Somewhat disagree ○ Disagree ○ Strongly disagree ○
d. I personally interacted with the BSC Simulation Officer or the BSC Staff.	TRUE ○ FALSE ○
e. Other people in my unit interacted with the BSC Simulation Officer or the BSC Staff.	TRUE ○ FALSE ○
f. I personally coordinated and scheduled training through the BSC for myself or my unit.	TRUE ○ FALSE ○
g. Other people in my unit coordinated and scheduled training through the BSC for myself or my unit.	TRUE ○ FALSE ○
h. What course/class did you attend and/or what exercise did you participate in at the BSC?	The 3 courses/classes that I attended most recently in the BSC were: Class #1:______________________ Class #2:______________________ Class #3:______________________ The 3 exercises I participated in most recently in the BSC were: Exercise #1:______________________

	Exercise #2:______________________ Exercise #3:______________________
c. The training that I received and/or the exercise I participated in at the BSC met my expectations (check **one** option only)	1: Strongly disagree ○ | 2: Disagree ○ | 3: Somewhat disagree ○ | 4: Neither agree or disagree ○ | 5: Somewhat agree ○ | 6: Agree ○ | 7: Strongly Agree ○
d. My overall experiences in the BSC were positive (check **one** option only).	1: Strongl Disagree ○ | 2: Disagree ○ | 3: Somewha disagree ○ | 4: Neither agree or disagree ○ | 5: Somewhat agree ○ | 6: Agree ○ | 7: Strongly Agree ○
i. Learning skills with simulations in the BSC is a very effective training approach (check **one** option only).	Strongly agree ○ | Agre e ○ | Somewhat agree ○ | Neither agree or disagree ○ | Somewhat disagree ○ | Disagre e ○ | Strongly disagree ○
j. I would recommend the BSC as a training tool/environment to other Marines in my unit and/or to other units (check **one** option only).	Strongly agree ○ | Agre e ○ | Somewhat agree ○ | Neither agree or disagree ○ | Somewhat disagree ○ | Disagre e ○ | Strongly disagree ○

12) Are you familiar with (have you ever heard of the name or acronym) the Deployable Virtual Training Environment (DVTE)? If your answer is no, then please proceed to Question 9.

Yes	No
○	○

13) Have you ever used the DVTE?

○ I have **never** used the DVTE: Proceed to question 5 (VBS 2 section).
○ I have used the DVTE: Please answer the following questions:

a. ○ I have used the DVTE in the past, but I do **NOT** currently use it. (If you selected this option, answer the questions to the right.)	When was the last time you used the DVTE? ___________ (YEAR) What unit(s) or school(s) were you with when you used the DVTE? ______________________________

b. Our unit currently owns or ○ has access to a DVTE, but we do **NOT** use it. (check **all** that apply.)	What are the reasons you do not use the DVTE? (check all that apply) ○ The DVTE is too difficult to set up. ○ I do NOT have confidence in its training capabilities. ○ Our unit has experienced throughput issues (we are not able to train everyone at the same time and when we needed to) ○ There was never anyone in our unit who knew how to set it up or operate it. ○ The Marine that knew how to use the DVTE has PCS'd, and no one else knows how to set it up or operate it. ○ I would use the DVTE if leadership allowed us to use it. ○ The DVTE is NOT easily accessible to me (computers are locked up). ○ The DVTE use is NOT integrated into our training schedule. ○ The DVTE is just a bunch of simulations that no one really cares about. ○ The DVTE provides no real training value to my unit.
c. I currently use the DVTE. ○ (If this is correct, answer the questions about DVTE below.	
d. If the DVTE is a **MANDATORY** ○ training tool for you or your unit, check **one** answer on the right.	Who made the decision to make the DVTE a MANDATORY training system for you or your unit? ○ Higher Leadership. (One or two levels above your command.) ○ Upper Leadership within your command. (CO, XO, S-3_Operations Officer/Chief) ○ Lower Leadership within your command. (OIC, SNCOIC, Training Section) ○ If a different individual or section within your command made DVTE MANDATORY, then please provide the rank of the individual and the name of this person's section here:_____________ ○ I do not know who made the DVTE a MANDATORY training system for my unit.
e. If the DVTE is an **OPTIONAL** ○ training tool for you or your Unit, check **one** answer on the right	Why do you think the DVTE was chosen as an OPTIONAL training system for you or your unit? ○ The DVTE is a very valuable training tool. ○ Several other units are using the DVTE, so we decided to use it as well. ○ We heard the DVTE was a good training tool, so we decided to use it. ○ The DVTE is used only during white space training and/or downtime. ○ I do NOT know why we use the DVTE in our unit. ○ Other reasons:____
f. Select all aspects of the DVTE that you feel define the overall	○ Consists of 9 pelican cases. ○ Contains 32 laptop computers. ○ Each laptop contains a suite of tactical simulations.

capabilities of the system. (check **all** that apply)	○ The DVTE suites serve as unit simulation centers and can be setup in any location (classroom, barracks, office spaces, etc.). ○ The DVTE is capable of training individual Marines. ○ The DVTE is capable of training Fire Teams. ○ The DVTE is capable of training Platoons. ○ The DVTE is capable of training Battalion Staffs. ○ Units can get DVTE training from the Battle Simulation Center located on base. ○ The Battle Simulation Center will train units on the DVTE at the unit's work space. ○ I have received training on the DVTE from the Battle Simulation Center.

	DVTE tactical simulations:	In the past year, estimate the total # of times that you've used the selected simulations.	Check if it was a MANDATORY training tool or OPTIONAL?
g. Select all the DVTE tactical simulations that you currently utilize. (check **all** that apply)	○ Virtual Battle Space 2 (VBS2)	________	○ Mandatory ○ Optional
	○ Combines Arms Network (CAN)	________	○ Mandatory ○ Optional
	○ Tactical Language Training System (TLTS)	________	○ Mandatory ○ Optional
	○ Recognition of Combatants (ROC), includes Vehicle, IED, and Suicide Bomber	________	○ Mandatory ○ Optional
	○ Combat Decision Range (CDR)	________	○ Mandatory ○ Optional
	○ MAGTF XXI	________	○ Mandatory ○ Optional
	○ Tactical Operations (TACOPS)	________	○ Mandatory ○ Optional
	○ Close Combat Marine (CCM)	________	○ Mandatory ○ Optional
	○ Logistics Tactical Decision Simulation (TDS)	________	○ Mandatory ○ Optional
	○ Joint Virtual Tactical Radio (JVTR)	________	○ Mandatory ○ Optional
	○ Other simulation: Please enter here: ____________________		○ Mandatory ○ Optional

h. Where did you first learn about the DVTE (check **one** option only)?	Bootcamp, MCT, TBS, IOC	MOS School	Other PME schools (NCO, SNCO Course, etc.)	From your current unit.	From a unit outside your current unit.	While on a field exercise or while deployed.	Local advertising on base (Radio, TV, Internet, E-mail, etc.)
	○	○	○	○	○	○	○
i. What do you **like** about the DVTE most? (check **all** that apply)	Easy to use	Easy to learn	Easy to set up	Easy to maintain	I have confidence in its training capabilities	It is capable of being deployed	The variety of training simulations that it offers (VBS2, CAN, TLTS etc.)

	○	○	○	○	○	○	○
j. What do you **dislike** about the DVTE most (check **all** that apply)?	Not easy to use ○	Not easy to learn ○	Not easy to set up ○	Not easy to maintain ○	I do not have confidence in its training capabilities ○	Although deployable, it is not used as a training system when my unit is deployed. ○	Throughput issues (to many people and not enough systems to train with) ○
k. I am very confident in the DVTE's overall training value. (check **one** option only)	1: Strongly disagree ○	2: Disagree ○	3: Somewhat disagree ○	4: Neither agree or disagree ○	5: Somewha agree ○	6: Agree ○	7: Strongly Agree ○
l. The DVTE is always accessible for me whenever I need it (check **one** option only).	1: Strongly disagree ○	2: Disagree ○	3: Somewhat disagree ○	4: Neither agree or disagree ○	5: Somewhat agree ○	6: Agree ○	7: Strongly Agree ○
m. There are enough DVTE assets in my unit for all of us to train, and we have never experienced throughput issues. (check **one** option only).	1: Strongly disagree ○	2: Disagree ○	3: Somewha disagree ○	4: Neither agree or disagree ○	5: Somewha agree ○	6: Agree ○	7: Strongly Agree ○
n. How much time on average do you spend preparing / planning for a training session prior to using the DVTE? (check **one** option only)	No time is ever spent preparing / planning. ○	< 30 min ○	1 hour ○	1-3 hours ○	> 3 hours ○		

THANK YOU FOR PARTICIPATING IN THIS SURVEY!!! HAVE A GREAT DAY!!!

<u>Trainers</u>: (BSC, TTECG, MCTOG, MCLOG, MAWTS-1, MWTC, Unit - training providers)

1) Choose **five (5)** training simulations that you think are **most frequently used** by Twentynine Palms units in your training facility.	○ MAGTF Tactical Warfare Simulation (MTWS)
	○ Joint Conflict and Tactical Simulation (JCATS)
	○ Forward Observer Personal Computer Simulation (FOPCSIM)
	○ Combined Arms Planning Tool (CAPT)
	○ Combined Arms Network (CAN) of Simulations
	○ Supporting Arms Virtual Trainer (SAVT)
	○ Virtual Battle Space 2 (VBS2)
	○ Combined Arms Command and Control Training Upgrade System (CACCTUS)
	○ Combat Convoy Simulator (CCS)
	○ Mobile Counter IED Trainer (MCIT)
	○ Recognition of Combatants (ROC)
	  ○ ROC-IED
	  ○ ROC-Suicide Bomber (ROC-SB)
	  ○ ROC-Vehicles (ROC-V)
	○ EagleEye
	○ Insurgent Methods Training – Network Enhanced Training (IMT-NET)
	○ Tactical Language Training System (TLTS)
	○ Indoor Simulated Marksmanship Trainer (ISMT)
	○ Operator Driver Simulator (ODS)
	○ HMMWV Egress Assistance Trainer (HEAT)
	○ Other Simulations: ____________ ______________ ________________

2) Choose **five (5)** training simulations that are **most frequently requested** by the units that you train.	○ MAGTF Tactical Warfare Simulation (MTWS)
	○ Joint Conflict and Tactical Simulation (JCATS)
	○ Forward Observer Personal Computer Simulation (FOPCSIM)
	○ Combined Arms Planning Tool (CAPT)
	○ Combined Arms Network (CAN) of Simulations
	○ Supporting Arms Virtual Trainer (SAVT)
	○ Virtual Battle Space 2 (VBS2)
	○ Combined Arms Command and Control Training Upgrade System (CACCTUS)
	○ Combat Convoy Simulator (CCS)
	○ Mobile Counter IED Trainer (MCIT)
	○ Recognition of Combatants (ROC)
	  ○ ROC-IED
	  ○ ROC-Suicide Bomber (ROC-SB)
	  ○ ROC-Vehicles (ROC-V)
	○ EagleEye
	○ Insurgent Methods Training – Network Enhanced Training (IMT-NET)
	○ Tactical Language Training System (TLTS)
	○ Indoor Simulated Marksmanship Trainer (ISMT)
	○ Operator Driver Simulator (ODS)
	○ HMMWV Egress Assistance Trainer (HEAT)
	○ Other Simulations: ____________ ______________ ________________

<table>
<tr><td></td><td colspan="7"></td></tr>
<tr><td>3) What simulations do you consider to be the most challenging (hardest) when it comes to developing scenarios and design of the terrain?</td><td colspan="7">Hard to develop scenarios for:
Simulation #1____
Simulation #2____
Simulation #3____

Hard to develop terrain for:
Simulation #1____
Simulation #2____
Simulation #3____</td></tr>
<tr><td>4) What simulations do you perceive as being difficult to teach to students?</td><td colspan="7">Simulation #1____
Simulation #2____
Simulation #3____</td></tr>
<tr><td>5) What other simulations have MAJOR problems and/or issues (software, hardware, maintenance, etc.? Please list the simulation and its respective issue.</td><td colspan="7">Simulation #1____
Issue____

Simulation #2____
Issue____

Simulation #3____
Issue____</td></tr>
<tr><td>6) Students attending classes at your facility/unit have positive attitudes about simulations (check one option only).</td><td>1: Strongly disagree
○</td><td>2: Disagree
○</td><td>3: Somewhat disagree
○</td><td>4: Neither agree or disagree
○</td><td>5: Somewhat agree
○</td><td>6: Agree
○</td><td>7: Strongly Agree
○</td></tr>
</table>

7) Based upon the Unit's overall confidence in the quality of the BSC's training, they send their Marines to the BSC numerous times in order to learn new simulations and/or to gain advanced skills in the simulations that they currently use. (check **one** option only).	1: Strongly disagree ○	2: Disagree ○	3: Somewhat disagree ○	4: Neither agree or disagree ○	5: Somewhat agree ○	6: Agree ○	7: Strongly Agree ○

8) On average over a last year period, how many units came more than once?	Never	1-2 units	3-4 units	5-6 units	7 units or more
	○	○	○	○	○

9) Unit Leadership strongly believes in the simulation training that their Marines receive from the BSC (check **one** option only).	1: Strongly disagree ○	2: Disagree ○	3: Somewhat disagree ○	4: Neither agree or disagree ○	5: Somewhat agree ○	6: Agree ○	7: Strongly Agree ○

10) List **three (3)** training simulations you perceive as being the most difficult to install, setup, and/or operate.	Simulation #1____ Simulation #2____ Simulation #3____
11) List **three (3)** training	Simulation #1____

simulations you think are the most useful training tools that benefit Marines in their day-to-day jobs and overall mission.	Simulation #2______________________________________ Simulation #3______________________________________
12) The BSC shares knowledge (scenarios, terrain, best practices, etc.) with other simulation centers (Can be a Simulation Center from a different service)?	TRUE ○ FALSE ○ If FALSE, then what are some of the reasons why this does not occur? ___________ ____ If TRUE, then please list what knowledge (scenarios, terrain, best practices, etc.) is shared and with what Simulation Center. 1.________________________________ Simulation Center:_______________________ 2.________________________________ Simulation Center:_______________________ 3.________________________________ Simulation Center:_______________________
13) Choose **five (5)** simulation training '**packages'** that are most frequently requested by units.	**Simulation Training Packages** ○ Deployable Virtual Training Environment (DVTE) DVTE assistance at their unit DVTE Setup Course Train the Operator Course Train the Trainer Course ○ Staff Training Kinetic Operations Amphibious Roots Training Mountain Exercise Transition Training Spartan Preparation ○ Small Unit Tactics Enhanced Mojave Viper (EMV) Motorized Operations Course (MOC) Rehearsal Enhanced Mojave Viper (EMV) Range 410 Rehearsal Afghan Convoy Patrol Afghan Dismounted Patrolling ○ Fire Support Team Enhanced Mojave Viper (EMV) Fire Support Coordination Exercise (FSCEX) Rehearsal Basic Call For Fire (CFF) and Close Air Support (CAS) Request Basic FiST Procedures Combined Arms Maneuver Package

	○ Counter IED Understanding the IED Threat Recognizing the IED Threat Finding the IED Threat The IED Threat in the Big Picture ○ Vehicle Driver Training Vehicle Rollover Training Off-Road Training Crew Reaction Drills ○ Other Packages: ____________ ______________ ________________						
14) For training exercises supported by you, units are always very well prepared at the beginning of the exercise. (STARTEX) (check **one** option only)	1: Strongly disagree ○	2: Disagree ○	3: Somewhat disagree ○	4: Neither agree or disagree ○	5: Somewhat agree ○	6: Agree ○	7: Strongly Agree ○
15) For training exercises supported by you, all unit participants (includes all cells) completely understand the training objectives and overall purpose of the exercise (check **one** option only)	1: Strongly disagree ○	2: Disagree ○	3: Somewhat disagree ○	4: Neither agree or disagree ○	5: Somewhat agree ○	6: Agree ○	7: Strongly Agree ○
16) For training exercises supported by you, Unit Leadership is always very involved and plays a significant role in the exercise	1: Strongly disagree	2: Disagree	3: Somewhat disagree	4: Neither agree or disagree	5: Somewhat agree	6: Agree	7: Strongly Agree

(check **one** option only)	○	○	○	○	○	○	○
17) For training exercises supported by you, units conduct very detailed, proper, and effective After Action Reviews. (AARs) (check **one** option only)	1: Strongly disagree ○	2: Disagree ○	3: Somewhat disagree ○	4: Neither agree or disagree ○	5: Somewhat agree ○	6: Agree ○	7: Strongly Agree ○
18) For training exercises supported by you, unit participants (includes all cells) constantly display a positive attitude about the simulation environment and its overall capabilities (includes all aspects of hardware and software). (check **one** option only)	1: Strongly disagree ○	2: Disagree ○	3: Somewhat disagree ○	4: Neither agree or disagree ○	5: Somewhat agree ○	6: Agree ○	7: Strongly Agree ○
19) For training exercises supported by you, what are the three (3) major complaints from unit participants?	**List 3 major complaints from unit participants during and/or after simulation training exercises.**						
	Complaint #1:______________________________						
	Complaint #2:______________________________						
	Complaint #3:______________________________						
20) For training exercises supported by you, what are	**List 3 major complaints from Unit Leadership during and/or after simulation training exercises.**						
	Complaint #1:______________________________						

the three (3) major complaints from Unit Leadership?			
			Complaint #2:______________________________
			Complaint #3:______________________________
	○	○	
21) When you were hired, were you provided with any type of initial training on a specific simulation and/or on Classroom Instruction / presentation skills?	YES	NO	If YES, then what training was provided to you and how long did each class last? ________ ______________________________
	○	○	If NO, then what training do you feel that you should have received up front prior to starting your position as an Instructor for simulations? ______________________________ ______________________________
22) Have you obtained any type of training certificates since you were hired as an instructor in your current job?	YES	NO	If YES, then list the training certificates that you have earned:______________________ ______________________________
	○	○	If NO, then are there training certificates that you would like to earn? If yes, then please list them here.______________________________ ______________________________

Computer-Supported Training Simulations versus Traditional Training on Physical Ranges

Traditional training can be defined as 'live' training (plan for/pack up and go to the field) conducted in a field environment. (Ex: A unit plans and executes a week long training exercise in the training areas of Twentynine Palms)

23) In your opinion, what are **three (3)** major **advantages** of training with simulations?

Advantage #1____

Advantage #2____

Advantage #3____

24) In your opinion, what are **three (3)** major **disadvantages** of training with simulations?

Disadvantage # 1____

Disadvantage # 2____
Disadvantage # 3____

25) In your opinion, what are **three (3)** major **advantages** of traditional training?
Advantage #1____
Advantage #2____
Advantage #3____

26) In your opinion, what are **three (3)** major **disadvantages** of traditional training?
Disadvantage # 1____
Disadvantage # 2____
Disadvantage # 3____

27) In your opinion, when training with simulations, what are the **three (3)** most important factors or elements that will make training exercise very successful?
Advantage #1____
Advantage #2____
Advantage #3____

28) In your opinion, when training with simulations, what are the most **three (3)** important factors or elements that should be **avoided** while preparing for or conducting a training exercise?
Advantage #1____
Advantage #2____
Advantage #3____

29) In your opinion, when training with traditional methods, what are the **three (3)** most important factors or elements that will make a training exercise very successful?
Advantage #1____
Advantage #2____
Advantage #3____

30) In your opinion, when training with traditional methods, what are the **three (3)** most important factors or elements that should be **avoided** while preparing for or conducting a training exercise?
Advantage #1____
Advantage #2____
Advantage #3____

31) If the simulation has an After Action	1: Strongly disagree	2: Disagree	3: Somewhat disagree	4: Neither agree or disagree	5: Somewhat agree	6: Agree	7: Strongly Agree

Review feature, then we always use it for our AAR?	○	○	○	○	○	○	○
32) The simulations that we currently use are old and need to be upgraded by newer simulation systems?	1: Strongly disagree ○	2: Disagree ○	3: Somewhat disagree ○	4: Neither agree or disagree ○	5: Somewhat agree ○	6: Agree ○	7: Strongly Agree ○
33) Our training facility endorses the use of EVERY simulation that we own?	1: Strongly disagree ○	2: Disagree ○	3: Somewhat disagree ○	4: Neither agree or disagree ○	5: Somewhat agree ○	6: Agree ○	7: Strongly Agree ○
34) Our training facility has a very strong working relationship with the BSC?	1: Strongly disagree ○	2: Disagree ○	3: Somewhat disagree ○	4: Neither agree or disagree ○	5: Somewhat agree ○	6: Agree ○	7: Strongly Agree ○
35) The training community in Twentynine Palms (MCTOG, MCLOG, TTECG, ATG, BSC, MISTC 29, etc.) constantly shares information (where applicable) in order to better the bases overall mission readiness.	1: Strongly disagree ○	2: Disagree ○	3: Somewhat disagree ○	4: Neither agree or disagree ○	5: Somewhat agree ○	6: Agree ○	7: Strongly Agree ○
36) The training community in Twentynine	1: Strongly disagree	2: Disagree	3: Somewhat disagree	4: Neither agree or disagree	5: Somewhat agree	6: Agree	7: Strongly Agree

Palms (MCTOG, MCLOG, TTECG, ATG, BSC, MISTC 29, etc.) constantly works together (if required) in order to better the bases overall mission readiness.	○	○	○	○	○	○	○
37) Are there other simulations that you do not possess that could benefit your students in their Training environment? If yes, then what simulations and for what purposes?	○ YES Simulation #1: ______________________ Simulation #1: ______________________ Simulation #1: ______________________ ○ NO, there are no other simulations that I can think of that could benefit our students. ○ I do not know.						
38) When a new simulation is approved for use by the Marine Corps, our team immediately explores its capabilities.	1: Very untrue of our team ○	2: Untrue of our team ○	3: Somewhat untrue of our team ○	4: Neither true or untrue ○	5: Somewhat true of our team ○	6: True of our team ○	7: Very true of our team ○
39) When a new simulation is approved for use by the Marine Corps, our team waits until other units try its capabilities.	1: Very untrue of our team ○	2: Untrue of our team ○	3: Somewhat untrue of our team ○	4: Neither true or untrue ○	5: Somewhat true of our team ○	6: True of our team ○	7: Very true of our team ○
40) Our training facility constantly	1: Very untrue of our team	2: Untrue of our team	3: Somewhat untrue of our team	4: Neither true or untrue	5: Somewhat true of our	6: True of our team	7: Very true of our team

demonstrates the capabilities and overall effectiveness of very useful simulations to other units.	○	○	○	○	team ○	○	○

41) Has the BSC supported a simulation exercise for your command?

a. The preparation / planning phases of the simulation exercise went very well?	1: Strongly disagree ○	2: Disagree ○	3: Somewhat disagree ○	4: Neither agree or disagree ○	5: Somewhat agree ○	6: Agree ○	7: Strongly Agree ○
b. The execution phases of the simulation exercise went very well?	1: Strongly disagree ○	2: Disagree ○	3: Somewhat disagree ○	4: Neither agree or disagree ○	5: Somewhat agree ○	6: Agree ○	7: Strongly Agree ○
c. The After Action Review phases of the simulation exercise went very well?	1: Strongly disagree ○	2: Disagree ○	3: Somewhat disagree ○	4: Neither agree or disagree ○	5: Somewhat agree ○	6: Agree ○	7: Strongly Agree ○

THANK YOU FOR PARTICIPATING IN THIS SURVEY!!! HAVE A GREAT DAY!!!

Trainees: Regiment level: Officers (Maj, Capt, 1st Lt and 2nd Lt) + Enlisted (E7 and below)
Battalion level: Officers (Maj, Capt, 1st Lt and 2nd Lt) + Enlisted (E7 and below)
Company level: Officers (1st and 2nd Lt) + Enlisted (E7 and below)
Platoon level: Marines - E6 and below

1) In the past **2 years**, what simulation training '**facilities'** have you used on base (Twentynine Palms, CA)?

a. ○ I have used base training facilities listed in Question 1b: Proceed to question 1b. ○ I have **not** used any of the base training facilities listed in Question 1b: Proceed on to Question 2 (Base training capabilities).			
b. I have used the following training <u>facilities</u> on base. (If you selected this option, please check **all** that apply)	<u>Twentynine Palms Simulation and/or Physical Training Facilities (not all inclusive)</u>:	In the past **2 years**, estimate the total # of times that you've used the selected simulation training capabilities.	Check if it was a MANDATORY training tool or OPTIONAL:
	○ Battle Simulation Center (BSC)	_______	○ Mandatory ○ Optional
	○ MAGTF Integrated System Training Center (MISTC) 29	_______	○ Mandatory ○ Optional
	- Command and Control Systems (AFATDS, BCS3, BAT, C2PC, CPOF, CLC2S, etc.)	_______	○ Mandatory ○ Optional
	○ Building 1707 (ISMT / DVTE)	_______	○ Mandatory ○ Optional
	○ Camp Wilson (HEAT, CCS, ODS, DVTE)	_______	○ Mandatory ○ Optional
	○ Tactical Training Exercise Control Group (TTECG)	_______	
	- CACCTUS	_______	○ Mandatory ○ Optional
	○ Supporting Arms Virtual Trainer (SAVT)	_______	○ Mandatory ○ Optional
	○ Rifle Range (ISMT)		○ Mandatory ○ Optional
	○ Deployable Virtual Training Environment (DVTE)		
c. If you chose MANDATORY to any of the training <u>facilities</u> in Question 2c, please select the group that made that decision most often and answer in	○ Higher Leadership. (One or two levels above your command.) ○ Upper Leadership within your command. (CO, XO, S-3_Operations Officer/Chief) ○ Lower Leadership within your command. (OIC, SNCOIC, Training Section) ○ If a different individual or section within your command made these facilities MANDATORY, then please provide the rank of the individual and the name of this person's section here:____________ ○ I do not know who made these facilities MANDATORY for my unit.		

your own words why you think this decision was made.	I think that decision was because:____
d. If you chose OPTIONAL to any of the training <u>facilities</u> in Question 1c, then in the space to the right, select the group that made that decision. After that, answer in your own words why you think they chose to utilize this specific capability.	○ Higher Leadership. (One or two levels above your command.) ○ Upper Leadership within your command. (CO, XO, S-3_Operations Officer/Chief) ○ Lower Leadership within your command. (OIC, SNCOIC, Training Section) ○ If a different individual or section within your command chose these facilities for your unit, then please provide the rank of the individual and the name of this person's section here:____________ ○ I do not know who chose these facilities to train my unit. I think this capability was chosen because:____

2) In the past **2 years**, what simulation training capabilities have you personally used on base (Twentynine Palms, CA)?

a. ○ I have used base training capabilities listed in Question 2b: Proceed to question 2b.

○ I have **not** used any of the base training capabilities listed in Question 2b: Proceed on to question 3.

b. I have used the following training <u>capabilities</u> on base. (If you selected this option, please **check all** capabilities that apply)	<u>Twentynine Palms Simulation Training Capabilities</u> <u>(not all inclusive)</u>:	In the past **2 years**, estimate the total # of times that you've used it:	Check if it was a MANDATORY training tool or OPTIONAL:	
	Staff Training			
	○ MAGTF Tactical Warfare Simulation (MTWS)	_______	○ Mandatory	○ Optional
	○ Joint Conflict and Tactical Simulation (JCATS)	_______	○ Mandatory	○ Optional
	Combined Arms Training	_______	○ Mandatory	○ Optional
	○ Forward Observer Personal Computer Simulation (FOPCSIM)	_______	○ Mandatory	○ Optional
	○ Combined Arms Planning Tool (CAPT)	_______	○ Mandatory	○ Optional
	○ Combined Arms Network (CAN) of Simulations	_______	○ Mandatory	○ Optional
	○ Supporting Arms Virtual Trainer (SAVT)	_______	○ Mandatory	○ Optional
		_______	○ Mandatory	○ Optional
	○ Virtual Battle Space 2 (VBS2)	_______	○ Mandatory	○ Optional
	○ Combined Arms Command and Control	_______	○ Mandatory	○ Optional

	Training Upgrade System (CACCTUS)	________	○ Mandatory ○ Optional
	Small Unit Training	________	○ Mandatory ○ Optional
	○ Virtual Battle Space 2 (VBS2)	________	○ Mandatory ○ Optional
	○ Combat Convoy Simulator (CCS)	________	○ Mandatory ○ Optional
	○ Mobile Counter IED Trainer (MCIT)	________	○ Mandatory ○ Optional
	○ Recognition of Combatants (ROC)	________	○ Mandatory ○ Optional
	○ ROC-IED		
	○ ROC-Suicide Bomber (ROC-SB)		
	○ ROC-Vehicles (ROC-V)	________	○ Mandatory ○ Optional
	○ EagleEye	________	○ Mandatory ○ Optional
	○ Insurgent Methods Training – Network	________	○ Mandatory ○ Optional
	Enhanced Training (IMT-NET)	________	○ Mandatory ○ Optional
	Task Trainers		
	○ Tactical Language Training System (TLTS)		
	○ Indoor Simulated Marksmanship Trainer (ISMT)	________	○ Mandatory ○ Optional
		________	○ Mandatory ○ Optional
	○ Operator Driver Simulator (ODS)	________	○ Mandatory ○ Optional
	○ HMMWV Egress Assistance Trainer (HEAT)	________	○ Mandatory ○ Optional
	Simulation Training Packages		
	○ Staff Training	________	○ Mandatory ○ Optional
	○ Kinetic Operations		
	○ Amphibious Roots Training	________	○ Mandatory ○ Optional
	○ Mountain Exercise Transition Training	________	○ Mandatory ○ Optional
	○ Spartan Preparation	________	○ Mandatory ○ Optional
	○ Small Unit Tactics		
	○ Enhanced Mojave Viper (EMV) Motorized	________	○ Mandatory ○ Optional
	Operations Course (MOC) Rehearsal	________	○ Mandatory ○ Optional
	○ Enhanced Mojave Viper (EMV) Range 410	________	○ Mandatory ○ Optional
	Rehearsal	________	○ Mandatory ○ Optional
	○ Afghan Convoy Patrol		
	○ Afghan Dismounted Patrolling	________	○ Mandatory ○ Optional
	○ Fire Support Team	________	○ Mandatory ○ Optional
	○ Enhanced Mojave Viper (EMV) Fire Support	________	○ Mandatory ○ Optional
		________	○ Mandatory ○ Optional
	Coordination Exercise (FSCEX) Rehearsal		
	○ Basic Call For Fire (CFF) and Close Air	________	○ Mandatory ○ Optional
		________	○ Mandatory ○ Optional
	Support (CAS) Request	________	○ Mandatory ○ Optional
	○ Basic FiST Procedures	________	○ Mandatory ○ Optional
	○ Combined Arms Maneuver Package	________	○ Mandatory ○ Optional
	○ Counter IED		

	○ Understanding the IED Threat _______ ○ Mandatory ○ Optional ○ Recognizing the IED Threat _______ ○ Mandatory ○ Optional ○ Finding the IED Threat _______ ○ Mandatory ○ Optional ○ The IED Threat in the Big Picture ○ Vehicle ○ Driver Training ○ Vehicle Rollover Training ○ Off-Road Training ○ Crew Reaction Drills ○ Deployable Virtual Training Environment (DVTE) ○ Your unit trained with your own DVTE ○ DVTE Setup Course ○ Train the Operator Course ○ Train the Trainer Course
c. If you chose MANDATORY to any of the <u>training capabilities</u> in Question 1c, please select the group that made that decision most often, and answer in your own words why you think this decision was made.	○ Higher Leadership. (One or two levels above your command.) ○ Upper Leadership within your command. (CO, XO, S-3_Operations Officer/Chief) ○ Lower Leadership within your command. (OIC, SNCOIC, Training Section) ○ If a different individual or section within your command made these capabilities MANDATORY, then please provide the rank of the individual and the name of this person's section here: Rank:____________________ Name of Section: ____________________ ○ I do not know who made these capabilities MANDATORY training systems for my unit. I think that decision was because:____ ____ __________________
d. If you chose OPTIONAL to any of the training <u>capabilities</u> in Question 1c, please select the group that made that decision most often and answer in your own words why you think they chose to utilize this specific capability.	○ Higher Leadership. (One or two levels above your command.) ○ Upper Leadership within your command. (CO, XO, S-3_Operations Officer/Chief) ○ Lower Leadership within your command. (OIC, SNCOIC, Training Section) ○ If a different individual or section within your command chose these capabilities for your unit, then please provide the rank of the individual and the name of this person's section here:____________ ○ I do not know who made these capabilities MANDATORY training systems for my unit. I think this capability was chosen because:____ ____ __________________

3) One of the Training Facilities that Twentynine Palms offers is the Battle Simulation Center (BSC). Are you familiar with and/or have used the BSC?

○ No, I am not familiar with it: Proceed to question #4.
○ Yes, I am familiar with it: answer the following questions:

a. Where is the BSC located?	The BCS is located ______________________________ ______________________________ __________ ______________________________ __________
b. I personally interacted with the BSC Simulation Officer or the BSC Staff.	TRUE ○ FALSE ○
c. Other people in my unit interacted with the BSC Simulation Officer or the BSC Staff.	TRUE ○ FALSE ○
d. I personally coordinated and scheduled training through the BSC for myself or my unit.	TRUE ○ FALSE ○
e. Other people in my unit coordinated and scheduled training through the BSC for myself or my unit.	TRUE ○ FALSE ○
f. What course/class did you attend and/or what exercise did you participate in at the BSC?	The 3 courses/classes that I attended most recently in the BSC were: Class #1:______________________ Class #2:______________________ Class #3:______________________ The 3 exercises I participated in most recently in the BSC were: Exercise #1:______________________ Exercise #2:______________________ Exercise #3:______________________
g. The training that I received and/or the exercise I participated in at the BSC met my expectations (check	1: Strongly disagree 2: Disagree 3: Somewhat disagree 4: Neither agree or disagree 5: Somewhat agree 6: Agree 7: Strongly Agree

one option only)	○ ○ ○ ○ ○ ○ ○
h. My overall experiences in the BSC were positive (check **one** option only).	1: Strongly Disagree ○ 2: Disagree ○ 3: Somewhat disagree ○ 4: Neithe agree or disagree ○ 5: Somewhat agree ○ 6: Agree ○ 7: Strongly Agree ○
i. Learning skills with simulations in the BSC is a very effective training approach (check **one** option only).	1: Strongly disagree ○ 2: Disagree ○ 3: Somewhat disagree ○ 4: Neithe agree or disagree ○ 5: Somewhat agree ○ 6: Agree ○ 7: Strongly Agree ○
j. I would recommend the BSC as a training tool/environment to other Marines in my unit and/or to other units (check **one** option only).	1: Strongly disagree ○ 2: Disagree ○ 3: Somewhat disagree ○ 4: Neithe agree or disagree ○ 5: Somewhat agree ○ 6: Agree ○ 7: Strongly Agree ○

4) Are you familiar with (have you ever heard of the name or acronym) the Deployable Virtual Training Environment (DVTE)? If your answer is no, then please proceed to Question 5.

Yes	No
○	○

5) Have you ever used the DVTE?

○ I have **never** used the DVTE: Proceed to question 5 (VBS 2 section).

○ I have used the DVTE: Please answer the following questions:

a. ○ I have used the DVTE in the past, but I do **NOT** currently use it. (If you selected this option, answer the questions to the right.)	When was the last time you used the DVTE? __________ (YEAR) What unit(s) or school(s) were you with when you used the DVTE? ______________________________
b. ○ Our unit currently owns or has access to a DVTE, but we do **NOT** use it. (check **all** that apply.)	What are the reasons you do not use the DVTE? (check all that apply) ○ The DVTE is too difficult to set up. ○ I do NOT have confidence in its training capabilities. ○ Our unit has experienced throughput issues (we are not able to train everyone at the same time and when we needed to) ○ There was never anyone in our unit who knew how to set it up or operate it. ○ The Marine that knew how to use the DVTE has PCS'd, and no one else knows how to set it up or operate it.

	○ I would use the DVTE if leadership allowed us to use it. ○ The DVTE is NOT easily accessible to me (computers are locked up). ○ The DVTE use is NOT integrated into our training schedule. ○ The DVTE is just a bunch of simulations that no one really cares about. ○ The DVTE provides no real training value to my unit.
c. I currently use the DVTE. ○ (If this is correct, answer the questions about DVTE below.	
d. If the DVTE is a **MANDATORY** ○ training tool for you or your unit, check **one** answer on the right.	Who made the decision to make the DVTE a MANDATORY training system for you or your unit? ○ Higher Leadership. (One or two levels above your command.) ○ Upper Leadership within your command. (CO, XO, S-3_Operations Officer/Chief) ○ Lower Leadership within your command. (OIC, SNCOIC, Training Section) ○ If a different individual or section within your command made DVTE MANDATORY, then please provide the rank of the individual and the name of this person's section here:____________ ○ I do not know who made the DVTE a MANDATORY training system for my unit.
e. If the DVTE is an **OPTIONAL** ○ training tool for you or your Unit, check **one** answer on the right	Why do you think the DVTE was chosen as an OPTIONAL training system for you or your unit? ○ The DVTE is a very valuable training tool. ○ Several other units are using the DVTE, so we decided to use it as well. ○ We heard the DVTE was a good training tool, so we decided to use it. ○ The DVTE is used only during white space training and/or downtime. ○ I do NOT know why we use the DVTE in our unit. ○ Other reasons:____
f. Select all aspects of the DVTE that you feel define the overall capabilities of the system. (check **all** that apply)	○ Consists of 9 pelican cases. ○ Contains 32 laptop computers. ○ Each laptop contains a suite of tactical simulations. ○ The DVTE suites serve as unit simulation centers and can be setup in any location (classroom, barracks, office spaces, etc.). ○ The DVTE is capable of training individual Marines. ○ The DVTE is capable of training Fire Teams. ○ The DVTE is capable of training Platoons. ○ The DVTE is capable of training Battalion Staffs. ○ Units can get DVTE training from the Battle Simulation Center located on base. ○ The Battle Simulation Center will train units on the DVTE at the unit's work space. ○ I have received training on the DVTE from the Battle Simulation Center.

g. Select all the DVTE tactical simulations that you currently utilize.(check **all** that apply)	DVTE tactical simulations:	In the past year, estimate the total # of times that you've used the selected simulations.	Check if it was a MANDATORY training tool or OPTIONAL?
	○ Virtual Battle Space 2 (VBS2)	________	○ Mandatory ○ Optional
	○ Combines Arms Network (CAN)	________	○ Mandatory ○ Optional
	○ Tactical Language Training System (TLTS)	________	○ Mandatory ○ Optional
	○ Recognition of Combatants (ROC), includes Vehicle, IED, and Suicide Bomber	________	○ Mandatory ○ Optional
	○ Combat Decision Range (CDR)	________	○ Mandatory ○ Optional
	○ MAGTF XXI	________	○ Mandatory ○ Optional
	○ Tactical Operations (TACOPS)	________	○ Mandatory ○ Optional
	○ Close Combat Marine (CCM)	________	○ Mandatory ○ Optional
	○ Logistics Tactical Decision Simulation (TDS)	________	○ Mandatory ○ Optional
	○ Joint Virtual Tactical Radio (JVTR)	________	○ Mandatory ○ Optional
	○ Other simulation: Please enter here: ____________________	________	○ Mandatory ○ Optional

h. Where did you first learn about the DVTE (check **one** option only)?	Bootcamp, MCT, TBS, IOC	MOS School	Other PME schools (NCO, SNCO Course, etc.)	From your current unit.	From a unit outside your current unit.	While on a field exercise or while deployed.	Local advertising on base (Radio, TV, Internet, E-mail, etc.)
	○	○	○	○	○	○	○

i. What do you **like** about the DVTE most? (check **all** that apply)	Easy to use	Easy to learn	Easy to set up	Easy to maintain	I have confidence in its training capabilities	It is capable of being deployed	The variety of training simulations that it offers (VBS2, CAN,TLTS etc.)
	○	○	○	○	○	○	○

j. What do you **dislike** about the DVTE most (check **all** that apply)?	Not easy to use	Not easy to learn	Not easy to set up	Not easy to maintain	I do not have confidence in its training capabilities	Although deployable, it is not used as a training system when my unit is deployed.	Throughput issues (to many people and not enough systems to train with)
	○	○	○	○	○	○	○

k. I am very confident in the	1: Strongly disagree	2: Disagree	3: Somewhat disagree	4: Neither agree or	5: Somewhat agree	6: Agree	7: Strongly Agree

DVTE's overall training value. (check **one** option only)			disagree				
	○	○	○	○	○	○	○
l. The DVTE is always accessible for me whenever I need it (check **one** option only).	1: Strongly disagree ○	2: Disagree ○	3: Somewhat disagree ○	4: Neither agree or disagree ○	5: Somewhat agree ○	6: Agree ○	7: Strongly Agree ○
m. There are enough DVTE assets in my unit for all of us to train, and we have never experienced throughput issues. (check **one** option only).	1: Strongly disagree ○	2: Disagree ○	3: Somewha disagree ○	4: Neithei agree or disagree ○	5: Somewha agree ○	6: Agree ○	7: Strongly Agree ○
n. How much time on average do you spend preparing / planning for a training session prior to using the DVTE? (check **one** option only)	No time is ever spent preparing / planning. ○	< 30 min ○	1 hour ○	1-3 hours ○	> 3 hours ○		

Please answer the following questions about the following computer-supported training simulations that you currently utilize in your unit and/or during your off duty time?

6) Are you familiar with the Virtual Battle Space 2? If your answer is no, then please proceed to Question 6.

Yes	No
○	○

○ I have **never** used VBS2: Proceed to question 6 (CAN 2 section).
○ I have used VBS2: Please answer the following questions:

a. ○ I have used VBS2 in the past, but I do **NOT** currently use it. (If you selected this option, answer the	When was the last time you used VBS2? __________ (YEAR) What unit(s) or school(s) were you with when you used VBS2? ______________________________

	questions to the right.)	
b.	Our unit currently owns or ○ has access to VBS2, but we do **NOT** use it. (check **all** that apply.)	What are some of the reasons you do not use VBS2? ○ VBS2 is not useful to my unit. ○ VBS2 is too difficult for me to set up. ○ We did not have confidence in its training capabilities. ○ No one has received training on VBS2. ○ No one in our unit knows how to set up and/or operate VBS2. ○ VBS2 is NOT easily accessible to me (locked up). ○ Using VBS2 does not fit into our training schedule. ○ VBS2 is just a game. ○ VBS2 provides no real training value to my unit.
c.	I currently use VBS2. ○ (If this is correct, answer the questions about VBS2 below.	
d. e.	If VBS2 is a **MANDATORY** ○ training tool for you or your unit, check **one** answer on the right.	Who chose to make VBS2 a MANDATORY training system for you or your unit? ○ Higher Leadership. (One or two levels above your command.) ○ Upper Leadership within your command. (CO, XO, S-3_Operations Officer/Chief) ○ Lower Leadership within your command. (OIC, SNCOIC, Training Section) ○ If a different individual or section within your command made VBS2 MANDATORY, then please provide the rank of the individual and the name of this person's section here:____________ ○ I do not know who made VBS2 a MANDATORY training system for my unit.
f.	If the VBS2 is an **OPTIONAL** ○ training tool for you or your Unit, check **one** answer on the right	Why do you think VBS2 was chosen as an OPTIONAL training system for you or your unit? ○ VBS2 is a very valuable training tool. ○ Several other units are using VBS2, so we decided to use it as well. ○ We heard VBS2 was a good training tool, so we decided to use it. ○ VBS2 is a game and is used only to bypass time. ○ I do NOT know why we use VBS2 in our unit.

g.	What is your general understanding of VBS2? (check **all** that apply.)	First Person Shooter ○	Small Unit Tactics ○	Can create customizable scenarios for your unit ○	Fully configurable virtual battlefield ○	Different types of terrains are available in VBS2 ○	Loaded as a simulation on all VBS2 suites ○	Battle Simulation Center provides VBS2 training ○
h.	How much time do you train with and/or use VBS2? (check **one**	○ Daily Enter # of Hours:____	○ Weekly Enter # of Hours:____	○ Monthly Enter # of Hours:____	○ Quarterly Enter # of Hours:____	○ Every 6 months Enter # of Hours:___	○ Annually Enter # of Hours:____	

	option only)							
i.	Where did you first learn about VBS2? (check **one** option only)	Bootcamp, MCT, TBS, IOC ○	MOS School ○	Other PME schools (NCO, SNCO Course, etc.) ○	From your current unit. ○	From a unit outside your current unit. ○	While on a field exercise or while deployed. ○	Local advertising on base (Radio, TV, Internet, E-mail, etc.) ○
j.	What do you like about VBS2 most? (check **all** that apply)	Easy to use ○	Easy to learn ○	Very realistic scenarios ○	Very realistic terrain ○	Very realistic representati on of Marines and Vehicles ○	Easily accessible within my unit ○	The variety of training application s that it offers (Tactical Training, Convoy Training, etc.) ○
k.	What do you dislike about VBS2 most? (check **all** that apply)	Not easy to use ○	Not easy to learn ○	Does not have realistic scenarios ○	Does not have realistic terrain ○	Marines and Vehicles are not very realistic looking ○	Not easily accessible within my unit ○	Throughput issues (to many people and not enough systems to train with) ○
l.	I am very confident in VBS2's overall training value (check **one** option only.)	1: Strongly disagree ○	2: Disagree ○	3: Somewhat disagree ○	4: Neithe agree or disagree ○	5: Somewha agree ○	6: Agree ○	7: Strongly Agree ○
m.	VBS2 is very accessible for me when I need it (check **one** option only.)	1: Strongly disagree ○	2: Disagre e ○	3: Somewhat disagree ○	4: Neither agre or disagree ○	5: Somewhat agree ○	6: Agree ○	7: Strongly Agree ○
n.	There are enough VBS2 assets in my unit for all of us to train, and we have never experienced throughput issues. (check **one** option only).	1: Strongly disagree ○	2: Disagree ○	3: Somewhat disagree ○	4: Neithe agree or disagree ○	5: Somewha agree ○	6: Agree ○	7: Strongly Agree ○
o.	How much time on average do you spend preparing / planning	No time is every spent preparing / planning to	< 1 hour	1-3 hours	4-7 hours	> 7 hours		

prior to using VBS2? (check **one** option only)	use VBS2. ○ ○ ○ ○ ○
p. What training applications do you use for VBS2? (check **all** that apply)	○ Tactical Training ____ ○ Convoy Training ____ ○ Course of Action Analysis ____ ○ Mission Simulation ____ ○ Vehicle Checkpoints and Area Control ____ ○ Cultural Awareness Training ____ ○ Weapon Familiarization/Experimentation ____ ○ Helicopter Loadmaster Training ____ ○ Tactical Use of UAV Platforms ____ ○ MOUT Training ____ ○ Individual and FiST Supporting Arms Training ____ ○ Call for CAS Procedures ____ ○ Integration of IDF and CAS with maneuver ____ ○ Company Level Fire Support Teams (FiST) ____ ____ In the past year, estimate the total # of hours that you've used the selected applications.

7) Are you familiar with the Combined Arms Network (CAN)? If your answer is no, then please proceed to the end of the survey and submit your answers.

Yes	No
○	○

○ I have **never** used CAN: Proceed to the end of the survey and submit your answers.
○ I have used CAN: Please answer the following questions:

a. I have used CAN in the ○ past, but I do **NOT** currently use it. (If you selected this option, answer the questions to the right.)	When was the last time you used CAN (Year)? ___________ In the past, what unit(s) were you with when you used CAN? ___________
b. Our unit currently owns or ○ has access to CAN, but we do **NOT** use it. (check **all** that apply.)	What are some of the reasons you do not use CAN? ○ CAN is not useful to my unit. ○ CAN is too difficult for me to set up. ○ We did not have confidence in its training capabilities. ○ No one has received training on CAN. ○ No one in our unit knows how to set up and/or operate CAN. ○ CAN is NOT easily accessible to me (locked up). ○ Using CAN does not fit into our training schedule.

	○ CAN is just a game. ○ CAN provides no real training value to my unit.
c. I currently use CAN. ○ (If this is correct, answer the questions about CAN below.	
d. If CAN is a **MANDATORY** ○ training tool for you or your unit, check **one** answer on the right.	Who chose to make CAN a MANDATORY training system for you or your unit? ○ Higher Leadership. (One or two levels above your command.) ○ Upper Leadership within your command. (CO, XO, S-3_Operations Officer/Chief) ○ Lower Leadership within your command. (OIC, SNCOIC, Training Section) ○ If a different individual or section within your command made CAN MANDATORY, then please provide the rank of the individual and the name of this person's section here:____________ ○ I do not know who made CAN a MANDATORY training system for my unit.
e. If the CAN is an **OPTIONAL** ○ training tool for you or your Unit, check **one** answer on the right	Why do you think CAN was chosen as an OPTIONAL training system for you or your unit? ○ CAN is a very valuable training tool. ○ Several other units are using CAN, so we decided to use it as well. ○ We heard CAN was a good training tool, so we decided to use it. ○ CAN is a game and is used only to bypass time. ○ I do NOT know why we use CAN in our unit.

f. What is your general understanding of CAN? (check **all** that apply.)	A series of personal computer based First Person Fire Support Simulations ○	Can be utilized in stand-alone mode ○	Can be used in a distributed networked model for training fire support teams (FiSTs) ○	Can develop and practice combine d arms and fire support skills on a variety of targets ○	Can provide doctrinal feedback on calls made and can help novices correct errors ○	CAN can work with CAN in order to provide a rehearsal platform for live training events ○	Is a simulation loaded on the CAN ○
g. How much time do you train with and/or use CAN? (check **one** option	○ Daily Enter # of Hours:____	○ Weekly Enter # of Hours:____	○ Monthly Enter # of Hours:____	○ Quarterly Enter # of Hours:____	○ Every 6 months Enter # of Hours:___	○ Annually Enter # of Hours:____	

	only)							
h.	Where did you first learn about CAN? (check **one** option only)	Bootcamp, MCT, TBS, IOC	MOS School	Other PME schools (NCO, SNCO Course, etc.)	From your current unit.	From a unit outside your current unit.	While on a field exercise or while deployed.	Local advertising on base (Radio, TV, Internet, E-mail, etc.)
		○	○	○	○	○	○	○
i.	What do you like about CAN most? (check **all** that apply)	Easy to use	Easy to learn	Very realistic missions	Very realistic terrain	Very realistic representation of Marines and Vehicles	Easily accessible within my unit	The variety of training application s that it offers (Tactical Training, Convoy Training, etc.)
j.		○	○	○	○	○	○	○
k.	What do you dislike about CAN most? (check **all** that apply)	Not easy to use	Not easy to learn	Does not have realistic missions	Does not have realistic terrain	Marines and Vehicles are not very realistic looking	Not easily accessible within my unit	Throughput issues (to many people and not enough systems to train with)
l.		○	○	○	○	○	○	○
m.	I am very confident in CAN's overall training value (check **one** option only.)	1: Strongly disagree	2: Disagree	3: Somewhat disagree	4: Neither agree or disagree	5: Somewhat agree	6: Agree	7: Strongly Agree
		○	○	○	○	○	○	○
n.	CAN is very accessible for me when I need it (check **one** option only.)	1: Strongly disagree	2: Disagree	3: Somewhat disagree	4: Neither agree or disagree	5: Somewhat agree	6: Agree	7: Strongly Agree
		○	○	○	○	○	○	○
o.	There are enough CAN assets in my unit for all of us to train, and we have never experienced throughput issues. (check **one** option only).	1: Strongly disagree	2: Disagree	3: Somewhat disagree	4: Neither agree or disagree	5: Somewhat agree	6: Agree	7: Strongly Agree
		○	○	○	○	○	○	○
p.	How much time on average do you spend preparing / planning	No time is every spent preparing / planning to	< 1 hour	1-3 hours	4-7 hours	> 7 hours		

prior to using CAN? (check **one** option only)	use CAN. ○ ○ ○ ○ ○
q. What training applications do you use for CAN? (check **all** that apply)	In the past year, estimate the total # of hours that you've used the selected applications. ○ Individual and FiST Supporting Arms Training ________ ○ Call for CAS procedures ________ ○ Familiarization with the different fire support equipment ________ ○ Company Level Fire Support Teams (FiST) ________ ○ Refresher training ________ ○ Use it with SAVT ________

THANK YOU FOR PARTICIPATING IN THIS SURVEY!!! HAVE A GREAT DAY!!!

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APPENDIX M. FOCUS GROUP QUESTIONS

FOCUS GROUP QUESTIONS

Although these questions are focused towards each specific group, as time permits, any question can also be asked to any of the groups. If this occurs, then the question might be stated in a slightly different manner, but will have the same original meaning, purpose, and overall intent.

Base Leadership

1. When you hear the words game-based training tool; what are your initial reactions? What do you feel the local Commander's/Sgt'sMaj/1stSgt's (Bn/Co) reactions would be to this question? What about the young Marines?

2. Are you familiar with the DVTE (Deployable Virtual Training Environment)? If yes, then what are your overall thoughts/opinions on the idea behind it? Deployable, unit simulation center, etc.?

3. When there are new tools offered by the Marine Corps, do you see Twentynine Palms as a base that jumps on the opportunity and requests it first, or do you think the base holds off until others have tried the tool?

4. Do you feel that there are facilities on the base (physical and/or simulation driven) that are a complete waste of time, energy, and resources? If yes, then what are they and why do you feel that way?

Unit Leadership

1. If you use computer-supported training simulations to train you unit, then are the simulation tools documented in your unit's training plan? What about the skills learned by the Marines? Do the Marines still have training jackets, and are they still used? Are they also captured in the individual Marine's training jacket?

2. Has your unit ever been told that you will use a simulation (made it MANDATORY), or any form of technology for training purposes? Have you ever made a simulation MANDATORY, and if yes, then what was it and why?

3. If you are not using computer-supported training simulations in your current training efforts/environment, then with all the budget cuts that are occurring and that will continue to occur over the next 5 – 10 years, do you see your unit having to find other methods to meet your mission, such as using simulation tools? If yes, then which ones? If no, then explain.

4. Have you or your unit ever had a bad experience using a computer-supported simulation and/or had a bad experience trying to coordinate or conduct a simulation exercise? Explain.

5. Are you familiar with the DVTE (Deployable Virtual Training Environment)? If yes, then what are your overall thoughts/opinions on the idea behind it? Deployable, unit simulation center, etc.? Does your unit currently use it, and if yes, then simulations do they use and for what purposes?

Trainers / Instructors:

1. Do you feel that the majority of the units are focused and committed to the exercise's mission and overall training objectives during the planning phases of a simulation exercise? Explain.

2. What good and bad things have you seen make or break the simulation exercise during the planning phase? Execution phase?

3. Do you feel that the unit's leadership is involved in the planning/preparation, execution, and/or After Action Review phases of the simulation exercise? What have you noticed about the AARs? Do they take them serious and is their leadership involved? For each phase, where does their leadership seem to focus their involvement, if at all?

4. Do you think units treat simulation exercises with the same motivation, dedication, commitment, and level of effort that they do towards their traditional training exercises? Explain.

5. Within your organization, describe the overall quality of your simulations that you currently utilize to train Marines. Provide both positive and negative comments, and explain why you feel that way.

Trainees:

These questions will be derived from the surveys, and the intent is to take a deeper dive into the about 3 or 4 questions pertaining to technology adoption, current training practices, and the DVTE and/or VBS2.

1. What have your overall experiences been with using computer-supported training simulations? Attitude? Positive versus Negative? Overall mindset with planning, executing, and After Actions. Realistic versus Unrealistic.

2. When you hear the words game-based training tool; what are your initial reactions? What do you feel your leadership's reactions would be to this same question? And senior leaders of the Marine Corps?

3. Should the Department of Defense invest time and energy into the development, introduction/fielding, and use of simulations as training tools in our military domain?

4. How does your unit employ simulations into your training plans? Documented in training plans; used as an annual requirement? Only as a white space filler?

5. If you could use a simulation to train your unit, then what simulation would you use and for what skills? Or if it does not exist, then what type of simulation would you want to see or use and what skills would be learned by it?

6. DVTE – Simulations and most used and WHY? Concept behind DVTE (traveling simulation center and deployable). Attitude? Positive versus Negative? Overall mindset with planning, executing, and After Actions. Their ideas for the 2020 DVTE solution.

7. If you were the Commanding Officer of your unit, then what simulation would you make MANDATORY and WHY?

8. What are your thoughts on the Indoor Simulated Marksmanship Trainer? Attitude? Positive versus Negative? Realistic versus unrealistic? Value added? What would you add, remove, improve?

9. What are your thoughts on the HMMWV Egress Assistance Trainer? Attitude? Positive versus Negative? Realistic versus unrealistic? Value added? What would you add? Remove, improve? Save lives?

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APPENDIX N. FOCUS GROUP TRANSCRIPTIONS

Focus Group #1 was conducted on July 10, 2013 and consisted of seven participants (Trainees and Trainers). The following questions and responses are transcribed as follows:

Trainees question #1. What have your overall experiences been with using computer-supported training simulations? Additional issues: Attitude towards simulations? Positive experiences versus negative; overall mindset with planning, executing, and After Actions; level of simulation realism.

- The Advanced Gunnery Training System (AGTS) trains a junior inexperienced crew on turret components and functions. They are introduced to simple procedural tasks (offensive, defensive, day/night), and then work up to platoon exercises integrating indirect fire against multiple computer simulated enemies.
- Very good hands on tool where basic experience can be learned; saves time and money.
- When using it for Section Gunnery, the system freezes up due to very large scenarios.
- Located in Building 1707; the battalion owns the system and it is maintained by one Contractor.
- The unit has noticed an increase in the gunnery scores over time with the use of the AGTS.
- The crew mentalities are the same with conducting AGTS exercises versus live exercises on the range. The AGTS causes no bad habits, but the environmental aspects can cause a different mentality.
- The environment for the gunners makes a huge difference; air conditioned and nice cool environment versus very hot, sweaty environment; a mental challenge more than anything.

- AARs are conducted the same way in the AGTS as during live fire exercises. Evaluators use the same score sheet and checklist. Evaluators use built-in AAR tools for debriefing as well. Copies are provided to the crews so that they can watch it to learn from the exercise.
- They would like to see more variety with the scenarios; more terrain and upgraded graphics.

Trainees question #2. When you hear the words game-based training tool, what are your initial reactions? What do you feel your leadership's reactions would be to this same question? And senior leaders of the Marine Corps?

- We are all from the era where technology is used a lot, so game-based training tools are not necessarily a bad thing. The Marines are usually enthusiastic and positive about using the simulators because they are cool and are like games.
- Some leaders tend to think of game-based systems as games, and not really useful tools. It's a mindset thing. When using the AGTS, the Marines can be pulled to complete other tasks as they are not in the field; however, on a live range, they will not be pulled away from the training event.

Trainees question #4. How does your unit employ simulations into your training plans? Documented in training plans; used as an annual requirement? Only as a white space filler?

- The AGTS is listed within the battalion's training plan; the system is required prior to any type of live fire exercise. This is built into their Marine Corps Warfighting Publication (MCWP), and different milestones must be met prior to conducting a live fire event. The scenarios and tables that are used within the AGTS are the same scenarios and tables that the crew will use during the live fire event.
- The Marines who are considered AGTS Trainers are qualified through completing a course; receive certificates as AGTS Instructors and Evaluators. These Trainers evaluate their crews, provide detailed

debriefs, and sign off on their pass/fail for their scenarios and tables.

- Training Jackets are used to track the completion of simulator exercise events and certifications.
- AGTS is also used as white space training for sustainment purposes every week.
- Shooting in the AGTS is a lot different than actually going to the range and shooting. There are some things that are realistic, but then there are things that are very unrealistic; but it definitely helps with getting you ready for the live fire event.
- In the AGTS, everything is perfect; you can build error into the bore site Battle Site Zero (BZO) and can introduce malfunctions, but it does not do justice to the way it is in real life on the range.

Trainees question #5. If you could use a simulation to train your unit, then what simulation would you use and for what skills? Or if it does not exist, then what type of simulation would you want to see or use and what skills would be learned by it?

- Want a Combined Arms approach so that AGTS and SAVT can be linked together. The two AGTS's are sitting right beside each other, but they cannot conduct joint training with tanks.

Trainees question #7. If you were the Commanding Officer of your unit, then what simulation would you make MANDATORY and WHY?

- The AGTS is mandatory, so who made this decision and why? A collective from all the battalion commanders and senior enlisted have made this decision. The unit provides numbers to the commanders on what resources would have been saved if they would have conducted an exercise in the field.

Trainees question #8. What are your thoughts on the Indoor Simulated Marksmanship Trainer? Attitude towards ISMT? Positive versus negative experiences? Level of simulation realism? Value added? What would you add, remove, improve?

- One Marine used the ISMT several years ago and had a bad experience; someone hit the projector and it affected the entire scenario and the training evolutions throughout the day. Others used the ISMT's weapons prior to going to a live fire shoot; it helped their live fire exercise.

Trainees question #9. What are your thoughts on the HMMWV Egress Assistance Trainer? Attitude? Positive versus Negative? Realistic versus unrealistic? Value added? What would you add? Remove, improve? Save lives?

- The training is realistic and works very well to prepare you for a vehicle rollover.

Trainers question #3: Do you feel that the unit's leadership is involved in the planning/preparation, execution, and/or After Action Review phases of the simulation exercise? What have you noticed about the AARs? Do they take them serious and is their leadership involved? For each phase, where does their leadership seem to focus their involvement, if at all?

- Unit leaders are involved during the AGTS events; however, they are usually working on their gunner qualifications with their teams as well.

Additional comments from the focus group. They do not have a deployable AGTS (DAGTS) within the battalion. The nearest DAGTS is located in Camp Pendleton, CA, so they do not have the opportunity to use it. They suggested that they need the DAGTS forward deployed. They also want to be certified for using the SAVT as they fee that it would benefit them and their Marines. The civilians are knowledgeable, but it would work better if they had more control of the training and the system itself.

Focus Group #2 was conducted on July 11, 2013 and consisted of eight participants (Trainees and Trainers). The following questions and responses are transcribed as follows:

- Trainees question #1. What have your overall experiences been with using computer-supported training simulations? Additional issues: Attitude towards simulations? Positive experiences versus negative; overall mindset with planning, executing, and After Actions; level of simulation realism.
- They mentioned they use the AAV up-gun system simulator. Uses compressed air for the weapons, but they are all being calibrated and upgraded in Florida. They have to use the simulation before they live fire, and it is mandatory. The issues with electrical and manual traversing; simulation is only electrical. During live fire exercises, the electrical traversing components do not work most of the time, so it feels as if negative learning is occurring.
- They used VBS2 about a year ago. One Marine used the DVTE suite on Inspector-Instructor (I-I) Duty, but it was rarely used. They had Trainers to train with them, but they just never used them because there was not enough time in the training schedule.
- They do not have enough time to try the simulations; the schedule is full and there is just not enough time.
- Using simulations definitely helps with building confidence in the junior Marines.
- The overall effort put into the simulation exercise is an individual effort. Some Marines do not take it serious and seem to treat it as a game.
- HEAT is used and it does help with learning how to egress from a vehicle.

Trainees question #2. When you hear the words game-based training tool; what are your initial reactions? What do you feel your leadership's reactions would be to this same question? And senior leaders of the Marine Corps?

- Game-based systems are good for beginners just starting out; junior Marines who need to develop their confidence. A lot of the feelings about game-based training systems are based upon individual personalities.
- They felt that their leadership would be open-minded about using game-based training systems to train their Marines.
- For the senior leaders, they felt the same; if the training was valuable, then they would support it; they would also want feedback from its use – the good and the bad things about the training.

Trainees question #4. How does your unit employ simulations into your training plans? Documented in training plans; used as an annual requirement? Only as a white space filler?

- The AAV up-gun simulator is documented in their training plans; mainly due to the requirements of the simulations being mandatory for live fire exercises.
- It is hard to lock on simulations as a white space filler due to scheduling and throughput issues.
- When working with simulations, they document their uses with platoon rosters and they are forwarded up to the Company training office.
- Do not have official training jackets for their MOS's, but have counseling jackets where some of the training might be documented.

Trainees question #5. If you could use a simulation to train your unit, then what simulation would you use and for what skills? Or if it does not exist, then what type of simulation would you want to see or use and what skills would be learned by it?

- Special simulations for creating AAV scenarios; more MRAP simulations. They want a full AAV simulator, similar to the full tank simulator that Tanks uses at their school house. The turret they use is the actual turret, but they sit at a desk and a normal chair, vice the actual vehicle environment.

- Camp LeJeune has more simulators so they can work on crew gunnery; more Marines were trained at once.
- They use simulated dunkers Submerged Vehicle Egress Trainer (SVET) and Shallow Water Egress trainer (SWET) in the pools at Camp Pendleton. One comment on the SVET was the fact that the seatbelts were very difficult to get off due to a lack of preventive maintenance.

Trainees question #8. What are your thoughts on the Indoor Simulated Marksmanship Trainer (ISMT)? Attitude toward ISMT? Positive versus Negative experiences? Level of simulation realism? Value added? What would you add, remove, improve?

- The ISMT is a good tool; however, the weapons are not updated - no Advanced Combat Optical Gun Sights (ACOGS), and the graphics need to upgraded.

Trainers question #3. Do you feel that the unit's leadership is involved in the planning/preparation, execution, and/or After Action Review phases of the simulation exercise? What have you noticed about the AARs? Do they take them serious and is their leadership involved? For each phase, where does their leadership seem to focus their involvement, if at all?

- The simulation exercises are treated as a check-in-the-box type of event, so it is treated differently than the live exercises.
- AAVs are more unpredictable, so the drivers and gunners learn more with experience and troubleshooting than with the simulations.

Focus Group #3 was conducted on July 12, 2013 and consisted of eight participants (Trainers). The following questions and responses are transcribed as follows:

Base Leadership question #2. Are you familiar with the DVTE? What are your thoughts/opinions on the idea behind it?

- Good concept to allow units to train at home or when deployed
- Expertise in the DVTE is perishable
- Maintenance and sustainment of DVTE suites are difficult
- DVTE suites tend to gather dust and are not used consistently or effectively

Trainees question #2. When you hear the words game-based training tool, what are your initial reactions? What do you feel your leadership's reactions would be to this same question? And senior leaders of the Marine Corps?

- From a young Marine's perspective – playtime, not serious, break from training, not actual training
- From a unit leader perspective - Video games, counter-productive training, waste of time, not serious training
- From a senior leaders perspective – babysitting their troops, not a valid training tool, waste of time

Trainers question #1. Do you feel the majority of the units are focused and committed to the exercise's mission and overall training objectives during the planning phases of a simulation exercise?

- Units focus and commitment during the planning of simulation exercises vary by unit, but generally they are committed and focused
- Many unit leaders have unrealistic expectations
- Often unit leaders are unsure of how to use simulations and have quite a bias against the effectiveness of simulations, which affects the commitment to a simulation exercise.

Trainers question #2. What good and bad things have you seen make or break the simulation exercise during the planning phase? Execution phase?

- DVTE training tends to be off the cuff and not planned at all.
- Small unit leaders not controlling the training audience to take the DVTE training seriously
- Unit leaders that have unrealistic expectations
- Unit leaders that do not get involved or stay involved throughout the planning and execution
- Unit leaders are unclear of their unit’s training needs
- Lack of clear training objectives

Trainers question #3. Do you feel the unit’s leadership is involved in the planning, preparation, execution, and After Action Review phases of the simulation exercise? What have you noticed about AAR’s? Do they take them serious and is their leadership involved? For each phase, where does their leadership seem to focus their involvement, if at all?

- It varies from unit to unit depending on the type and unit mission

Trainers question #4. Do you think units treat simulation exercises with the same motivation, dedication, commitment, and level of effort that they do towards their traditional training exercises? Explain.

- Units do not approach simulation exercises the same as live training…simulations are used to prepare for live training
- No matter how serious a unit takes the simulation exercise the same friction will not be present as it is in live fire exercises

Trainers question #5. Within your organization, describe the overall quality of your simulations that you currently utilize to train Marines. Provide both positive and negative comments, and explain why you feel that way.

- Our simulations feed all current Marine Corps C2 systems
- Our simulations cover the complete spectrum of Marine Corps Warfighting
- Proper planning and execution is the fundamental strength and weakness of any exercise live, virtual or constructive.

APPENDIX O. ADDITIONAL SURVEY DATA SETS

Table 25. Technology owned and frequency of use per day and week

Technology Owned and Frequency of Use Per Day and Week			Trainees	Unit Leadership	Trainers	Simulation Instructors
Sample Size			**220**	**35**	**28**	**11**
LAPTOP / DESKTOP	**daily**	**#**	113	30	20	10
		%	51.36	85.71	71.43	90.91
		% of users	**59.16**	**85.71**	**71.43**	**90.91**
	Weekly	**#**	49	5	6	0
		%	22.27	14.29	21.43	0.00
		% of users	25.65	14.29	21.43	0.00
TABLET	**daily**	**#**	32	12	10	2
		%	**14.55**	**34.29**	**35.71**	**18.18**
		% of users	42.11	63.16	55.56	50.00
	Weekly	**#**	16	4	3	1
		%	7.27	11.43	10.71	9.09
		% of users	21.05	21.05	16.67	25.00
SMART PHONE	**daily**	**#**	196	34	24	6
		%	**89.09**	**97.14**	**85.71**	**54.55**
		% of users	95.61	100.00	92.31	100.00
	Weekly	**#**	3	0	0	0
		%	1.36	0.00	0.00	0.00
		% of users	1.46	0.00	0.00	0.00
CELL PHONE	**daily**	**#**	23	0	4	4
		%	**10.45**	**0.00**	**14.29**	**36.36**
		% of users	60.53	0.00	66.67	66.67
	Weekly	**#**	0	0	0	0
		%	0.00	0.00	0.00	0.00
		% of users	0.00	0.00	0.00	0.00
GAME CONSOLE	**dail**	**#**	89	1	6	0
		%	**40.45**	**2.86**	**21.43**	**0.00**
		% of	50.00	4.17	30.00	0.00

		users				
	Weekly	#	48	8	10	0
		%	21.82	22.86	35.71	0.00
		% of users	26.97	33.33	50.00	0.00
E-READER	daily	#	12	4	2	1
		%	**5.45**	**11.43**	**7.14**	**9.09**
		% of users	24.00	21.05	20.00	33.33
	Weekly	#	12	6	5	2
		%	5.45	17.14	17.86	18.18
		% of users	24.00	31.58	50.00	66.67
DIGITAL MEDIA PLAYER	daily	#	72	11	11	1
		%	**32.73**	**31.43**	**39.29**	**9.09**
		% of users	57.60	42.31	61.11	20.00
	Weekly	#	22	8	5	3
		%	10.00	22.86	17.86	27.27
		% of users	17.60	30.77	27.78	60.00
DIGITAL CAMERA	daily	#	11	1	1	0
		%	**5.00**	**2.86**	**3.57**	**0.00**
		% of users	10.68	5.00	4.76	0.00
	Weekly	#	13	2	4	0
		%	5.91	5.71	14.29	0.00
		% of users	12.62	10.00	19.05	0.00
VIDEO CAMERA	daily	#	8	0	0	0
		%	**3.64**	**0.00**	**0.00**	**0.00**
		% of users	14.04	0.00	0.00	0.00
	Weekly	#	9	1	1	0
		%	4.09	2.86	3.57	0.00
		% of users	15.79	7.14	8.33	0.00
INTERNET CONNECTION AT HOME (HOUSE, APARTMENT, BARRACKS)	daily	#	155	34	25	9
		%	**70.45**	**97.14**	**89.29**	**81.82**
		% of users	86.59	100.00	96.15	90.00
	Weekly	#	13	0	1	0
		%	5.91	0.00	3.57	0.00
		% of users	7.26	0.00	3.85	0.00

Table 26. Buy technology only after hearing from peers — "%" is the % of full sample size

Buy technology only after hearing from peers		Trainees	Unit Leadership	Trainers	Simulation Instructors
Sample Size		220	35	28	11
I wait until I hear about the tech-nology devices from my peers before I buy them.	7. Strongly Agree	13	3	0	0
	%	5.91	8.57	0.00	0.00
	6. Agree	34	7	4	1
	%	15.45	20.00	14.29	9.09
	5. Somewhat Agree	49	15	7	4
	%	22.27	42.86	25.00	36.36
	4. Neither Agree or Disagree	53	6	9	1
	%	24.09	17.14	32.14	9.09
	3. Somewhat Disagree	22	0	3	1
	%	10.00	0.00	10.71	9.09
	2. Disagree	25	2	2	2
	%	11.36	5.71	7.14	18.18
	1. Strongly Disagree	24	2	3.00	2
	%	10.91	5.71	10.71	18.18
	AGREE (7.+6.+5.)	96	25	11	5
	%	**43.63**	**71.43**	**39.29**	**45.45**
	DISAGREE (3.+2.+1.)	71	4	8	5
	%	**32.27**	**11.42**	**28.56**	**45.45**

Table 27. Among the first to buy new games / applications — "%" is the % of full sample size

Among the First to Buy new games / applications		Trainees	Unit Leadership	Trainers	Simulation Instructors
Sample Size		**220**	**35**	**28**	**11**
I am one of the first people to buy new applications or games.	**7. Strongly Agree**	4	0	0	0
	%	1.82	0.00	0.00	0.00
	6. Agree	13	1	2	0
	%	5.91	2.86	7.14	0.00
	5. Somewhat Agree	22	5	3	0
	%	10.00	14.29	10.71	0.00
	4. Neither Agree or Disagree	54	7	7	2
	%	24.55	20.00	25.00	18.18
	3. Somewhat Disagree	29	6	2	1
	%	13.18	17.14	7.14	9.09
	2. Disagree	39	6	9	5
	%	17.73	17.14	32.14	45.45
	1. Strongly Disagree	59	10	5.00	3
	%	26.82	28.57	17.86	27.27
	AGREE (7.+6.+5.)	39	6	5	0
	%	**17.73**	**17.15**	**17.85**	**0.00**
	DISAGREE (3.+2.+1.)	127	22	16	9
	%	**57.73**	**62.85**	**57.14**	**81.81**

Table 28. Buy games / applications only after hearing from peers — "%" is the % of full sample size

Buy games / applications only after hearing from peers		Trainees	Unit Leadership	Trainers	Simulation Instructors
Sample Size		**220**	**35**	**28**	**11**
I wait until I hear about the new applications or games from my peers before I buy them.	**7. Strongly Agree**	7	1	0	1
	%	3.18	2.86	0.00	9.09
	6. Agree	16	4	1	1
	%	7.27	11.43	3.57	9.09
	5. Somewhat Agree	37	15	7	2
	%	16.82	42.86	25.00	18.18
	4. Neither Agree or Disagree	70	8	10	3
	%	31.82	22.86	35.71	27.27
	3. Somewhat Disagree	21	2	2	0
	%	9.55	5.71	7.14	0.00
	2. Disagree	29	1	3	2
	%	13.18	2.86	10.71	18.18
	1. Strongly Disagree	40	4	5.00	2
	%	18.18	11.43	17.86	18.18
	AGREE (7.+6.+5.)	60	20	8	4
	%	**27.27**	**57.15**	**28.57**	**36.36**
	DISAGREE (3.+2.+1.)	90	7	10	4
	%	**40.91**	**20.00**	**35.71**	**36.36**

Table 29. Always look for information on new games / applications — "%" is the % of full sample size

Always look for information on new games or applications.		Trainees	Unit Leadership	Trainers	Simulation Instructors
Sample Size		220	35	28	11
I always look for information about the latest applications or games.	7. Strongly Agree	11	0	2	3
	%	5.00	0.00	7.14	27.27
	6. Agree	18	1	3	0
	%	8.18	2.86	10.71	0.00
	5. Somewhat Agree	29	4	1	1
	%	13.18	11.43	3.57	9.09
	4. Neither Agree or Disagree	60	10	6	3
	%	27.27	28.57	21.43	27.27
	3. Somewhat Disagree	22	3	4	1
	%	10.00	8.57	14.29	9.09
	2. Disagree	30	9	6	1
	%	13.64	25.71	21.43	9.09
	1. Strongly Disagree	50	8	6.00	2
	%	22.73	22.86	21.43	18.18
	AGREE (7.+6.+5.)	58	5	6	4
	%	**26.36**	**14.29**	**21.42**	**36.36**
	DISAGREE (3.+2.+1.)	102	20	16	4
	%	**46.37**	**57.14**	**57.15**	**36.36**

Table 30. Easily influenced by advertising — "%" is the % of full sample size

Easily influenced by advertising		Trainees	Unit Leadership	Trainers	Simulation Instructors
Sample Size		**220**	**35**	**28**	**11**
I am easily influenced by the advertising information in the media.	**7. Strongly Agree**	0	1	0	0
	%	0.00	2.86	0.00	0.00
	6. Agree	1	0	1	0
	%	0.45	0.00	3.57	0.00
	5. Somewhat Agree	12	1	1	0
	%	5.45	2.86	3.57	0.00
	4. Neither Agree or Disagree	50	8	4	1
	%	22.73	22.86	14.29	9.09
	3. Somewhat Disagree	18	6	3	0
	%	8.18	17.14	10.71	0.00
	2. Disagree	61	8	10	6
	%	27.73	22.86	35.71	54.55
	1. Strongly Disagree	78	11	9.00	4
	%	35.45	31.43	32.14	36.36
	AGREE (7.+6.+5.)	13	2	2	0
	%	**5.90**	**5.72**	**7.14**	**0.00**
	DISAGREE (3.+2.+1.)	157	25	22	10
	%	**71.36**	**71.43**	**78.56**	**90.91**

Table 31. Leadership endorsement on adoption of innovation — "%" is the % of full sample size

Leadership Endorsement on Adoption of Innovation		Trainees	Unit Leadership	Trainers	Simulation Instructors
Sample Size		**220**	**35**	**28**	**11**
In order for any new or existing concept / idea to exist and survive within a unit, it takes full support and endorsement from unit leadership.	**7. Strongly Agree**	48	13	8	4
	%	21.82	37.14	28.57	36.36
	6. Agree	75	14	8	3
	%	34.09	40.00	28.57	27.27
	5. Somewhat Agree	36	5	5	3
	%	16.36	14.29	17.86	27.27
	4. Neither Agree or Disagree	40	0	4	0
	%	18.18	0.00	14.29	0.00
	3. Somewhat Disagree	7	2	2	0
	%	3.18	5.71	7.14	0.00
	2. Disagree	5	1	0	0
	%	2.27	2.86	0.00	0.00
	1. Strongly Disagree	9	0	1	1
	%	4.09	0.00	3.57	9.09
	AGREE (7.+6.+5.)	159	32	21	10
	%	**72.27**	**91.43**	**75.00**	**90.90**
	DISAGREE (3.+2.+1.)	21	3	3	1
	%	**9.54**	**8.57**	**10.71**	**9.09**

Table 32. Knowledge of base training facilities / simulations and usage — "Trainees"; "#" is the number of self-declared users, "%" is the % of full sample size

Knowledge of Base Training Facilities (w/ simulations) and Usage "TRAINEES"		**BSC**	**MISTC**	**Building 1707 (ISMT OR DVTE)**	**Camp Wilson**	**TTECG**	**SAVT**	**ISMT**	**DVTE**
Sample Size: 220									
Have heard of or visited	**#**	24	15	112	108	33	41	150	18
	%	10.91	6.82	50.91	49.09	15.00	18.64	68.18	8.18
Used more than 9 times	**#**	1	0	24	5	1	9	9	4
	%	0.45	0.00	10.91	2.27	0.45	4.09	4.09	1.82
Used 7-9 times	**#**	1	1	5	4	0	2	6	3
	%	0.45	0.45	2.27	1.82	0.00	0.91	2.73	1.36
Used 4-6 times	**#**	3	0	19	11	1	6	12	2
	%	1.36	0.00	8.64	5.00	0.45	2.73	5.45	0.91
Used 1-3 times	**#**	12	9	53	60	19	19	81	13
	%	5.45	4.09	24.09	27.27	8.64	8.64	36.82	5.91
Used at least once	**#**	17	10	101	80	21	36	108	22
	%	7.73	4.55	45.91	36.36	9.55	16.36	49.09	10.00
Have NEVER used, but have been inside or received a tour	**#**	6	3	6	9	8	3	8	5
	%	2.73	1.36	2.73	4.09	3.64	1.36	3.64	2.27
Have	**#**	197	207	113	131	191	181	104	193

NEVER used	%	89.55	94.09	51.36	59.55	86.82	82.27	47.27	87.73

Table 33. Knowledge of base training facilities / simulations and usage — Unit Leadership; "#" is the number of self-declared users, "%" is the % of full sample size

Knowledge of Base Training Facilities (w/ simulations) and Usage "UNIT LEADERSHIP"		BSC	MISTC	Building 1707 (ISMT OR DVTE)	Camp Wilson	TTECG	SAVT	ISMT	DVTE
Sample Size: 35									
Have heard of or visited	#	15	19	26	21	21	24	28	9
	%	42.86	54.29	74.29	60.00	60.00	68.57	80.00	25.71
Used more than 9 times	#	0	1	5	0	3	0	1	0
	%	0.00	2.86	14.29	0.00	8.57	0.00	2.86	0.00
Used 7-9 times	#	0	0	0	3	1	2	0	0
	%	0.00	0.00	0.00	8.57	2.86	5.71	0.00	0.00
Used 4-6 times	#	2	1	1	0	3	3	2	1
	%	5.71	2.86	2.86	0.00	8.57	8.57	5.71	2.86
Used 1-3 times	#	4	8	8	13	6	9	10	1
	%	11.43	22.86	22.86	37.14	17.14	25.71	28.57	2.86
Used at least once	#	6	10	14	16	13	14	13	2
	%	17.14	28.57	40.00	45.71	37.14	40.00	37.14	5.71
Have NEVER used, but have been inside or	#	3	1	6	2	5	5	6	2
	%	8.57	2.86	17.14	5.71	14.29	14.29	17.14	5.71

receive d a tour									
Have NEVER used	**#**	26	24	15	17	17	16	16	31
	%	**74.29**	**68.57**	**42.86**	**48.57**	**48.57**	**45.71**	**45.71**	**88.57**

Table 34. Attitude toward simulations as being as effective as traditional tools — "%" is the % of full sample size

Attitude toward Computer-Supported Training Simulations		**Trainees**	**Unit Leadership**
Sample Size		**220**	**35**
Computer-supported simulation training tools are in their own way as effective as traditional tools.	**7. Strongly Agree**	15	4
	%	6.82	11.43
	6. Agree	31	8
	%	14.09	22.86
	5. Somewhat Agree	44	11
	%	20.00	31.43
	4. Neither Agree or Disagree	78	9
	%	35.45	25.71
	3. Somewhat Disagree	14	1
	%	6.36	2.86
	2. Disagree	13	2
	%	5.91	5.71
	1. Strongly Disagree	25	0
	%	**11.36**	**0.00**
	AGREE (7.+6.+5.)	90	23
	%	**40.91**	**65.72**
	DISAGREE (3.+2.+1.)	52	3
	%	**23.63**	**8.57**

Table 35. Attitude toward simulations as being a waste of time and money — "%" is the % of full sample size

Attitude toward simulations as being cost effective		**Trainees**	**Unit Leadership**
Sample Size		**220**	**35**
I strongly feel that computer-supported training simulations are a complete waste of time and money.	**7. Strongly Agree**	7	0
	%	3.18	0.00
	6. Agree	6	0
	%	2.73	0.00
	5. Somewhat Agree	18	0
	%	8.18	0.00
	4. Neither Agree or Disagree	75	10
	%	34.09	28.57
	3. Somewhat Disagree	28	4
	%	12.73	11.43
	2. Disagree	45	14
	%	20.45	40.00
	1. Strongly Disagree	41	7
	%	18.64	20.00
	AGREE (7.+6.+5.)	31	0
	%	**14.09**	**0.00**
	DISAGREE (3.+2.+1.)	114	25
	%	**51.82**	**71.43**

Table 36. Attitude toward live training as the only effective tool — "%" is the % of full sample size

Attitude toward live training as the only effective tool		Trainees	Unit Leadership
Sample Size		**220**	**35**
Live training is the only real way to effectively train my Marines.	**7. Strongly Agree**	19	3
	%	8.64	8.57
	6. Agree	29	1
	%	13.18	2.86
	5. Somewhat Agree	34	4
	%	15.45	11.43
	4. Neither Agree or Disagree	82	6
	%	37.27	17.14
	3. Somewhat Disagree	16	4
	%	7.27	11.43
	2. Disagree	16	15
	%	7.27	42.86
	1. Strongly Disagree	24	2
	%	10.91	5.71
	AGREE (7.+6.+5.)	82	8
	%	**37.27**	**22.86**
	DISAGREE (3.+2.+1.)	56	21
	%	**25.45**	**60.00**

Table 37. Attitude toward the success of using simulations for training purposes — "%" is the % of full sample size

Success in using simulations for training.		Trainees	Unit Leadership
Sample Size		**220**	**35**
My unit has had a great deal of success in using computer-supported training simulations for our training purposes.	**7. Strongly Agree**	12	6
	%	5.45	17.14
	6. Agree	19	8
	%	8.64	22.86
	5. Somewhat Agree	37	7
	%	16.82	20.00
	4. Neither Agree or Disagree	119	12
	%	54.09	34.29
	3. Somewhat Disagree	5	1
	%	2.27	2.86
	2. Disagree	8	1
	%	3.64	2.86
	1. Strongly Disagree	20	0
	%	9.09	0.00
	AGREE (7.+6.+5.)	68	21
	%	**30.91**	**60.00**
	DISAGREE (3.+2.+1.)	33	2
	%	**15.00**	**5.72**

Table 38. The amount of time using simulations for training is appropriate — "%" is the % of full sample size

The amount of time simulations are used is appropriate.		Trainees	Unit Leadership
Sample Size		**220**	**35**
The amount of time our unit currently uses training simulations is appropriate.	**7. Strongly Agree**	5	0
	%	2.27	0.00
	6. Agree	16	7
	%	7.27	20.00
	5. Somewhat Agree	32	10
	%	14.55	28.57
	4. Neither Agree or Disagree	116	14
	%	52.73	40.00
	3. Somewhat Disagree	23	1
	%	10.45	2.86
	2. Disagree	9	2
	%	4.09	5.71
	1. Strongly Disagree	19	1
	%	8.64	2.86
	AGREE (7.+6.+5.)	53	17
	%	**24.09**	**48.57**
	DISAGREE (3.+2.+1.)	51	4
	%	**23.18**	**11.43**

Table 39. Attitude towards more investing in simulations — "#" is the number of self-declared users, "%" is the % of full sample size

Attitudes towards more investing in simulations		Trainees	Unit Leadership
Sample Size		**220**	**35**
I would personally like to see MORE time invested in using simulations in our training.	**7. Strongly Agree**	17	1
	%	7.73	2.86
	6. Agree	27	5
	%	12.27	14.29
	5. Somewhat Agree	39	11
	%	17.73	31.43
	4. Neither Agree or Disagree	103	14
	%	46.82	40.00
	3. Somewhat Disagree	10	3
	%	4.55	8.57
	2. Disagree	7	1
	%	3.18	2.86
	1. Strongly Disagree	17	0
	%	7.73	0.00
	AGREE (7.+6.+5.)	83	17
	%	**37.73**	**48.58**
	DISAGREE (3.+2.+1.)	34	4
	%	**15.46**	**11.43**

Table 40. User endorsement of simulations — "%" is the % of full sample size

User endorsement of simulations.		Trainees	Unit Leadership
Sample Size		**220**	**35**
I actively endorse the use of simulations in our training practices.	**7. Strongly Agree**	14	6
	%	6.36	17.14
	6. Agree	34	13
	%	15.45	37.14
	5. Somewhat Agree	36	9
	%	16.36	25.71
	4. Neither Agree or Disagree	108	5
	%	49.09	14.29
	3. Somewhat Disagree	7	1
	%	3.18	2.86
	2. Disagree	7	1
	%	3.18	2.86
	1. Strongly Disagree	14	0
	%	6.36	0.00
	AGREE (7.+6.+5.)	84	28
	%	**38.17**	**79.99**
	DISAGREE (3.+2.+1.)	28	2
	%	**12.72**	**5.72**

Table 41. Attitude toward unit completely supporting the use of simulations — "%" is the % of full sample size is the % of full sample size

Attitude toward unit completely supporting the use of simulations		**Trainees**	**Unit Leadership**
Sample Size		**220**	**35**
You feel strongly that your current unit is completely supportive of the idea of computer-supported training simulations.	**7. Strongly Agree**	11	0
	%	5.00	0.00
	6. Agree	25	2
	%	11.36	5.71
	5. Somewhat Agree	38	0
	%	17.27	0.00
	4. Neither Agree or Disagree	123	5
	%	55.91	14.29
	3. Somewhat Disagree	9	3
	%	4.09	8.57
	2. Disagree	3	12
	%	1.36	34.29
	1. Strongly Disagree	11	13
	%	5.00	37.14
	AGREE (7.+6.+5.)	74	2
	%	**30.63**	**5.71**
	DISAGREE (3.+2.+1.)	23	28
	%	**10.45**	**80.00**

Table 42. Unit attitude and effort towards conducting training with simulations versus traditional training — "%" is the % of full sample size

Attitude and effort towards completing simulation versus live exercises.		**Trainees**	**Unit Leadership**
Sample Size		**220**	**35**
When conducting an exercise with training simulation, my unit's attitude and overall level of effort towards completing the mission are no different that when we conduct traditional training exercises like on a training range.	**7. Strongly Agree**	10	2
	%	4.55	5.71
	6. Agree	23	8
	%	10.45	22.86
	5. Somewhat Agree	22	6
	%	10.00	17.14
	4. Neither Agree or Disagree	130	9
	%	59.09	25.71
	3. Somewhat Disagree	15	7
	%	6.82	20.00
	2. Disagree	7	2
	%	3.18	5.71
	1. Strongly Disagree	13	1
	%	5.91	2.86
	AGREE (7.+6.+5.)	55	16
	%	**25.00**	**45.71**
	DISAGREE (3.+2.+1.)	35	10
	%	**15.91**	**28.57**

Table 43. Unit attitude on planning and executing tasks with simulations versus traditional training — "%" is the % of full sample size

Planning and executing simulation versus live exercises.		**Trainees**	**Unit Leadership**
Sample Size		**220**	**35**
When conducting an exercise with training simulations, my unit plans and executes all tasks in the same manner that we would as if we were conducting a traditional exercise like on a training range (i.e. we prepare planning documents, do rehearsals, use the same TTPs, conduct AARs, etc.)	**7. Strongly Agree**	10	4
	%	4.55	11.43
	6. Agree	27	6
	%	12.27	17.14
	5. Somewhat Agree	25	2
	%	11.36	5.71
	4. Neither Agree or Disagree	126	12
	%	57.27	34.29
	3. Somewhat Disagree	11	5
	%	5.00	14.29
	2. Disagree	9	6
	%	4.09	17.14
	1. Strongly Disagree	12	0
	%	5.45	0.00
	AGREE (7.+6.+5.)	62	12
	%	**28.18**	**34.28**
	DISAGREE (3.+2.+1.)	32	11
	%	**14.54**	**31.43**

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