

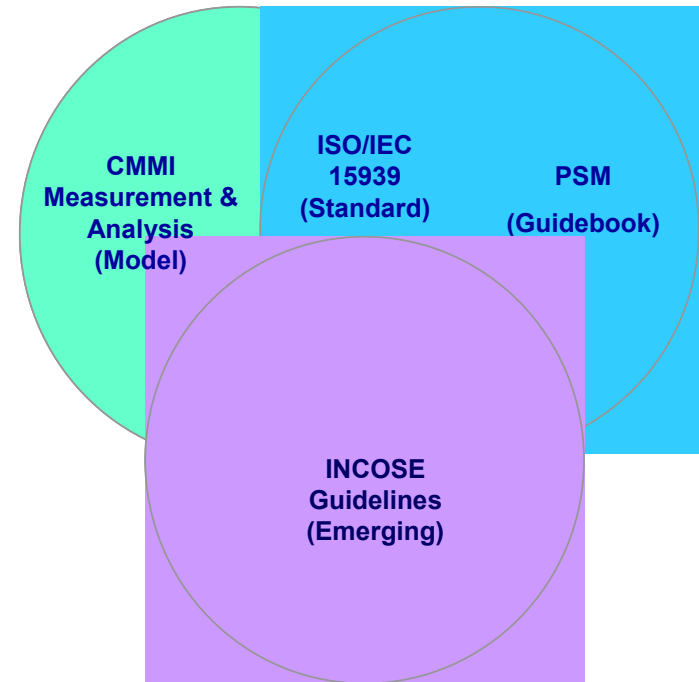
# *Practical Experience in Developing a CMMI Based Measurement Program*

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# Abstract

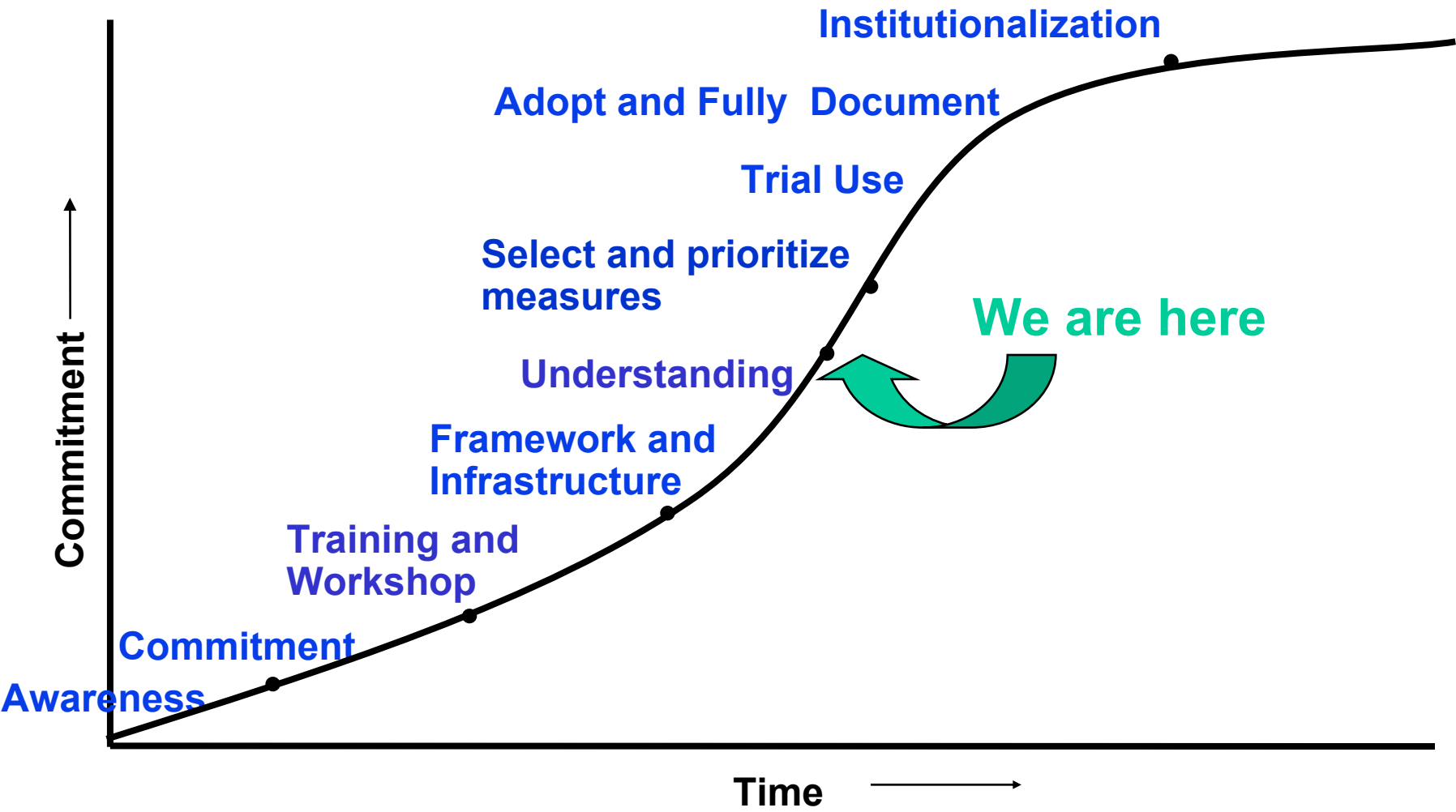
- Practical experience and lessons learned using PSM to plan and begin implementation of a sustainable CMMI-based, top down measurement program
- How management is involved
- How they developed the measurement plan and organization
- Experiences with defining and implementing the chosen measures using PSM's guidelines



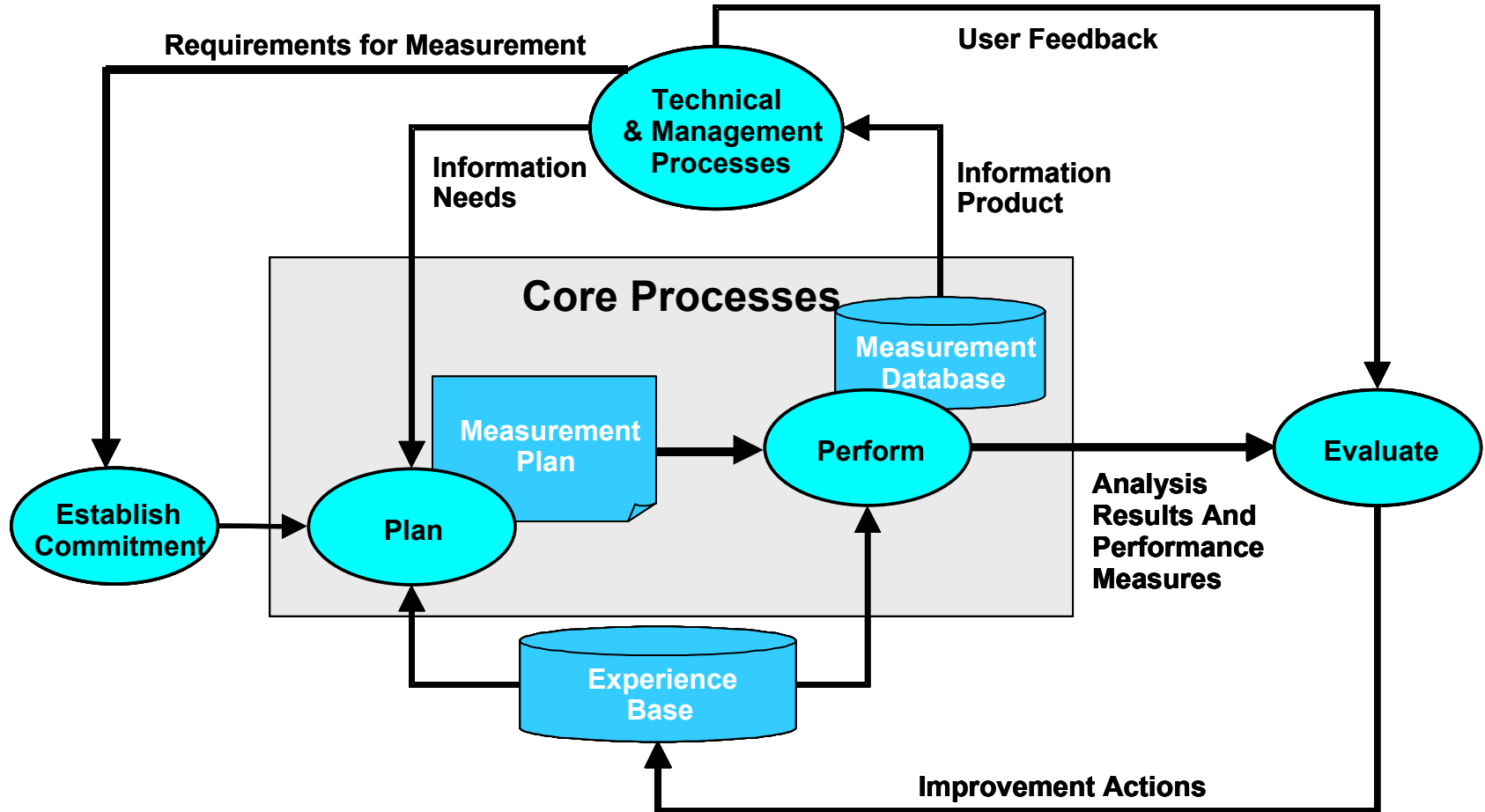
Why measurement improvement is important to management:

- Current environment
  - Primary defense subcontractor for Canada
  - Customers are governments around the world
  - Multiple Business Areas
  - Diverse product applications
  - Wide range in size: \$K to \$M to \$B
- Executive management commitment
  - Consistency in reporting for management decision-making
    - Across all programs and functions
    - Aligned at all management levels
  - Transitioning to CMMI and higher order maturity

# Where We Are

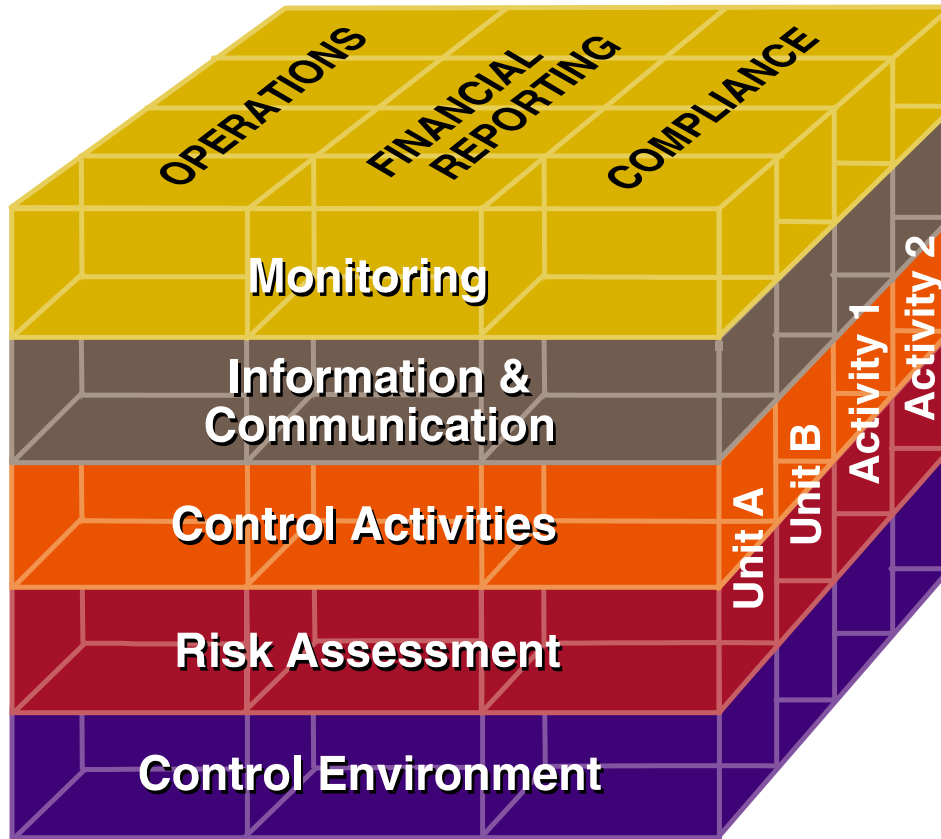


# Information Model Used for Planning



Adapted from ISO/IEC CD 15939, Information Technology

## Measurement Framework is Adaptable



### **Sarbanes-Oxley Act Compliance**

Groundbreaking Congressional legislation in response to corporate corruption scandals

### **Treadway Commission**

(National Commission on Fraudulent Financial Reporting)

Committee of Sponsoring Organizations (COSO's) report, "Internal Control – Integrated Framework" is the standard to measure against

# Current Status

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## *Ready... Aim ...*

- Initial focus was on commitment and training
  - Strong involvement by executive and program management
  - Exec Management briefing, PSM and workshop for users
- Measurement plan in place
  - Based on ISO/IEC 15939
  - Provides comprehensive measurement framework
- Infrastructure is well underway
  - Organizational hierarchy, initial staffing for measurement are in place
  - Projects, other supporting organizations are involved
- Some experience gained in defining base measures and information products

# Poop!

## (We Got Bugged Down)

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### *Why were definition and implementation of measures progressing so slowly?*

- PSM is an excellent method for conceptualizing and discretely defining measures
  - Defining individual information products is difficult and slow
- We have user needs at three levels of decision-making
  - Higher order information products require numerous supporting indicators at lower levels
- People often cannot clearly articulate their information needs and indicators (“*I’ll know it when I see it*”)
  - Counterproductive to spend a lot of effort in defining something that is likely to change
  - Need to let them experiment and tune the measures first



# The Solution

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- We needed to increase the speed of building and implementing measures
  - Get some early successes to show the benefits
  - Begin changing the culture
- Reusing existing information needs and measures is more effective than starting with a clean slate
- Key is not to reinvent the wheel
- Examine, prioritize, standardize and update existing measures

# Existing Measures

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- Numerous initiatives involving measurement and tools are in various stages of planning, implementation and use
  - Executive management's stated needs
  - Company incentives
  - Company Mission and Policy Statements/Indicators
  - Project Management improvements including PMI
  - Standard Operational Performance Reviews
  - Standard Software Tracking and Oversight Reports
  - HR – Employee Satisfaction
  - EC/Finance – Sarbanes-Oxley guidelines
- Created measurement analysis poster to present current situation

## Existing Measures (2)

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- Each initiative has multiple measures and indicators
  - Many express unstated information needs, not clearly aligned with business case
  - Many overlap
    - Created by different processes
    - May have different definitions for same indicators
  - Most not multi-layered – cannot drill down
  - Many are useful
  - Others lack clarity
  - Most need better definition and statement of purpose
  - Some should be deleted

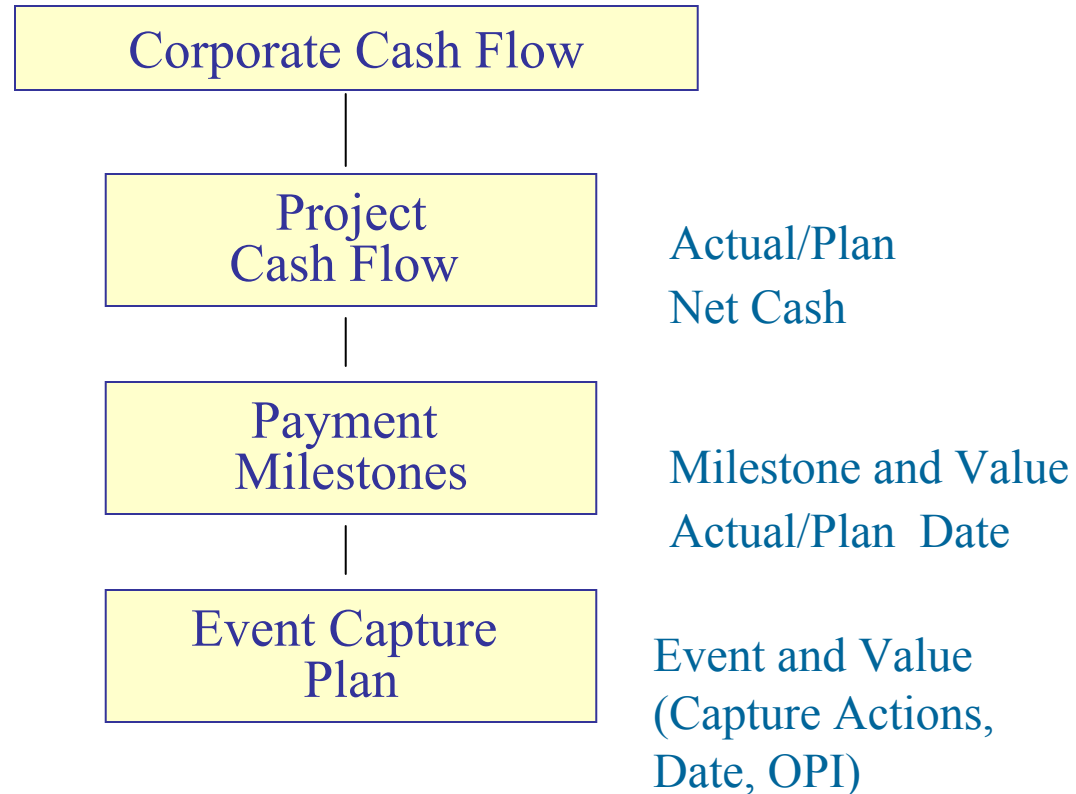
# Speeding up the Pace

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1. Prioritize the existing measures
2. Ensure alignment with business needs and clarity of purpose
3. Ensure that the indicator clearly measures the intended purpose
4. Exercise the measure to ensure its effectiveness, modify as needed
  - Use Information Model's feedback loops
5. If not a good measure, delete it
6. If appropriate, approve the measure as a standard
7. Complete the documentation per PSM standards

Examples of what we expect to find in our new  
process

# Cash Flow – Current Picture

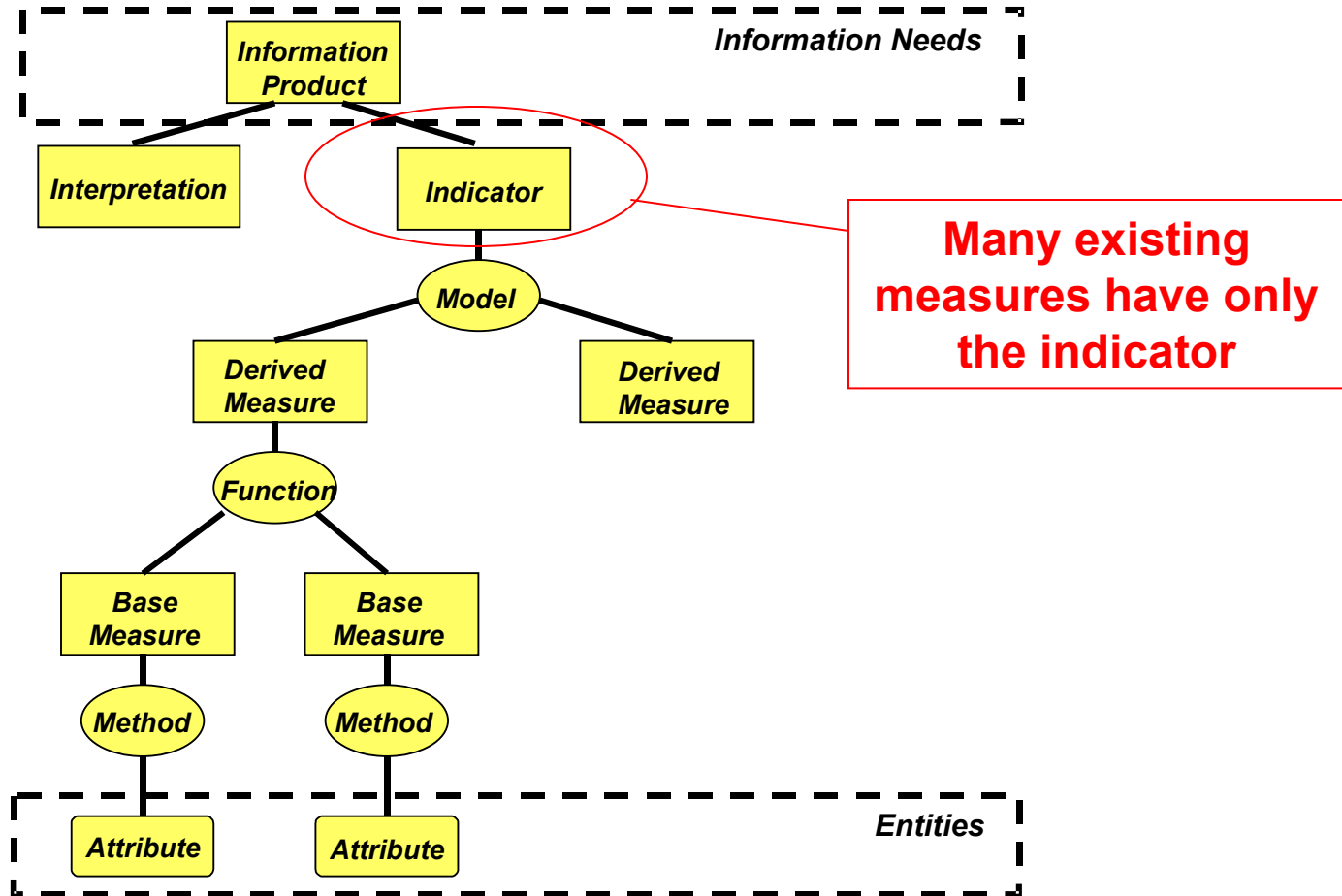


## Suggested improvements:

- Establish consistency among related indicators
- Define information product for each level
- Define or reuse base measures as required (high level)

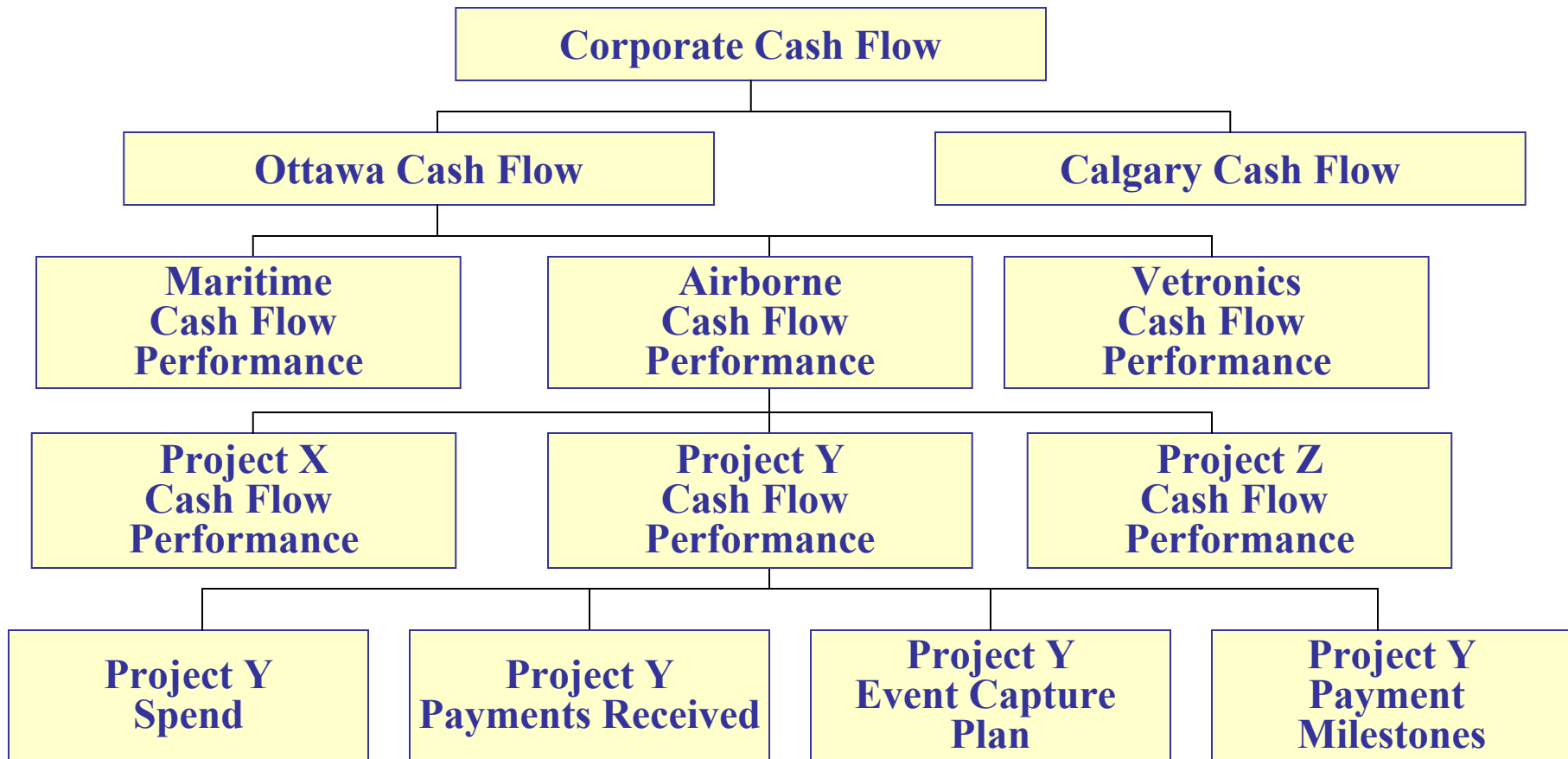
# A Useful Chart to Get Message Out

## Information Model



Adapted from ISO/IEC CD 15939, Information Technology – Software Measurement Process

# Cash Flow – Needed Framework



- Provides relevant information at each management level
- Allows ‘drill down’ to find root cause of anomalies in lower levels
- Ensures consistency of data across all functions, at all levels



# The Awesome Power of a Chart

What do these standard images mean?



Blue
Green
Yellow
Red
N/A

Can you trust the data?

An example of why we would want to provide better definitions. What do the colors really mean? How were they derived?

# Project Scoreboard

The measurement analyst or lower level managers should be prepared to show charts that answer the obvious questions: Why is it that color, what's causing it, how and when will it become green?

In this case, related data exists, but there is no one-to-one mapping.

Success Factors	Current		Prior		Remarks
	GD	Customer	GD	Customer	
	mm/yy	mm/yy	mm/yy	mm/yy	
Schedule	G	G	Y	Y	
Cost	G	Y	Y	Y	
Risk	Y	Y	Y	Y	
Technical	G	G	G	G	
Manpower	B	G	G	G	
Cash Flow	R	Y	Y	G	
Other	NA	NA	NA	NA	
Overall	G	G	G	Y	

Blue	Exceeds plan
Green	Meets plan
Yellow	Risk of not meeting plan
Red	Unlikely to meet plan
NA	Not applicable

Is excess staffing good or bad?

What does this mean? Is it (+/- 5%, 10%, 20%?), or is it simply a guess?

Look at the "Current" and "Prior" columns for customer:

If 3 greens of 6 = green in current column, Why do 3 greens out of 6 = yellow in prior column ?

In the GD "Prior" column, why do 4 yellows and 2 greens = green?

**Opportunities for quick improvement**

# Lessons Learned

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- Start with management commitment and involvement
- Involve an expert
- Augment PSM with ISO/IEC 15939 and CMMI M&A Practice Area
- Time and effort spent in gaining commitment, training, workshops and planning are good investments
- Be inclusive – get management and projects involved early and often
  - Sr. Mgmt reviews, sponsor, project champions, standards committee, process owners
- Do not assume that different tools or systems implement the same measure in the same way (LOC, man-month, etc)
- It takes a lot of effort to do it right – get proper staffing, and delegate
- The best way to build a measurement culture is to get people measuring – find a way to expedite the process of producing usable measures for decisions

# Questions?