MarineNet User Engagement Exercise

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ABSTRACT

The Marine Corps Distance Learning Network (MarineNet) is the United States Marine Corps' enterprise level Learning Management System. MarineNet is employed to increase operational readiness by improving training quality and accessibility for individual Marines. The Marine Corps University's (MCU) College of Distance Education and Training (CDET) is the entity responsible for managing MarineNet. Like many technology heavy organizations, CDET has encountered several challenges in adapting and aligning organizational practices with emerging technologies and evolving user needs**.** This paper details CDET's efforts to mitigate these challenges through the conduct of the MarineNet User Engagement Exercise (MUE2).

The MUE2 was executed as an instructor led discussion and survey. Participants were drawn from the I, II, and III Marine Expeditionary Forces, Marine Forces Reserve, and MCU's Professional Military Education resident schoolhouses. The problem the MUE2 research addressed focused on the development of a procedural method to tap into the range and depth of knowledge available within the MarineNet end user community. Based on the principles of human-centered design, the MUE2 is a requirements elicitation project that directly engaged the MarineNet end user community as an exploitable systems design asset. The objective of the MUE2 was to give voice to the MarineNet end user population and to provide CDET with a contextually based understanding of the concerns held by the end user community. The purpose of the MUE2 was to provide CDET with a data-driven decision support methodology on which the architecture changes designed to improve MarineNet's capabilities could be validated and appropriately prioritized.

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INTRODUCTION

Marine Corps University's (MCU) College of Distance Education and Training (CDET) is the entity responsible for managing the Marine Corps Distance Learning Network (MarineNet), the United States Marine Corps' (USMC) enterprise level Learning Management System (LMS). From July through December 2014, CDET conducted the MarineNet User Engagement Exercise (MUE2). The MUE2 was a series of requirements elicitation exercises that directly engaged junior enlisted Marines, Non Commissioned Officers, and Company Grade Officers from the Fleet Marine Forces (FMF) and Marine Forces Reserve (MFR). The objective of the MUE2 engagements was to give voice to the MarineNet end user population and to provide CDET with a contextually based understanding of the concerns held by the end user community. The purpose of the MUE2 was to provide CDET with a data-driven decision support methodology on which the architecture changes designed to improve LMS capabilities could be validated and appropriately prioritized.

THE MARINE CORPS DISTANCE LEARNING NETWORK

The USMC invests a considerable amount of time, energy, and effort, in the training and education of its human resources. Due to its expeditionary nature, the Marine Corps has long sought to extend learning beyond the boundaries of the traditional classroom. From its humble beginnings in the1920s with the inception of Marine Corps Institutes' vocational correspondence courses, the USMC has explored and exploited the value of distance learning. In 1997, the USMC created a technology enabled distance-learning infrastructure. The face of this infrastructure, MarineNet, was designed and implemented to increase operational readiness by improving training quality and accessibility for individual Marines (CDET, 2014a). MarineNet is an established Acquisition Category III (ACAT III) program. MarineNet services over 325,000 unique annual users (TECOM, 2014). As of the 3rd Quarter Fiscal Year (FY) 2015, over 2,250 courses are hosted on MarineNet. In FY14 alone, MarineNet serviced over 5.62 million course enrollments and 3.99 million course completions (Smith, 2015)

Figure 1. MarineNet User Base (From TECOM, 2014)

CDET is the organization tasked with the development, hosting, and management of distance learning courseware (CDET, 2014b). CDET supports Professional Military Education, Military Occupational Specialty (MOS) skill progression training, pre-deployment training, and cross-functional training applicable to all Marines (CDET, 2014b). CDET employs MarineNet to reach Marines with focused training and education programs and is the USMC's enterprise level medium responsible for facilitating technology enabled distance education and training (CDET, 2014b).

Regular architecture reviews regarding MarineNet are conducted to ensure that the system as a whole continues to meet the demands of the user community as it prepares for the integration of emerging technologies. The most recent critical design review (CDR), the *MarineNet Architecture Design* detailed the architecture decisions designed to provide the foundation for future technical releases and support the next generation of MarineNet (NAVAIR, 2013). The new architecture promises a wide array of possibilities, but transforming that possibility into specific desired capabilities cannot happen all at once; initiatives must be prioritized based on several competing factors. The group charged with elaborating and defining functional capabilities and establishing the prioritization of initiatives is the Configuration Control Board (CCB) (NAVAIR, 2013).

The stakeholder group most seriously affected by the CCBs deliberations is also the group most seriously underrepresented: the MarineNet end user community. This underrepresentation risks the misalignment of existing CDET services and end user satisfaction. In order to ensure the Marines of the end user community have a representative voice in the decision-making process and to provide the CCB with the data necessary to make more informed decisions in shaping the next generation of MarineNet, the CDET Director ordered the execution of the MUE2.

CAPABILITY GAP ANALYSIS

Like many technology heavy public sector organizations, CDET has encountered several challenges in adapting organizational practices with emerging technologies and evolving user needs. MarineNet exists as a system of systems that integrates numerous activities and processes. The complexity of the interdependent components requires a high degree of coordination to maintain the existing capabilities. Introducing new capabilities to MarineNet demands an equally high level of coordination to ensure improvements are integrated without negatively affecting existing components or component relationships. Taking advantage of the emerging technologies available to support distance education and training must be balanced within the constraint of maintaining the existing MarineNet system capabilities. This overarching design constraint requires a distinct focus on internal processes and procedures to support well-informed configuration management decisions. This internal focus has led to a target fixation on internal operations that exclude external considerations. Configuration management decisions based solely on internal evaluations marginalize the needs of the end user stakeholder. Organizational experts are required to shape system changes, but the tradeoff decisions in the improvement design must be heavily influenced by their impact on those directly affected by the system; the Marine Student. An analysis of the current business practices revealed that there is *no procedural method to involve the end-user community in the configuration management decision process*.

RESEARCH DESIGN AND EXECUTION

The lack of end-user stakeholder involvement is a primary causal factor in the misalignment of CDET's provided services and customer satisfaction. *The problem is that there is no procedural method to tap into the range and depth of knowledge available within the MarineNet end user community*. The lack of a persistent and actionable user feedback mechanism incurs an unacceptable lost opportunity cost through a failure to exploit available assets. This inability to consistently identify, understand, and mitigate the needs of the Marine user base degrades mission effectiveness.

The *objective* of the MUE2 was to provide CDET with a contextually based understanding of the concerns held by the end user community. The *purpose* of the MUE2 was to provide a data driven decision support methodology on which the architecture changes outlined in the CDR and designed to improve LMS capabilities could be appropriately prioritized. The *methodology* used to shape the MUE2 research was based on the principles of human

centered design. The *scope* of the MUE2 was bounded by intentionally targeting end user participants identified as millennial generation Marines. Based on the hierarchical structure of the USMC, soliciting Marine participants from the grades of E1 – E5 and O1 – O3 offered an organizationally expedient means to capture this demographic.

The justification for limiting participation to millennial generation Marines was three-fold. Fully 62% of the USMC is twenty-five years old or younger (HQMC MF, 2013). This demographic represents the *most common and intimate end user of the MarineNet system*. The term "digital-native" has been used to describe the millennial generation and its ability to naturally understand the digital language of computers, video games, and the Internet (Prensky, 2001). This *digital fluency and recent experience* provides a wealth of tacit knowledge surrounding the current systems' strengths and deficiencies. Although the MarineNet system has undergone several iterative improvements since its inception, persistent issues with reliability, accessibility, and compatibility have irrevocably marred MarineNet's reputation. MarineNet has undergone significant rework and has had substantial upgrades, but to a certain extent, the reputational damage is irrecoverable. When a new piece of technology fails to deliver on its promises of performance, it is human nature to ascribe that poor reputation and subsequent negative connotations onto each subsequent version of that product. Sociologist Dr. Everett Rogers (1995) coined the phrase "failed diffusion" to help explain the phenomena. When a new technology is introduced to a community, even if the utility of the technology can deliver positive results, the cultural belief system will rail against the adoption of a system that carries a stained reputation. Even the improvements to MarineNet have been met with this proto-typical response to failed technology. Fleet operators expect MarineNet to fail so it is marginalized on the operator level. For the purposes of participant selection, the phenomenon of *failed diffusion* has poisoned the proverbial well of more senior MarineNet end users. The selection of junior Enlisted and Officers for the MUE2 participation served to mitigate the apathetic confirmation bias so prevalent in more senior and seasoned USMC MarineNet users.

While the members of the USMC share a common ethos, factors such as component, combat element, and geographic location foster very different interaction experiences with the MarineNet system. For example, compare two active duty Corporals, one an Administrative Clerk aboard Marine Corps Base Quantico and the other, a Mortarman stationed at Camp Hansen, Okinawa. The former works primarily in an office environment, has a dedicated government computer asset, and shares the same duty working hours with the MarineNet HelpDesk. The latter works primarily in a field environment, has a $1/30^{th}$ share of a government computer asset, and is 14 time zones ahead of the HelpDesk service hours. These hypothetical Corporals' circumstances set the stage for dramatically different interactions with MarineNet before they ever log into the actual system.

The hypothetical Corporals represent typical MarineNet users, even though there is nothing typical about or between their individual interactions with the system. Since even cursory differences and simple restrictions establish fundamental differences in the end users' baseline interactions, it was necessary to account for these factors. In order to capture a representative sample of the total end user community, the MUE2 accounted for organizational nuance and geographic dispersal by soliciting Marine participants equitably distributed across the Air Combat Element (ACE), Ground Combat Element (GCE), Logistics Combat Element (LCE), and Headquarters element of the I, II and III Marine Expeditionary Forces (MEF), MFR, and the MCU's PME Schoolhouses. This approach provided a participant population representative of the total active and reserve force.

The foundation of the MUE2 research followed a design thinking methodology based on the principles of Human-Centered-Design (HCD; IDEO, 2013). The design-based methodology provided an elegant process to generate and capture innovative ideas from the diverse stakeholder populations (dSchool, 2013a). These ideas, alone, provide little more than a collection of wish-list perspectives from the various participants. The advantage of this methodology resides in its ability to create the context for those perspectives between the stakeholders. The overarching intent of the endeavor was to provide a shared mental model where stakeholders enjoy a contextually based understanding of the problems and then use that understanding to shape solutions.

The principles of HCD served as the method by which the MUE2 explored the alignment of CDET provided services and customer satisfaction**.** The MUE2 was a partnered effort between CDET, MFR, and the Naval Post Graduate School (NPS). The data the MUE2 engagements gathered is being analyzed by these partnered organizations in several concurrent and mutually supporting research studies. In order to ensure the needs of each research effort were met, a team comprised of representatives from CDET, MFR, and NPS composed the structure and conduct of the MUE2 engagements. This team also worked with guidance and assistance from the USMC's Operational Analysis Division (OAD) to develop a written survey. The combined efforts of these partnered

organizations developed the MUE2 engagements that followed a relatively prescriptive format of: scheduled encounter, verbal survey, annotated survey, data analysis, and intercept encounter.

The MUE2 was executed as an instructor led discussion followed by a paper-based survey. The discussion served as a verbal survey. The structure of the discussion was designed to build rapport with the participant group, solicit initial feedback, and facilitate data collection. The MUE2 Staff would conduct an introductory brief regarding the missions of CDET and the current capabilities of MarineNet. This was followed by an open forum discussion of the participants' individual experiences, concerns, suggestions, and recommendations for what they wanted and expected for the future of their MarineNet system.

The Verbal Survey was intended to provide the MUE2 Staff with a contextual basis to understand the participants' concerns as well as to stimulate the participants' memory of their experiences interacting with the MarineNet system. Following the Verbal Survey, the participant group was provided with the MUE2 Written Survey. This survey was limited to seven overall questions and broken down into three general categories: demographics, opinions on eLearning, and personal experiences with MarineNet. The opinion questions served to assess the participant groups' views on the value of eLearning to the USMC and whether or not MarineNet, as the USMC's enterprise level vehicle for eLearning, was meeting their established expectations. The MarineNet experience questions provided the participants a means to express their existing issues with the MarineNet system and to provide suggestions for future desired functionality, capability, and features.

The results of the verbal and annotated surveys produced an enormous amount of raw data for analysis. In order to ensure that the MUE2 had collected, analyzed, and interpreted, the raw data correctly, the MUE2 staff conducted individual interviews with randomly selected members of the participant groups. The intent of these intercept encounters were to test and validate established operational definitions and ensure contextual agreement of the discussed problem and solution sets. The purpose of these encounters was to provide clarity to participant responses and to mitigate potential miscommunications or translation errors between the participants and the MUE2 Staff. In addition to providing a high degree of definitional granularity, these encounters provided a mechanism to further crowd source solution sets to the problems identified during the Verbal and Annotated Surveys.

RESULTS

The MUE2 consisted of 62 individual engagements with a total of 1,550 active duty and reserve Marines from 191 different MOS. These Marines were drawn from the ACE, GCE, LCE, and Headquarters element, of the I, II and III MEF, MFR, and MCU's PME School Houses. The MUE2 engagements were conducted aboard Marine Corps Base (MCB) Quantico and Camp Upshur in Virginia, Marine Corps Air Station (MCAS) Cherry Point and Camp Lejeune in North Carolina, Marine Corps Air Ground Combat Center Twenty Nine Palms and Camp Pendleton in California, MCB Kaneohe Bay in Hawaii, and Camp Foster, Camp Schwab, and Camp Kinser, in Okinawa Japan.

The MUE2 participants included 969 members of the active duty component and 581 members of the reserve component. Of these, 391 were Officers and 1,157 were Enlisted members. The average age of the Officer respondents was 31 and the average age of the Enlisted was 25. Officers cited an average of ten instances of concern per submitted survey and Enlisted members cited an average of five instances of concern per survey. The data collected and information derived from the MUE2 revealed some surprising results, brought clarity to several long-held organizational assumptions, and provided strong insight into how CDET may align its provided services with customer desires.

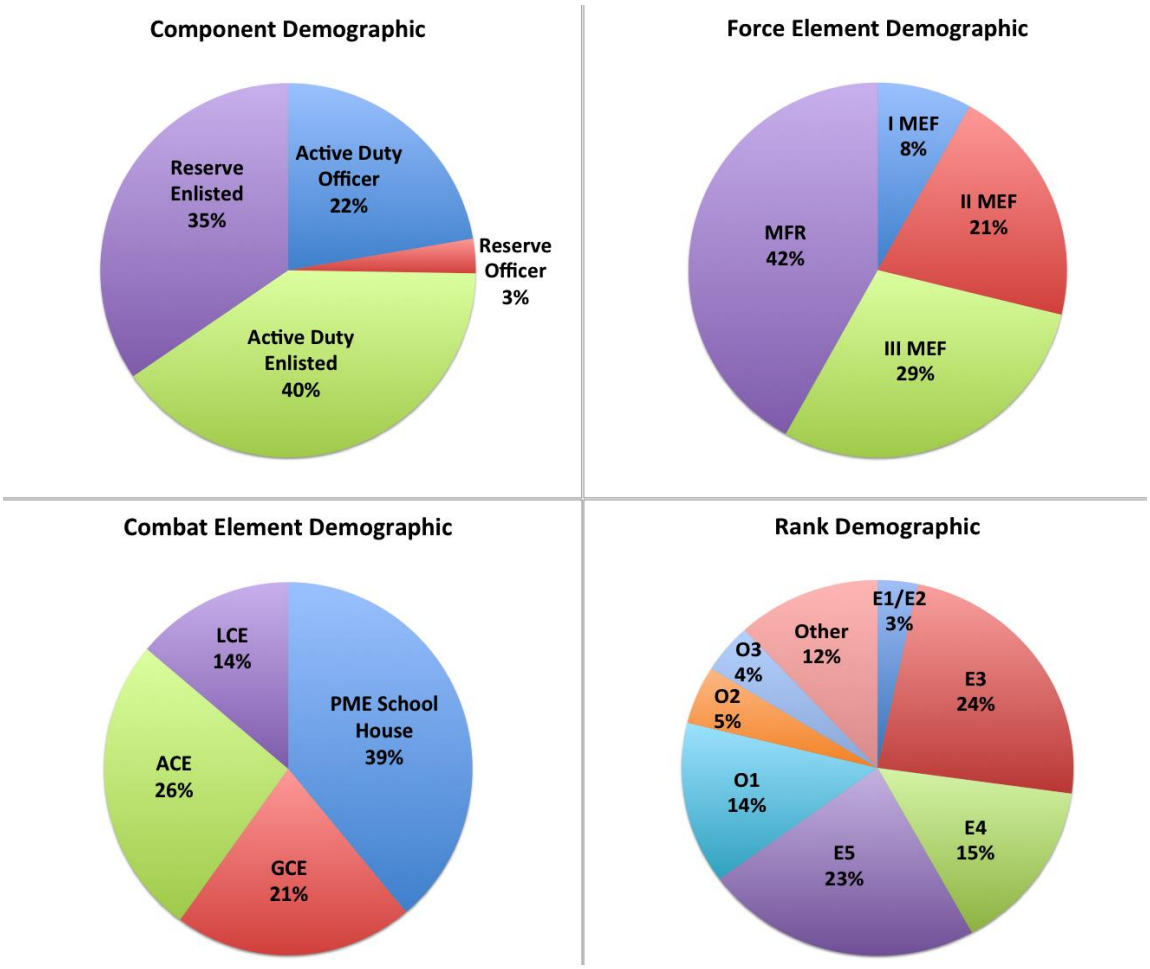

Figure 2. Survey Demographic Information

The engagements produced 6,518 instances of concern. The collected data has been compiled into a study specific MUE2 Database. The data has been catalogued into nine major Categories, thirty-three Topics, and twenty-five SubTopics. The cataloguing methodology and operational definitions of the categories, topics, and subtopics were published in the MUE2 Database Training Guide (DTG).

Over 95% of Marines surveyed believe that technology enabled distance education and training is a USMC force multiplier. Contrarily, only 22% of those surveyed believe that MarineNet, the USMC's primary vehicle for technology enabled distance education and training, is meeting their expectations. A pattern analysis of the Marines' survey responses revealed nine primary areas of concern: Content, Unrealized Capability, Accessibility, Reliability, Policy, User Interface Design, Incentives, General Comments, and Customer Support.

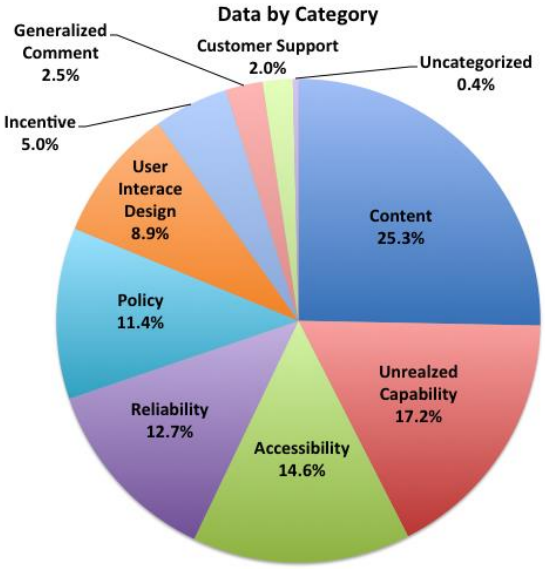

Figure 3. Breakdown of Concerns by Category

The Marines' primary stated concerns were with the courseware content offered on MarineNet. Their issues revolved around the current content, its relevancy, effectiveness, and delivery styles, but their responses also demonstrated a strong desire for new and diverse types of content beyond the interactive multi-media instructional (IMI) courseware. The majority of Marine respondents discussed the unrealized capability of the MarineNet system. The Marines presented arguments for improving MarineNet capability by presenting several suggestions on how to improve their eLearning experience. The most common suggestions were mobile friendly responsive design, a more intuitive presentation layer, a socially interactive experience, and a means to produce and publish user-generated content.

Additional recurring themes surrounded the challenges users experienced with accessing the LMS and the incompatibility of the system with the more common web browsers and operating systems. Issues surrounding system reliability and incessant failures with both the courseware and the system itself were common themes, as were several of the policies the Marines' felt unnecessarily limited their eLearning experience. Marines are highly critical of their inability to enroll in next level PME and vehemently denounced the oft-circumvented restrictions imposed by the existent proctoring model. The antediluvian design of user-interface and the lack of any true incentive beyond directed compliance to interact with the system were common themes, as was the lack of full time customer service support agency.

IMPLICATIONS

The USMC operates several information systems that directly affect individual Marines. MarineNet is arguably the only USMC information system with which every Marine connects to and interacts with on a regular basis. MUE2 participants provided thousands of examples of what was wrong with the MarineNet LMS. This was not unexpected when one considers the centuries old adage that a griping Marine is a happy Marine. But the participants also provided thousands of suggestions of what could be done to improve the LMS and improve the Marines' eLearning experience.

The data revealed that there is a utility gap between the current instance of MarineNet and the end-users' desired future state of MarineNet as a performance support tool. The MUE2 participants' most common call to support quality education and training was for the end user to reach beyond the limitations of the one-dimensional interactions that currently exist and to directly engage MarineNet content in more participative and collaborative interactions. Essentially, these calls were for the inclusion of Web 2.0 functionality such as leveraging user profiles,

social/professional collaborative forums based on rank, role, and position, searchable and sortable video based content, a vehicle for users to generate content, a means to rate and comment on new and existing content, and a mechanism for user-based troubleshooting. The effective need is that MarineNet must realign its services to provide value added training that is current, relevant, performance supporting, and on par with common commercially available information systems.

Many of these elements had been introduced in CDET's 2013 rendition of the *MarineNet 2018 Vision* (Smith, 2013). This *Vision* broadly defined a strategic intent to evolve MarineNet into a next generation web service that "hosts, manages and delivers effective, intuitive, adaptive, responsive and relevant electronic distance learning resources available anywhere, anytime to the USMC Total Force, civilian workforce and family members" (Smith, 2013).

Where the *Vision* (Smith, 2013) conceptualizes the next generation of MarineNet, the most recent CDR, the *MarineNet Architecture Design* (NAVAIR, 2013) details the architecture decisions necessary to support that *Vision*. The strategic vision and the new architecture design promise a wide array of possibilities, but transforming that possibility into specific desired capability is confronted by two major obstacles: each of these new improvement initiatives must be explicitly defined and instantiating these initiatives cannot happen all at once; they must be prioritized based on several competing factors. The MUE2 served as the mechanism to breach these obstacles.

By reaching out directly to the end user community through instructor led discussions rooted in the principles of HCD, participants were given a voice in the configuration management process. The MUE2 served as more than a simple user-jury deliberating the current MarineNet instance. Participants were given an active role in designing the future state of their eLearning system. For all intents and purposes, the MUE2 facilitated 6,518 robust requests-for-information (RFI) from the warfighting community for action by CDET. By capturing these elaborate RFIs, the MUE2 data provides CDET with the traceable elements required to explicitly define desired capability as tangible system requirements. Prioritization of these requirements is also facilitated by the MUE2. By eliciting requirements from the end user and analyzing that data to determine warfighter priorities, the MUE2 serves as a decision support tool to appropriately sequence, schedule, and program the functional initiatives that will instantiate the Next Generation of MarineNet.

CONCLUSIONS

The MUE2 established a contextual relationship between CDET and the user community that identified and defined system shortfalls and crowd sourced desired capabilities meted by eLearning expectations. The data derived from the MUE2 has helped drive the CCB's deliberations and helped shape the authoring of future systems' requirements. The MUE2 data has served to open the aperture of the internally focused system improvement process by directly involving the end user stakeholder as a system design asset in the configuration management decision process. The MUE2 has provided CDET with a data driven decision support methodology capable of validating improvement initiatives and rationalizing the sequencing of those initiatives to develop a robust integration plan that will instantiate the Next Generation of MarineNet.

While the substantive elements to redesign the features and functionality of MarineNet exist, the Next Generation of MarineNet still resides at a relatively high level of abstraction. CDET's strategic *Vision* has established an ideal future state, the *CDR* has outlined the requisite architecture decisions, and the *MUE2* has provided the coordinating elements necessary to design and implement the Next Generation of MarineNet. CDET has taken the next logical development step, which is to leverage and align these mutually supporting efforts into a detailed and actionable requirements construct. This requirements document defines the technical, business process, and policy standards necessary to support the adoption and integration of Web 2.0 technology into the current MarineNet suite of systems. The beta version of the Next Generation of MarineNet will introduce a mobile delivery platform, a profile based content feed, peer-to-peer communication capability, a user generated content suite, and a video streaming service. The phased launch of this beta begins in Q2 of FY16.

The initial MUE2 proved to be a successful requirements elicitation exercise. Phase 1 of the project solicited input from the ultimate end user, the individual Marine. The capabilities of the Next Generation of MarineNet must support the efforts of the multiple elements and agencies within the USMC's training and education infrastructure.

In order to accommodate this next higher echelon of the end user community, Phase 2 of the project will focus on the USMC's Resident Schoolhouses and Formal Learning Centers. Phase 3 of the project will focus on the training and education needs of the Major Subordinate Commands.

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