What Does it Mean to *Effectively* Communicate Risk?

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Compliance vs. *Effectiveness*

Compliance: "Do things the way I tell you to, and you will succeed."

Effectiveness: "It doesn't matter *how* you do things, so long as you succeed."

*Compliance* **may—or may not—lead to** *effectiveness.*

A Fresh Perspective

In a new perspective on Risk management, we discuss analogies of a telecommunications network to how we believe a Risk Management should operate in the context of an organization's communications structure.

This perspective is not a new way of doing risk management—it simply describes what has always been happening, and considers how tools can measure and improve the behavior of the communications network.

Observation: *Every project, program, and organization has a risk management process, whether it is planned or not, recognized or not. It may be effective or extremely limited, but if it can be understood and measured, it can be improved.*

The CRM Paradigm
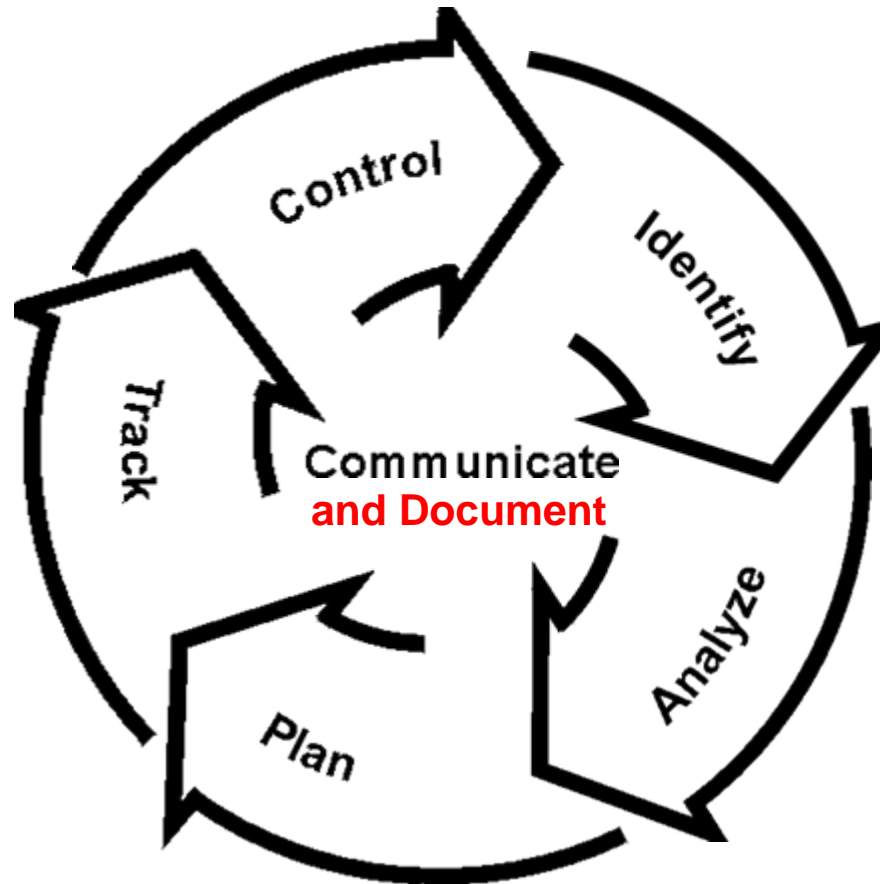
Risk Management ⇔ communications

In Continuous Risk Management it is recognized that communications is the "hub" of the CRM paradigm wheel, and it is emphasized that a key enabler for effective risk management is getting people to communicate effectively about risks.

Risk management effectiveness is determined by the *participation* of people in an organization, and by the *speed* and *fidelity* of communications between those people.

1st Principle: *You can't count on people to communicate risks unless that communication benefits them in some way, personally and immediately.*

Risk Management and Decision-making

The *purpose* of a tool-supported risk management system is to enable better decision-making: **pro**active rather than **re**active.

A risk management system that the primary decision-makers in an endeavor never look at—or only look at when required by a meeting agenda item—is not serving that person, and is not fully effective.

If we could measure how often the decision-makers use the information in the risk management system to make decisions we could probably tell whether it was effective—but we wouldn't know <u>why</u> it was (or wasn't).

Key RM System Characteristics

- Users of the RM system perceive immediate personal benefit.

- Low barriers to input—*anyone* can pick up the "phone," and they make "local calls" every day

- System handles high data input volume without overload

- Carefully structured information "packets," to avoid misunderstanding

- Trust that information will not be misused

- Fast, reliable "throughput" from "worker bees" to the appropriate decision-makers

- Minimum "distortion" of information

"Picture of Success" Concept

Risks and issues are meaningless except with respect to some goal that is desired.

Every endeavor has "pictures of success," but there are typically *too many* of them—sometimes more than one in the mind of each person involved.

Different parts of the endeavor—work teams, management levels, stakeholders—have legitimately different "pictures of success," that have a major influence on the risks they see and how important they perceive them to be.

2nd Principle: *You can't identify and analyze risks with consistency unless you understand your team's "picture of success," and those of the teams, managers, and stakeholders with whom you communicate. The pictures should be explicit and shared.*

Explicit "Picture of Success"

A minimum set of conditions, set at a specific time in the future, which must be met for team members to consider their effort a "success." An example:

On October 17, 1997, the IRSIP system will be ready to fly on the AA satellite. It will

- be fully tested and integrated with the other systems of the satellite,
- have a defined and acceptable number of defects,
- include as much functionality as is needed to fulfill its required mission (as defined at that time), and
- cost less than 120% of its initial budget.

The Picture of Success should be documented, succinct, and in front of the team at all times when risks are being identified and analyzed.
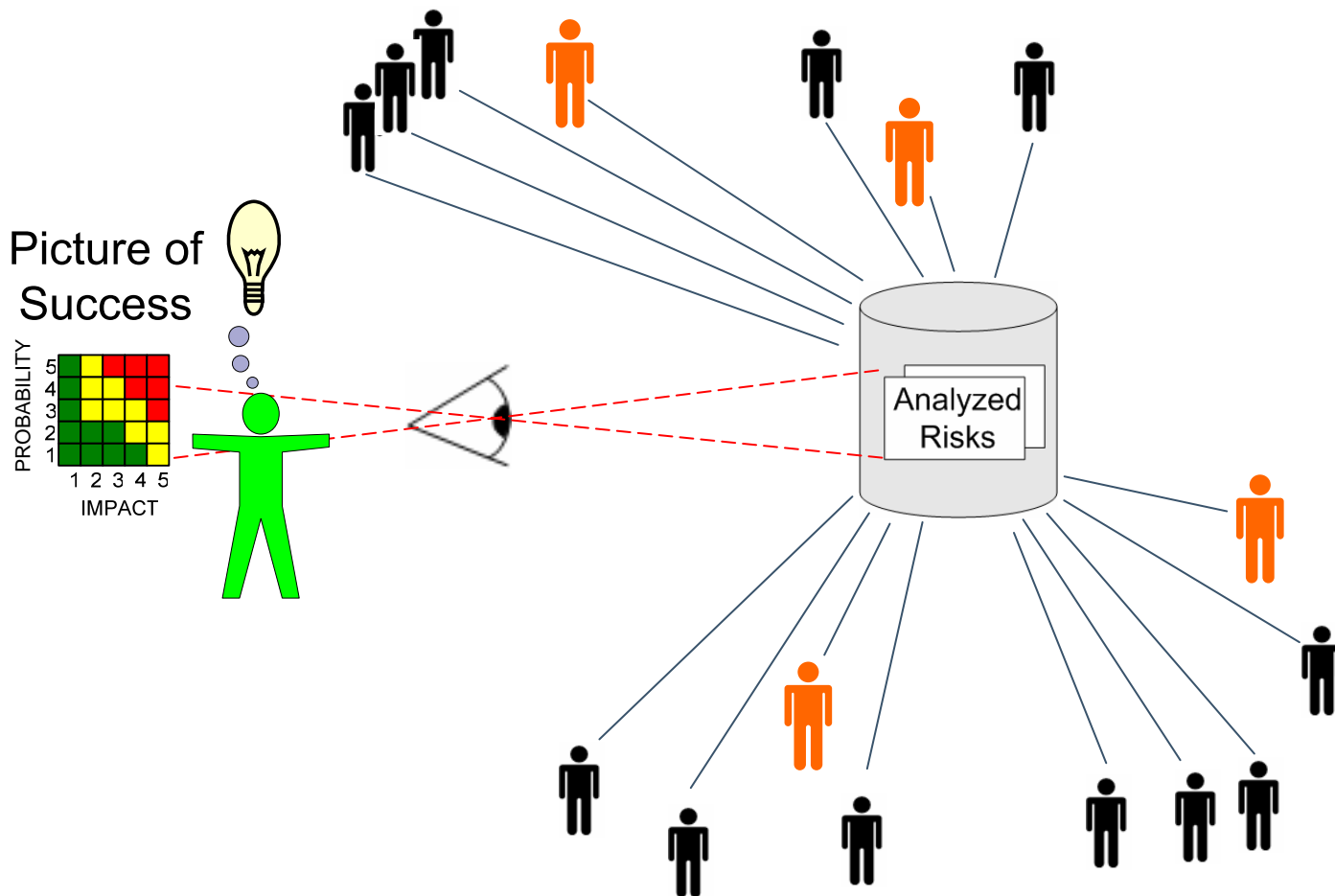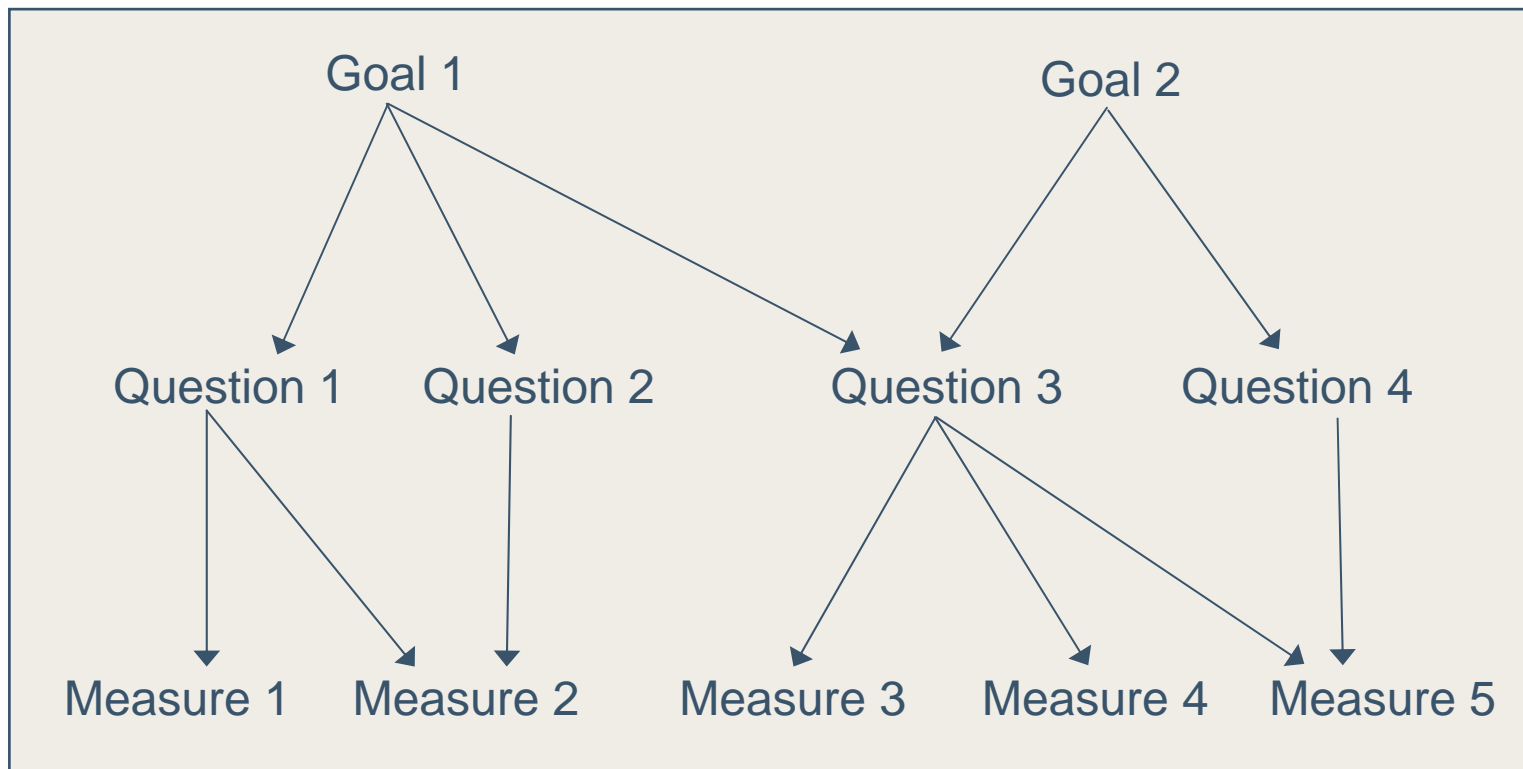
Unstructured Risk Management
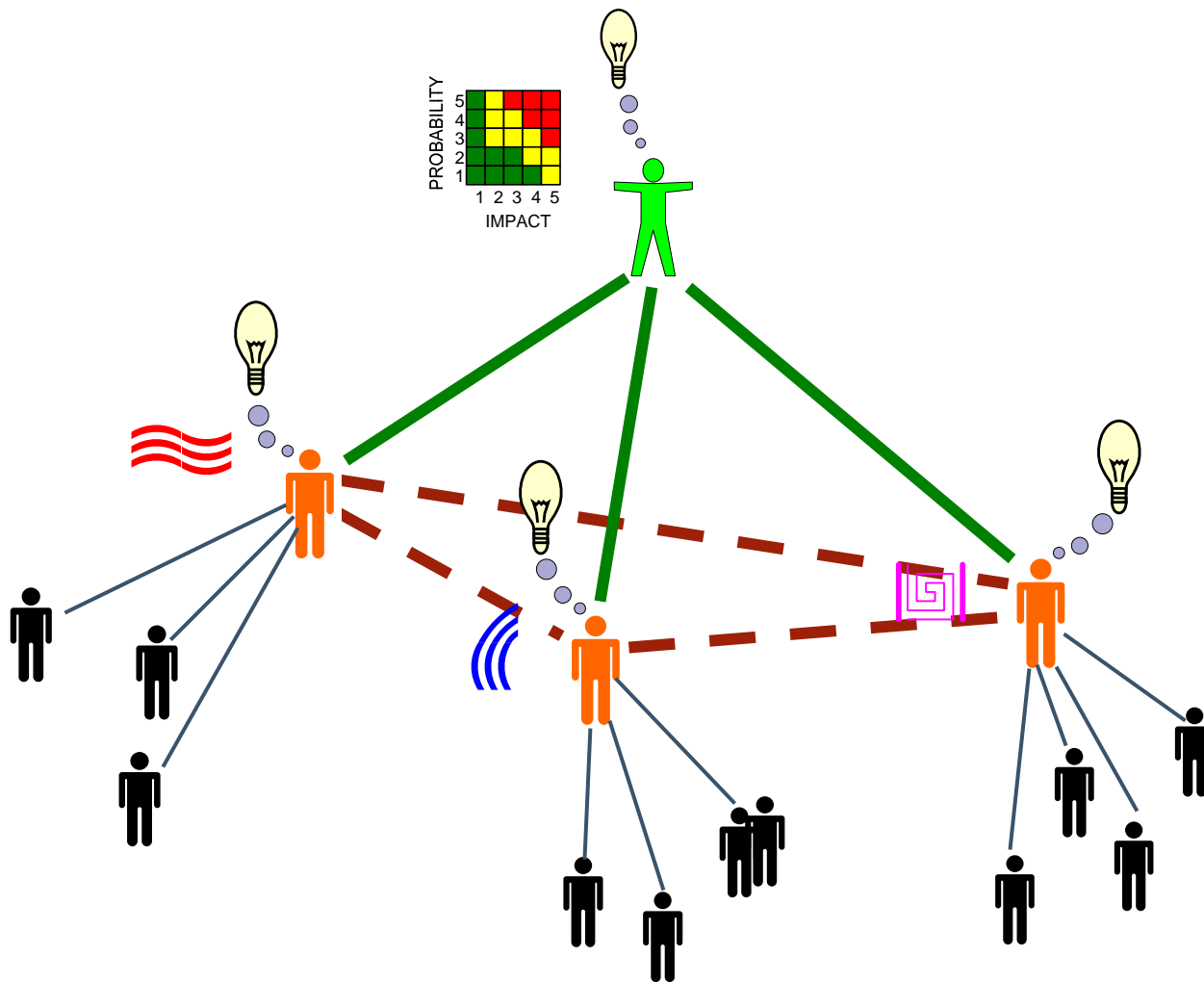
How We Typically Think of a Risk Tool

Tool-Supported Risk Management

Goal-Question-Measure

What Questions?

If we accept *effective* risk management as the goal for any risk management system in NASA, what questions would we ask to determine if a particular system, already in place and operating, is effective?

1. **<u>Input:</u>** Is there anything slowing risks from being documented once they are recognized, or keeping them from being documented at all?
2. **<u>Speed:</u>** How long does it take for a risk to get from its source to the right destination (i.e., appropriate decision-maker)?
3. **<u>Fidelity:</u>** Does the risk input arrive at the decision-maker still true to its original intent (i.e., without distortion)?
4. **<u>Synthesis:</u>** Does the decision-maker get a view of risks that considers and correlates input from multiple sources?

What Metrics?[1]

If these are the appropriate questions to be answered, then what might be some appropriate metrics to answer them?

1. **Input**
   - Frequency of input from each source
   - Participation of sources
   - Input delay (recognition to documentation)
   - Number of *unidentified* risks that materialized

2. **Speed**
   - Time from input to the *right* decision-maker
   - Frequency of "data dropping"
   - Rate at which risk items are being refreshed, reviewed, and maintained

What Metrics?₂

(Continued…)

3. **Fidelity**
   - Clarity of risk item description and context at input (true to perception)
   - Content change from source to destination (true to input)
   - Network traffic — parts of organization that are over- or under-represented (true to the "big picture")

4. **Synthesis**
   - Percentage of correlation (# of risk items that have been related to others)
   - Number of populated perspectives
   - Percentage of risk items that are covered by some active mitigation strategy

The IRMA Tool at JSC

NASA developed web-based database used (by ISS, SSP, JSC, and other groups) to identify, plan, track, control and communicate risks and risk data

- Facilitates management of technical, costs, schedules and safety facets
- Tiered levels (Risks, Watch Items, Concerns)

Provides the following attributes for risk items
- Risk description (risk statement & context)
- Risk scoring (5x5 matrix) and risk prioritization (Top N)
- Mitigation planning and tracking (burn down process)
- Risk status journal
- Closure/Acceptance criteria & rationale
- Risk flight tracking/coordination/integration

All data is under configuration management controls

What Metrics Does IRMA Have Now?

These are process metrics that IRMA currently produces:

- **Staleness report**—metrics for how often the individual risk owners manage and update their risk information

- **Mitigation Tardiness report**—timeliness metrics for mitigation plans

- **Time in System report**—how long risks are worked in the system before closure

- **Risk Organization Breakdown report**—metrics for type and quantity of open risks in the system broken down by organization

What Metrics Do We Propose to Add?

The following are metrics we believe could be added to the IRMA tool or its administration to address the question of *effectiveness*.

- **Speed:** Time it takes from input to be elevated to the appropriate decision-maker

- **Fidelity:** Conformity to standard risk statement format and size; clarity

- **Fidelity:** Top N risks compared to original input

- **Synthesis:** Percent of risks that are correlated

What Implications for Others?

There are several risk management tools in use at other centers of NASA, e.g., ARM, PRIMX, RMIT, and ePORT. None of the concepts discussed in this presentation are dependent upon the use of IRMA as the risk management tool.

A minimum set of metrics that we suggest other NASA centers consider adding to help understand system and tool effectiveness:

- **Input:** Which sources contribute, and how often
- **Speed:** How much time did it take for risks to be "Top N" after they were identified?
- **Fidelity:** Top N risks compared to original input
- **Synthesis:** Percent of risks that are correlated

Summary

- Every project and program has a risk management system already—always has had, always will have.
- Getting decision-makers to switch from the risk management system they already have to a tool-driven system that is provided to them will only be successful if the new system is more *useful* than the one they already have.
- The tool-driven system will be more useful if it can be shown to be more *effective*.
- We believe we can measure "effectiveness" of a tool-driven risk management system, and we propose to try it on IRMA.
- Other groups in NASA can do this, too.

Next Steps

For next year's conference, we plan to present the data yielded by these metrics on IRMA, and to interpret the data in terms of effectiveness of the process and areas needing improvement.

We invite other centers to join in this project.

Questions?