MULTIAGENT SIMULATIONS FOR INTEROPERABILITY DURING DISASTER MANAGEMENT

A gaming and simulation framework for designing, testing and validating SOPs for disaster management.

OBJECTIVE

This project uses a gaming and simulation framework for designing, testing and validating Standard Operating Procedures (SOPs) for disaster management which adhere to the local institutional support frameworks, and are process and semantically inter-operable.

We use a gaming and computerized simulation methods in conjunction with each other for participatory design of interoperable standards for disaster management. Gaming methods provide a platform for experiential learning for the participants, and for validation of SOPs through what-if scenarios. Computerized simulations help test the efficacy of the shared vocabularies which is used by agencies involved in disaster management.
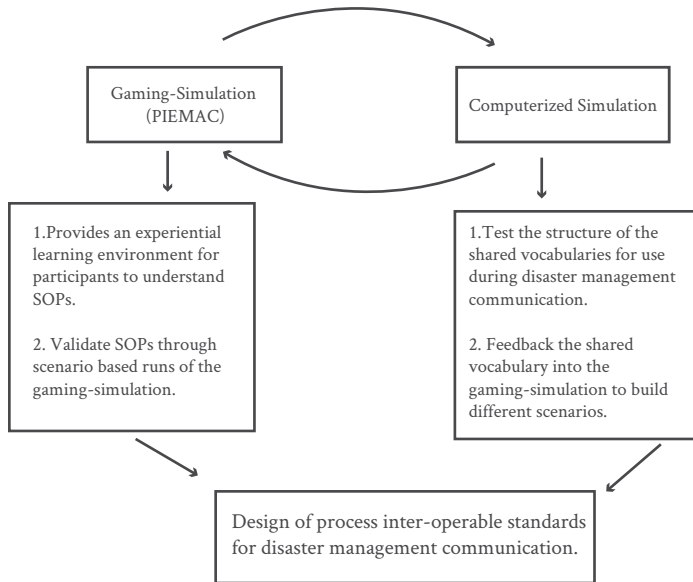
Intended Audience
Policy Makers

Keywords
SOP, policy, PIEMAC, shared vocabulary

APPROACH

To test Standard Operating Protocols and their operation during disaster management, we use games to collect data about messaging constructs – how do agencies communicate with each other? We then build a shared vocabulary for communication that the agencies can use for semantic interoperability. A shared vocabulary informs participants about who they can communicate with, what their message constructs ought to be, and what file format of communication they could use, among other things. Using the computerized simulations, we test the shared vocabularies under different disaster scenarios.

Multiagent Simulations for Interoperability During
Disaster Management
Simulations at Fields of View

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Gaming-Simulation          Computerized Simulation
    (PIEMAC)
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Gaming-Simulation (PIEMAC)

1. Provides an experiential learning environment for participants to understand SOPs.

2. Validate SOPs through scenario based runs of the gaming-simulation.

Computerized Simulation

1. Test the structure of the shared vocabularies for use during disaster management communication.

2. Feedback the shared vocabulary into the gaming-simulation to build different scenarios.

Design of process inter-operable standards for disaster management communication.

CASE STUDY

We developed a simulation tool to test the effect of use of shared vocabularies on communication during disaster management. The shared vocabularies were built using messages from sessions of the PIEMAC game. The computerized simulation developed was used to test the efficacy of this shared vocabulary under different disaster scenarios, and the simulation results were analysed to provide recommendations for effectively designing the shared vocabularies.

OUTPUT

This effort utilises PIEMAC as a crucial component in the framework, as a game for data collection. Two key outputs are the simulation itself, and recommendations for the Standard Operating Procedures.

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