

# Developing a Graphical CONOPS

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## Traditional CONOPS (circa 1960s)

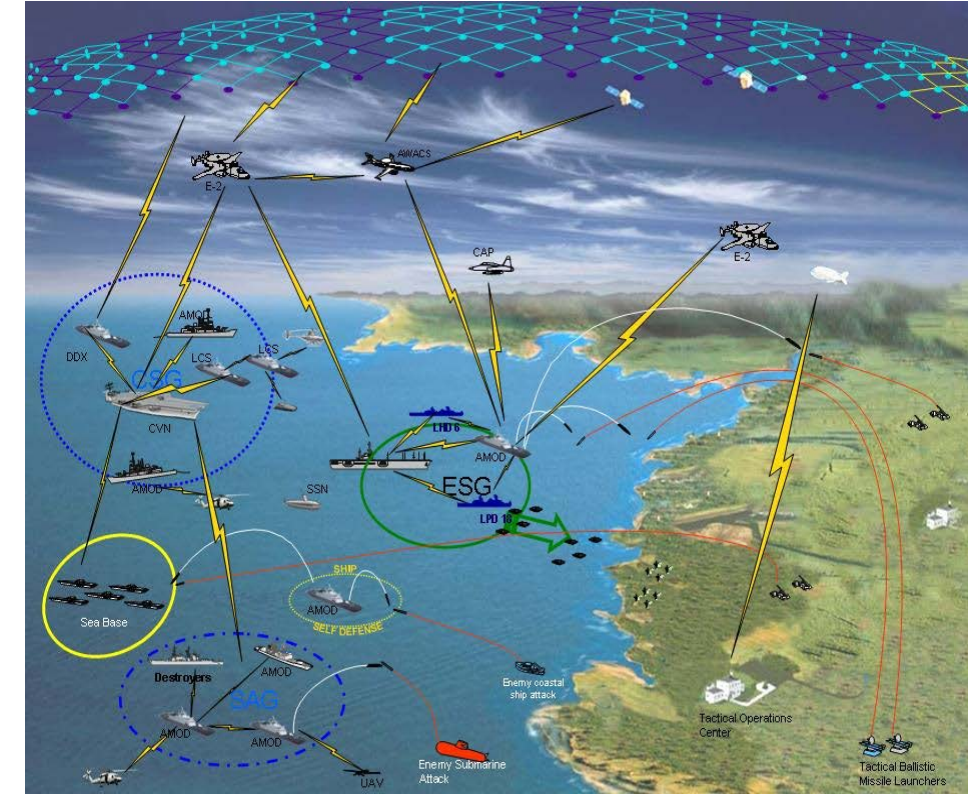
Textual  
CONOPS  
Standards

### Problems:

Takes a long time to create. Customer is not involved. Result is a static document  
Not interactive, not amenable to "what if" analysis



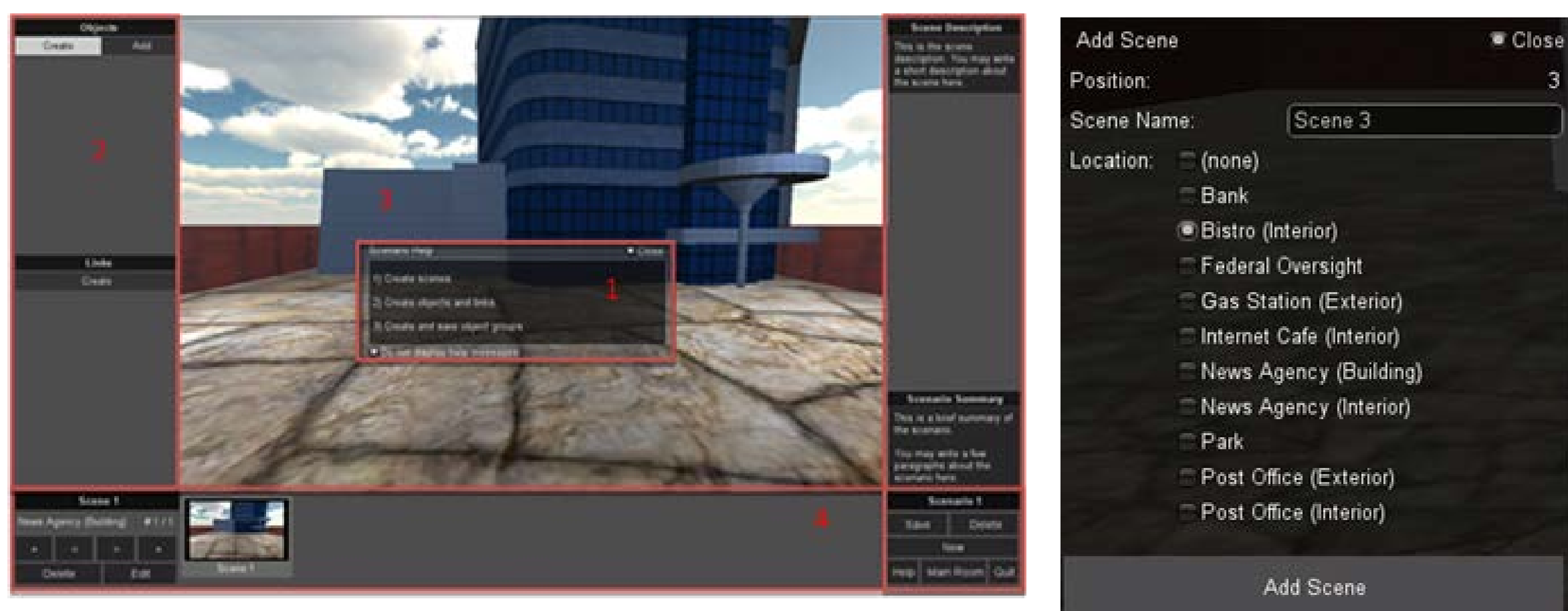
## "Graphical" CONOPS (circa 1990's)



### Problems:

Still takes a long time to create  
Result is static text and graphics  
Difficult to change  
No human roles are represented  
Even with pictures, it's still difficult to visualize

## Integrated Concept Engineering Framework (ICEF) for the 21<sup>st</sup> Century

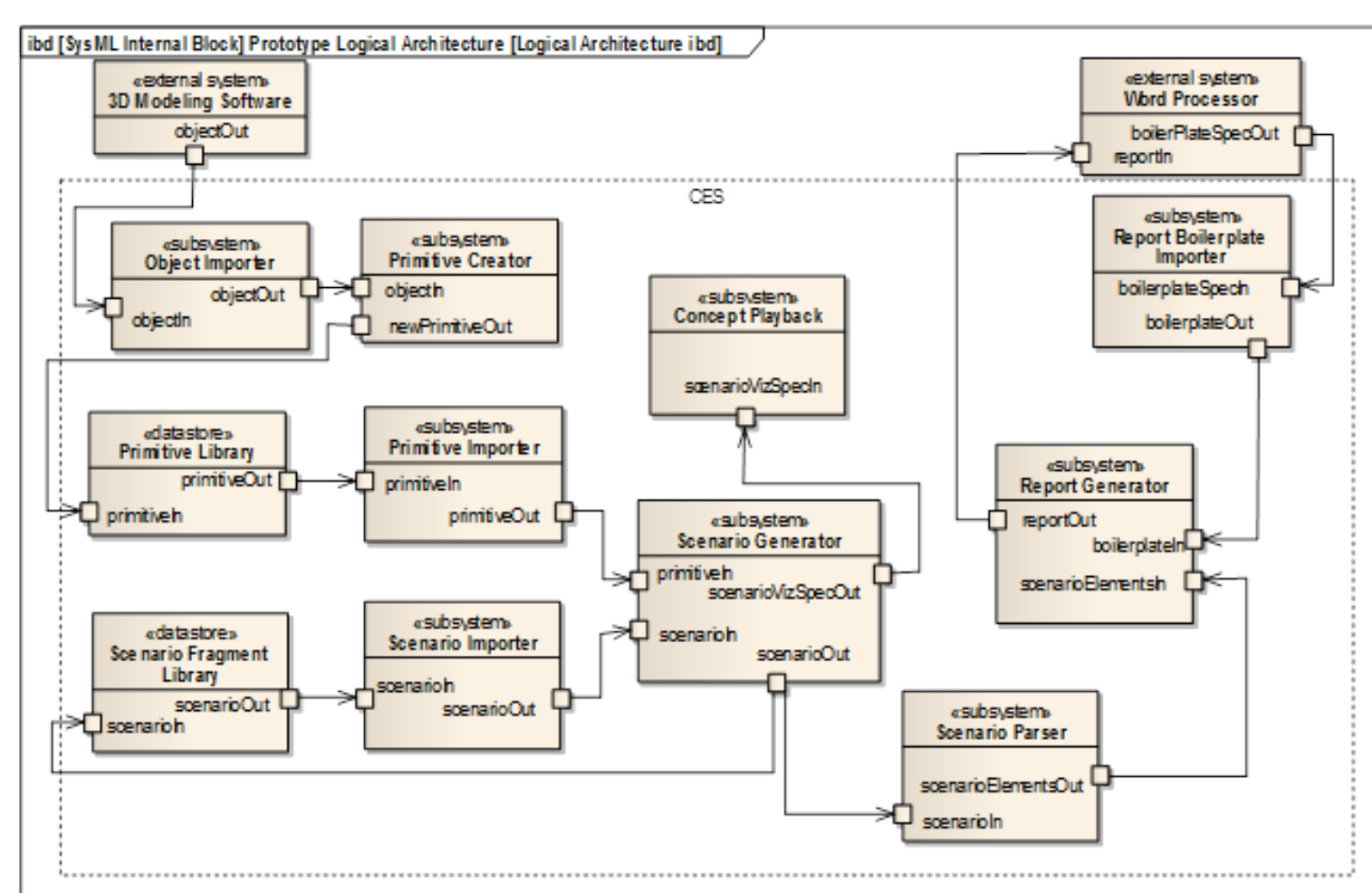


**Primary Research Question:** Can the process of CONOPS development and understanding be improved through the use of a "drag and drop" graphical user interface?

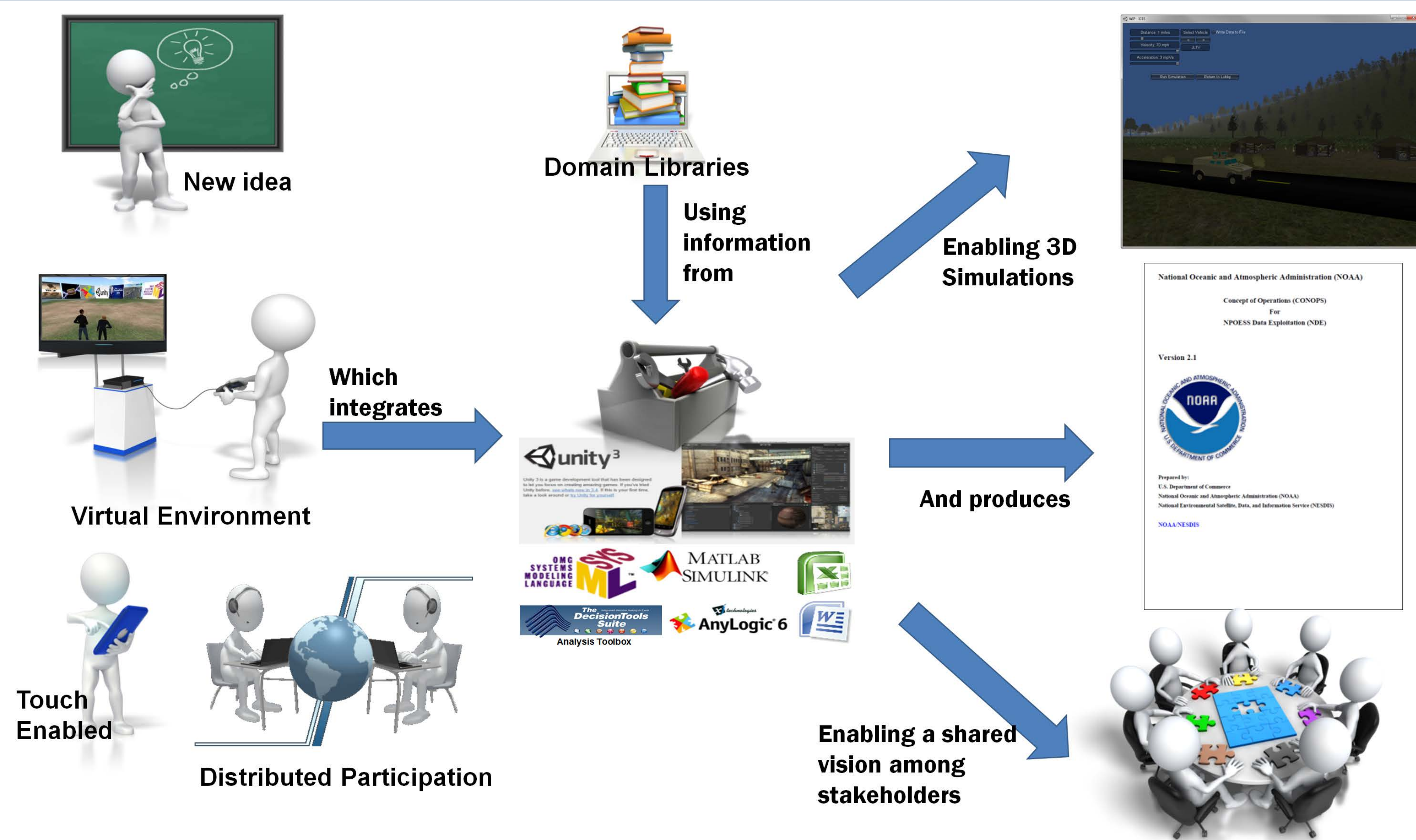
The Team developed an environment to test the hypotheses that:

1. A virtual concept engineering process (VCEP) will improve the operational scenario artifact of a CONOPS document

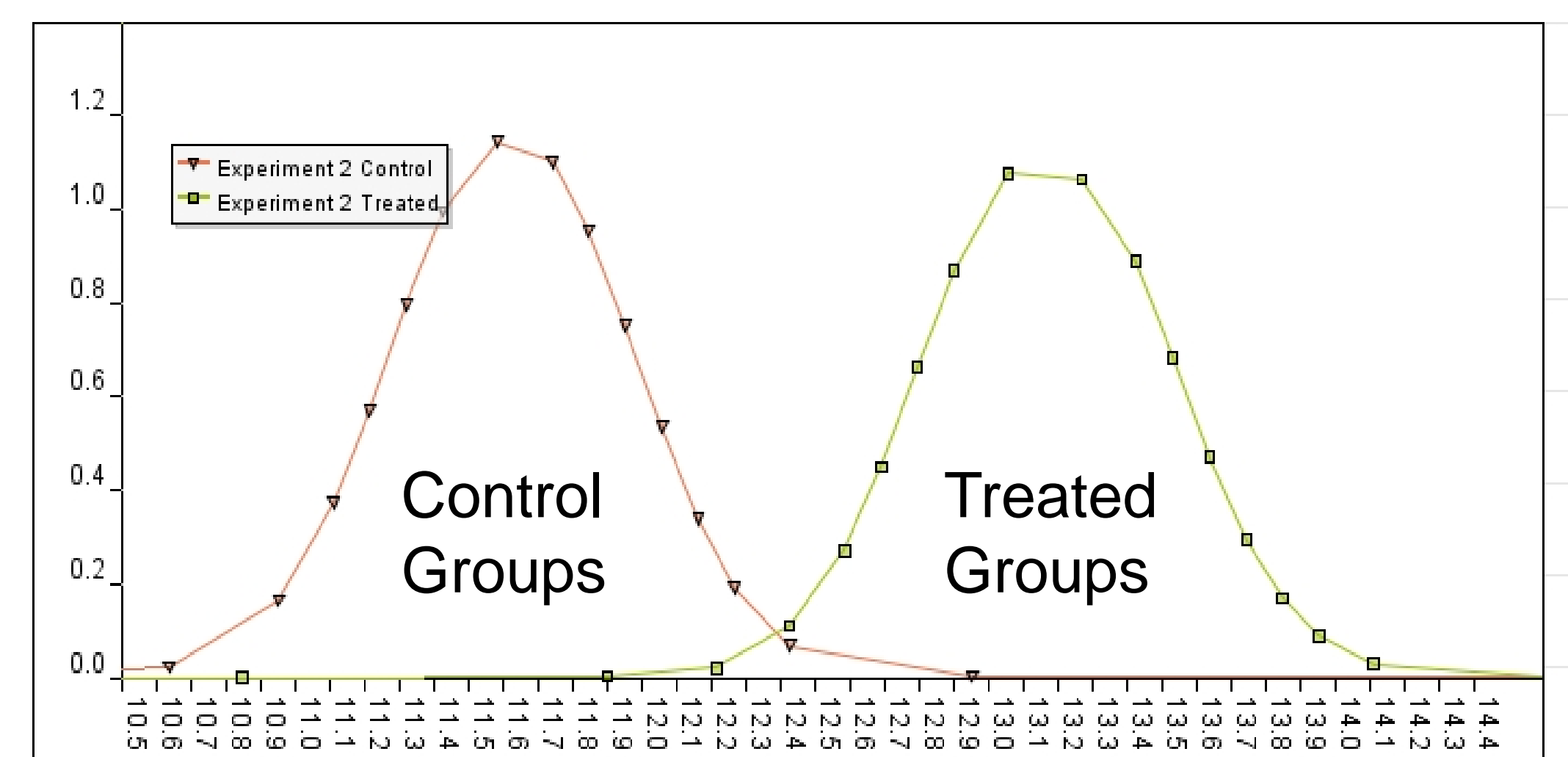
2. A virtual concept engineering process (VCEP) will improve collaboration during the development of the operational scenarios section of a CONOPS



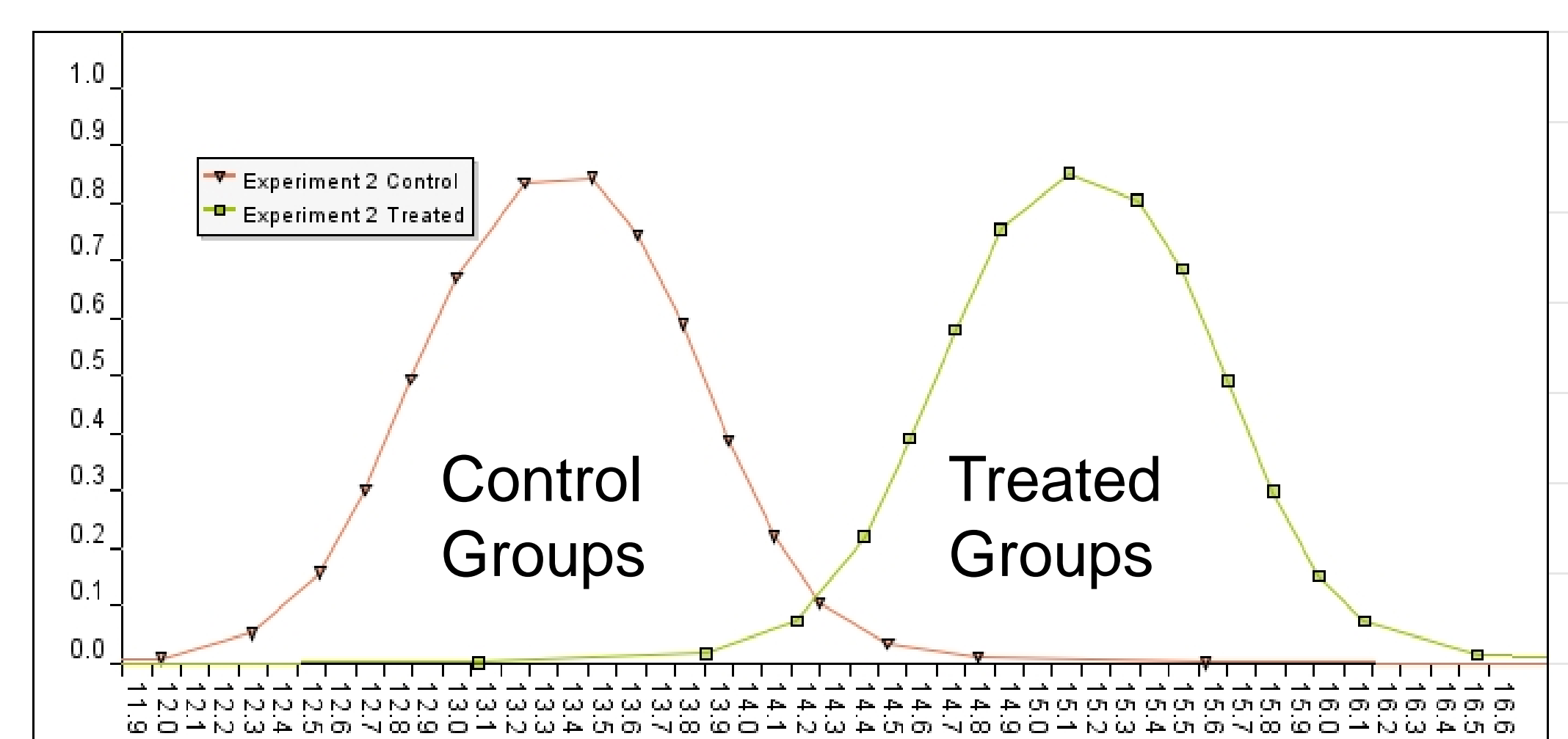
## Using the Concept Engineering Framework



## Research Results



Evidence shows a preference for VCEP approach over traditional CONOPS approach in terms of artifact quality\*



Evidence shows a preference for VCEP approach over traditional CONOPS approach in terms of collaboration quality\*

## Artifacts Produced as a Result of this Research

### Deliverables

#### Technical Reports & Software

1. ICEF Software Code
2. SERC-2011-TR-031-2
3. SERC-2013-TR-030-2
4. SERC-2011-TR-030
5. SERC-2011-TR-031
6. SERC-2010-TR-007
7. SERC-2009-TR-003

Additionally, this research produced one **Doctoral Dissertation** and one **Master's Thesis**

### Journals and Conference Papers

1. Korfiatis, P., Cloutier, R., Zigh, T. (2012). Graphical CONOPS Development to Enhance Model Based Systems Engineering, Third International Engineering Systems Symposium, CESUN 2012, Delft University of Technology, The Netherlands, 18-20 June 2012
2. Mostashari, A., McComb, S. A., Kennedy, D. M., Cloutier, R., & Korfiatis, P. (2012). Developing a stakeholder-assisted agile CONOPS development process. Systems Engineering, 15(1), 1-13

\* Korfiatis, Peter. (2013). Development of a Virtual Concept Engineering Process to Extend Model-Based Systems Engineering. Doctor Dissertation. Stevens Institute of Technology, Hoboken, NJ.