**High Maturity Misconceptions:
Common Misinterpretations of
CMMI Maturity Levels 4 & 5**

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- Organizational Process Performance (OPP)
- Quantitative Project Management (QPM)
- Causal Analysis and Resolution (CAR)
- Organizational Innovation Deployment (OID)

Misperception –1

If we **measure** more things, and involve more people in reviewing and using the **measures**, we will eventually achieve Maturity Level 4…

The key to achieving high maturity is **measuring** the right things, and using the correct techniques to analyze and interpret the **measures**…

We need to wait until we have more of the right kind of **data** before we can attempt to implement High Maturity Practices…

Misperception –2

Adding the use of **Control Charts** to the practice of measurement and analysis results in Maturity Level 4…

All I need to do is to use **Control Charts** to analyze the outcome of our critical subprocesses, and we can control them…

Using threshold based on specification limits is an acceptable alternative practice for QPM…

Misperception –3

My organization only has small short-cycle projects, so we can never apply QPM…

There is some minimum number of subprocesses (yet to be specified) that must be statistically managed before you can achieve Maturity Level 4…

Misperception –4

All the things we need to understand about high maturity practices can be adequately explained in a single conference presentation or tutorial.
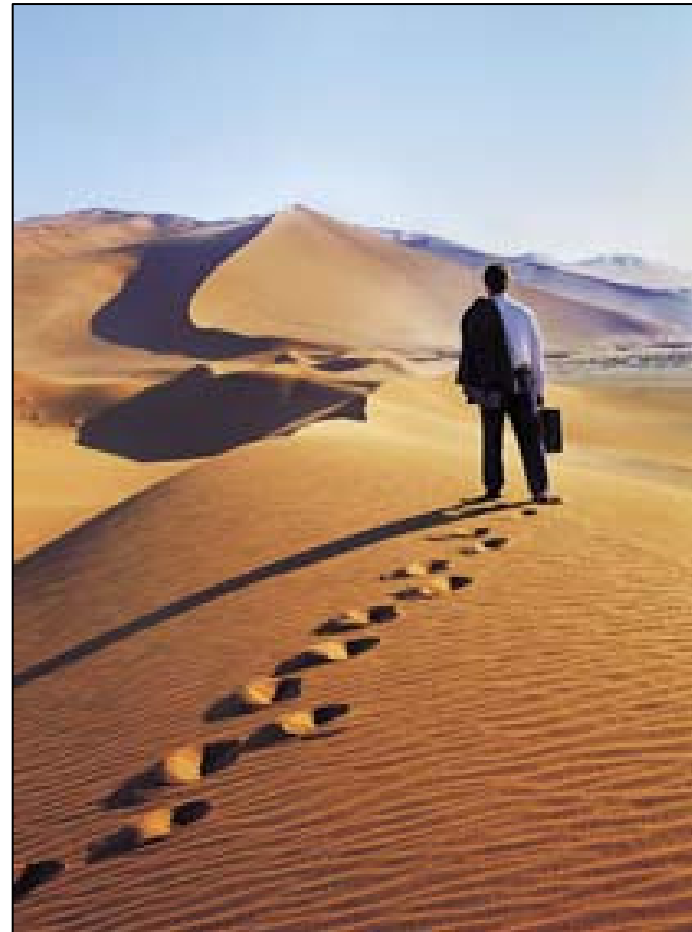
Instructive Examples:
Recognizing Misinterpretation

Tongue-In-Cheek Warning!

The audience is reminded that the examples in the next four slides are intended to be instructive – not pejorative.

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You Might Have Misunderstood OPP If…

A table showing projected defects by phase looks like a *Process Performance Model* to you…

The corporate average "Lines of Code Per Staff Day" by year looks like a *Process Performance Baseline* or a *Process Performance Model* to you…

A control chart used to 'manage' defects escaping into the field looks like a *Process Performance Model* to you…

An Earned Value Management System seems to fulfill the requirements of Maturity Level 4…

You Might Have Misunderstood QPM If…

"Tracking bugs across the lifecycle" looks like *statistical management* to you…

You plan to "re-baseline" the *control limits* used to manage critical subprocesses on a quarterly basis…

'Management judgment' is used to 'adjust' *control limits* used as thresholds to drive corrective actions…

Schedule variance and defect density look like perfectly good subprocesses to statistically manage…

You Might Have Misunderstood CAR If…

You always respond to "Hi Severity" defects by saying "Let's run a *causal analysis* and see what's going on"…

Causal analysis is used only to find and resolve the root cause of defects…

You don't see the value of applying DAR to select when and how to apply CAR…

You don't see the value of applying CAR to select when, what and how to apply OID…

You don't see how *Process Performance Models* and *Process Performance Baselines* contribute to CAR…

You Might Have Misunderstood OID If…

You think 42 Six Sigma projects – all focused on the inspection process – make a company Maturity Level 5…

A 5% boost in the performance of a process that fluctuates by ±7% looks like a best practice to roll out immediately…

The strength of an improvement proposal can only be measured by the persuasiveness of the author…

You work-off improvement proposals only in the order in which they were received…

You don't see how *Process Performance Models* and *Process Performance Baselines* contribute to OID…

Standards for Interpretation:
Expectations from Informative Material

Interpreting OPP –1

Essential ingredients of *Process Performance Models:*

- They relate the behavior or circumstance of a process or subprocess to an outcome (or a set of outcomes)

- They predict future outcomes based on possible or actual changes to factors (e.g. support "what-if" analysis)

- They use factors from one or more subprocesses to conduct the prediction

- The factors used are preferably controllable so that projects may take action to influence outcomes

- They are statistical or probabilistic in nature rather than deterministic (e.g. they account for variation in a similar way that QPM statistically accounts for variation; they model uncertainty in the factors and predict the uncertainty or range of values in the outcome)
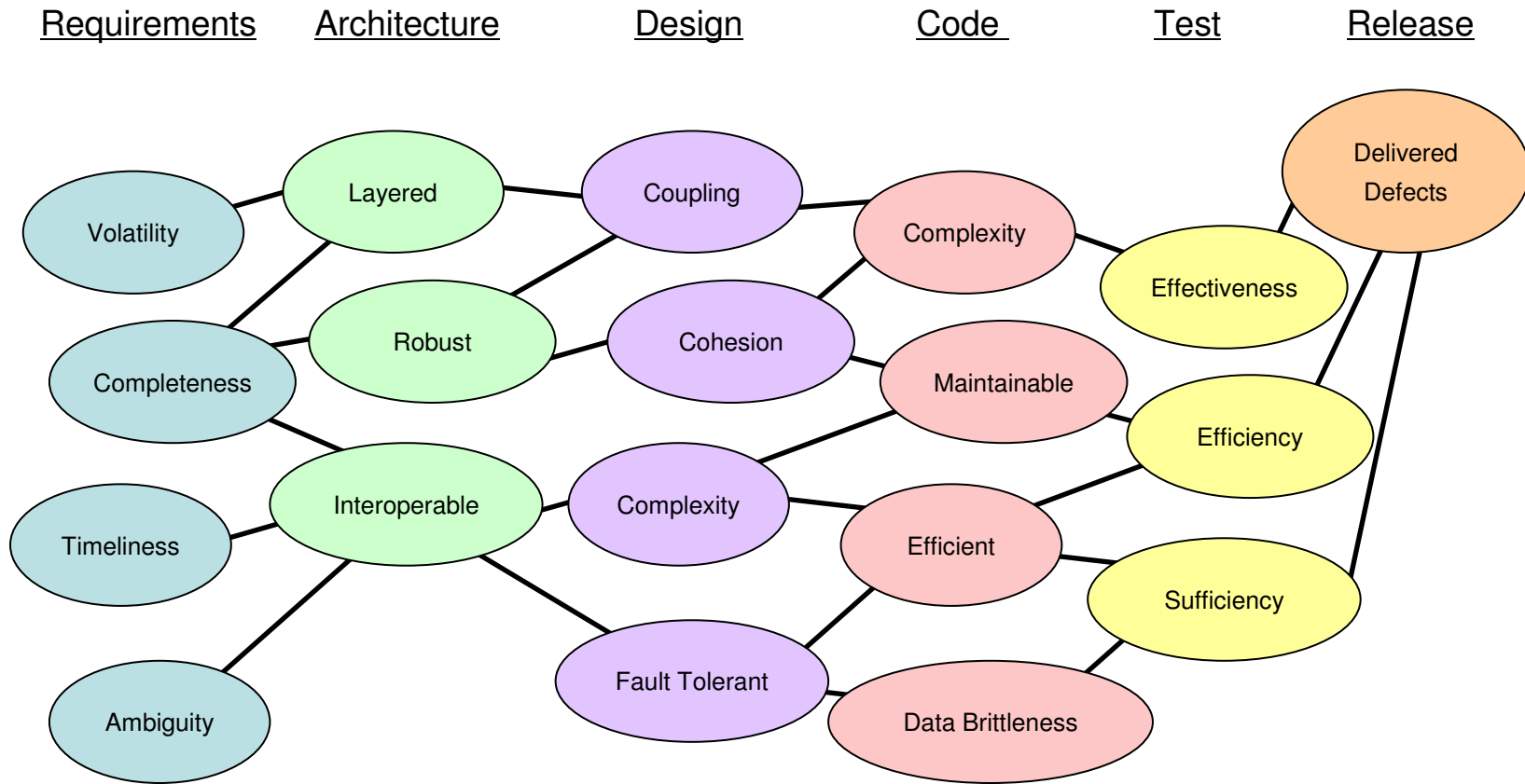
Interpreting OPP –2

High Maturity organizations generally possess a collection of *Process Performance Models* that go beyond predicting cost and schedule variance, based on Earned Value measures.

Specifically, the models predict quality and performance outcomes from factors related to one or more subprocesses involved in the development, maintenance, service or acquisition processes performed within the projects.

Interpreting OPP –3

Requirements   Architecture   Design   Code   Test   Release

- Volatility
- Completeness
- Timeliness
- Ambiguity
- Layered
- Robust
- Interoperable
- Coupling
- Cohesion
- Complexity
- Fault Tolerant
- Complexity
- Maintainable
- Efficient
- Data Brittleness
- Effectiveness
- Efficiency
- Sufficiency
- Delivered Defects

Bayesian Belief Network Example from Bob Stoddard

Interpreting OPP –4

Process Performance Models are often created dynamically in order to support 'what-if analyses.'

Sampling and modeling methods are often used to populate *Process Performance Baselines* when historical data sets are small.
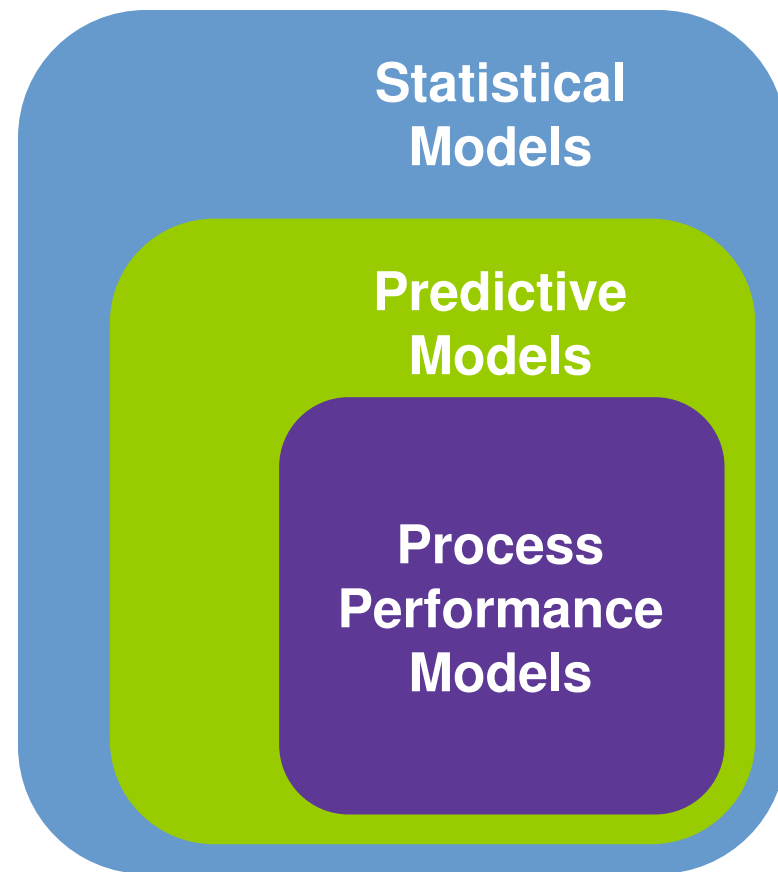
Not All Useful Models are PPMs

Not all Statistical Models are Predictive Models

Not all Predictive Models are Process Performance Models

There are *many* valuable applications of statistics.

Statistical Models

Predictive Models

Process Performance Models

Interpreting QPM –1

The purpose is to enable proactive project management through use of:

- Statistical management of critical subprocesses

- Quantitative management of the project

Retrospective analysis of aggregated data does not ensure proactive management.

Understanding how current performance will impact downstream objectives is the point. We want leading indicators, not lagging indicators.

Interpreting QPM –2

vs.

Interpreting QPM –3

If a subprocess is critical to the performance of a project, you probably want to measure more than one attribute of its performance.

The term 'variance' is not intended to mean the difference between planned and actual.

If you don't measure variation, you can't apply statistical management as intended in CMMI.

Interpreting CAR –1

A quantitatively managed process is intended when interpreting this process area.

Specific Goal 1 implies a systematic approach to focus CAR activities, which relies on more than management or engineering judgment.

There is a significant difference between using causal analysis techniques at the lower levels, and satisfying the goals of this process area.

Interpreting CAR –2

Process Performance Baselines and *Models* are commonly used to focus on high-value problems and opportunities.

Interpreting OID –1

A quantitatively managed process is intended when interpreting this process area.

The difference between OPF and OID is more than the presence of additional data.

Specific Goal 1 implies a systematic approach to focus OID activities, which relies on more than management or engineering judgment.

Interpreting OID –2

More than just gathering great ideas, the intent is to focus the search for innovation and maximize the opportunity to have impact.

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