Analysis and Design using Distributed Simulation Engineering and Execution Process (DSEEP) as a System Development Life Cycle of iLVC Simulators

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Abstract--- Military Simulation and Training (MS&T) Master Plan of Defense Technology Institution (DTI) has intended to build the next generation training simulators. In addition, these systems must be integrated and inter-operated under disparate distributed virtual environment. Dealing with single or multi-architecture for simulation environment, it is necessary that the best practice system engineering must be employed. Distributed Simulation Engineering and Execution Process (DSEEP) is a suitable standard for this purpose because it is formulated as a system development life cycle (SDLC) for MS&T. Thus, it is the objective in this paper to investigate how DSEEP can help the developers in building this type of simulator. Command Post Exercise (CPX) requirements are adopted as a problem domain, and analysis and design of the system will follow DSEEP steps. The work results will be analyzed and explained.

Keywords--- DSEEP;IEEE 1730-2010; SDLC; MASE; DIS; TENA; HLA; Simulation Environment; Member Application; Conceptual Model; Use Case; Collaboration Diagram

I. INTRODUCTION

DTI plans to R & D military training simulators started in the year 2016 [1] including the system such as armored personal carrier's training simulator, strategic wargame, disaster simulation, UAV flight simulator, and etc. These systems can be designed and developed individually based on user's requirements, but, according to DTI's plan, they also must be integrated and inter-operated in a distributed simulation environment (iLVC model) [2]. This creates many challenges for developers-e.g. representation challenge and implementation challenge [3]. The most significant one is the interoperability issues as explained in [4]. Thus, developers must ensure that the selected development process incorporates the solution to these issues.

In the architectural perspective, choosing single architecture for simulation environment seems to be a viable solution for all training simulators under developed at DTI. Nevertheless, single architecture is unfeasible since DTI has obligations not only developing its own systems but also integrating the existing and legacy systems from Thai armed force [2]. Thus, multi-architecture simulation environment (MASE) is inevitably the principal architecture at present, and the interoperability issue can be resolved by using either gateway or middleware that