Organizing for a Complex World: The Way Ahead

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What do we mean by “complexity”?

- **Different from “complicated”**
  - Large scale / multiple elements / non-linear
- **Whole different than sum of parts**
  - Changes to (interaction of) elements cannot be accurately predicted
  - Integration brings additional capability not otherwise achievable
- **Organizational politics internal to complexity**
  - Programs implemented in pluralist environment with divergent views
It’s pervasive…

- **Technology**
  - More sophisticated devices
  - High pace of change / innovation
- **Environment: tactical / operational / strategic**
  - Platforms must be capable of multiple roles / missions
  - More elements / less predictability
- **Organizations (public and private)**
  - Bigger
  - More constraints
…and it’s difficult

- Staying on budget, on schedule and meeting requirements becomes harder

- Traditional approach (deconstruction) not applicable
  - Too many moving parts and unclear relations between them
  - Too difficult to anticipate everything in advance
  - Lose added value from system-of-systems / net-centricity

It’s just as much about governance and organization as it is about technology and engineering
The governance / management model links the organization to the program

Understand both of these....

Organization

Program

Governance / management model

...in order to select this
### A short history of governance models

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<thead>
<tr>
<th></th>
<th>Arsenal</th>
<th>Contract</th>
<th>Weapon system manager</th>
<th>Private arsenal (outsourcing)</th>
<th>Lead System Integrator</th>
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<tbody>
<tr>
<td>Program requirements</td>
<td>Gov’t</td>
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<td>Technical direction</td>
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<td>Program management</td>
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<td>Technical execution</td>
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**Government does less, forgets how!**

January 2009: publication of book

- Clarify the operating environment
- Lay groundwork for new models, such as:
  - Models from other industries
  - Network-centric organization
  - Operational value assessment
  - “Improved” LSI
  - ...
- However, different programs require different models
To govern and manage complex programs you must:

- Choose a suitable governance/management model
  - Understand attributes important to your program’s success
  - Understand organizational attributes that meet program requirements

- Insure against possible future need to change that model
  - Because inappropriate model was initially chosen
  - Because circumstances changed
To understand the organization, you must measure / compare its key attributes

- Premises:
  - Different organization types offer different attributes
  - We can measure – relatively if not absolutely – the degree to which an organization demonstrates a given attribute

- Compare organization types for ability to manage complex programs
  - For example: assess organization types for access to knowledge and ability to share it
Some key attributes by organization type

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<th>Government lab</th>
<th>Industry</th>
<th>FFRDC/UARC</th>
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<tbody>
<tr>
<td>Technical awareness</td>
<td>-</td>
<td>+</td>
<td>+</td>
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<tr>
<td>Project management skill</td>
<td>-</td>
<td>+</td>
<td>+ / -</td>
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<tr>
<td>Customer understanding</td>
<td>+ / -</td>
<td>+</td>
<td>+</td>
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<tr>
<td>Organizational longevity</td>
<td>+</td>
<td>-</td>
<td>+</td>
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<tr>
<td>Manufacturing expertise</td>
<td>-</td>
<td>+</td>
<td>-</td>
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<tr>
<td>Organizational independence</td>
<td>-</td>
<td>-</td>
<td>+</td>
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+ = strong performance; - = weak performance; +/- = mixed capabilities

Choosing the governance / management model

- The model must align program needs with what the organization can provide
  - Examples:
    - LSI may be best approach for multi-platform network-oriented system
    - WSM may be best approach for upgrade to existing system
  - Assess governance / management models for their ability to deliver the necessary organizational attributes
Flexibility and resilience (F&R) insure against possible future need to change model

- Address complexity by anticipating it
  - Be ready for anything, not plan for everything
- Build ‘fault-tolerant’ organizations
  - Flexibility: adapt and respond to anticipated, but unpredictable changes
  - Resilience: withstand effects of changes while adapting and responding to them
- Applicable at any stage, in any organization type
Flexibility & resilience in key organization types

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<td>Flexibility</td>
<td>• Range of collaborative efforts with academia and industry</td>
<td>• Ability to manage relationships with customers as well as with partners / suppliers</td>
<td>• Independence (incl. ability to verify performance) and lack of conflict of interest</td>
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<td></td>
<td></td>
<td>• Ability to attract talent</td>
<td>• Ability to attract talent</td>
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<tr>
<td></td>
<td></td>
<td>• Strong (financial) incentive to adapt to changing conditions</td>
<td>• Work on long-term contracts</td>
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<td></td>
<td></td>
<td></td>
<td>• Institutional memory</td>
</tr>
<tr>
<td>Resilience</td>
<td>• Long-term customer relationships</td>
<td>• High level of customer understanding</td>
<td>• Technical expertise across wide range of topics</td>
</tr>
<tr>
<td></td>
<td>• Organizational longevity</td>
<td></td>
<td>• Ability to retain talent</td>
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The governance / management model links the organization to the program

Understand both of these....

Program
• Understand critical risks
• Understand what organizational attributes best address these risks

Governance / management model
• Historical
• LSI, arsenal, WSM, …
• New

Organization
• Understand what attributes the organization type offers
• Government lab, industry, FFRDC / UARC

...in order to select this
What’s next?

- Continue work on new governance / management models
  - Re-assess existing models within measurement / F&R frameworks
- How to ensure that both program and organization attributes are taken into account when choosing a governance / management model?
- Develop mechanisms for better measuring / comparing organization types
- Devise approach to better measure flexibility and resilience across organization types
  - FFRDC/UARC, government lab, private contractor
- How to institute / cultivate / perpetuate F&R?
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