

The Integrator

INCOSE North Star Chapter



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North Star Newsletter

INCOSE North Star Newsletter Communication

This issue's featured article is by INCOSE's Director of Technical Operations, Dick Kitterman. Enjoy!

Eileen Arnold, Editor, BAE Systems

Systems Engineering at its Best!

Metrics: Their Properties and Uses

The following article makes six assertions about metrics that may cause thought-provoking stimulation, or even disagreement. The article was written to stimulate thought and discussion among our Systems Engineers.

The assertions:

- 1) Metrics can measure one of two attributes: effectiveness or efficiency. There are no other attributes.
- 2) Metrics must capture one or more dimensions of quantity, quality, cost, or time. There are no other dimensions.
- 3) Metrics only exist to trigger decision making. If no decision is involved, it's wallpaper, not a metric.
- 4) Each specific metric must relate to a specific decision maker as well as a specific decision.
- 5) What you measure at one level (e.g., organization level) or viewpoint (e.g., function, process) is not what you should measure at another level or viewpoint because the decisions are not the same. If the decisions are the same, reorganize to eliminate the duplicate decision makers.
- 6) Metrics presentation is nearly as important as metrics content (and most people never think about the presentation aspect of metrics).

Assertion 1: Metrics can measure one of two attributes: effectiveness (did we get what we wanted?) or efficiency (did it take more or less effort to get something, whether it was what we wanted or not?)

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Chapter President's Corner

Neill Radke, Eaton Corporation and John Palmer, U of Minnesota, 2008 Co-Presidents

On October 11th, the North Star Chapter Leadership Team held a planning meeting to lay out the program for the coming year. At the meeting, the chapter leadership finalized its 2009-2013 Strategic Goals and Objectives, and drafted the 2009 program plan, which consists of 10 monthly meetings, 2 social events, and semi-annual tutorials.

Within the Strategic Goals and Objectives, the North Star chapter mission is to encourage the appreciation for and growth of the Systems Engineering profession in the twin cities and surrounding region. Five-year goals were defined as follows:

1. Support SE related activities relative to INCOSE initiatives and vision
2. Create, maintain and grow a network of SE professionals who engage in activities that support the INCOSE North Star Chapter mission statement
3. Support SE related activities in other professional societies
4. Support SE related activities in local schools, colleges and universities
5. Provide financial support to organizations that promote SE principles and methods on a controlled and regular basis
6. Formally recognize individuals who contribute to the advancement of SE through their involvement in international, regional, and local INCOSE activities.

For 2009, the theme "Practical Application of Systems Engineering" was selected with a program defined to implement the 2009 objectives.

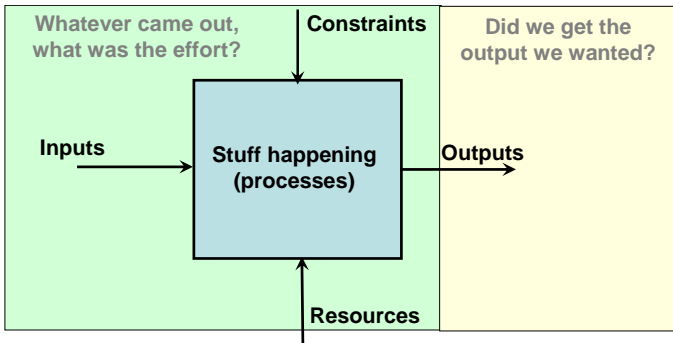
We look forward to another exciting program. To get involved, please contact:

jpalm@usfamily.net OR NeillBRadke@Eaton.com

North Star Chapter Website
<http://www.incose.org/northstar>

There are no other attributes.

Black box analogy - Look at everything you want to measure as if it were a black box.



Assertion 2: Metrics must capture one or more dimensions of: quantity, quality, cost, or time. There are no other dimensions.

- (Q) Quantity—how many?
- (Q) Quality—how good (vs. requirements)?
- (C) Cost—how much?
- (T) Time—by when?

Assertion 3: Metrics only exist to trigger decision-making. If there is no decision involved, it's wallpaper, not a metric.

- A metric is a comparison of a measured value against a pre-established desired value (Q, Q, C, T)
- The comparison is made to determine if there is a variation of actual from desired.
- The only reason to make the comparison is to take action if the variation is beyond the desired value.

If there is no decision, there is no action and therefore no reason for the metric to exist.

Assertion 4: Each specific metric must relate to a specific decision maker as well as a specific decision.

- Many people can be involved in carrying out a decision.
- Many people can be involved in reaching a decision.
- Only one person can actually make a particular decision.
- Anything that makes that unclear leads to confusion, inaction or inappropriate action.

The result is: One metric - one decision maker - one decision.

Assertion 4: What you measure at one level (e.g., organization level) or viewpoint (e.g., function, process) is not what you should measure at another level or viewpoint because the decisions are not the same. If

they are, reorganize to eliminate the duplicate decision makers.

- It is ever so easy for higher levels to depend on lower levels for metrics.
- Unfortunately, all they will get will be metrics appropriate for the lower levels.
- All the decisions will be ones that relate to the lower levels.
- The higher levels will basically end up stealing the decisions they are paying the lower levels to make.
- They will also either not make the decisions that would be appropriate for their level, or make decisions in the absence of relevant metrics, or both.

Add metrics or subtract layers of metrics.

Metrics presentation is nearly as important as metrics content (and most people never think about the presentation aspect of metrics)

- The best metric in the world is only as good as the understanding of the people who see it
- If you are a decision maker, how can people appreciate your action if they can't understand your metric?
- An increasing number of people are being taught about metric content (what the first five assertions address)
- Practically nobody is taught about what metrics should look like—the presentation aspect

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WELCOME, NORTH STAR NEW MEMBERS!

Name	Company	Title
Adam Fischbach	Transoma Medical	Principle SE
Shane Jensen	Medtronic	Principle SE
Anthony Kempka	ITT	Principal Eng
Thomas Paul	Stratasys, Inc.	Systems Eng
Monte Thue	Shadin Avionics	Avionic Sys Mgr
Duane	MTS	SE

Next Meetings:

November 11, 2008 Tuesday ATK Risk Management
 December Holiday Party