THE USE OF SERIOUS GAMES TO SUPPORT CONCEPT AND CAPABILITY DEVELOPMENT

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PURPOSE AND AGENDA

The purpose of this presentation is to:

- Introduce the idea of using games to support concept and capability development
- Briefly describe some potential benefits of using games to shape the future of the Army
- Describe what the U.S. Army has done recently
- Describe the potential uses across the community

Spark some thought and discussion about how we can innovate *better* using 21st Century tools.

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WHAT IS THE PROBLEM

- Warfare is becoming increasingly complex
- Opportunities to gain and maintain an 'overmatch' over our adversaries are fleeting
- Our ability to understand the impact of technology in concert with concepts of employment and force organization has been isolated to high-fidelity, expensive, time consuming, and often classified experiments
- Failed programs are too expensive to tolerate
- Soldiers know what they want, but don't know what can be done. Engineers know what can be done, but don't know what is needed.

We need an inexpensive way connect Soldiers to Technologists to rapidly explore future concepts with just enough fidelity to learn what we need to make smart decisions

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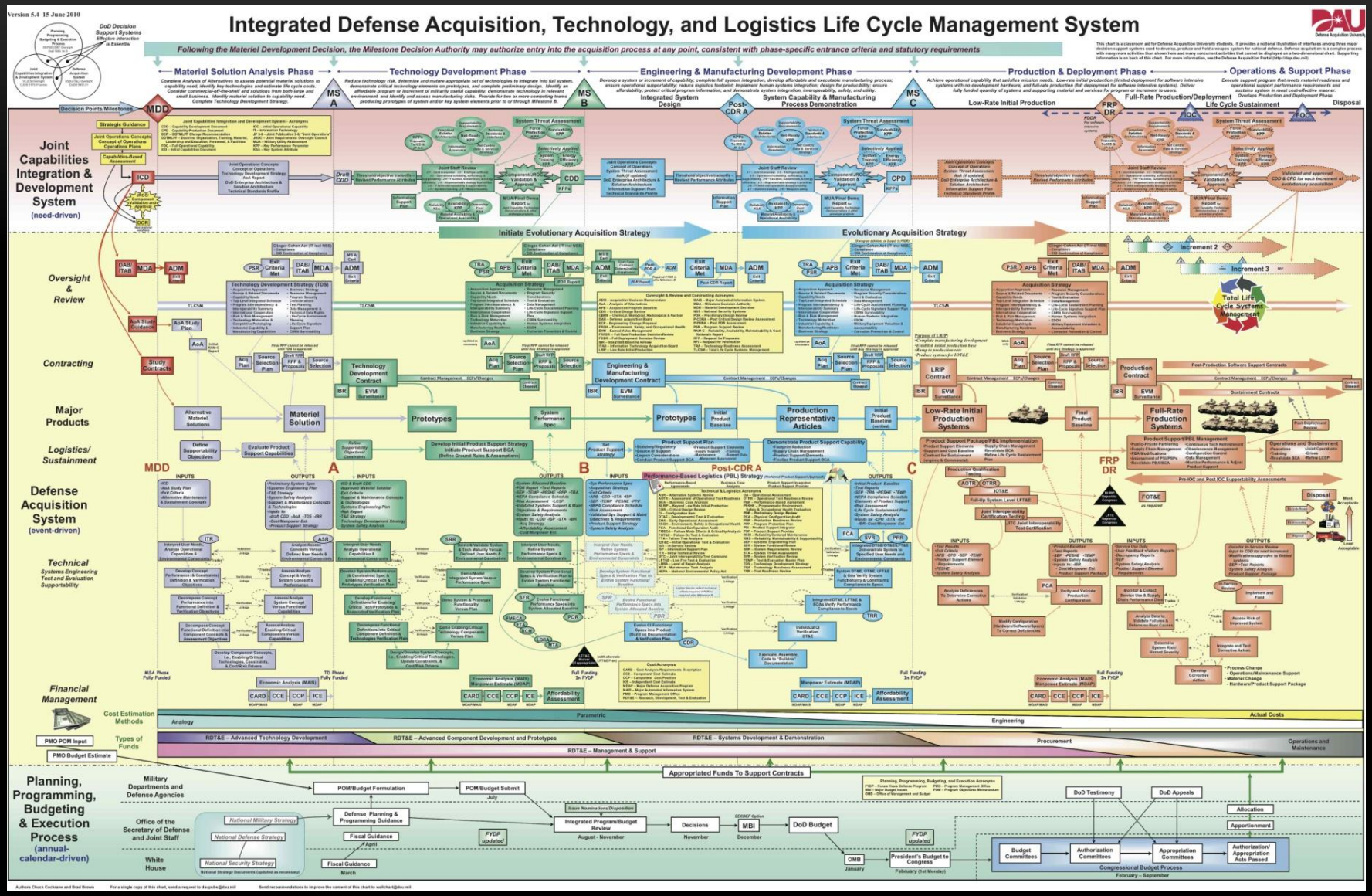
…AND ANOTHER PROBLEM…



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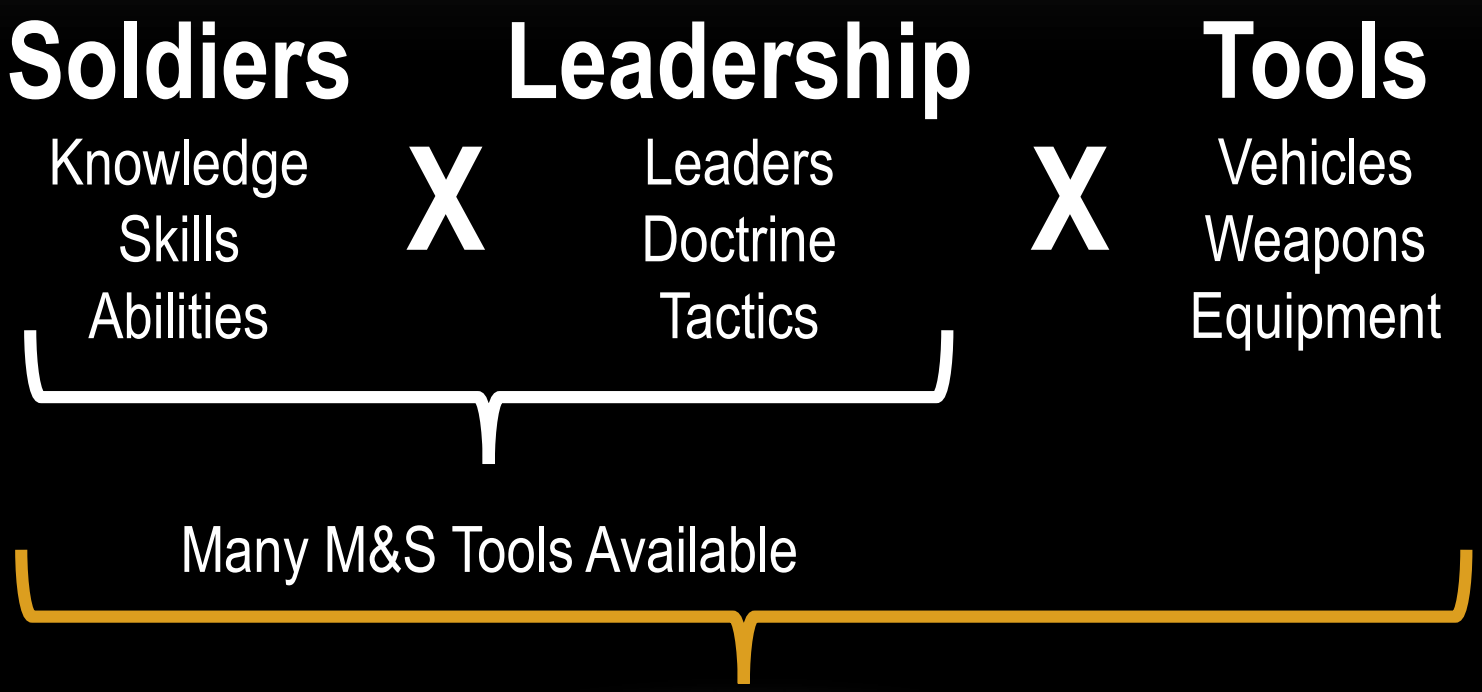
A FEW QUICK DEFINITIONS

- **Model**: A physical, mathematical or otherwise logical representation of a system, entity, phenomenon or process.
- **Simulation**: A method of implementing *model* over time (may or may not include humans in the loop)
- **Game**: A *simulation* that includes humans, rules, goals/objectives. Most common purpose is entertainment.
- **Serious Game**: A *game* that is intended for something else other than entertainment.

COMBAT EFFECTIVENESS AND M&S TOOLS AVAILABLE



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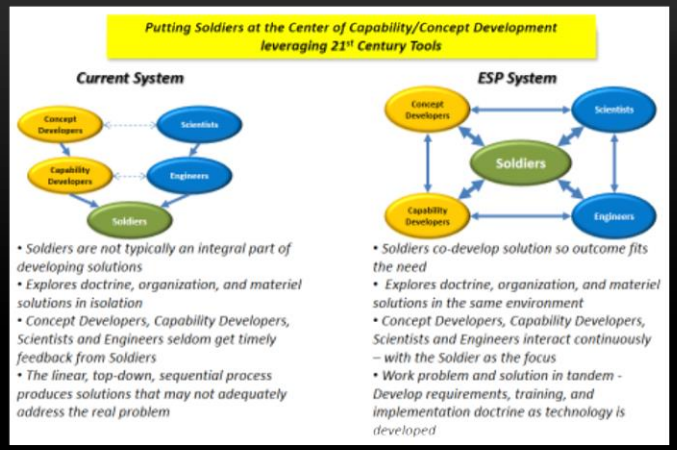
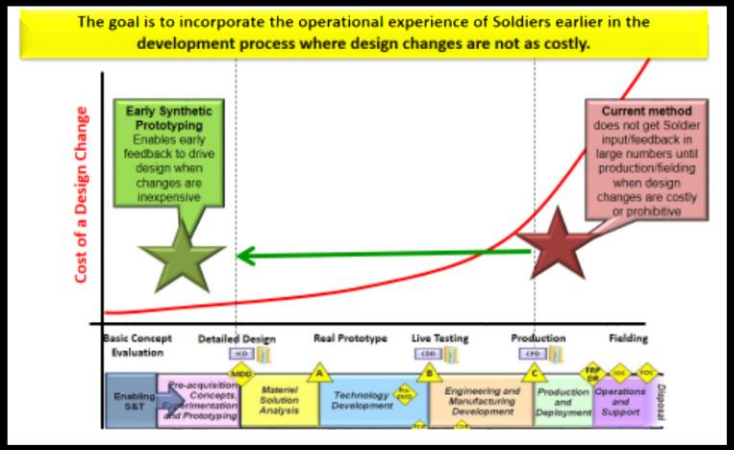
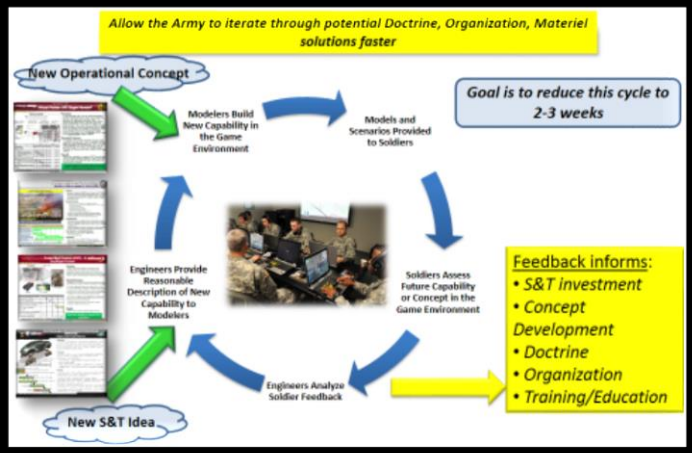
POTENTIAL BENEFITS



Soldiers at the Center of Capability Development



Explore options when design changes are the least expensive



Iterate through many doctrine, organization, materiel solutions in a shorter period of time

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EARLY SYNTHETIC PROTOTYPING VISION

Early Synthetic Prototyping (ESP) enables the Army to conduct 'early fidelity' exploration of Doctrine, Organization, and Materiel solutions in game environments to support the development of the future force.

ESP is comprised of three main components:

1 – Collaboration, feedback, and game analytic/post-experiment tools

- This is the main effort of Early Synthetic Prototyping.

2 – Game environment(s)

- A small unit, first-person shooter game environment to examine how Soldiers interact with individual pieces of equipment at a small unit level.
- A large unit, strategy game environment to examine how units composed of future capabilities are organized and employed on the battlefield.

3 – Distribution and network capability

- This is needed to deliver and host the game environment(s) and the feedback, collaboration and game analytic tools.

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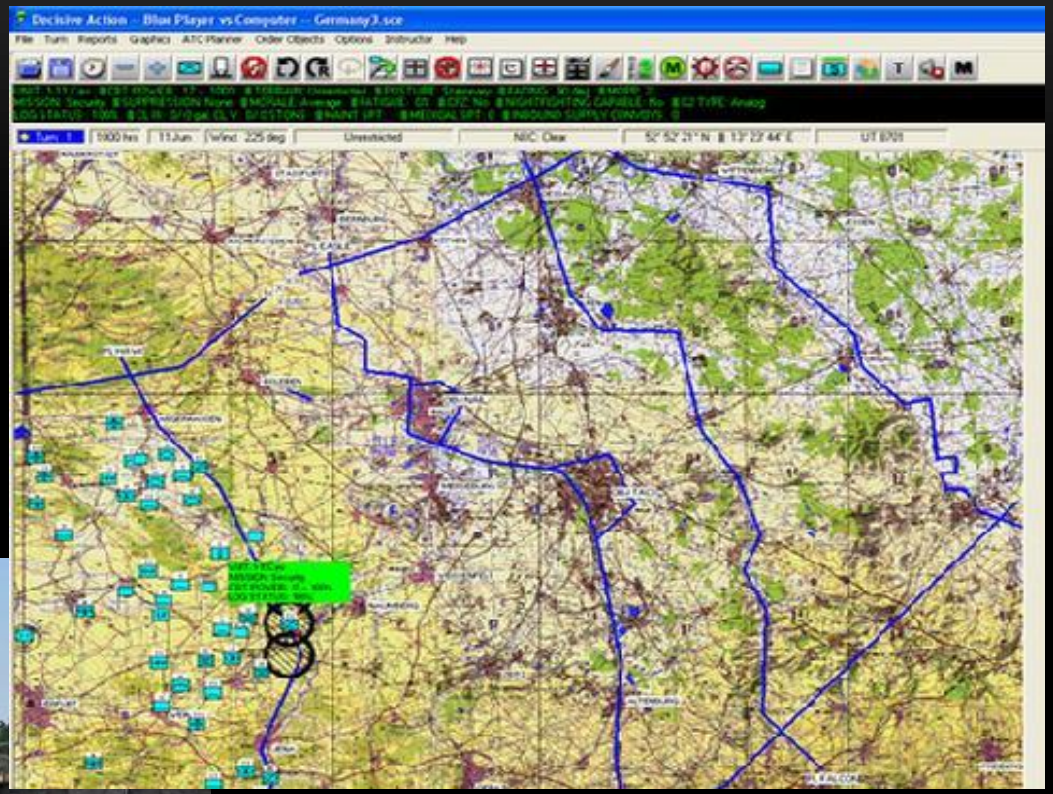
TWO GAME ENVIRONMENTS

First – Person Shooter



Turn-Based Strategy

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BUT WILL SOLDIERS PLAY IT?

- 85% of Soldiers play military-themed video games
- 50% of Soldiers play more than 10 hours per week
- Following a proof of concept test with Soldiers:
  - 80% would contribute to future efforts to develop or test ideas in a game environment
  - 78% would likely participate in their off-duty time
  - 86% would provide feedback at the end of their game play
  - 87% thought they could innovate in the game environment
  - 75% thought the game was immersive enough that results would correlate to the real world

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POTENTIAL BENEFITS TO THE COMMUNITY

- Low cost game environments can be used to explore interoperability challenges when design changes are inexpensive.
- Continuous experimentation could lead to better shared understanding of the problem, or at least identify where we 'agree to disagree.'
- Games can 'hide' classified/proprietary capabilities to protect national and industry sensitive research and development.
- Develop future capabilities to meet future needs, not today's needs.

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CHALLENGES AND BARRIERS

- Not all capabilities can be properly modeled in a game.
- Game analytics is currently focused on making commercial games more profitable. We need to better understand how to use game analytics.
- We need a better understanding about Soldier motivation to participate.
- We need a better understanding about the quality of Soldier feedback and its usefulness.
- Developing new tools and simulations is challenging. However, these challenges are not as great as changing the way people work. Therefore, the strongest barrier is our own organization's business rules.

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THE EARLY SYNTHETIC PROTOTYPING TEAM

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CONCLUSION

Innovation in the 21st Century requires 21st Century tools and techniques.

Game environments potentially holds the key to rapid, low-cost innovation that can enable Soldiers, scientists, engineers, academia, and industry to turn ideas into valued outcomes.

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QUESTIONS AND DISCUSSION

https://www.milsuite.mil/book/groups/early-synthetic-prototyping

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BACK UP SLIDES

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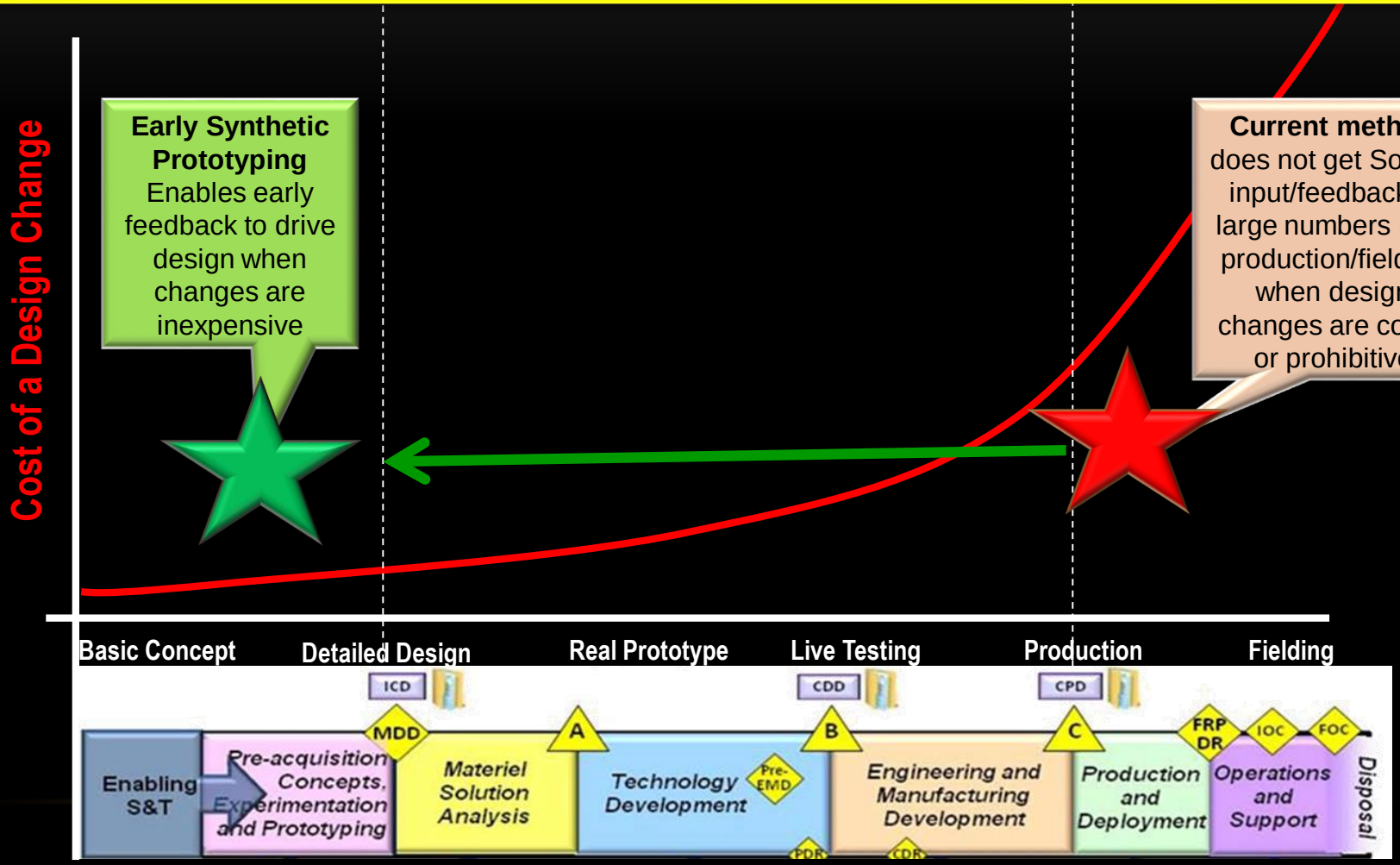
REDUCES RISK AND DEVELOPMENT COSTS

The goal is to incorporate the operational experience of Soldiers earlier in the development process where design changes are not as costly.



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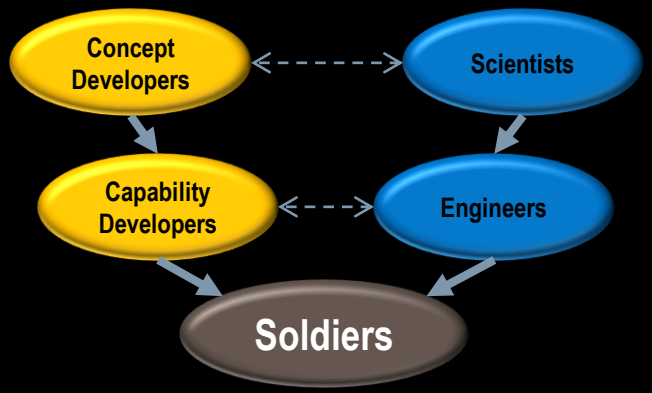
SOLDIERS AT THE CENTER OF CAPABILITY DEVELOPMENT

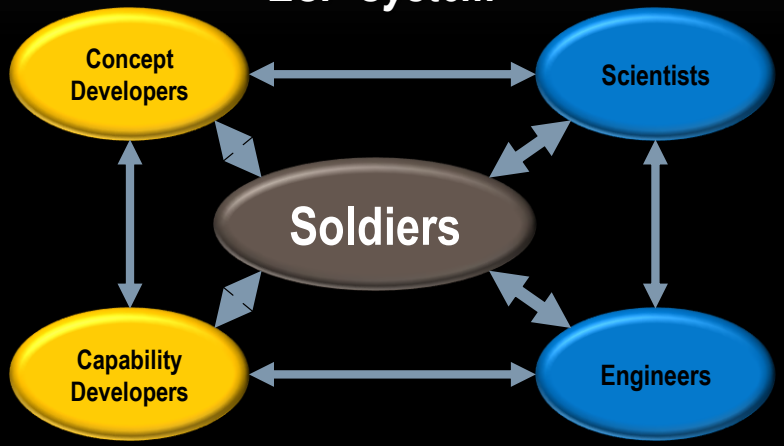
Putting Soldiers at the Center of Capability/Concept Development leveraging 21st Century Tools

Current System



- *Soldiers are not typically an integral part of developing solutions*
- *Explores doctrine, organization, and materiel solutions in isolation*
- *Concept Developers, Capability Developers, Scientists and Engineers seldom get timely feedback from Soldiers*
- *The linear, top-down, sequential process produces solutions that may not adequately address the real problem*

ESP System



- *Soldiers co-develop solution so outcome fits the need*
- *Explores doctrine, organization, and materiel solutions in the same environment*
- *Concept Developers, Capability Developers, Scientists and Engineers interact continuously – with the Soldier as the focus*
- *Work problem and solution in tandem - Develop requirements, training, and implementation doctrine as technology is developed*

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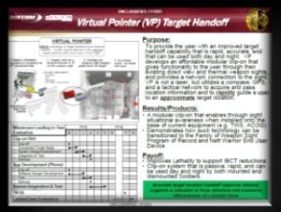
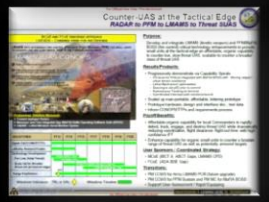
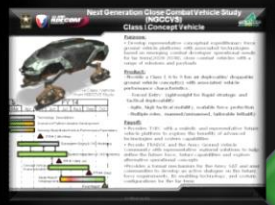
EARLY SYNTHETIC PROTOTYPING CYCLE

Allow the Army to iterate through potential Doctrine, Organization, Materiel solutions faster

New Operational Concept







New S&T Idea

Modelers Build New Capability in the Game Environment

Models and Scenarios Provided to Soldiers

Soldiers Assess Future Capability or Concept in the Game Environment

Engineers Analyze Soldier Feedback

Engineers Provide Reasonable Description of New Capability to Modelers

Goal is to reduce this cycle to 2-3 weeks

Feedback informs:

- *S&T investment*
- *Concept Development*
- *Doctrine*
- *Organization*
- *Training/Education*

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