



# A Perspective on Prototyping to Aid in the Formation of a Spiral Development Strategy

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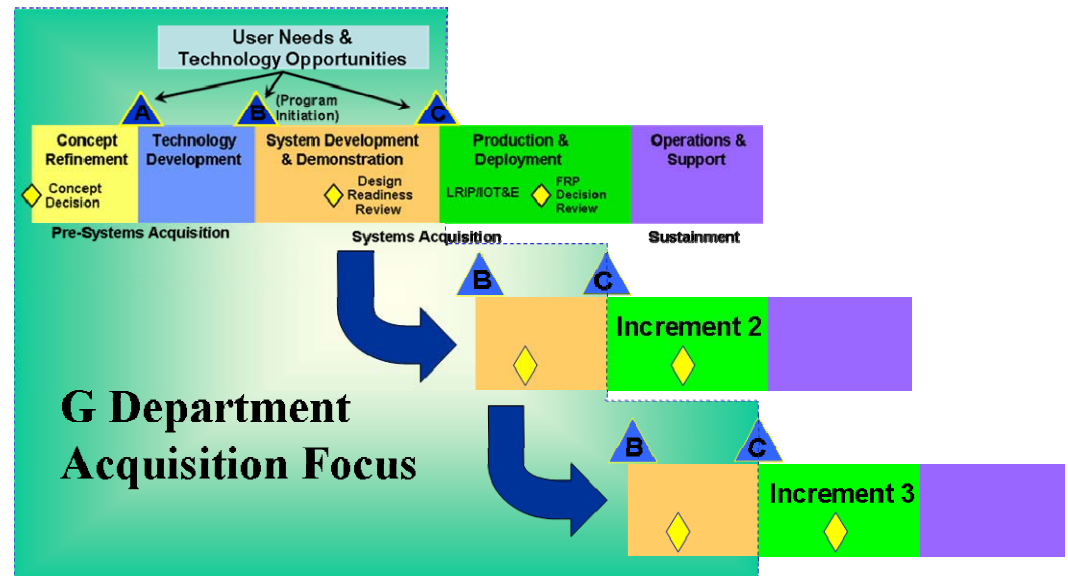
# Engagement Systems Department

## *MISSION:*

*To conduct analysis, research, development, test & evaluation, systems engineering and integration to field safe, innovative and cost effective engagement systems*

## Acquisition Focus:

- Technology Opportunities
- Pre-Systems Acquisition
- System Development and Demonstration





# Technology Opportunity – Example Gunslinger

## Purpose:

- Demonstrate and/or deploy hostile fire detection and counter-fire capability

## Military Relevance:

- Decreased Response Time
- Increased Situational Awareness

- Increased Return Fire Accuracy
- Enhanced Detection and Location

### **Spiral 1:** Integrated weapon and sensors on HMWVV

- Stationary capability. (Demonstration Capability)
- Evaluated in CONUS



### **Spiral 2:** Integrated Gunslinger Enclosure on MX-MTV

- On-The-Move capability
- (Deployed Capability)



### **Spiral 3:** Integrated Miniaturized, modular, networked capability on HMWVV

- Evaluated in CONUS
- Potential Transition to JLTV & MRAP





# Importance of Prototyping

- Prototyping plays a key role in spiral development
  - Provides a means for quickly assessing technologies,
  - Helps refine concepts and mature technologies
  - Provide concrete data for technology risk assessments
  - Provides data needed to develop a spiral development plan
- We have started using prototyping as part of the technology opportunities development
  - Quickly transition concepts and capabilities into Acquisition programs
  - Provides more refined concepts for transition into Pre-System Acquisition (Reduces time spent in Pre-System Acquisition)
  - Provides needed data for Spiral Development planning

**The earlier a user can assess a prototype, the quicker a capability can transition into an acquisition program**



# Technology Opportunity Development Approach

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1. Understand the User Desired Capability
  - Strive to work with User/Warfighter
  - Respond to Urgent Need Statement
  - Focus on desired capabilities and not detailed requirements
2. Develop and Assess Concept to Meet Desired Capability
  - Evaluate emergent technologies
  - Develop a prototype
  - Conduct User evaluation of prototype
  - Ideally, provide to user for “In-Theater” evaluation
3. Transition Concept or promising technologies to Pre-System Acquisition or Acquisition as appropriate
  - Need to gain PM’s “Buy-In” during concept development and evaluation
  - Work with the PMs on transition plans

**This Approach provides data (not a paper study) on the military relevance of a concept and assists in Spiral Development Planning**



# Technology Opportunity Development Guidelines

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- Integrate innovative technologies into tools for the warfighter
  - Leverage the S&T community (Work with ONR and DDR&E)
  - Build teams with warfighter, industry, academia, other labs
- Use open systems and standards (Adaptability)
- Use tenets of Urgent Material Release process
  - Safe
  - Suitable
  - Sustainable
- In-Theater Deployment is highly desirable
- Shorten Spirals as much as possible (Ideally 6- 10 months)
- Provide PMs relevant data on technology/concept performance, maturity, and military utility
  - Allows PM to formulate Spiral Development Strategy that accounts for actual technology maturity
  - Allows PM to shorten Pre-System acquisition Phase
  - Provide PM actual user input, which is a tenet of Spiral Development and Evolutionary Acquisition



# Our Technology Opportunity Development Products

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- Military relevance of Concepts and Technologies
- Pipeline of Mature Concepts and Technologies developed as part of the Technology Opportunity activities that can be
  - Transitioned into a reduced Pre-System Acquisition Phase
  - Or... transitioned directly into SDD
- Better understanding of the capabilities desired by the warfighter

**Hard Data on Technology Risks that are needed to  
Successfully plan a spiral Development Approach**



# Conclusions

- We have successfully used a Spiral development Approach during the Technology Opportunity Activities
  - We are able to determine the Military relevance of Concepts and Technologies
  - We can shorten the overall Acquisition of a Capability
  - We gain a better understanding of the capabilities desired by the warfighter
  - We obtain the Technology Risk Data needed to Successfully plan a spiral Development Approach
- Key Challenges include:
  - Ensure proper POM Cycle Planning needed for follow-on acquisition Programs
  - Understanding the limitations of In-Theater User Evaluations

**This Approach Allows the Technology Opportunity Activities to greatly reduce the risk of an acquisition Program and successfully plan for spiral development**