

ATTACHMENT A

Statements of Work for Educational Gaming

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Appendix 1

Performance Work
Statement for Charge Nurse
(CN) and
Medical Surgical Nurse
(MSN)
Games
VHA SimLEARN

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1. EXECUTIVE SUMMARY

A formal instructional system needs assessment and gap analysis has identified a Charge Nurse and Medical Surgical Nurse training requirements. The Veterans Health Administration (VHA) Simulation Learning Education and Research Network (SimLEARN) Educational Gaming section has been determined to be the best modality to satisfy this requirement.

1.1 Charge Nurse

The Charge Nurse game-based learning provides Veterans personalized, proactive, patient-driven healthcare through advancing innovation trials, emerging health technologies, and experimentation. The complete Charge Nurse instructional package is comprised of an educational game with didactic job aids. The whole Charge Nurse Game package integrates within the Veterans Administration (VA) Network software and hardware architecture requirements.

The contractor shall design and develop the Charge Nurse Game using a game engine with embedded tracking technology to log, record, and display learner performance outcome feedback for in-process guidance, after-action reviews and performance scores that integrates into the entire Charge Nurse Game package. The Charge Nurse Game shall include at least eight high fidelity virtual simulation medical scenarios overlaid with front-end challenging game elements.

The Charge Nurse Game is formative in design, embedded tracking technology, data, and feedback guide learner improvements. In addition, the Charge Nurse Game is summative in design, embedded tracking data measures the level of success or proficiency obtained at the end of a virtual simulation scenario activity and game ending. A final Charge Nurse Game summative high stakes minimum score is pass-fail.

1.2 Medical Surgical Nurse

Prior to surgery, patients may spend considerable time preparing for surgery. Preparations often include learning about the procedure, recovery, and any postoperative processes that might occur. Postoperative recovery starts in the Post-Anesthesia Care Unit (PACU) and then moves to the medical-surgical floor of the hospital. The Med-Surg unit is dedicated to meeting the patient's needs thereby minimizing post-operative complications. The post operation recovery period begins after the procedure has been completed.

While in the Medical Surgical Unit (MSU) a patient could experience Postoperative Nausea and Vomiting (PONV), a low blood sugar level, fever, and/or Patient-Controlled Analgesia (PCA). The nurse caring for this patient has to monitor the patient's conditions to ensure their condition does not seriously deteriorate and impede recovery. The Med-Surg game will educate those nurses on typical patient situations that indicate deterioration and where left untreated the patient will require an emergency team response.

2. BACKGROUND/RATIONALE

2.1 Charge Nurse

The Charge Nurse training needs assessment and analysis identified educational and training program gaps. There is a paucity of research and training in the Charge Nurse roles, competencies, performances, and evaluations. In some circumstance the direct care nurse chosen to assume the role of Charge Nurse because of clinical experience has had little opportunity to receive education, training, or role and responsibility clarification. Moreover, the complex Charge Nurse role requires new management, leadership, administrative, educational, and clinical skills to be an effective Charge Nurse (references a-e).

This Charge Nurse (CN) educational game will help develop successful nurse leaders who supervise, evaluate, support, and mentor a nursing staff while maintaining a high level of patient care and act as an educational resource through the acquisition of effective communication, collaboration, team building, systems thinking, decision-making, and creative problem solving skills. As a nurse leader, the Charge Nurse also develops conflict, financial, and human resource management skills.

2.2 Medical Surgical Nurse

The theoretical definition of postoperative recovery is an energy-requiring process of returning to normality and wholeness. It is defined by comparative standards, achieved by regaining control over physical, psychological, social and habitual functions, and results in a return to preoperative level of independence/dependency in activities of daily living and optimum level of psychological well-being (reference a and b).

The most common complication in the medical-surgical floor of a hospital is postoperative nausea and vomiting (PONV), with incidences reported between 10 and 30 percent. A retrospective review involving 18,473 patients found an overall incidence of PACU complications of 23 percent. After PONV, the most common complications were upper airway problems (6.9 percent), hypotension (2.7 percent), dysrhythmias (1.4 percent), hypertension (1.1 percent), altered mental status (0.6 percent), and suspected or major cardiac events (0.6 percent) (reference a).

3. PURPOSE

The virtual game space is designed to shape the context for specific performance outcomes with dynamic immediate formative assessment feedback and overall summative evaluation feedback. The training requirement content, needs assessment, and gap analysis defines the curriculum objectives, goals, and scope. The target learners for this effort are those healthcare practitioners and associated healthcare specialists responsible for care of the nation's Veterans.

3.1 Charge Nurse

The purpose of this training is to help participants develop effective communication, collaboration, team building, systems thinking, decision-making, creative problem solving, supervision, evaluation, support, and mentor skills, along with conflict, financial, and human resource management skills.

This game will provide an effective and efficient instructional strategy to train staff personnel in the Charge Nurse's roles and responsibilities. The game design and development process provides an opportunity to construct learning environments for practical experience in a range of Charge Nurse Scenarios.

3.2 Medical Surgical Nurse

In the Med-Surg unit, the nurse is required to assess the patient needs and vital signs. A patient may need to wear certain devices to automatically monitor their vital signs. These devices include a blood pressure cuff, oximeter (records pulse), and EKG leads (monitors the heart). The Intravenous Catheter (IV) remains in place to deliver medication and fluids intravenously. A urinary catheter collects urine to help the nurse monitor kidney function and hydration after many surgical procedures. On a regular basis, a nurse assesses the patient's overall condition and takes measures to ensure successful recovery. This helps to minimize post-operative complications. The Med-Surg Game allows target learners to practice identifying a rapidly failing patient and taking action to improve the patient's situation to avoid digression into a situation that necessitates an emergency response team activation or 'code'. A code is a situation where the patient's condition is deteriorating and immediate action has to occur. Normally a team of highly trained professionals respond to the emergency response team.

This game will provide a quick and efficient training methodology to educate staff personnel on Medical Surgical Nurse duties in very specific situations. The game design development process provides an opportunity to construct a learning environment for practical experience in a range of medical surgical nurse scenarios.

4. SCOPE

4.1. **Game Subject:** Charge Nurse and Medical-Surgical Nurse

4.2. **Medical Target Audience:** Registered Nurse (RN), Charge Nurse, Licensed Practical Nurse (LPN) and Advanced Registered Nurse Practitioner (ARNP) at VHA facilities for charge nurse. Certified Medical Surgical Nurse, Registered Respiratory Therapists, Registered Nurse, and Pulmonologist for medial surgical nurse.

4.3. **Learning Objective(s):** Game scenario will be realistic so that the healthcare provider can evaluate a patient's current or future state.

4.3.1. **Charge Nurse:** Upon completion of the Charge Nurse Educational Game in the simulated virtual medical game-based learning scenarios the participant will meet the following Learning Objectives:

- Act as a change agent
- Create an environment of empowerment
- Demonstrate humility
- Describe policies and procedures
- Develop a vision
- Develop flexibility
- Develop self-knowledge
- Develop specialized practice activities
- Develop specialized units
- Discover the sign-posts
- Formulate innovations
- Identify policies and procedures
- Plan quality improvement strategies
- Practice conflict management skills
- Practice Creativity
- Practice critical thinking skills
- Practice customer service skills
- Practice inspiring and leading change
- Practice leadership training skills
- Practice mentoring skills
- Practice relationship building skills
- Practice research development activities.
- Practice risk management skills
- Practice strategic planning
- Practice supervision skills
- Practice systems thinking
- Practice team building skills
- Recognize conflict as opportunity to change
- Show delegation skills
- Show personal mastery
- Support staff through change
- Use communication skills
- Use financial management skills
- Use human resource management skills

- Value chaos and complexity
- 4.3.2. **Medical Surgical Nurse:** Upon completion of the Medical Surgical Nurse Educational Game in the simulated virtual medical game-based learning scenarios the participant will meet the following Learning Objectives:
- Increase the Medical Surgical Nurses' understanding and recognition of indicators of a post-operative patient's deteriorating condition.
 - Increase the Medical Surgical Nurses' assessment knowledge necessary to recognize a rapidly deteriorating patient and avoid the necessity for a major emergency response or code.

5. GAME CONCEPT

The Educational Game shall use game based mechanics, structured play, rules, aesthetics, challenges, and game thinking to immerse learners, motivate action, solve problems and promote learning with formative and summative assessment feedback. The game design will help learners develop and acquire specific predefined professional medical healthcare knowledge, skills, and attitudes. These learning gamification concepts and principles can subsume several different game categories (for example, serious games, educational games, instructional games, or training games). Game authenticity shall include fantasy/abstraction for intrinsic and extrinsic motivation and high fidelity realism to contextualize learnings and increase transfer to the healthcare environments.

5.1 Charge Nurse

The Charge Nurse Educational Game intent is to help develop successful nurse leaders. The Charge Nurse game design combines virtual avatar high fidelity simulations with multi-level game-based learning elements. The instructional cognitive, affective, and psychomotor focus is on the time-based critical clinical decision making related to various Charge Nurse roles and responsibilities.

An effective Charge Nurse needs to be a confident delegator and problem solver. Have change management and transformational leadership skills to influence and manage vision, purpose, and motivation. Good Charge Nurse planning and decision-making require constructive thinking, process management, financial management skills for budgeting, and organizational skills for time, capacity, and priority management. The successful nurse leader needs to acquire a complex of systems thinking and management skills to include communication skills, critical thinking skills, creative problem skills, instructional skills, and supervisory skills.

The Charge Nurse must be able to communicate effectively by giving feedback and use conflict management skills to hold crucial conversations and provide constructive conflict advice, make presentations with impact, know how to speak so people listen. Moreover they use talent management knowledge and skills to identify and recruit talent, select talent, develop and retain talent, and deal with motivation and ability issues through effective discipline. Manage relationships through building and

strengthening relationships, performance management, managing teams, and coaching.

In addition, a service orientation makes the Charge Nurse customer focused and accountable for performance management and setting reasonable expectations to deal with customer service issues. These multifaceted Charge Nurses appreciate the role and opportunity to make a difference. They show the way through setting an example, guiding decision making, advising clinical practice, leading the team, completing puzzles by putting it all together, coordinating care, maintaining collaborative connections, managing the flow through a balanced staff in a fast-paced environment, putting out fires by responding to calls and being an effective and efficient problem solver as the frontline go-to person,

The Charge Nurses in practice do the rounds to monitor for quality while listening to concerns and promoting patient satisfaction to keep patients happy. The Charge Nurse creates a safe environment by prioritizing safety first, being close to the patient bedside and checking back to keep patient safe while vigilantly guarding patient care and maintaining a watchful state to provide for staff safety.

5.2 Medical Surgical Nurse

Medical Surgical Nurse game shall emphasize the use of proper nursing techniques to monitor a patient's condition. In the each scenario of the game the patient's condition takes a turn for the worst and the nurse has to be proactive in their treatment and avoid having to activate an emergency response team. The nurse will have to pick up subtle clues about the patient's deteriorating condition. The game shall contain four scenarios for male and female patients in which the nurse has to monitor the patient's condition and respond accordingly.

6. PERIOD/PLACE OF PERFORMANCE AND TRAVEL

6.1. PERIOD OF PERFORMANCE

6.1.1. The base period of performance shall be one (1) year from date of award with a four (4) year option per the lifecycle of the contract.

6.1.2. Any work at the Government site shall not take place on Federal holidays or weekends unless directed by the Contracting Officer (CO).

6.1.3. There are ten (10) Federal holidays set by law (USC Title 5 Section 6103) that VA follows:

6.1.3.1. Under current definitions, four are set by date:

New Year's Day	January 1
Independence Day	July 4
Veterans Day	November 11
Christmas Day	December 25

6.1.3.2. If any of the above falls on a Saturday, then Friday shall be observed as a holiday. Similarly, if one falls on a Sunday, then Monday shall be observed as a holiday.

6.1.4. The other six are set by a day of the week and month:

Martin Luther King's Birthday	Third Monday in January
Washington's Birthday	Third Monday in February
Memorial Day	Last Monday in May
Labor Day	First Monday in September
Columbus Day	Second Monday in October
Thanksgiving	Fourth Thursday in November

6.2. **PLACE OF PERFORMANCE**

6.2.1. Tasks under this contract shall be primarily performed at Contractor facilities.

6.3. **TRAVEL**

The Government anticipates travel under this effort to perform the tasks associated with the effort, as well as to attend program-related meetings or conferences through the period of performance. The location of these trips shall be Orlando, Florida and/or other VHA medical facilities/program offices dependent upon clinical Subject Matter Expert (SME) location. Reimbursing will be on a cost basis and frequency of travel will depend on the complexity of the game.

All travel must be approved in advance by the COR and recorded in a travel register. Travel and per diem shall be reimbursed in accordance with Federal Travel Regulations. Local travel within a 50-mile radius from the Contractor's facility is considered the cost of doing business and will not be reimbursed. This includes travel, subsistence, and associated labor charges for travel time. Travel performed for personal convenience and daily travel to and from work at the Contractor's facility will not be reimbursed. Travel, subsistence and associated labor charges for travel time for travel beyond a 50-mile radius of the Contractor's facility are authorized on a case-by-case basis and must be preapproved by the COR. The travel cost will be reimbursed at cost. Contractor shall provide receipts for all travel expenses.

6.3.1 Charge Nurse

The contractors shall be expected to travel up to four times, during a 12-month development cycle of the Alpha, Beta, and Gold versions.

6.3.2 Medical Surgical Nurse

The contractors shall be expected to travel up to four times, during a 12-month development cycle of the Alpha, Beta, and Gold versions.

7. SPECIFIC TASKS AND DELIVERABLES

The services contemplated under this contract include front end analysis, design, development, integration, storyboards, test, management, documentation, delivery, implementation and sustainment of gaming capabilities, and all that may be necessary to complete a particular project. There maybe services requirements in only one of these activities or a combination of the activities. All requirements, tasks and deliverables apply to the contractor and all subcontractors awarded under this contract and all task orders.

Maintenance of games, normally games do not require maintenance like equipment. After initial launch a troubleshooting or debugging time period will have to be established. Games in general have a relatively short lifecycle of about 18 months but since our contracts run on a fiscal year the average span of the game would be one year.

The contractor shall perform the following:

7.1. CONTRACT PROJECT MANAGEMENT

7.1.1 PROJECT MANAGEMENT PLAN

The Contractor shall deliver a Project Master Schedule (PMS) that defines the Contractor's approach, timeline and tools to be used in execution of the contract. The PMS should take the form of both a narrative and graphic format that displays the schedule, milestones, risks and resource support. The PMS shall also include how the Contractor shall coordinate and execute planned, routine, and ad hoc data collection reporting requests as identified within the PWS. The initial baseline PMS shall be concurred upon and updated monthly thereafter. The Contractor shall update and maintain the VHA Project Manager (PM) approved PMS throughout the period of performance.

7.1.1.1. Deliverable:

- Project Master Schedule

7.2. REPORTING REQUIREMENTS

- 7.2.1.1. The Contractor shall present the initial baseline Project Master Plan (PMS) for concurrence as part of a contract Kick-Off Meeting. The PMS will include a detailed Gaming Project Plan and Schedule to track the development of game based products identified by the Government and

report monthly to VHA Gaming Project Manager. Meeting minutes from the Kick Off Meeting discussions shall be prepared by the Contractor.

7.2.1.2. The Contractor shall provide the Contracting Officer's Representative (COR) with Monthly Progress Reports in electronic form in Microsoft Word and Project formats. The report shall include detailed instructions/explanations for each required data element, to ensure that data is accurate and consistent. These reports shall reflect data as of the last day of the preceding month.

7.2.1.3. The Monthly Progress Reports shall cover all work completed during the reporting period and work planned for the subsequent reporting period. The report shall also identify any problems that arose and a description of how the problems were resolved. If problems have not been completely resolved, the Contractor shall provide an explanation including their plan and timeframe for resolving the issue. The Contractor shall monitor performance against the PMS and report any deviations. It is expected that the Contractor will keep in communication with VHA SimLEARN accordingly so that issues that arise are transparent to both parties to prevent escalation of outstanding issues.

7.2.1.4. Deliverables:

- Project Master Plan (to include a Gaming Project Plan and Schedule)
- Kick-Off Meeting Minutes
- Monthly Progress Report

7.3. GAMING SOFTWARE

The Contractor shall develop the system software and firmware in accordance with recognized industry gaming standards and internally documented processes. The design shall incorporate features that promote ease of operation, ease of software maintenance, ease of future updates and modifications, data void work around, and also any smart designs that can justify a reduction in the amount of documentation. Computer programs and computer data system shall be fully integrated in accordance with the system specification and Veterans Administration information technology and assurance restrictions. The Contractor shall conduct market surveillance and market investigations, in order to maximize the procurement of commercial and non-developmental software. The Contractor shall maintain a software Controlled Development Environment that complies with the industry standards. The Contractor shall employ well-defined security policy models, structured, disciplined, and rigorous hardware and software development techniques, and sound system/security engineering principles.

7.4. SOFTWARE REQUIREMENTS AND ARCHITECTURE DEVELOPMENT AND REVIEW

The Contractor shall develop software requirements in accordance with the Veterans Administration (VA) information technology network architecture, hardware, and software

requirements. For maximum utility across the VA and Veteran's Health Administration (VHA) Enterprise, the games will be hosted on VA servers accessible via a browser but be portable to use on a mobile platform – tablet or phone. The VHA uses Microsoft Internet Explorer web browser version 11 on OS Windows 7 enterprise 64bit Service Pack 1, DirectX runtime version 11.0, Graphics Card Nvidia 4200M, Driver version 327.62 on a Dell Intel i5 computer with 4GB RAM.

The contractor is encouraged to suggest revisions to government requirements where such revisions would result in cost or schedule reduction or performance improvements. The contractor shall define and record the operational concept for the gaming system, and define and record the architectural design of the gaming system (identifying the components of the system, their interfaces, and a concept of execution among them) and the traceability between the gaming components and requirements.

Shortly after the kickoff meeting is conducted, the contractor shall work within the Integrated Product Team (IPT) to iterate the system (VMC) and System-of-System (SoS) software requirements and architecture. The IPT team consists of SMEs, Designers, contractors, and Management. Based upon analysis of system requirements, system design, and other considerations, the contractor shall define and record the software requirements to be met by each software item, the methods to be used to ensure that each requirement has been met, and the traceability between the gaming software item requirements and gaming system requirements.

7.5. SOFTWARE DESIGN AND IMPLEMENTATION

The contractor shall design Gaming software, develop government expectation, perform unit testing, and integrate software components (with each other and with hardware components) to meet gaming system requirements. Software design includes not only design to requirements, but selection of existing software products including open source software to meet gaming requirements, and iterating the requirements to allow use of existing products. The contractor, as a deliverable, will for the gaming design and implementation phase follow the Storyboard, Alpha, and Beta testing strategy.

- 7.5.1. Storyboard - Contractor shall develop storyboard capturing requirements outline in the statement of need or as provided by the end user. Contractor shall include the appropriate SMEs both internal and Government during storyboard development. Contractor shall submit Storyboard for review and final approval by the government prior to entering into Alpha Testing. Storyboard development timeline will be capture in the schedule.
- 7.5.2. Alpha Testing - Contractor shall conduct an Alpha review prior to any Alpha testing. Alpha review will consist of providing the Government and Subject Matter Experts with Gaming script prior to development of the Beta Test Procedures. Contractor shall outline in the script the game look, feel and how the playing mechanics satisfy the learning objectives. Alpha review and testing timeline will be capture in the schedule.

- 7.5.3. Beta Test Procedures/Testing - Contractor should develop and submit for review Beta Test Procedures to the Government. Beta testing will include participants identified by the Government. Beta testing timeline will be capture in the scheduled.
- 7.5.4. Scenarios – Contractor shall develop 8 scenarios that provide the target audience experiential learning opportunities to apply temporal-based decision making technical skills in stressful and emotional situations that stimulate an common medical surgical situations.
- 7.5.5. Game Elements –
Charge Nurse Game front end game elements overlay a series of gamified high fidelity Charge Nurse virtual medical simulations.
Medical Surgical Nurse Game front end game elements overlay a series of gamified medical simulations.
- 7.5.6. Completed Game formative end-state Gold Versions. The contractor shall submit a Game Gold version final end state for review as outlined in Addendum C.
- 7.5.7. Deliverables:
 - Design Document for Game
 - Storyboards
 - Scenario Design
 - Alpha Test Procedures for the Game
 - Alpha Version for Game
 - Beta Test Procedures for Game
 - Beta Version for Game
 - Completed Game or games with tutorials

8. HARDWARE AND SOFTWARE INTERGRATION

The Contractor shall perform all activities to integrate and assemble the hardware and software to achieve a fully functional gaming system, with all support systems. The contractor shall deliver the optimal hardware performance specifications for the operational gaming capabilities. For maximum utility across the VA and Veteran's Health Administration (VHA) Enterprise, the games will be hosted on VA servers accessible via a browser but be portable to use on a mobile platform – tablet or phone. The VHA uses Microsoft Internet Explorer web browser version 11 on OS Windows 7 enterprise 64bit Service Pack 1, DirectX runtime version 11.0, Graphics Card Nvidia 4200M, Driver version 327.62 on a Dell Intel i5 computer with 4GB RAM.

9. TESTING

The Contractor shall verify the complete integration of the Gaming Product through the utilization of test procedures. Test Procedures shall be developed and implemented prior to Alpha testing and as part of the Storyboard development and review.

10. SECURITY SYSTEM

Security System compatibility and compliance shall be established for any Gaming product that touches the VA Network directly or indirectly or has the capability to connect, providing network administrators and security personnel with mechanisms to prevent, detect, track, report, and remediate malicious computer-related activities and incidents across all VA networks and information systems as outlined in Addendum A and B, if possible.

11. QUALITY ASSURANCE (QA)

The contractor shall implement a QA program using industry-accepted best practices that comply and is accordance with the contractor's internal processes to ensure the system requirements are met. The contractor shall utilize measurement points that will provide maximum visibility into processes. The contractor shall select the proper methods to analyze these processes to continuously improve the system.

12. REFERENCES

12.1. Charge Nurse:

- a. Baldwin, Kathleen, Black, Denise, Normand, Lorrie and Crenshaw, Jeannette, Redefining "charge nurse" within the front line, Nursing Management, September 2014 <http://www.nursingmanagement.com>
- b. Eggenberger, Terry, Exploring the charge nurse role holding the frontline, JONA Vol. 42, No 11 November 2012
- c. Homer, Rosemary and Ryan, Linda, Making the grade: Charge nurse education improves job performance, Nursing Management March 2013 <http://www.nursingmanagement.com>
- d. Krugman, Mary and Smith, Vivienne, Charge nurse leadership development and evaluation, JONA Vol. 33, No 5 May 2003
- e. Ritze-Cullen, Nancy, Tyrrell, and Wojciechowski, Elizabeth, Understanding the learning needs of the charge nurse, Implications for nursing staff development, Journal for Nurses in Staff Development Vol. 27, No 4, July/August 2011.

12.2. Medical Surgical Nurse

- a. Medical Surgical Nurse: Medical-surgical nursing is the foundation of all nursing practice.
<https://www.amsn.org/practice-resources/what-medical-surgical-nursing>
- b. Overview of complications occurring in the post-anesthesia care unit:
 - 1) <http://www.uptodate.com/contents/overview-of-complications-occurring-in-the-post-anesthesia-care-unit>
 - 2) <http://www.nursesbooks.org/Main-Menu/Standards/H--N/Nursing-Scope-and-Standards-of-Practice.aspx>
 - 3) www.nursingworld.org

ADDENDUM A

Cyber and Information Security Requirements for VA IT Services

The Contractor shall ensure adequate LAN/Internet, data, information, and system security in accordance with VA standard operating procedures and standard PWS language, conditions, laws, and regulations.¹ The Contractor's firewall and web server shall meet or exceed VA minimum requirements for security. All VA data shall be protected behind an approved firewall. Any security violations or attempted violations shall be reported to the VA Program Manager and VA Information Security Officer as soon as possible. The Contractor shall follow all applicable VA policies and procedures governing information security, especially those that pertain to certification and accreditation.

Each documented initiative under this contract incorporates the security clause VAAR 852.273-75 by reference as though fully set forth therein, as well as the VA Handbook 6500.6, "Contract Security," March 12, 2010, in its entirety. Both the security clause VAAR 852.273-75 and the VA Handbook 6500.6, "Contract Security" shall also be included in every related agreement, contract or order.

Training requirements: The Contractor shall complete all mandatory training courses identified on the current external VA training site, the Employee Education System (EES), and will be tracked therein. The EES may be accessed at <https://www.ees-learning.net/librix/loginhtml.asp?v=librix>. If the decision is made by the local Program Office to provide the Contractor a VA Talent Management System (TMS) account, the Contractor shall use the VA TMS to complete their mandatory training, accessed at <http://www.insidetms.va.gov/>

Contractor employees shall complete a VA Systems Access Agreement if they are provided access privileges as an authorized user of the computer system of VA.

VA Enterprise Architecture Compliance

The applications, supplies, and services furnished under this contract must comply with One-VA Enterprise Architecture (EA), available at <http://www.ea.oit.va.gov/index.asp> in force at the time of issuance of this contract, including the Program Management Plan and VA's rules, standards, and guidelines in the Technical Reference Model/Standards Profile (TRMSP). The VA reserves the right to assess contract deliverables for EA compliance prior to acceptance.

VA Internet and Intranet Standards:

The Contractor shall adhere to and comply with VA Directive 6102 and VA Handbook 6102, Internet/Intranet Services, including applicable amendments and changes, if the Contractor's work includes managing, maintaining, establishing and presenting information on VA's Internet/Intranet Service Sites. This pertains, but is not limited to: creating announcements; collecting information; databases to be accessed, graphics and links to external sites.

¹ See VAAR 852.273-75 referenced *infra*.

Internet/Intranet Services Directive 6102 is posted at (copy and paste the following URL to browser): http://www1.va.gov/vapubs/viewPublication.asp?Pub_ID=409&FType=2

Internet/Intranet Services Handbook 6102 is posted at (copy and paste following URL to browser): http://www1.va.gov/vapubs/viewPublication.asp?Pub_ID=410&FType=2

Notice of the Federal Accessibility Law Affecting All Electronic and Information Technology Procurements (Section 508)

On August 7, 1998, Section 508 of the Rehabilitation Act of 1973 was amended to require that when Federal departments or agencies develop, procure, maintain, or use Electronic and Information Technology, that they shall ensure it allows Federal employees with disabilities to have access to and use of information and data that is comparable to the access to and use of information and data by other Federal employees. Section 508 required the Architectural and Transportation Barriers Compliance Board (Access Board) to publish standards setting forth a definition of electronic and information technology and the technical and functional criteria for such technology to comply with Section 508. These standards have been developed and published with an effective date of December 21, 2000. Federal departments and agencies shall develop all Electronic and Information Technology requirements to comply with the standards found in 36 CFR 1194.

Section 508 – Electronic and Information Technology (EIT) Standards:

The Section 508 standards established by the Architectural and Transportation Barriers Compliance Board (Access Board) are incorporated into, and made part of all VA orders, solicitations and purchase orders developed to procure Electronic and Information Technology (EIT). These standards are found in their entirety at: <http://www.section508.gov> and <http://www.access-board.gov/sec508/standards.htm>. A printed copy of the standards will be supplied upon request. The Contractor shall comply with the technical standards as marked:

- ☒ § 1194.21 Software applications and operating systems
- ☒ § 1194.22 Web-based intranet and internet information and applications
- ☒ § 1194.23 Telecommunications products
- ☒ § 1194.24 Video and multimedia products
- ☒ § 1194.25 Self-contained, closed products
- ☒ § 1194.26 Desktop and portable computers
- ☒ § 1194.31 Functional Performance Criteria
- ☒ § 1194.41 Information, Documentation, and Support

The standards do not require the installation of specific accessibility-related software or the attachment of an assistive technology device, but merely require that the EIT be compatible with

such software and devices so that it can be made accessible if so required by the agency in the future.

Physical Security & Safety Requirements:

The Contractor and their personnel shall follow all VA policies, standard operating procedures, applicable laws and regulations while on VA property. Violations of VA regulations and policies may result in citation and disciplinary measures for persons violating the law.

1. The Contractor and their personnel shall wear visible identification at all times while they are on the premises.
2. The VA does not provide parking spaces at the work site; the Contractor must obtain parking at the work site if needed. It is the responsibility of the Contractor to park in the appropriate designated parking areas. The VA will not invalidate or make reimbursement for parking violations of the Contractor under any conditions.
3. Smoking is prohibited inside/outside any building other than the designated smoking areas.
4. Possession of weapons is prohibited.
5. The Contractor shall obtain all necessary licenses and/or permits required to perform the work, with the exception of software licenses that need to be procured from a Contractor or vendor in accordance with the requirements document. The Contractor shall take all reasonable precautions necessary to protect persons and property from injury or damage during the performance of this contract.

Confidentiality and Non-Disclosure

The Contractor shall follow all VA rules and regulations regarding information security to prevent disclosure of sensitive information to unauthorized individuals or organizations.

The Contractor may have access to Protected Health Information (PHI) and Electronic Protected Health Information (EPHI) that is subject to protection under the regulations issued by the Department of Health and Human Services, as mandated by the Health Insurance Portability and Accountability Act of 1996 (HIPAA); 45 CFR Parts 160 and 164, Subparts A and E, the Standards for Privacy of Individually Identifiable Health Information ("Privacy Rule"); and 45 CFR Parts 160 and 164, Subparts A and C, the Security Standard ("Security Rule").

Pursuant to the Privacy and Security Rules, the Contractor must agree in writing to certain mandatory provisions regarding the use and disclosure of PHI and EPHI.

1. The Contractor may have access to some privileged and confidential materials of VA. These printed and electronic documents are for internal use only, are not to be copied or released without permission, and remain the sole property of VA. Some of these materials are protected by the Privacy Act of 1974 (revised by PL 93-5791) and Title 38. Unauthorized disclosure of Privacy Act or Title 38 covered materials is a criminal offense.
2. The VA Contracting Officer will be the sole authorized official to release in writing, any data, draft deliverables, final deliverables, or any other written or printed materials pertaining to this contract. The Contractor shall release no information. Any request for information relating to this contract presented to the Contractor shall be submitted to the VA Contracting Officer for response.
3. Contractor personnel recognize that in the performance of this effort, Contractor personnel may receive or have access to sensitive information, including

information provided on a proprietary basis by carriers, equipment manufacturers and other private or public entities. Contractor personnel agree to safeguard such information and use the information exclusively in the performance of this contract. Contractor shall follow all VA rules and regulations regarding information security to prevent disclosure of sensitive information to unauthorized individuals or organizations as enumerated in this section and elsewhere in this Contract and its subparts and appendices.

4. Contractor shall limit access to the minimum number of personnel necessary for contract performance for all information considered sensitive or proprietary in nature. If the Contractor is uncertain of the sensitivity of any information obtained during the performance this contract, the Contractor has a responsibility to ask the VA Contracting Officer.
5. Contractor shall train all of their employees involved in the performance of this contract on their roles and responsibilities for proper handling and nondisclosure of sensitive VA or proprietary information. Contractor personnel shall not engage in any other action, venture or employment wherein sensitive information shall be used for the profit of any party other than those furnishing the information. The sensitive information transferred, generated, transmitted, or stored herein is for VA benefit and ownership alone.
6. Contractor shall maintain physical security at all facilities housing the activities performed under this contract, including any Contractor facilities according to VA-approved guidelines and directives. The Contractor shall ensure that security procedures are defined and enforced to ensure all personnel who are provided access to patient data must comply with published procedures to protect the privacy and confidentiality of such information as required by VA.
7. Contractor must adhere to the following:
 - a. The use of "thumb drives" or any other medium for transport of information is expressly prohibited.
 - b. Controlled access to system and security software and documentation.
 - c. Recording, monitoring, and control of passwords and privileges.
 - d. All terminated personnel are denied physical and electronic access to all data, program listings, data processing equipment and systems.
 - e. VA, as well as any Contractor (or Subcontractor) systems used to support development, provide the capability to cancel immediately all access privileges and authorizations upon employee termination.
 - f. Contractor PM and VA PM are informed within twenty-four (24) hours of any employee termination.
 - g. Acquisition sensitive information shall be marked "Acquisition Sensitive" and shall be handled as "For Official Use Only (FOUO)".
 - h. Contractor does not require access to classified data.
8. Regulatory standard of conduct governs all personnel directly and indirectly involved in procurements. All personnel engaged in procurement and related activities shall conduct business in a manner above reproach and, except as authorized by statute or regulation, with complete impartiality and with preferential treatment for none. The general rule is to strictly avoid any conflict of interest or even the appearance of a conflict of interest in VA/Contractor relationships.

ADDENDUM B

1 Charge Nurse Game-based Learning

- 1.1. The complete Charge Nurse game-based learning is comprised of one educational game with didactic job aids. The whole Charge Nurse game-based learning package integrates within the Veterans Administration (VA) Network software and hardware architecture requirements. The Government will provide required information to the Contractor as Charge Nurse Development Government Provided Contractor Information.
- 1.2. The contractor shall design and develop the Game using a game engine with embedded tracking technology to log, record, and display learner performance outcome feedback for in-process guidance, after-action reviews and performance scores that integrate into the entire Charge Nurse learning package. The Charge Nurse Game shall include at least eight high fidelity virtual simulation medical scenarios overlaid with front end challenging game elements.
- 1.3. The Charge Nurse Game is formative in design, embedded tracking technology data and feedback guide learner improvements and is summative in design, embedded tracking data measures the level of success or proficiency obtained at the end of a virtual simulation scenario activity and game ending. The Game 1 final summative high stakes minimum score is pass-fail.
- 1.4. The Contractor will design frontend theme-based game element overlays layered over a sequence of high fidelity virtual avatar medical simulations. This educational game overlay should incorporate multiple game genres and emphasize fantasy, imaginary, or abstract styles in contrast to the high fidelity virtual avatar simulations.

Game Scenarios - Thematic: The Charge Nurse roles and responsibilities

Scenarios	Theme	Subtheme
Scenario 1	Creating a safety net	Keeping patients safe Setting safety as a priority Creating an environment of safety Providing for staff safety
Scenario 2	Monitoring for quality	Checking back Vigilantly guarding patient care Maintaining a state of watchfulness
Scenario 3	Showing the way	Advising clinical practice Leading the team Setting an example Guiding decision making
Scenario 4	Completing the puzzle	Putting it all together Coordinating care Maintaining collaborative connections
Scenario 5	Managing the flow	Balancing the staffing Fast-paced environment Getting caught in the middle

Scenario 6	Making a difference	Appreciating the role Close to the bedside Quantifying value
Scenario 7	Putting out fires	Frontline go-to person Responding to calls Problem solver
Scenario 8	Keeping patients happy	Listening to concerns Promoting patient satisfaction Doing my rounds

2. Medical Surgical Nurse Game-locations

Standardized Environments I, Levels I

- Operating Room Theater I (OR),
- Intensive Care Unit I (ICU)
- Emergency Room I (ER)
- Surgical Medical Floor I

Standardized Scenarios 1, Levels 1, and 8 scenarios set with randomization

- Can't control fever (male/female)
- Can't control nausea and vomiting (male/female)
- Can't control airway problems (male/female)
- Can't control hypotension (male/female)

Game Scenarios - Thematic: Medical Surgical Nurse roles and responsibilities

Scenario 1	Can't control fever	Patient	32 year old male, 72 inches, 180 kg
		Location	OR
Scenario 2	Can't control fever	Patient	54 year old female, 68 inches 150 kg
		Location	OR
Scenario 3	Can't control nausea and vomiting	Patient	90 year old male, 69 inches, 180 kg
		Location:	ED

Scenario 4	Can't control nausea and vomiting	Patient	70 year old female, 69 inches, 100 kg
		Location	ED
Scenario 5	Can't control airway problems	Patient	86 year old female, 69 inches, 120 kg
		Location	ICU
Scenario 6	Can't control airway problems	Patient	55 year old male, 69 inches, 130 kg
		Location	ICU
Scenario 7	Can't control hypotension	Patient	70 year old female, 69 inches, 160 kg
		Location	IR
Scenario 8	Can't control hypotension	Patient	35 year old male, 69 inches, 200 kg
		Location	IR

Appendix 2

Performance Work
Statement for

Difficult Airway Algorithm
and Rescue Cricothyrotomy
(DAARC) Educational Game

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1. EXECUTIVE SUMMARY

A formal instructional system needs assessment and gap analysis has identified a Cricothyrotomy training requirement. The Veterans Health Administration (VHA) Simulation Learning Education and Research Network (SimLEARN) Educational Gaming section has been determined to be the best modality to satisfy this VA Medical Practitioner training need.

The DAARC learning system provides Veterans personalized, proactive, patient-driven healthcare through advancing innovation trials, emerging health technologies, and experimentation.

The complete DAARC learning system is comprised of two educational games, Game 1 and Game 2, along with a simulation mannequin task-trainer module, a training video module with didactic job aids. The whole DAARC learning system package integrates within the Veterans Administration (VA) Network software and hardware architecture requirements.

The contractor shall design and develop only Game 1 and Game 2, using a game engine with embedded tracking technology to log, record, and display learner performance outcome feedback for in-process guidance, after-action reviews and performance scores that integrate into the entire DAARC learning system package. Game 1 and Game 2 shall include at least 12 high fidelity virtual simulation medical scenarios overlaid with front end challenging game elements.

For maximum utility across the Veteran's Health Administration (VHA) Enterprise, the games will be hosted on VA servers accessible via a browser but be portable to use on a mobile platform – tablet or phone. The VHA uses Microsoft Internet Explorer web browser version 11 on OS Windows 7 enterprise 64bit Service Pack 1, DirectX runtime version 11.0, Graphics Card Nvidia 4200M, Driver version 327.62 on a Dell Intel i5 computer with 4GB RAM.

Game 1 is formative in design, embedded tracking technology data and feedback guide learner improvements. Game 2 is summative in design, embedded tracking data measures the level of success or proficiency obtained at the end of a virtual simulation scenario activity and game ending. The final Game 2 summative high stakes score is pass-fail. The games shall be independently capable modules but integrated as a part of the percutaneous cricothyrotomy learning system as a whole.

2. BACKGROUND/RATIONALE

Difficult Airway Algorithm & Rescue Cricothyrotomy (DAARC), as an educational program, is a novel composite of Virtual Avatar Learning-based Games with Simulation Mannequin-based Task Trainer activities designed to help reduce patient morbidity and mortality associated with difficult and lost airways. The instructional cognitive, affective, and psychomotor focus is on the time-based critical clinical decision making related to a difficult

airway management algorithm (Vortex) and the placement of a percutaneous cricothyrotomy catheter.

DAARC emphasizes the use of the percutaneous cricothyrotomy technique during failed airway scenarios in virtual operating rooms, emergency rooms, intensive care units, and in any location physicians practice Advanced Cardiac Life Support (ACLS). Additionally, the assessment strategy collects performance data to measure cognitive changes involved in the application of the difficult airway management guidelines as well as time dependent skills maintenance or degradation periods. The training audience is Anesthesiologists, Emergency Medicine Physicians, Critical Care Physicians and Otolaryngologists. This training is online anytime anywhere with internet access and local simulation mannequin-based task trainer practice.

3. PURPOSE

In order to provide veterans mission critical personalized, proactive, patient-driven health care through innovation and improvements, professional medical providers need iterative Emergency Difficult Airway Algorithm and Rescue Percutaneous Cricothyrotomy training. The DAARC training program intends to help reduce patient morbidity and mortality associated with difficult and lost airways.

The purpose of this training is to help participants develop:

- Airway Management temporal decision-making skills in the context of rare Emergency Difficult Airway, Can't Intubate and Can't Ventilate (CICV) scenarios.
- A new Percutaneous Cricothyrotomy procedural understanding in the context of an emergent failed airway in and out of the operating room setting.
- A tactile understanding and appreciation of percutaneous airway placement through safe virtual and simulated hands-on experiential learning activities.

4. SCOPE

- 4.1. Game Subject: Emergency Airway Management and Rescue Cricothyrotomy.
- 4.2. Medical Target Audience: Anesthesiologists, Emergency Medicine Physicians, Critical Care Physicians and Otolaryngologists at VHA facilities.
- 4.3. Learning Objective(s):
 - 4.3.1. Upon completion of Game 1 and Game 2 in the DAARC simulated virtual medical game-based learning system scenarios the participant will meet the following Learning Objectives:
 - 4.3.1.1. Identify which Emergency Cricothyrotomy Catheter kits or instruments available at their facility.

- 4.3.1.2. Assess rapidly the patient with an Unanticipated Difficult Airway.
- 4.3.1.3. Identify the anticipated emergent airway where the patient's ability to maintain their airway deteriorates rapidly. To the extent, the majority of patients lose the ability to maintain their own airway.
- 4.3.1.4. Achieve an acceptable performance level for Difficult Airway Management temporal decision making in various critical emergency difficult airway situations.
- 4.3.1.5. Demonstrate Difficult Airway Management temporal decision-making skills in time-limited activities with death a possible outcome.
- 4.3.1.6. Describe three different surgical techniques for gaining airway access. The Melker Percutaneous Bougie technique, the Scalpel Spreader Bougie technique, and the Cric-Control System.
- 4.3.1.7. Apply three different surgical techniques for gaining airway access.
- 4.3.1.8. Use a Melker Percutaneous Cricothyrotomy technique during Advanced Cardiac Life Support (ACLS).
- 4.3.1.9. Use a Scalpel Spreader Bougie Open Surgical Technique during Advanced Cardiac Life Support (ACLS)
- 4.3.1.10. Use a Cric-Control System Open Surgical Technique during Advanced Cardiac Life Support (ACLS)
- 4.3.1.11. Use a Melker Percutaneous Cricothyrotomy technique during emergent failed airways.
- 4.3.1.12. Use a Scalpel Spreader Bougie Open Surgical Technique during emergent failed airways.
- 4.3.1.13. Use a Cric-Control System Open Surgical Technique during emergent failed airways.
- 4.3.1.14. Identify relevant anatomical landmarks.
- 4.3.1.15. Introduce an 18-gauge needle through the cricothyroid membrane.
- 4.3.1.16. Aspirate free air to confirm location of needle tip in trachea.
- 4.3.1.17. Advance the guidewire through the 18- gauge needle followed by removal of the needle leaving the guidewire in place and advance a dilator-airway catheter assembly over the guidewire.
- 4.3.1.18. Inflate the catheter cuff and confirm catheter placement with end tidal CO2 during ventilation.

5. GAME CONCEPT

Difficult Airway Algorithm & Rescue Cricothyrotomy (DAARC), as an educational program, is a novel composite of Virtual Avatar Learning-based Games with Simulation Mannequin-based Task Trainer activities designed to help reduce patient morbidity and mortality associated with difficult and lost airways. The instructional cognitive, affective, and psychomotor focus is on the time-based critical clinical decision making related to a difficult airway management algorithm (Vortex) and the placement of a percutaneous cricothyrotomy catheter.

DAARC emphasizes the use of the percutaneous cricothyrotomy technique during failed airway scenarios in virtual operating rooms, emergency rooms, intensive care units, and in any location physicians practice Advanced Cardiac Life Support (ACLS). Additionally, the assessment strategy collects performance data to measure cognitive changes involved in the application of the difficult airway management guidelines as well as time dependent skills maintenance or degradation periods. The training audience is Anesthesiologists, Emergency Medicine Physicians, Critical Care Physicians and Otolaryngologists. This training is online anytime anywhere with internet access and local simulation mannequin-based task trainer practice.

6. PERIOD/PLACE OF PERFORMANCE AND TRAVEL

6.1. PERIOD OF PERFORMANCE

- 6.1.1. The base period of performance shall be one (1) year from date of award.
- 6.1.2. Any work at the Government site shall not take place on Federal holidays or weekends unless directed by the Contracting Officer (CO).
- 6.1.3. There are ten (10) Federal holidays set by law (USC Title 5 Section 6103) that VA follows:

- 6.1.3.1. Under current definitions, four are set by date:

New Year's Day	January 1
Independence Day	July 4
Veterans Day	November 11
Christmas Day	December 25

- 6.1.3.2. If any of the above falls on a Saturday, then Friday shall be observed as a holiday. Similarly, if one falls on a Sunday, then Monday shall be observed as a holiday.

- 6.1.4. The other six are set by a day of the week and month:

Martin Luther King's Birthday	Third Monday in January
Washington's Birthday	Third Monday in February
Memorial Day	Last Monday in May
Labor Day	First Monday in September
Columbus Day	Second Monday in October
Thanksgiving	Fourth Thursday in November

6.2. PLACE OF PERFORMANCE

- 6.2.1. Tasks under this contract shall be primarily performed at Contractor facilities.

6.3. TRAVEL

- 6.3.1. The Government anticipates travel under this effort to perform the tasks associated with the effort, as well as to attend program-related meetings or conferences through the period of performance. The contractors shall travel 12

times, once per month during a 12-month development cycle of the Alpha, Beta, and Gold versions. The location of these trips shall be Orlando, Florida.

All travel must be approved in advance by the COR and recorded in a travel register. Travel and per diem shall be reimbursed in accordance with Federal Travel Regulations. Local travel within a 50-mile radius from the Contractor's facility is considered the cost of doing business and will not be reimbursed. This includes travel, subsistence, and associated labor charges for travel time. Travel performed for personal convenience and daily travel to and from work at the Contractor's facility will not be reimbursed. Travel, subsistence and associated labor charges for travel time for travel beyond a 50-mile radius of the Contractor's facility are authorized on a case-by-case basis and must be preapproved by the COR. The travel cost will be reimbursed at cost. Contractor shall provide receipts for all travel expenses.

7. SPECIFIC TASKS AND DELIVERABLES

The services contemplated under this contract include front end analysis, design, development, integration, test, management, documentation, delivery, implementation of gaming capabilities, and all that may be necessary to complete a particular project. All requirements, tasks and deliverables apply to the contractor and all subcontractors awarded under this contract.

The contractor shall perform the following:

7.1. CONTRACT PROJECT MANAGEMENT

7.1.1. PROJECT MASTER SCHEDULE

The Contractor shall deliver a Project Master Schedule (PMS) that defines the Contractor's timeline and tools to be used in execution of the contract/order. The Contractor shall deliver the schedule in a graphic format that displays the schedule, milestones, risks, and resource support. The Contractor shall update and maintain the VHA Project Manager (PM) approved Schedule throughout the period of performance.

7.1.1.1. Deliverable:

- Project Master Schedule

7.1.2. REPORTING REQUIREMENTS

7.1.2.1. The Contractor shall present the initial baseline Project Master Schedule (PMS) for concurrence as part of a contract Kick-Off Meeting. The Schedule will track the development of game based products identified by the Government and provide a monthly report to the VHA Gaming Project Manager. The Contractor shall prepare meeting minutes from the Kick-Off Meeting discussions.

- 7.1.2.2. The Contractor shall provide the Contracting Officer's Representative (COR) with Monthly Progress Reports in electronic form in Microsoft Word and Project formats. The report shall include detailed instructions/explanations for each required data element, to ensure that data is accurate and consistent. These reports shall reflect data as of the last day of the preceding Month.
- 7.1.2.3. The Monthly Progress Reports shall cover all work completed during the reporting period and work planned for the subsequent reporting period. The report shall also identify any problems that arose and a description of how the problems were resolved. If problems have not been completely resolved, the Contractor shall provide an explanation including their plan and timeframe for resolving the issue. The Contractor shall monitor performance against the SCHEDULE and report any deviations. VHA SimLEARN expects that the Contractor will keep in communication accordingly so that issues that arise are transparent to both parties to prevent escalation of outstanding issues.
- 7.1.2.4. Deliverables:
- Kick-Off Meeting Minutes
 - Monthly Progress Report

7.2. GAMING SOFTWARE

The Contractor shall develop the gaming software in accordance with recognized industry gaming standards and internally documented processes. The design shall incorporate features that promote ease of operation, ease of software maintenance, ease of future updates and modifications, data void work around, and any smart designs that can justify a reduction in the amount of documentation. Computer programs and computer data system shall be fully integrated in accordance with the system specification and Veterans Administration information technology and assurance restrictions. The Contractor shall conduct market surveillance and market investigations, in order to maximize the procurement of commercial and non-developmental software. The Contractor shall maintain a software Controlled Development Environment that complies with the industry standards. The Contractor shall employ well-defined security policy models, structured, disciplined, and rigorous hardware and software development techniques, and sound system/security engineering principles.

7.2.1. SOFTWARE REQUIREMENTS AND ARCHITECTURE DEVELOPMENT AND REVIEW

The Contractor shall develop software requirements in accordance with the Veterans Administration (VA) information technology network architecture, hardware, and software requirements. For maximum utility across the VA and Veteran's Health Administration (VHA) Enterprise, the games will be hosted on VA servers accessible via a browser but be

portable to use on a mobile platform – tablet or phone. The VHA uses Microsoft Internet Explorer web browser version 11 on OS Windows 7 enterprise 64bit Service Pack 1, DirectX runtime version 11.0, Graphics Card Nvidia 4200M, Driver version 327.62 on a Dell Intel i5 computer with 4GB RAM.

The Contractor is encouraged to suggest revisions to government requirements where such revisions would result in cost or schedule reduction or performance improvements. The Contractor shall define and record the operational concept for the gaming system, and define and record the architectural design of the gaming system (identifying the components of the system, their interfaces, and a concept of execution among them) and the traceability between the gaming components and requirements. As part of this activity, the contractor shall work within the Integrated Product Team (IPT) to iterate the system and System-of-System (SoS) software requirements and architecture. Based upon analysis of system requirements, system design, and other considerations, the contractor shall define and record the software requirements to be met by each software item, the methods to be used to ensure that each requirement has been met, and the traceability between the gaming software item requirements and gaming system requirements.

7.2.2. SOFTWARE DESIGN AND IMPLEMENTATION

The Contractor shall design and develop Gaming software, perform unit testing, and integrate software components (with each other and with hardware components) to meet gaming system requirements. Software design includes not only design to requirements, but selection of existing software products including open source software to meet gaming requirements, and iterating the requirements to allow use of existing products. The game design and implementation will follow the Storyboard, Prototypes, Alpha, Beta, and Gold Go-Live testing strategy.

7.2.2.1. Storyboards - Contractor shall develop storyboard capturing requirements outlined in the statement of need or as provided by the end user. Contractor shall include the appropriate SMEs both internal and Government during storyboard development. Contractor shall submit Storyboard for review and final approval by the Government prior to Prototyping and entering into Alpha Testing. Storyboard development timeline will be captured in the schedule.

7.2.2.2. Scenarios – Contractor shall develop 12 high-fidelity difficult airway scenarios that provide the target audience experiential learning opportunities to apply temporal-based decision making technical skills in stressful and emotional situations that stimulate an

emergent difficult airway response and possible surgical rescue cricothyrotomy interventions.

7.2.2.3. Game Elements – DAARC Game1 and Game 2 front end game elements overlay a series of gamified high fidelity cricothyrotomy medical simulations.

7.2.2.4. Alpha Test Procedure/Testing - Contractor shall conduct an Alpha review prior to any Alpha testing. Alpha review will consist of providing the Government and Subject Matter Experts with Gaming script prior to development of the Beta Test Procedures. Contractor shall outline in the script the game look, feel and how the playing mechanics satisfy the learning objectives. Alpha review and testing timeline will be captured in the schedule.

7.2.2.5. Beta Test Procedures/Testing - Contractor shall develop and submit for review Beta Test Procedures to the Government. The Government will identify participants to include in the Beta testing. Beta testing timeline will be captured in the schedule.

7.2.2.6. Completed Game 1 formative end-state and Game 2 summative end-state Gold Versions. The contractor shall submit a Game 1 Gold version final end state and a Game 2 Gold version final end state for review as outlined in Addendum C.

7.2.3. Deliverables:

7.2.3.1. Design Document for Games 1 and Games 2

7.2.3.2. Storyboards

7.2.3.3. Scenario Design

7.2.3.4. Alpha Test Procedures for Games 1 and 2

7.2.3.5. Alpha Version for Games 1 and 2

7.2.3.6. Beta Test Procedures for Games 1 and 2

7.2.3.7. Beta Version for Games 1 and 2

7.2.3.8. Completed Games 1 and 2 with tutorials

8. HARDWARE AND SOFTWARE INTEGRATION

8.1. HARDWARE SPECIFICATION

The Contractor shall perform all activities to integrate and assemble the hardware and software to achieve a fully functional gaming system, with all support systems. The contractor shall deliver the optimal hardware performance specifications for the operational gaming capabilities. For maximum utility across the VA and Veteran's Health Administration (VHA) Enterprise, the games will be hosted on VA servers accessible via a browser but be portable to use on a mobile platform – tablet or phone. The VHA uses Microsoft Internet Explorer web browser version 11 on OS Windows 7 enterprise 64bit Service Pack 1, DirectX runtime version 11.0, Graphics Card Nvidia 4200M, Driver version 327.62 on a Dell Intel i5 computer with 4GB RAM.

9. TESTING

The Contractor shall verify the complete integration of the Gaming Product through the utilization of test procedures. Test Procedures shall be developed and implemented prior to Alpha testing and as part of the Storyboard development and review.

10. SECURITY SYSTEM

Security System compatibility and compliance shall be established for any Gaming product that touches the VA Network directly or indirectly or has the capability to connect, providing network administrators and security personnel with mechanisms to prevent, detect, track, report, and remediate malicious computer-related activities and incidents across all VA networks and information systems as outlined in Addendum A. The contractor shall comply with 508 requirements, if possible, as outlined in addendum A.

11. QUALITY ASSURANCE (QA)

The contractor shall implement a QA program using industry-accepted best practices that comply and is accordance with the contractor's internal processes to ensure the system requirements are met. The contractor shall utilize measurement points that will provide maximum visibility into processes. The contractor shall select the proper methods to analyze these processes to continuously improve the system.

12. REFERENCES

- American Society of Anesthesiologists (2013). Practice guidelines for management of the difficult airway. *Anesthesiology*, 98(5), 1269-1277.
- Anderson, P. J., & Klock, A. (2014). Airway management. *Anesthesiology Clinics* 32 (2) 445-461.
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- Deransy, R., Dupont, H., Duwat, A., Hubert, V., & Mahjoub, Y. (2014) Effect of simulation training on compliance with difficult airway management algorithms, technical ability, and skills retention for emergency Cricothyrotomy. *Anesthesiology*, 120(4).
- Marshall, D., & Mehra, R., (2014). The effects of a displayed cognitive aid on non-technical skills in a simulated can't intubate, can't oxygenate crises. *Anesthesia*, 69, 669-677.
- Melker, J. S., & Gabriella, A. (2005). Melker Cricothyrotomy Kit: An alternative to the surgical technique. *Annals of Otolaryngology, Rhinology, & Laryngology*, 114(7), 525-528.

ADDENDUM A

Cyber and Information Security Requirements for VA IT Services

The Contractor shall ensure adequate LAN/Internet, data, information, and system security in accordance with VA standard operating procedures and standard PWS language, conditions, laws, and regulations.² The Contractor's firewall and web server shall meet or exceed VA minimum requirements for security. All VA data shall be protected behind an approved firewall. Any security violations or attempted violations shall be reported to the VA Program Manager and VA Information Security Officer as soon as possible. The Contractor shall follow all applicable VA policies and procedures governing information security, especially those that pertain to certification and accreditation.

Each documented initiative under this contract incorporates the security clause VAAR 852.273-75 by reference as though fully set forth therein, as well as the VA Handbook 6500.6, "Contract Security," March 12, 2010, in its entirety. Both the security clause VAAR 852.273-75 and the VA Handbook 6500.6, "Contract Security" shall also be included in every related agreement, contract or order.

Training requirements: The Contractor shall complete all mandatory training courses identified on the current external VA training site, the Employee Education System (EES), and will be tracked therein. The EES may be accessed at <https://www.ees-learning.net/librix/loginhtml.asp?v=librix>. If the decision is made by the local Program Office to provide the Contractor a VA Talent Management System (TMS) account, the Contractor shall use the VA TMS to complete their mandatory training, accessed at <http://www.insidetms.va.gov/>

Contractor employees shall complete a VA Systems Access Agreement if they are provided access privileges as an authorized user of the computer system of VA.

VA Enterprise Architecture Compliance

The applications, supplies, and services furnished under this contract must comply with One-VA Enterprise Architecture (EA), available at <http://www.ea.oit.va.gov/index.asp> in force at the time of issuance of this contract, including the Program Management Plan and VA's rules, standards, and guidelines in the Technical Reference Model/Standards Profile (TRMSP). The VA reserves the right to assess contract deliverables for EA compliance prior to acceptance.

VA Internet and Intranet Standards:

The Contractor shall adhere to and comply with VA Directive 6102 and VA Handbook 6102, Internet/Intranet Services, including applicable amendments and changes, if the Contractor's work includes managing, maintaining, establishing and presenting information on VA's Internet/Intranet Service Sites. This pertains, but is not limited to: creating announcements; collecting information; databases to be accessed, graphics and links to external sites.

² See VAAR 852.273-75 referenced *infra*.

Internet/Intranet Services Directive 6102 is posted at (copy and paste the following URL to browser): http://www1.va.gov/vapubs/viewPublication.asp?Pub_ID=409&FType=2

Internet/Intranet Services Handbook 6102 is posted at (copy and paste following URL to browser): http://www1.va.gov/vapubs/viewPublication.asp?Pub_ID=410&FType=2

Notice of the Federal Accessibility Law Affecting All Electronic and Information Technology Procurements (Section 508)

On August 7, 1998, Section 508 of the Rehabilitation Act of 1973 was amended to require that when Federal departments or agencies develop, procure, maintain, or use Electronic and Information Technology, that they shall ensure it allows Federal employees with disabilities to have access to and use of information and data that is comparable to the access to and use of information and data by other Federal employees. Section 508 required the Architectural and Transportation Barriers Compliance Board (Access Board) to publish standards setting forth a definition of electronic and information technology and the technical and functional criteria for such technology to comply with Section 508. These standards have been developed and published with an effective date of December 21, 2000. Federal departments and agencies shall develop all Electronic and Information Technology requirements to comply with the standards found in 36 CFR 1194.

Section 508 – Electronic and Information Technology (EIT) Standards:

The Section 508 standards established by the Architectural and Transportation Barriers Compliance Board (Access Board) are incorporated into, and made part of all VA orders, solicitations and purchase orders developed to procure Electronic and Information Technology (EIT). These standards are found in their entirety at: <http://www.section508.gov> and <http://www.access-board.gov/sec508/standards.htm>. A printed copy of the standards will be supplied upon request. The Contractor shall comply with the technical standards as marked:

- ☒ § 1194.21 Software applications and operating systems
- ☒ § 1194.22 Web-based intranet and internet information and applications
- ☒ § 1194.23 Telecommunications products
- ☒ § 1194.24 Video and multimedia products
- ☒ § 1194.25 Self-contained, closed products
- ☒ § 1194.26 Desktop and portable computers
- ☒ § 1194.31 Functional Performance Criteria
- ☒ § 1194.41 Information, Documentation, and Support

The standards do not require the installation of specific accessibility-related software or the attachment of an assistive technology device, but merely require that the EIT be compatible with

such software and devices so that it can be made accessible if so required by the agency in the future.

Physical Security & Safety Requirements:

The Contractor and their personnel shall follow all VA policies, standard operating procedures, applicable laws and regulations while on VA property. Violations of VA regulations and policies may result in citation and disciplinary measures for persons violating the law.

1. The Contractor and their personnel shall wear visible identification at all times while they are on the premises.
2. The VA does not provide parking spaces at the work site; the Contractor must obtain parking at the work site if needed. It is the responsibility of the Contractor to park in the appropriate designated parking areas. The VA will not invalidate or make reimbursement for parking violations of the Contractor under any conditions.
3. Smoking is prohibited inside/outside any building other than the designated smoking areas.
4. Possession of weapons is prohibited.
5. The Contractor shall obtain all necessary licenses and/or permits required to perform the work, with the exception of software licenses that need to be procured from a Contractor or vendor in accordance with the requirements document. The Contractor shall take all reasonable precautions necessary to protect persons and property from injury or damage during the performance of this contract.

Confidentiality and Non-Disclosure

The Contractor shall follow all VA rules and regulations regarding information security to prevent disclosure of sensitive information to unauthorized individuals or organizations.

The Contractor may have access to Protected Health Information (PHI) and Electronic Protected Health Information (EPHI) that is subject to protection under the regulations issued by the Department of Health and Human Services, as mandated by the Health Insurance Portability and Accountability Act of 1996 (HIPAA); 45 CFR Parts 160 and 164, Subparts A and E, the Standards for Privacy of Individually Identifiable Health Information ("Privacy Rule"); and 45 CFR Parts 160 and 164, Subparts A and C, the Security Standard ("Security Rule").

Pursuant to the Privacy and Security Rules, the Contractor must agree in writing to certain mandatory provisions regarding the use and disclosure of PHI and EPHI.

1. The Contractor may have access to some privileged and confidential materials of VA. These printed and electronic documents are for internal use only, are not to be copied or released without permission, and remain the sole property of VA. Some of these materials are protected by the Privacy Act of 1974 (revised by PL 93-5791) and Title 38. Unauthorized disclosure of Privacy Act or Title 38 covered materials is a criminal offense.
2. The VA Contracting Officer will be the sole authorized official to release in writing, any data, draft deliverables, final deliverables, or any other written or printed materials pertaining to this contract. The Contractor shall release no information. Any request for information relating to this contract presented to the Contractor shall be submitted to the VA Contracting Officer for response.
3. Contractor personnel recognize that in the performance of this effort, Contractor personnel may receive or have access to sensitive information, including

information provided on a proprietary basis by carriers, equipment manufacturers and other private or public entities. Contractor personnel agree to safeguard such information and use the information exclusively in the performance of this contract. Contractor shall follow all VA rules and regulations regarding information security to prevent disclosure of sensitive information to unauthorized individuals or organizations as enumerated in this section and elsewhere in this Contract and its subparts and appendices.

4. Contractor shall limit access to the minimum number of personnel necessary for contract performance for all information considered sensitive or proprietary in nature. If the Contractor is uncertain of the sensitivity of any information obtained during the performance this contract, the Contractor has a responsibility to ask the VA Contracting Officer.
5. Contractor shall train all of their employees involved in the performance of this contract on their roles and responsibilities for proper handling and nondisclosure of sensitive VA or proprietary information. Contractor personnel shall not engage in any other action, venture or employment wherein sensitive information shall be used for the profit of any party other than those furnishing the information. The sensitive information transferred, generated, transmitted, or stored herein is for VA benefit and ownership alone.
6. Contractor shall maintain physical security at all facilities housing the activities performed under this contract, including any Contractor facilities according to VA-approved guidelines and directives. The Contractor shall ensure that security procedures are defined and enforced to ensure all personnel who are provided access to patient data must comply with published procedures to protect the privacy and confidentiality of such information as required by VA.
7. Contractor must adhere to the following:
 - a. The use of "thumb drives" or any other medium for transport of information is expressly prohibited.
 - b. Controlled access to system and security software and documentation.
 - c. Recording, monitoring, and control of passwords and privileges.
 - d. All terminated personnel are denied physical and electronic access to all data, program listings, data processing equipment and systems.
 - e. VA, as well as any Contractor (or Subcontractor) systems used to support development, provide the capability to cancel immediately all access privileges and authorizations upon employee termination.
 - f. Contractor PM and VA PM are informed within twenty-four (24) hours of any employee termination.
 - g. Acquisition sensitive information shall be marked "Acquisition Sensitive" and shall be handled as "For Official Use Only (FOUO)".
 - h. Contractor does not require access to classified data.
8. Regulatory standard of conduct governs all personnel directly and indirectly involved in procurements. All personnel engaged in procurement and related activities shall conduct business in a manner above reproach and, except as authorized by statute or regulation, with complete impartiality and with preferential treatment for none. The general rule is to strictly avoid any conflict of interest or even the appearance of a conflict of interest in VA/Contractor relationships.

ADDENDUM B

3. Game-based Learning System

- 3.1. The complete DAARC learning system is comprised of two educational games, Game 1 and Game 2, along with a simulation mannequin task-trainer module, a training video module with didactic job aids. The whole DAARC learning system package integrates within the Veterans Administration (VA) Network software and hardware architecture requirements. The Government will provide required information to the Contractor as DAARC Development Government Provided Contractor Information.
- 3.2. The contractor shall design and develop only Game 1 and Game 2, using a game engine with embedded tracking technology to log, record, and display learner performance outcome feedback for in-process guidance, after-action reviews and performance scores that integrate into the entire DAARC learning system package. Game 1 and Game 2 shall include at least 12 high fidelity virtual simulation medical scenarios overlaid with front end challenging game elements.
- 3.3. Game 1 is formative in design, embedded tracking technology data and feedback guide learner improvements. Game 2 is summative in design, embedded tracking data measures the level of success or proficiency obtained at the end of a virtual simulation scenario activity and game ending. The final Game 2 summative high stakes score is pass-fail. The games shall be independently capable modules but integrated as a part of the percutaneous cricothyrotomy learning system as a whole.
- 3.4. The Contractor will design frontend Vortex theme-based game element overlays layered over a sequence of high fidelity virtual avatar medical simulations. This educational game overlay shall incorporate multiple game genres and emphasize fantasy, imaginary, or abstract styles in contrast to the high fidelity virtual avatar simulations.

4. Game 1 Formative

4.1. Game-based Learning in Virtual Avatar Simulations

4.1.1. Cognitive Decisions for the Difficult Airway Algorithm

- Standardized Environments I, Levels I
 - Operating Room Theater I (OR),
 - Intensive Care Unit I (ICU)
 - Emergency Room I (ER)
 - Surgical Medical Floor I
- Standardized Scenarios 1, Levels 1, and 12 scenario set with randomization
 - Can't Intubate 1
 - Can't Ventilate 1
 - Can't Intubate & Can't Ventilate 1
 - Obvious Upper Airway Occlusion 1

5. Simulation Mannequin-based Task Trainer

5.1. Percutaneous Cricothyrotomy Technique Skills Training :

- Difficult Airway Management Mannequin Training System (DAMMTS)
- Difficult Airway Algorithm & Rescue Cricothyrotomy (DAARC) Training Video

6. Game 2 Summative

6.1. Game-based Learning in Virtual Avatar Simulations

6.1.1. Cognitive Decisions for the Difficult Airway Algorithm

- Standardized Environments 2, Levels 2,
 - Operating Room Theater II (OR)
 - Intensive Care Unit II (ICU)
 - Emergency Room II (ER)
 - Surgical Medical Floor II
- Standardized Scenarios 2, Levels 2, and 12 scenario set with randomization
 - Can't Intubate 2
 - Can't Ventilate 2
 - Can't Intubate & Can't Ventilate 2
 - Obvious Upper Airway Occlusion 2

7. DAARC Game-based Learning System Scenario Set

Scenario 1	Ventilate successful	Patient	32 year old male, 72 inches, 180 kg
		Location	OR
Scenario 2	Masking	Patient	54 year old male, 68 inches 150 kg, Obese
	Cannot ventilate	Location	ER
	Intubation required		PMH: CAD Dx1
Scenario 3	Fixed upper airway foreign body	Patient	90 year old male
	Cannot ventilate	Location:	Emergency Department (ED)

Scenario 4	Cricothyrotomy	Patient	70 year old male
		Location	
Scenario 5	COPD with history of radiation for lymphoma	Patient	86 year old
		Location	Intensive Care Unit (ICU)
Scenario 6	LMA rescue	Patient	55 year old male
	Cannot ventilate	Location	
	cannot intubate		History of cirrhosis
Scenario 7	Can ventilate	Patient	70 year old female
	Can't intubate	Location	IR
Scenario 8	Cricothyrotomy	Patient	Patient 65 year old male ACLS
	Cannot ventilate	Location	
	Cannot intubate failed		
Scenario 9	LMA	Patient	55 year old female
		Location	
Scenario 10	Awake tracheotomy	Patient	Patient 70 year old male, 72 inches, 80 Kg
	Must Cric.	Location	ED Emergency Department

Scenario 11		Patient	54 year old male, 70 inches, 100kg
		Location	ED Emergency Department
Scenario 12		Patient	65 year old Female, 68 inches, 80kg
		Location	ICU Intensive care unit

Appendix 3

Performance Work Statement for National Simulation Center Virtual Greeter

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1.0 Executive Summary

The Veterans Health Administration Simulation Learning, Education and Research Network (SIMLEARN) is in the process of developing a world class 52,000 ft² national simulation and training center in the Lake Nona Medical City complex in Orlando. The center is planned as a state of the art education and training facility and will showcase new technologies that will support improved Veteran's care.

This contracting effort will provide a multi-purpose and technologically advanced game based reception Avatar in the lobby of the new National Simulation Center (NSC). This intelligent greeter will virtually meet visitors and provide them the focused information that they need to either get to the right location on the Orlando Veterans Administration Medical Center Complex or to get registered for and locate an NSC class. The avatar will be positioned on computer kiosks or via holographic imagery, if affordable, in the lobby of the NSC and in other locations for the convenience of the visitor.

The avatar greeter will verbally welcome guests to the facility and provide customized information for each visitor. The visitor may need directions to a location on the greater Veterans Administration campus or just need to register for a class at the NSC. The avatar will provide those services pleasantly and without the need for a human in the loop. The avatar will incorporate the latest in natural language and animation technology.

2.0 Background/Rationale

The National Simulation Center is intended to be a showcase and proving ground for simulation and gaming science. The avatar greeter represents cutting edge technology that reaches beyond just the NSC. The technology shows potential for improvement of simulation training delivery and conduct of training debriefs. It is anticipated that the avatar technology has applicability to increasing patient access to care. The avatar could, in future, provide the patient a virtual interface to providers to convey initial information and also track patient self-maintenance (at-home physical therapy, etc.) and current health status. The NSC is chartered to explore/research the latest in simulation technology and the avatar provides a useable platform for exploring the technology. The greeter provides another value to the organization as it provides a receptionist and takes the burden of greeting off the human staff, so that they can focus on their more essential tasks.

3.0 Purpose

The NSC avatar greeter will identify the approach of a visitor using movement sensors and proactively greet (say hello) any visitor to the facility. The avatar will then determine the purpose for the visit and provide assistance. The preponderance of visitors is expected to be either Veterans who have become misdirected on the Orlando VA Medical Center campus or NSC guests/students. The avatar will be capable of providing directions to the correct facility on the VA campus, notifying the correct NSC individual of the arrival of guests or register and direct the student to the correct classroom in the facility.

4.0 Scope

The avatar will interact with scheduled and unscheduled visitors to the NSC and provide an interactive experience for all. The requirement is for a fully functional avatar greeter that will showcase state of the art capabilities and improve responses. Over time, based on user experiences, the avatar will develop additional appropriate responses. The avatar will assist the NSC in determining user acceptance of an avatar based application. The avatar will primarily be used on kiosks in the NSC lobby but will also be portable to mobile platforms for student preregistration. The primary language will be American English.

5.0 Requirement

5.1 General Description

The Veterans Health Administration SimLEARN requires an enterprise license for a virtual intelligent greeter for the new simulation facility being built on the Orlando VA Medical Center (VAMC) campus - Lake Nona Medical City complex. The avatar will be capable of providing visitors an interactive conversational experience and provide motion sensing, information, maps and directions, directory services, class registration and connect to external services such as in facility directories, registration software and schedules. The avatar will use a motion sensor to identify when a visitor approaches and pleasantly greet and solicit from them the purpose for their visit. The avatar will then respond with the appropriate information and or registration interface, and provide a friendly farewell salutation once the visitor has been satisfactorily informed. The avatar will process natural language and respond appropriately. The avatar will also be capable of learning new responses based on interactions with visitors, visitor surveys and external inputs.

5.2 Target Audience – any visitor to the NSC, here are some example visitors:

5.2.1 The misoriented Veteran enters the NSC and requires directions or directory information for a specific location on the VAMC campus.

5.2.2 An NSC student enters the NSC and needs registration and directions to the applicable classroom.

5.2.3 A visitor enters the NSC and the avatar greets the visitor, determines their purpose and contacts the appropriate NSC personnel while queuing up a SimLEARN video to entertain and inform the visitor while they wait.

5.3 Role-play – The intelligent avatar will role-play a friendly receptionist and handle a variety of visitor queries and issues.

5.4 Avatar Graphical Representation – The avatar's graphical representation will be as human-like as possible with common gestures, facial expressions and other animations to convey a life-like, warm and welcoming 'face' for the NSC.

6.0 Period/Place of Performance and Travel

6.1 Period of Performance

6.1.1 The base period of performance shall be one (1) year from date of award.

6.1.2 Any work at the Government site shall not take place on Federal holidays or weekends unless directed by the Contracting Officer (CO).

6.1.3 There are ten (10) Federal holidays set by law (USC Title 5 Section 6103) that VA follows:

6.1.1.1 Under current definitions, four are set by date:

New Year's Day	January 1
Independence Day	July 4
Veterans Day	November 11
Christmas Day	December 25

6.1.1.2 If any of the above falls on a Saturday, then Friday shall be observed as a holiday. Similarly, if one falls on a Sunday, then Monday shall be observed as a holiday.

6.1.4 The other six are set by a day of the week and month:

Martin Luther King's Birthday	Third Monday in January
Washington's Birthday	Third Monday in February
Memorial Day	Last Monday in May
Labor Day	First Monday in September
Columbus Day	Second Monday in October
Thanksgiving	Fourth Thursday in November

6.2 Place of Performance Tasks under this contract shall be primarily performed at the Contractor's facilities.

6.3 Travel The Government anticipates travel under this effort to perform the tasks associated with the effort, as well as to attend program-related meetings or conferences through the period of performance. The contractors shall travel up to four times throughout the period of performance. The location of these trips shall be Orlando, Florida.

All travel must be approved in advance by the COR and recorded in a travel register. Travel and per diem shall be reimbursed in accordance with Federal Travel Regulations. Local travel within a 50-mile radius from the Contractor's facility is considered the cost of doing business and will not be reimbursed. This includes travel, subsistence, and associated labor charges for travel time. Travel performed for personal convenience and daily travel to and from work at the Contractor's facility will not be reimbursed. Travel, subsistence and associated labor charges for travel time for travel beyond a 50-mile radius of the Contractor's facility are authorized on a

case-by-case basis and must be preapproved by the COR. The travel cost will be reimbursed at cost. Contractor shall provide receipts for all travel expenses.

7.0 Specific Tasks and Deliverables

The services contemplated under this contract include front end analysis, design, development, integration, test, management, documentation, delivery, implementation and all that may be necessary to complete the project. All requirements, tasks and deliverables apply to the contractor and all subcontractors awarded under this contract.

7.1 Visual Space – The setting for the avatar will be similar to the NSC which is a representation of a generic VA hospital.

7.2 Avatar Features – The avatar will be outfitted as a medical professional in a lab coat or Allied Health uniform.

7.3 Fidelity – The game content will, as close as possible, represent actual artifacts found in a hospital lobby. (color, sound, lighting, audio, and ambient noise)

7.4 Artificial Intelligence – The avatar will identify the presence of a visitor using a motion sensor. The avatar will also be capable of machine learning and add learned content/responses based on conversation exchanges, surveys or external inputs.

7.5 Tasks

7.5.1 Contract Project Management

7.5.1.1 Project Master Schedule

The Contractor shall deliver a Project Master Schedule that defines the Contractor's timeline and tools to be used in execution of the contract/order. The schedule should be delivered in graphic format that displays the schedule, milestones, risks and resource support. The initial baseline shall be concurred upon and updated monthly thereafter. The Contractor shall update and maintain the VHA Project Manager (PM) approved schedule throughout the period of performance.

7.5.1.2 Deliverable:

- Project Master Schedule

7.5.2 Reporting Requirements

7.5.2.1 The Contractor shall present the initial baseline Project Master Schedule for concurrence as part of a contract Kick-Off Meeting. The Schedule will track the development of game based products identified by the Government and report monthly to VHA Gaming Project Manager. Meeting minutes from the Kick Off Meeting discussions shall be prepared by the Contractor.

7.5.2.2 The Contractor shall provide the Contracting Officer's Representative (COR) with Monthly Progress Reports in electronic form in Microsoft Word and Project formats. The report shall include detailed instructions/explanations for each required data element, to ensure that data is accurate and consistent. These reports shall reflect data as of the last day of the preceding Month.

7.5.2.3 The Monthly Progress Reports shall cover all work completed during the reporting period and work planned for the subsequent reporting period. The report shall also identify any problems that arose and a description of how the problems were resolved. If problems have not been completely resolved, the Contractor shall provide an explanation including their plan and timeframe for resolving the issue. The Contractor shall monitor performance against the Schedule and report any deviations. VHA SimLEARN expects that the Contractor will keep in communication accordingly so that issues that arise are transparent to both parties to prevent escalation of outstanding issues.

7.5.2.4 Deliverables

7.5.2.4.1 Kick-Off Meeting Minutes

7.5.2.4.2 Monthly Progress Report

7.5.3 Avatar Software The Contractor shall develop the avatar software in accordance with recognized industry gaming standards and internally documented processes. The design shall incorporate features that promote ease of operation, ease of software maintenance, ease of future updates and modifications, data void work around, and any smart designs that can justify a reduction in the amount of documentation. Computer programs and computer data system shall be fully integrated in accordance with the system specification and Veterans Administration information technology and assurance restrictions in Addendum A and B. The Contractor shall conduct market surveillance and market investigations, in order to maximize the procurement of commercial and non-developmental software. The Contractor shall maintain a software Controlled Development Environment that complies with the industry standards. The Contractor shall employ well-defined security policy models, structured, disciplined, and rigorous hardware and software development techniques, and sound system/security engineering principles.

7.5.3.1 Software Requirements and Architecture Development and Review

The Contractor shall develop software requirements in accordance with the Veterans Administration (VA) information technology network architecture, hardware, and software requirements. For maximum utility across the VA and Veteran's Health Administration (VHA) Enterprise, the games will be hosted on VA servers accessible via a browser but be portable to use on a mobile platform – tablet or phone. The VHA uses Microsoft Internet Explorer web browser version 11 on OS Windows 7 enterprise 64bit Service Pack 1, DirectX runtime version 11.0, Graphics Card Nvidia 4200M, Driver version 327.62 on a Dell Intel i5 computer with 4GB RAM.

The Contractor is encouraged to suggest revisions to government requirements where such revisions would result in cost or schedule reduction or performance improvements. The Contractor shall define and record the operational concept for the gaming system, and define and record the architectural design of the gaming system (identifying the components of the system, their interfaces, and a concept of execution among them) and the traceability between the avatar components and requirements. As part of this activity, the contractor shall work within the Integrated Product Team (IPT) to iterate the system and System-of-System (SoS) software requirements and architecture. Based upon analysis of system requirements, system design, and other considerations, the contractor shall define and record the software requirements to be met by each software item, the methods to be used to ensure that each requirement has been met, and the traceability between the avatar software item requirements and avatar system requirements.

7.5.3.2 Software Design and Implementation

The Contractor shall design and develop Avatar software, perform unit testing, and integrate software components (with each other and with hardware components) to meet avatar system requirements. Software design includes not only design to requirements, but selection of existing software products including open source software to meet avatar requirements, and iterating the requirements to allow use of existing products. The game design and implementation will follow the Storyboard, Prototypes, Alpha, Beta, and Gold Go-Live testing strategy.

- 7.5.3.2.1 Storyboards - Contractor shall develop storyboard capturing requirements outlined in the statement of need or as provided by the end user. Contractor shall include the appropriate SMEs both internal and Government during storyboard development. Contractor shall submit Storyboard for review and final approval by the Government prior to Prototyping and entering into Alpha Testing. Storyboard development timeline will be capture in the schedule.
- 7.5.3.2.2 Scenarios – Contractor shall develop 12 high-fidelity difficult airway scenarios that provide the target audience experiential learning opportunities to apply temporal-based decision making technical

skills in stressful and emotional situations that stimulate an emergent difficult airway response and possible surgical rescue cricothyrotomy interventions.

7.5.3.2.3 Game Elements – DAARC Game1 and Game 2 front end game elements overlay a series of gamified high fidelity cricothyrotomy medical simulations.

7.5.3.2.4 Alpha Test Procedure/Testing - Contractor shall conduct an Alpha review prior to any Alpha testing. Alpha review will consist of providing the Government and Subject Matter Experts with Avatar script prior to development of the Beta Test Procedures. Contractor shall outline in the script the game look, feel and how the playing mechanics satisfy the learning objectives. Alpha review and testing timeline will be captured in the schedule.

7.5.3.2.5 Beta Test Procedures/Testing - Contractor should develop and submit for review Beta Test Procedures to the Government. The Government will identify participants to include in the Beta testing.. Beta testing timeline will be captured in the schedule.

7.5.3.2.6 Completed Game 1 formative end-state and Game 2 summative end-state Gold Versions. The contractor shall submit a Game 1 Gold version final end state and a Game 2 Gold version final end state for review as outlined in Addendum C.

7.5.3.3 Deliverables

7.5.3.3.1 Design Document for Avatar

7.5.3.3.2 Storyboards

7.5.3.3.3 Scenario Design

7.5.3.3.4 Alpha Test Procedures for Avatar

7.5.3.3.5 Alpha Version for Avatar

7.5.3.3.6 Beta Test Procedures for Avatar

7.5.3.3.7 Beta Version for Avatar

7.5.3.3.8 Completed Avatar with tutorials

8.0 Hardware and Software Integration

The Contractor shall perform all activities to integrate and assemble the hardware and software to achieve a fully functional avatar system, with all support systems. The contractor shall deliver the optimal hardware performance specifications for the operational avatar capabilities. For maximum utility across the VA and Veteran's Health Administration (VHA) Enterprise, the games will be hosted on VA servers accessible via a browser but be portable to use on a mobile platform – tablet or phone. The VHA uses Microsoft Internet Explorer web browser version 11 on OS Windows 7 enterprise 64bit Service Pack 1, DirectX runtime version 11.0, Graphics Card Nvidia 4200M, Driver version 327.62 on a Dell Intel i5 computer with 4GB RAM.

9.0 Testing

The Contractor shall verify the complete integration of the Gaming Product through the utilization of test procedures. Test Procedures shall be developed and implemented prior to Alpha testing and as part of the Storyboard development and review.

10.0 Security System

Security System compatibility and compliance shall be established for any Gaming product that touches the VA Network directly or indirectly or has the capability to connect, providing network administrators and security personnel with mechanisms to prevent, detect, track, report, and remediate malicious computer-related activities and incidents across all VA networks and information systems as outlined in Addendum A and B, if applicable. The contractor should comply with 508 requirements, if possible, as outlined in Addendum A.

11.0 Quality Assurance (QA)

The contractor shall implement a QA program using industry-accepted best practices that comply and is accordance with the contractor's internal processes to ensure the system requirements are met. The contractor shall utilize measurement points that will provide maximum visibility into processes. The contractor shall select the proper methods to analyze these processes to continuously improve the system.

ADDENDUM A

Cyber and Information Security Requirements for VA IT Services

The Contractor shall ensure adequate LAN/Internet, data, information, and system security in accordance with VA standard operating procedures and standard PWS language, conditions, laws, and regulations.³ The Contractor's firewall and web server shall meet or exceed VA minimum requirements for security. All VA data shall be protected behind an approved firewall. Any security violations or attempted violations shall be reported to the VA Program Manager and VA Information Security Officer as soon as possible. The Contractor shall follow all applicable VA policies and procedures governing information security, especially those that pertain to certification and accreditation.

Each documented initiative under this contract incorporates the security clause VAAR 852.273-75 by reference as though fully set forth therein, as well as the VA Handbook 6500.6, "Contract Security," March 12, 2010, in its entirety. Both the security clause VAAR 852.273-75 and the VA Handbook 6500.6, "Contract Security" shall also be included in every related agreement, contract or order.

Training requirements: The Contractor shall complete all mandatory training courses identified on the current external VA training site, the Employee Education System (EES), and will be tracked therein. The EES may be accessed at <https://www.ees-learning.net/librix/loginhtml.asp?v=librix>. If the decision is made by the local Program Office to provide the Contractor a VA Talent Management System (TMS) account, the Contractor shall use the VA TMS to complete their mandatory training, accessed at <http://www.insidetms.va.gov/>

Contractor employees shall complete a VA Systems Access Agreement if they are provided access privileges as an authorized user of the computer system of VA.

VA Enterprise Architecture Compliance

The applications, supplies, and services furnished under this contract must comply with One-VA Enterprise Architecture (EA), available at <http://www.ea.oit.va.gov/index.asp> in force at the time of issuance of this contract, including the Program Management Plan and VA's rules, standards, and guidelines in the Technical Reference Model/Standards Profile (TRMSP). The VA reserves the right to assess contract deliverables for EA compliance prior to acceptance.

VA Internet and Intranet Standards:

The Contractor shall adhere to and comply with VA Directive 6102 and VA Handbook 6102, Internet/Intranet Services, including applicable amendments and changes, if the Contractor's work includes managing, maintaining, establishing and presenting information on VA's Internet/Intranet Service Sites. This pertains, but is not limited to: creating announcements; collecting information; databases to be accessed, graphics and links to external sites.

³ See VAAR 852.273-75 referenced *infra*.

Internet/Intranet Services Directive 6102 is posted at (copy and paste the following URL to browser): http://www1.va.gov/vapubs/viewPublication.asp?Pub_ID=409&FType=2

Internet/Intranet Services Handbook 6102 is posted at (copy and paste following URL to browser): http://www1.va.gov/vapubs/viewPublication.asp?Pub_ID=410&FType=2

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Section 508 – Electronic and Information Technology (EIT) Standards:

The Section 508 standards established by the Architectural and Transportation Barriers Compliance Board (Access Board) are incorporated into, and made part of all VA orders, solicitations and purchase orders developed to procure Electronic and Information Technology (EIT). These standards are found in their entirety at: <http://www.section508.gov> and <http://www.access-board.gov/sec508/standards.htm>. A printed copy of the standards will be supplied upon request. The Contractor shall comply with the technical standards as marked:

- ☒ § 1194.21 Software applications and operating systems
- ☒ § 1194.22 Web-based intranet and internet information and applications
- ☒ § 1194.23 Telecommunications products
- ☒ § 1194.24 Video and multimedia products
- ☒ § 1194.25 Self-contained, closed products
- ☒ § 1194.26 Desktop and portable computers
- ☒ § 1194.31 Functional Performance Criteria
- ☒ § 1194.41 Information, Documentation, and Support

The standards do not require the installation of specific accessibility-related software or the attachment of an assistive technology device, but merely require that the EIT be compatible with

such software and devices so that it can be made accessible if so required by the agency in the future.

Physical Security & Safety Requirements:

The Contractor and their personnel shall follow all VA policies, standard operating procedures, applicable laws and regulations while on VA property. Violations of VA regulations and policies may result in citation and disciplinary measures for persons violating the law.

1. The Contractor and their personnel shall wear visible identification at all times while they are on the premises.
2. The VA does not provide parking spaces at the work site; the Contractor must obtain parking at the work site if needed. It is the responsibility of the Contractor to park in the appropriate designated parking areas. The VA will not invalidate or make reimbursement for parking violations of the Contractor under any conditions.
3. Smoking is prohibited inside/outside any building other than the designated smoking areas.
4. Possession of weapons is prohibited.
5. The Contractor shall obtain all necessary licenses and/or permits required to perform the work, with the exception of software licenses that need to be procured from a Contractor or vendor in accordance with the requirements document. The Contractor shall take all reasonable precautions necessary to protect persons and property from injury or damage during the performance of this contract.

Confidentiality and Non-Disclosure

The Contractor shall follow all VA rules and regulations regarding information security to prevent disclosure of sensitive information to unauthorized individuals or organizations.

The Contractor may have access to Protected Health Information (PHI) and Electronic Protected Health Information (EPHI) that is subject to protection under the regulations issued by the Department of Health and Human Services, as mandated by the Health Insurance Portability and Accountability Act of 1996 (HIPAA); 45 CFR Parts 160 and 164, Subparts A and E, the Standards for Privacy of Individually Identifiable Health Information ("Privacy Rule"); and 45 CFR Parts 160 and 164, Subparts A and C, the Security Standard ("Security Rule").

Pursuant to the Privacy and Security Rules, the Contractor must agree in writing to certain mandatory provisions regarding the use and disclosure of PHI and EPHI.

1. The Contractor may have access to some privileged and confidential materials of VA. These printed and electronic documents are for internal use only, are not to be copied or released without permission, and remain the sole property of VA. Some of these materials are protected by the Privacy Act of 1974 (revised by PL 93-5791) and Title 38. Unauthorized disclosure of Privacy Act or Title 38 covered materials is a criminal offense.
2. The VA Contracting Officer will be the sole authorized official to release in writing, any data, draft deliverables, final deliverables, or any other written or printed materials pertaining to this contract. The Contractor shall release no information. Any request for information relating to this contract presented to the Contractor shall be submitted to the VA Contracting Officer for response.
3. Contractor personnel recognize that in the performance of this effort, Contractor personnel may receive or have access to sensitive information, including

information provided on a proprietary basis by carriers, equipment manufacturers and other private or public entities. Contractor personnel agree to safeguard such information and use the information exclusively in the performance of this contract. Contractor shall follow all VA rules and regulations regarding information security to prevent disclosure of sensitive information to unauthorized individuals or organizations as enumerated in this section and elsewhere in this Contract and its subparts and appendices.

4. Contractor shall limit access to the minimum number of personnel necessary for contract performance for all information considered sensitive or proprietary in nature. If the Contractor is uncertain of the sensitivity of any information obtained during the performance this contract, the Contractor has a responsibility to ask the VA Contracting Officer.
5. Contractor shall train all of their employees involved in the performance of this contract on their roles and responsibilities for proper handling and nondisclosure of sensitive VA or proprietary information. Contractor personnel shall not engage in any other action, venture or employment wherein sensitive information shall be used for the profit of any party other than those furnishing the information. The sensitive information transferred, generated, transmitted, or stored herein is for VA benefit and ownership alone.
6. Contractor shall maintain physical security at all facilities housing the activities performed under this contract, including any Contractor facilities according to VA-approved guidelines and directives. The Contractor shall ensure that security procedures are defined and enforced to ensure all personnel who are provided access to patient data must comply with published procedures to protect the privacy and confidentiality of such information as required by VA.
7. Contractor must adhere to the following:
 - a. The use of "thumb drives" or any other medium for transport of information is expressly prohibited.
 - b. Controlled access to system and security software and documentation.
 - c. Recording, monitoring, and control of passwords and privileges.
 - d. All terminated personnel are denied physical and electronic access to all data, program listings, data processing equipment and systems.
 - e. VA, as well as any Contractor (or Subcontractor) systems used to support development, provide the capability to cancel immediately all access privileges and authorizations upon employee termination.
 - f. Contractor PM and VA PM are informed within twenty-four (24) hours of any employee termination.
 - g. Acquisition sensitive information shall be marked "Acquisition Sensitive" and shall be handled as "For Official Use Only (FOUO)".
 - h. Contractor does not require access to classified data.
8. Regulatory standard of conduct governs all personnel directly and indirectly involved in procurements. All personnel engaged in procurement and related activities shall conduct business in a manner above reproach and, except as authorized by statute or regulation, with complete impartiality and with preferential treatment for none. The general rule is to strictly avoid any conflict of interest or even the appearance of a conflict of interest in VA/Contractor relationships.