

Can Defining Levels of VV&A Help Joint Programs

November 15, 2001

Agenda

- **Definition:** What do we mean by “levels of VV&A?”
- **Reason:** Why create levels of VV&A?
- **Criteria:** What should we base our levels on?
- **Obstacles:** Where do the levels fall short?
- **Suggestions:** Level areas

What are levels of VV&A?

level *n*.

1. Relative position or rank on a scale: *the local level of government; studying at the graduate level.*
2. A relative degree, as of achievement, intensity, or concentration: *an unsafe level of toxicity; a high level of frustration.*
3. A natural or proper position, place, or stage: *I finally found my own level in the business world.*
4. Position along a vertical axis; height or depth: *a platform at knee level.*

What are levels of VV&A?

class *n*.

1. A set, collection, group, or configuration containing members regarded as having certain attributes or traits in common; a kind or category.

2. A division based on quality, rank, or grade, as:

A grade of mail: *a package sent third class*.

A quality of accommodation on public transport: *tourist class*.

Biology. A taxonomic category ranking below a phylum or division and above an order.

Statistics. An interval in a frequency distribution.

Linguistics. A group of words belonging to the same grammatical category that share a particular set of morphological properties, such as a set of inflections.

What are levels of VV&A?

- Each level would contain a class of VV&A activities that are at the same quality, rank, or grade
- The sum total of all VV&A levels would span the entire spectrum of VV&A classes
- Each level of VV&A would indicate its rank or position in the ordered set of VV&A classes

Why create levels of VV&A?

- Main application comes from the re-use of a model or simulation
- Allows subsequent users **clear understanding** of previous VV&A efforts
 - Aids in M&S selection process
 - Aids in estimation of new VV&A effort
 - Aid cross-program and -service communication
- Allows for long term planning of long term, piecewise VV&A strategy

What should we base our levels on?

- Need to treat each of the three separate processes (verification, validation, and accreditation) separately
- Goal is to identify and manage risks in applying M&S to a problem, so levels should reflect known levels of risk

What should we base our levels on?

- What others have suggested
 - Crusader methodology seen yesterday based on level of data validation
 - NASA risk assessment methodology applies weighted average method
 - Climb based on level of M&S abstraction
 - V&V Triangle based on depth and breath of M&S V&V activities

What should we base our levels on?

- Some factors to consider
 - Level of requirements traceability
 - Level of documentation
 - Level of adherence to standards
 - Level of management control
 - Level of operator training

Where do the levels fall short?

- VV&A is a function of the intended use, or application
- M&S uses cannot be ranked against one another

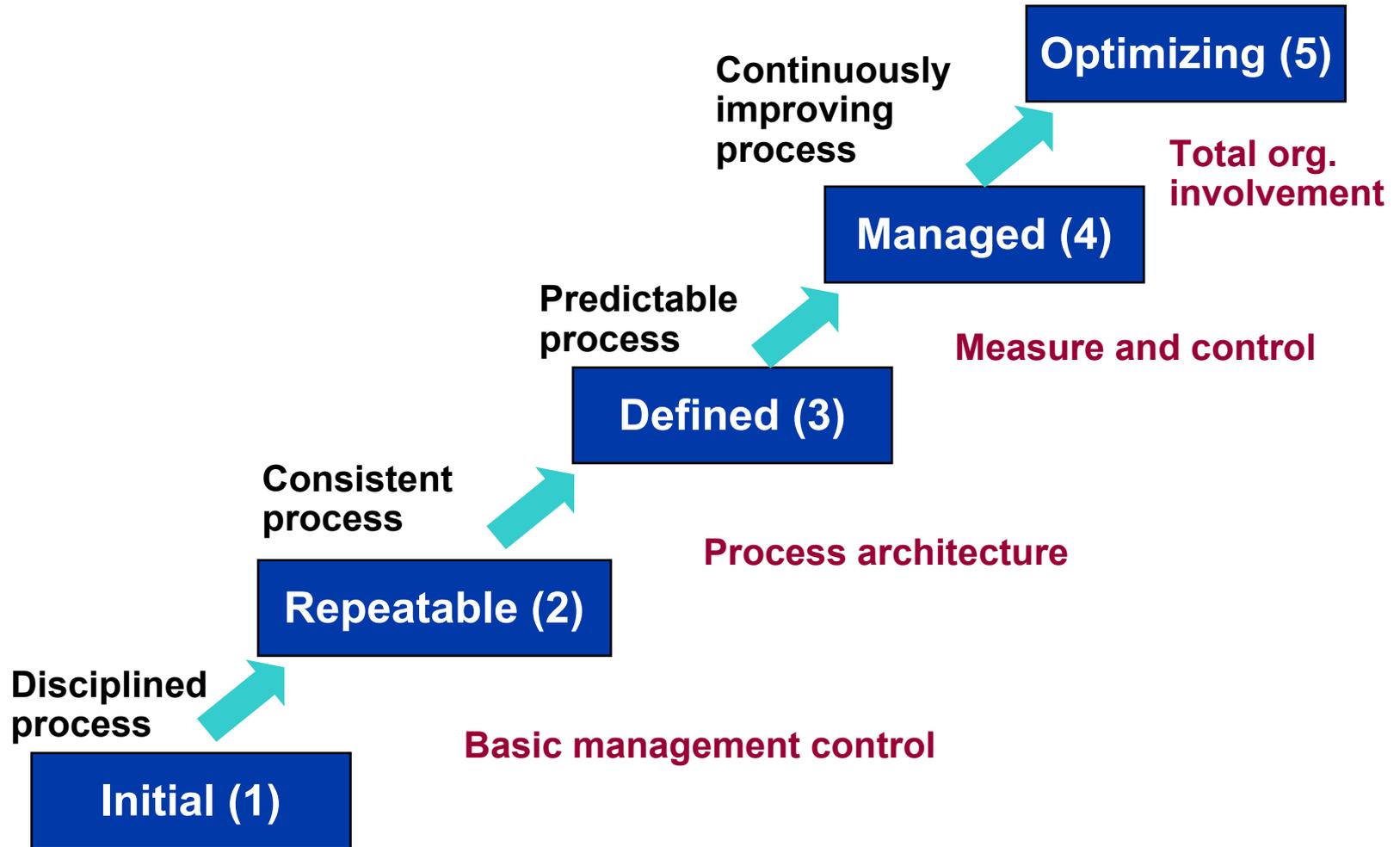
Where do the levels fall short?

- Levels can mislead potential users
 - The higher the level the better
 - If its at a high enough level, then no additional effort is needed

Suggestions

- Apply a collection of levels dedicated to single qualities
- Report these levels separately
- Adopt existing structures wherever possible

Suggestions



Identify M&S Management Process Level

Suggestions

Level	Characteristics
1	No formal documentation
2	Partial Documentation
3	Full documentation
4	Full and automated documentation

Define Full and Partial M&S Documentation Sets

Suggestions

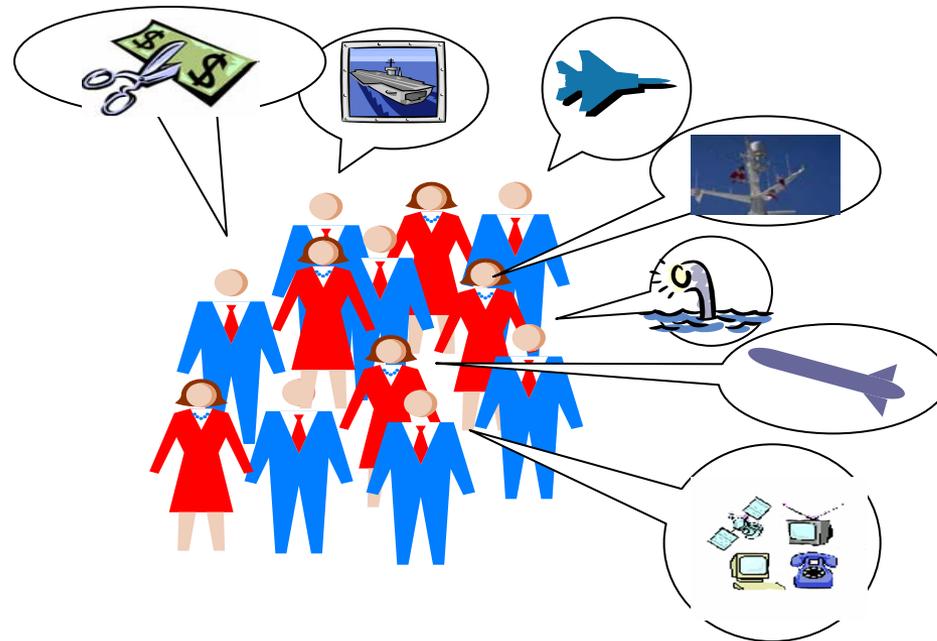
- Define levels of M&S adherence to known standards
 - Architecture standards (i.E. HLA)
 - Coding standards
 - Data standards

Suggestions

- Define levels of M&S operator expertise
 - Years of experience
 - Subject area mastery
 - Education levels

Suggestions

- Do not include risk assessment in levels, as risks are a function of user need, resources, schedule, and risk comfort levels



Please Phone In!

- Navy VV&A Program is seeking to gather information on this topic
- Send in your opinion/information /suggestions

Point-of-Contact Info

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