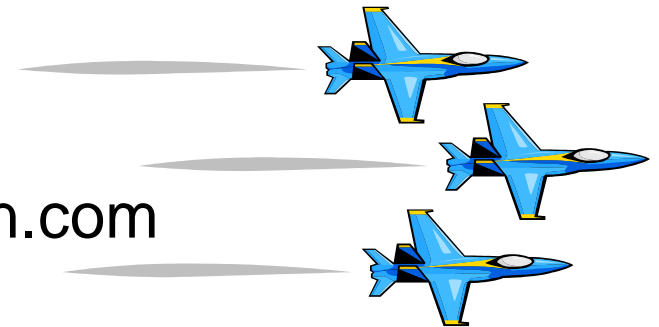# Using the OODA Loop
(Observe, Orient, Decide, Act)
for Measurement & Analysis
or
"Measure Like a Fighter Pilot"

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Purpose

- Introduce the OODA Loop as an Enabler for Implementing Measurement and Analysis (MA)

- Scope
    - Project Level Measurement
    - Measurement Analyst/Practitioner perspective
    - Implementation Strategy
    - Lessons Learned
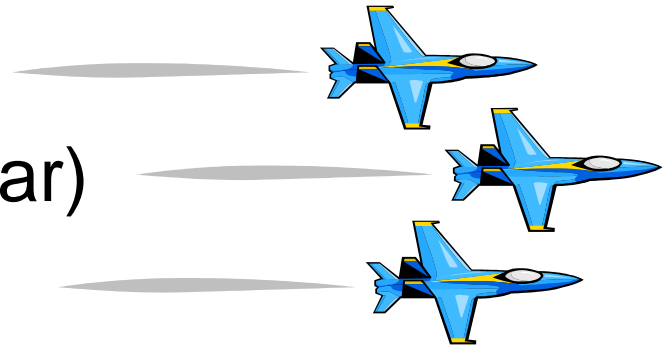
Agenda

John Boyd's OODA Loop

Rationale for its Use in MA

The OODA Loop for MA

Summation

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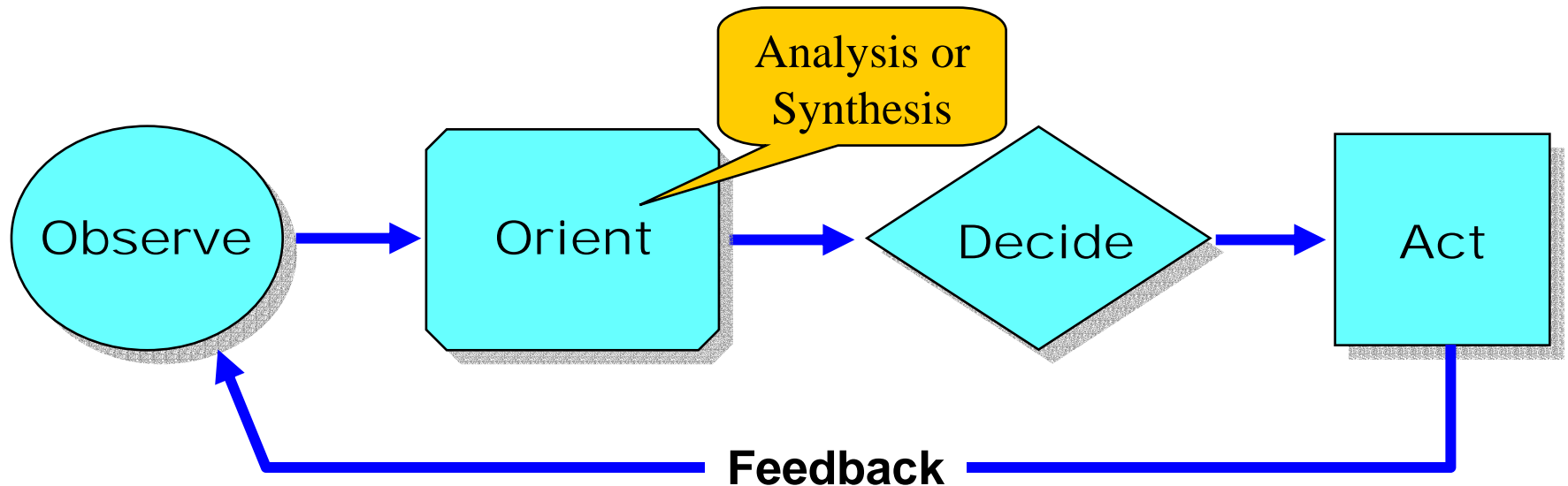
The Legacy of
Colonel John Boyd (USAF Ret)

- "40-Second Boyd" (Korean War)

- "Mad Major" (F-15, F-16)

- "Genghis John"

  The OODA Loop & Maneuver Warfare

  ➢ U.S. Marine Corps

  ➢ Both Gulf Wars

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Boyd's OODA Loop

Observe → Orient → Decide → Act

Analysis or Synthesis (pointing to Orient)

Feedback (from Act back to Observe)

- Relates to all human behavior

- Goal: Successful interaction with other loops

- Get inside the opposing OODA Loop

  – Destructive: Air Combat, Warfare

  – Constructive: Engineering Process
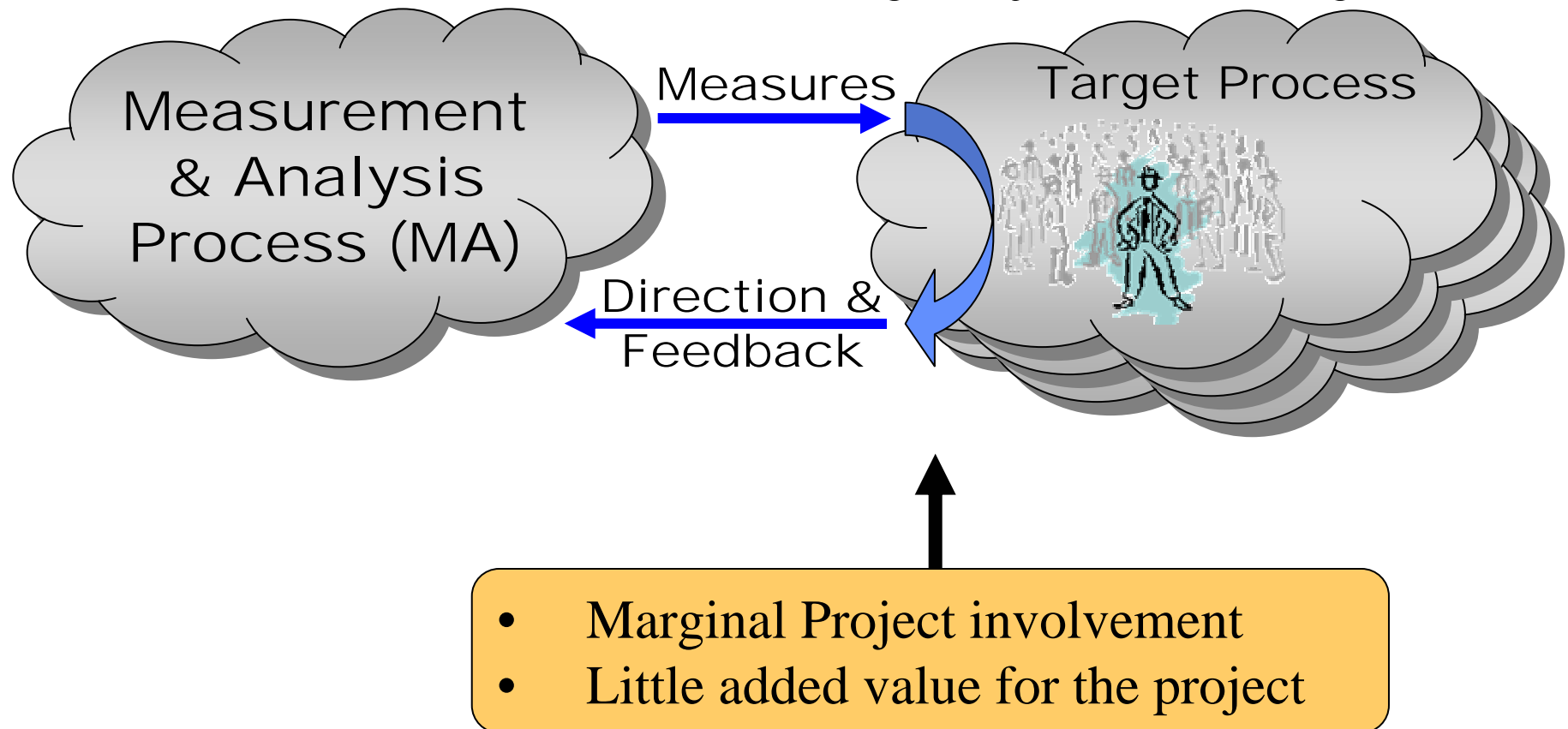
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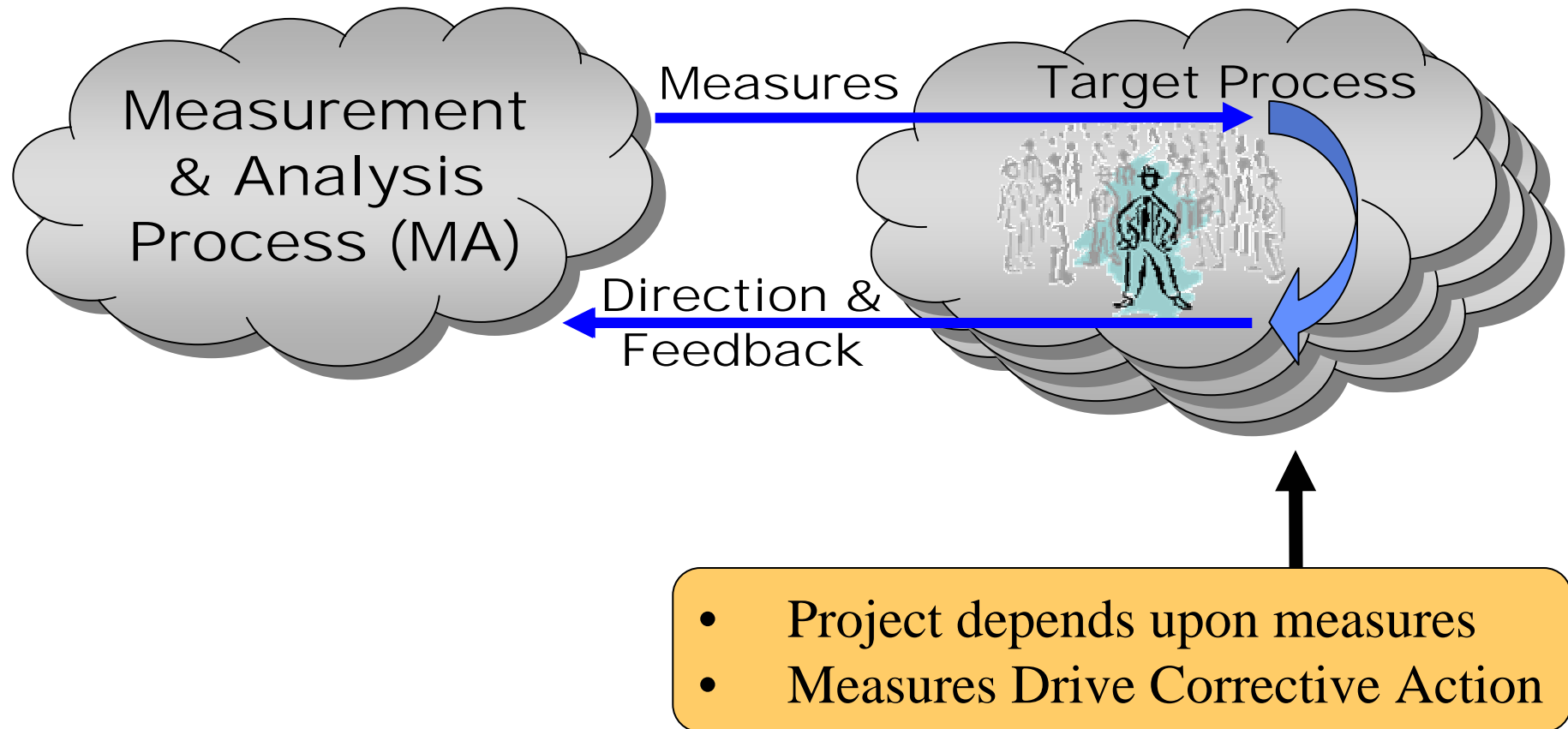
Shallow Measurement Loops Fail

e.g. Project Monitoring & Control

Measurement & Analysis Process (MA)

Measures →

← **Direction & Feedback**

Target Process

- Marginal Project involvement
- Little added value for the project

Deep Measurement Loops "Engage" and Succeed

Measurement & Analysis Process (MA)

Measures →

Target Process

← **Direction & Feedback**

- Project depends upon measures
- Measures Drive Corrective Action

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"Engage" by Getting Inside the Target OODA Loop

Target Process

MA

Observe → **Orient** → **Decide** → **Act**
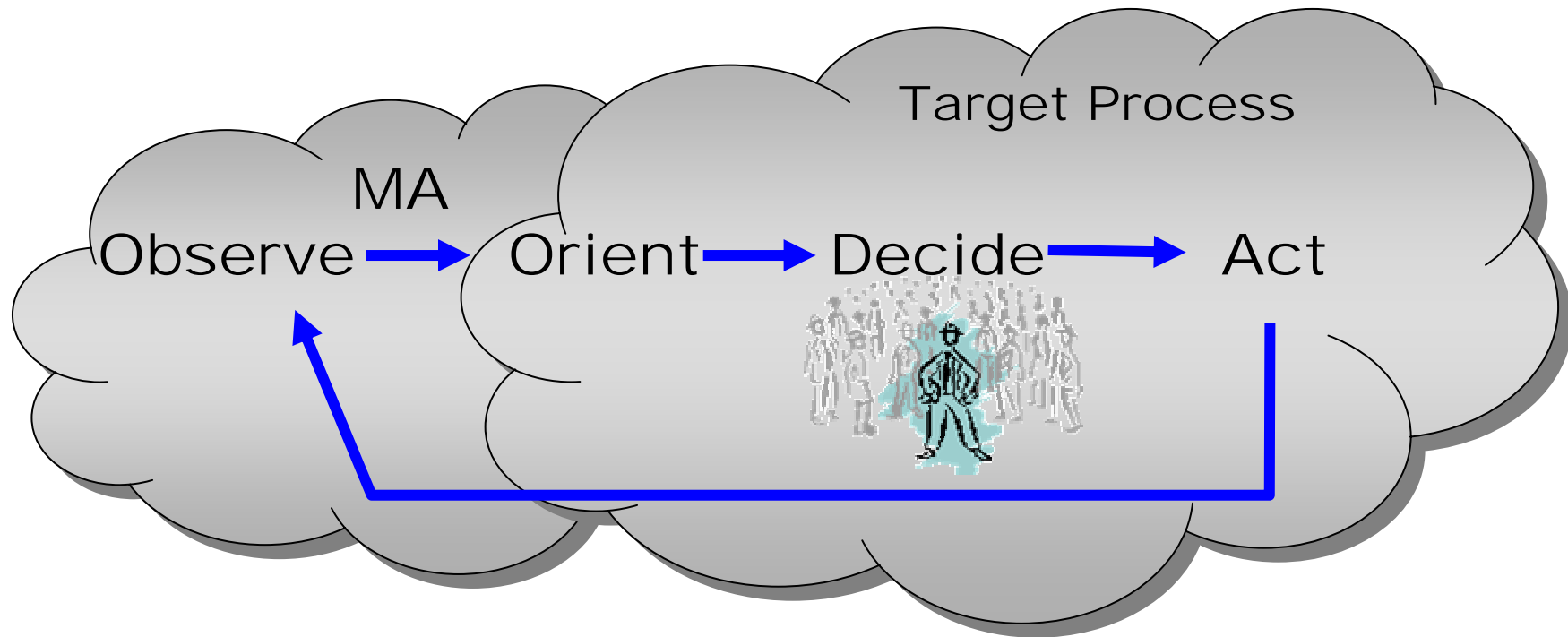
- Shifts focus to Target Process
- Provides an agile Framework for Action
- Drives Process Change and Corrective Action

Agenda

John Boyd's OODA Loop

Rationale for its Use in MA
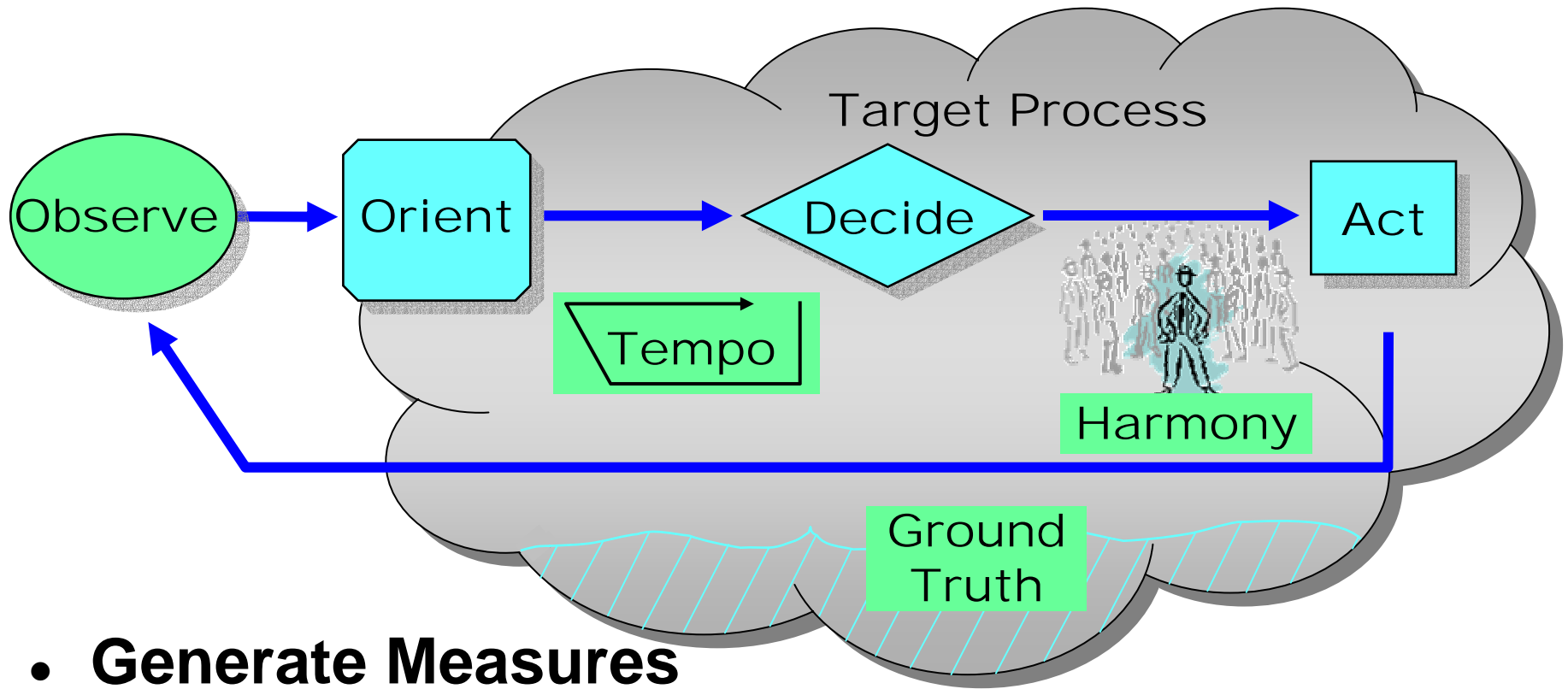
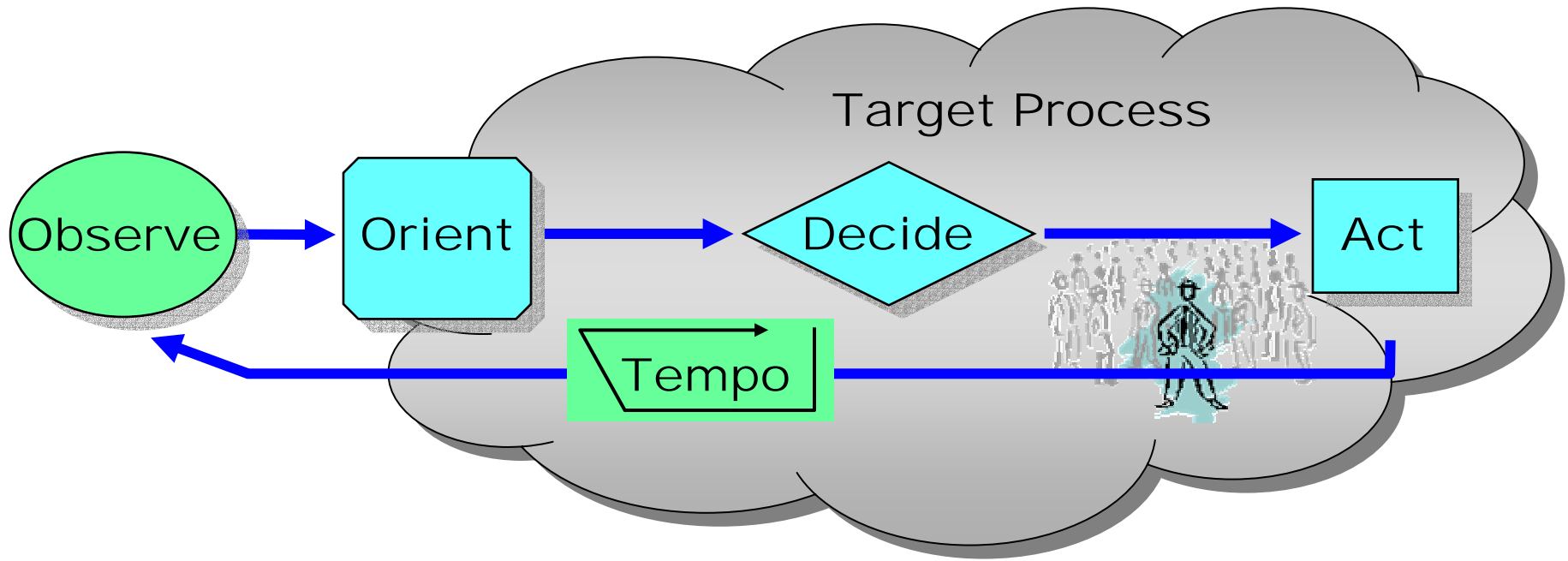**The OODA Loop for MA**

Summation

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Observe

- **Generate Measures**
  - Establish Tempo
  - Create Harmony with the Staff
  - Establish Ground Truth

Observe (Tempo)

- Tempo: "Measurement Frequency & Timeliness"
- Very challenging
- Tools are critical

Observe (Harmony)
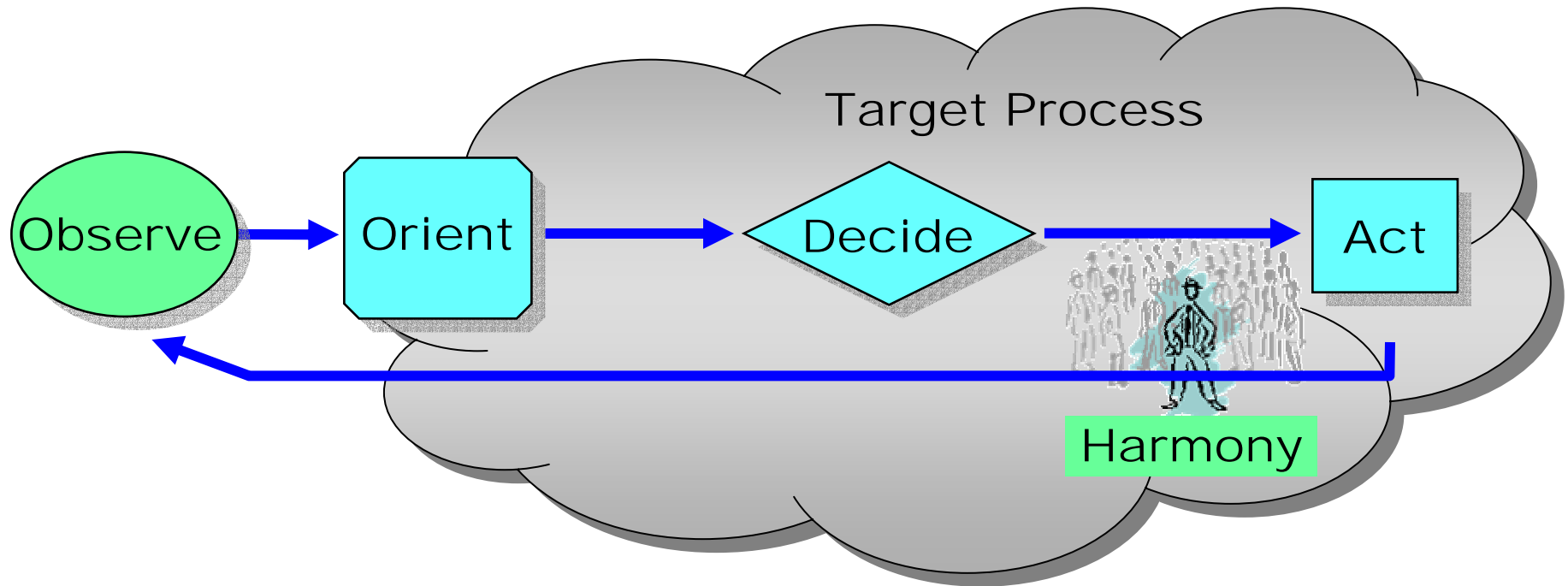
- Sell measurement
- Establish trust and a common goal
- Avoid friction

Observe (Ground Truth)

Target Process

Observe → Orient → Decide → Act

Ground Truth

Measures:

- Credible, Accessible, Flexible
- Finger-tip Feel
- Primary Reference

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Observe (Example Defect Chart)

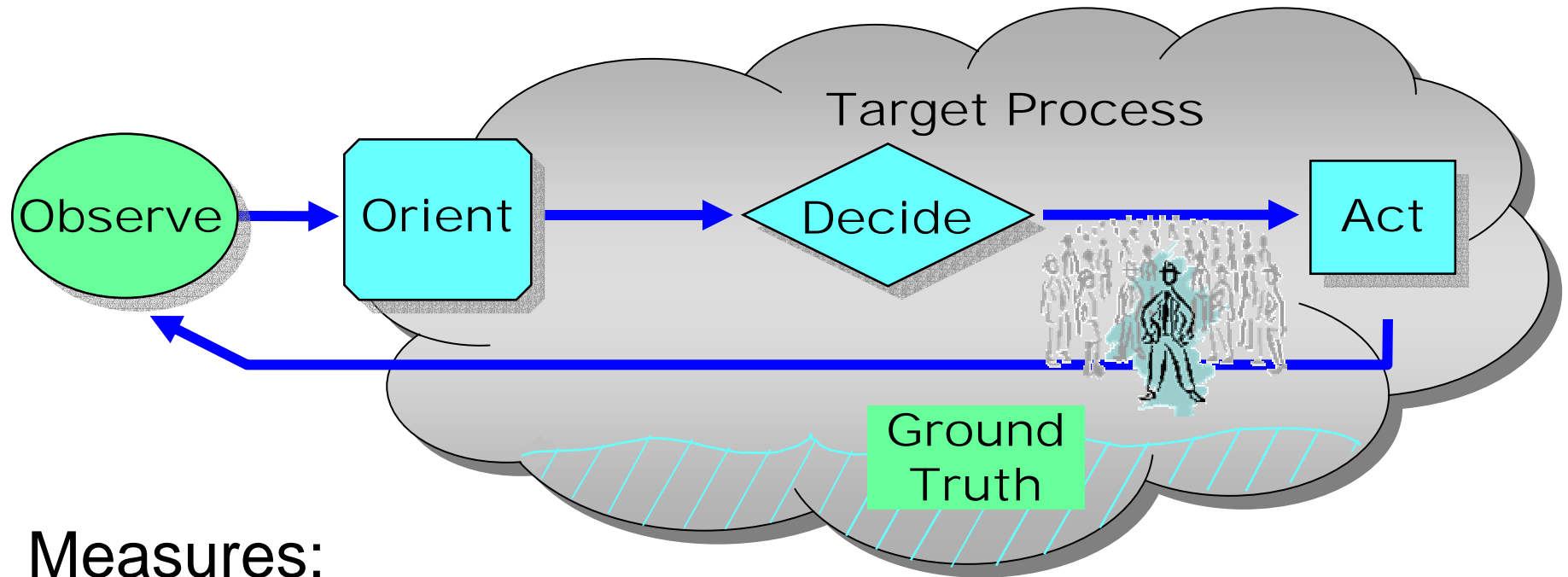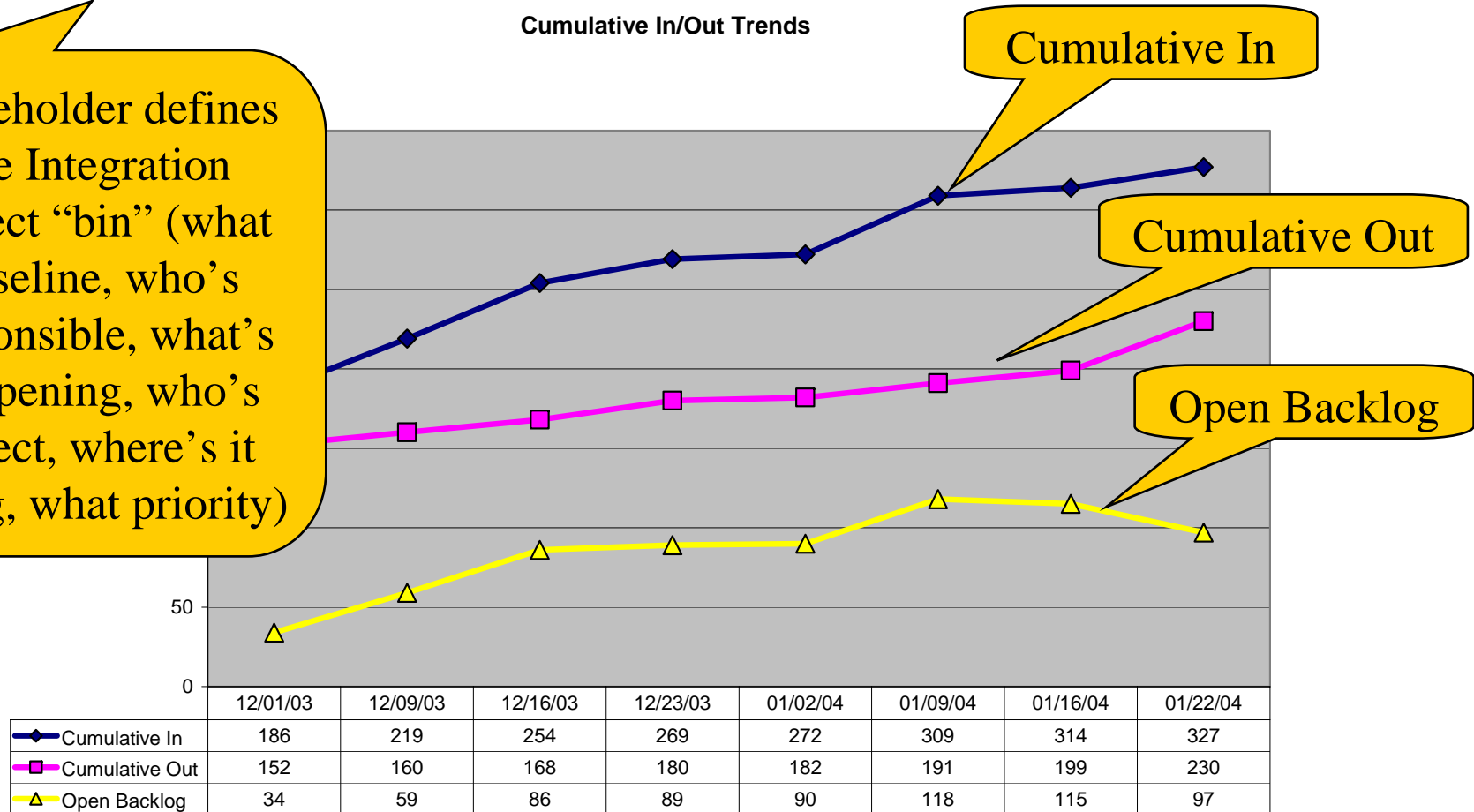| Baseline | V2.0 | Responsible Org | (All) | Defect State | Fixing | Where Detected | DXMod | Build | (All) | Priority | (All) |

Cumulative In/Out Trends

Stakeholder defines the Integration Defect "bin" (what baseline, who's responsible, what's happening, who's defect, where's it going, what priority)

Cumulative In

Cumulative Out

Open Backlog

	12/01/03	12/09/03	12/16/03	12/23/03	01/02/04	01/09/04	01/16/04	01/22/04
Cumulative In	186	219	254	269	272	309	314	327
Cumulative Out	152	160	168	180	182	191	199	230
Open Backlog	34	59	86	89	90	118	115	97

Date

Credible, Accessible, Flexible and Finger-tip Feel

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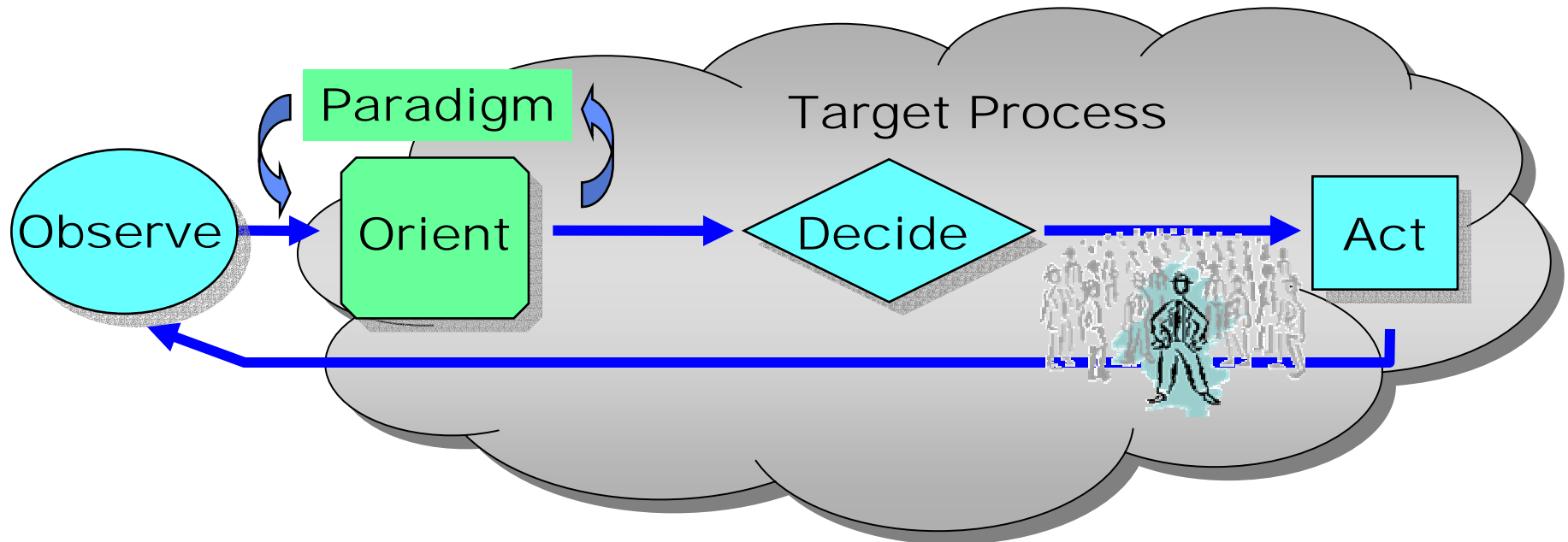
Orient

Orient to Measures and Environment

- Orient the Stakeholders
- Gain Leverage using Perspectives

Orient (Stakeholders)

- Understand the Stakeholder Paradigm:
  - May pull or push-back
  - May need adjustment
- Brief with Charts that support Decision-Making

Orient (Example Code Size Charts)

All — Summary Level

Equivalent KSLOC

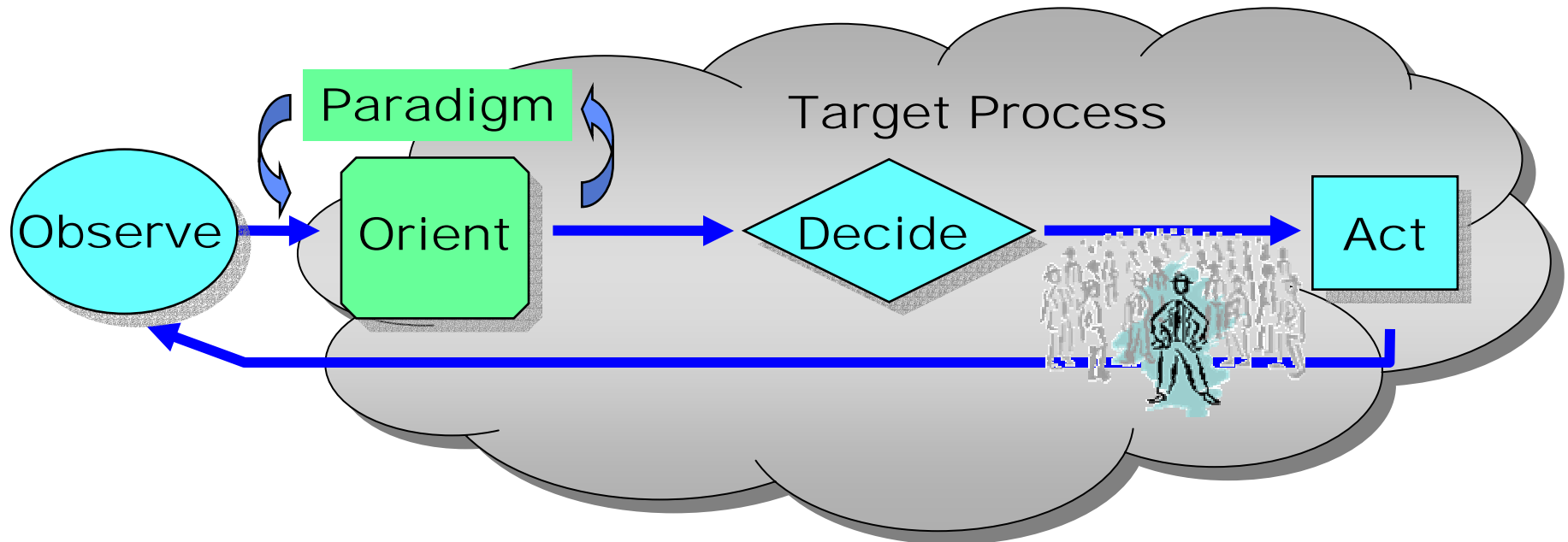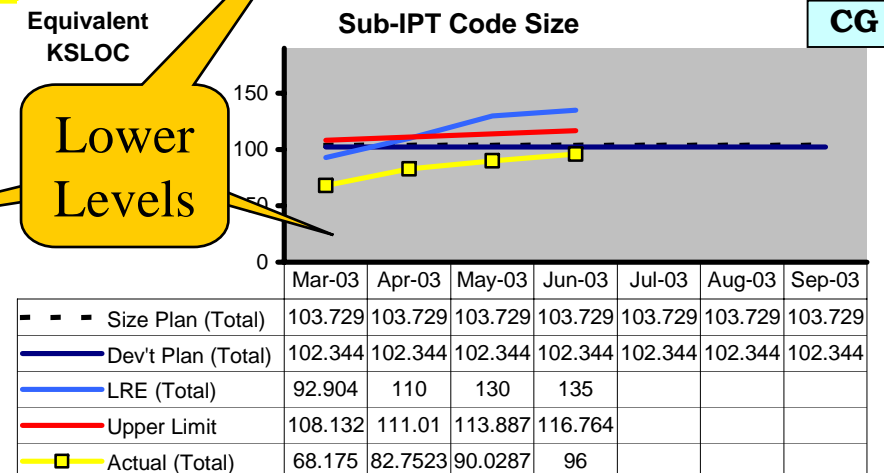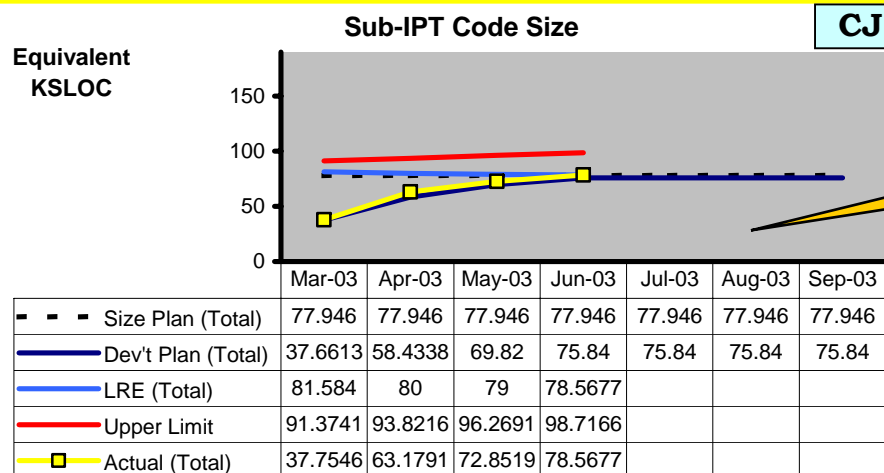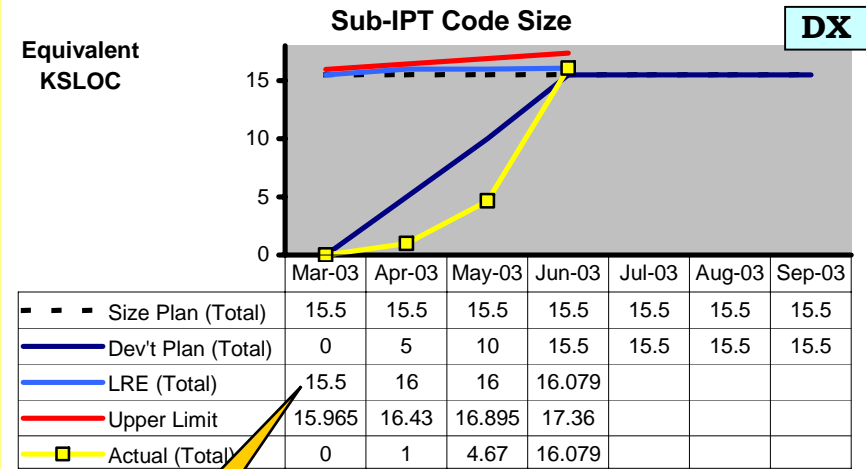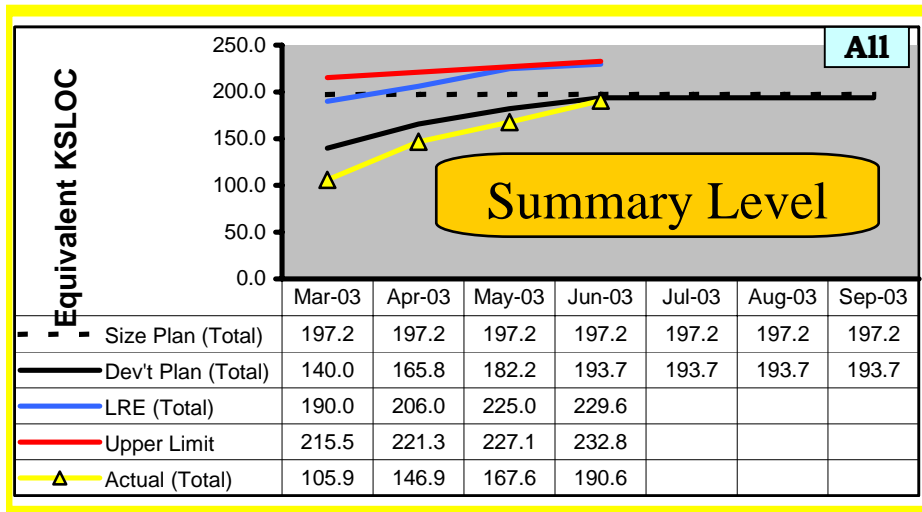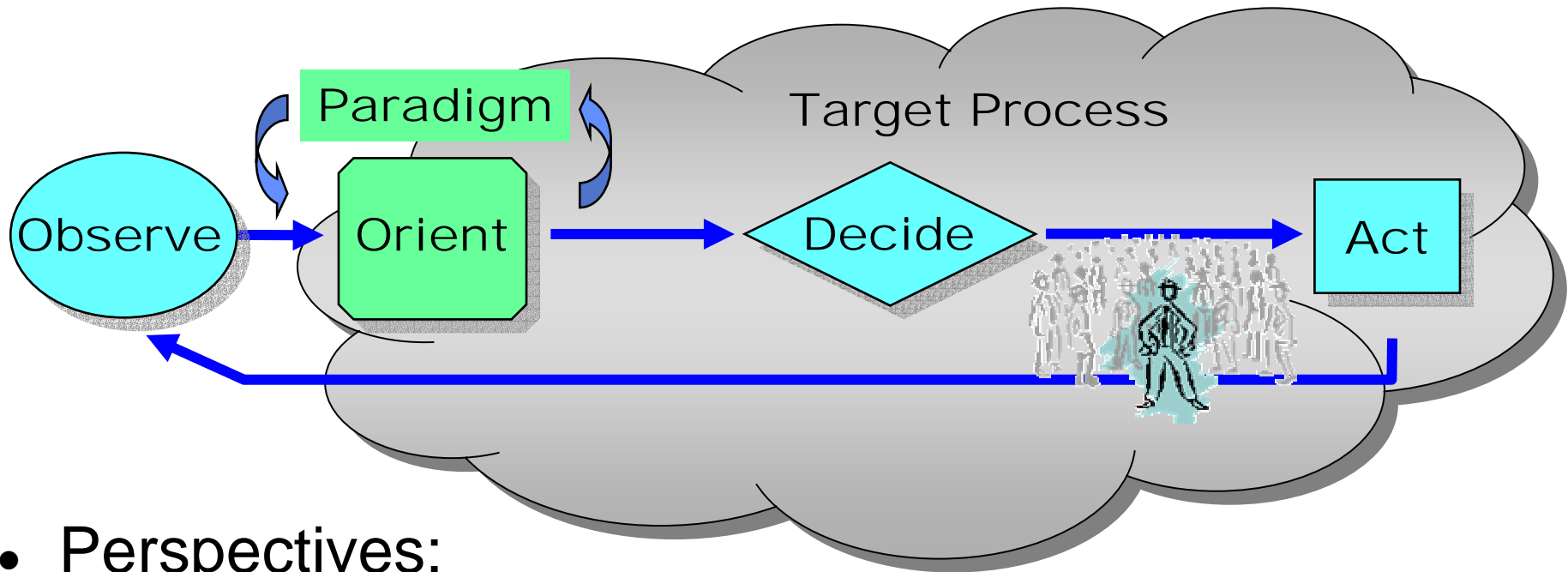|	Mar-03	Apr-03	May-03	Jun-03	Jul-03	Aug-03	Sep-03
- - - Size Plan (Total)	197.2	197.2	197.2	197.2	197.2	197.2	197.2
Dev't Plan (Total)	140.0	165.8	182.2	193.7	193.7	193.7	193.7
LRE (Total)	190.0	206.0	225.0	229.6			
Upper Limit	215.5	221.3	227.1	232.8			
△ Actual (Total)	105.9	146.9	167.6	190.6			

DX — Sub-IPT Code Size

Equivalent KSLOC

	Mar-03	Apr-03	May-03	Jun-03	Jul-03	Aug-03	Sep-03
- - - Size Plan (Total)	15.5	15.5	15.5	15.5	15.5	15.5	15.5
Dev't Plan (Total)	0	5	10	15.5	15.5	15.5	15.5
LRE (Total)	15.5	16	16	16.079			
Upper Limit	15.965	16.43	16.895	17.36			
Actual (Total)	0	1	4.67	16.079			

CJ — Sub-IPT Code Size

Equivalent KSLOC

	Mar-03	Apr-03	May-03	Jun-03	Jul-03	Aug-03	Sep-03
- - - Size Plan (Total)	77.946	77.946	77.946	77.946	77.946	77.946	77.946
Dev't Plan (Total)	37.6613	58.4338	69.82	75.84	75.84	75.84	75.84
LRE (Total)	81.584	80	79	78.5677			
Upper Limit	91.3741	93.8216	96.2691	98.7166			
Actual (Total)	37.7546	63.1791	72.8519	78.5677			

CG — Sub-IPT Code Size

Equivalent KSLOC

	Mar-03	Apr-03	May-03	Jun-03	Jul-03	Aug-03	Sep-03
- - - Size Plan (Total)	103.729	103.729	103.729	103.729	103.729	103.729	103.729
Dev't Plan (Total)	102.344	102.344	102.344	102.344	102.344	102.344	102.344
LRE (Total)	92.904	110	130	135			
Upper Limit	108.132	111.01	113.887	116.764			
Actual (Total)	68.175	82.7523	90.0287	96			

Lower Levels

Goal: Complete, Consistent, Insightful, No Frills

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Orient (Leverage)

- Perspectives:
  - Cost
  - Customer
  - Competition
  - Responsibility
- Tools are critical

Decide & Act

Target Process

Observe → Orient → Decide → Act
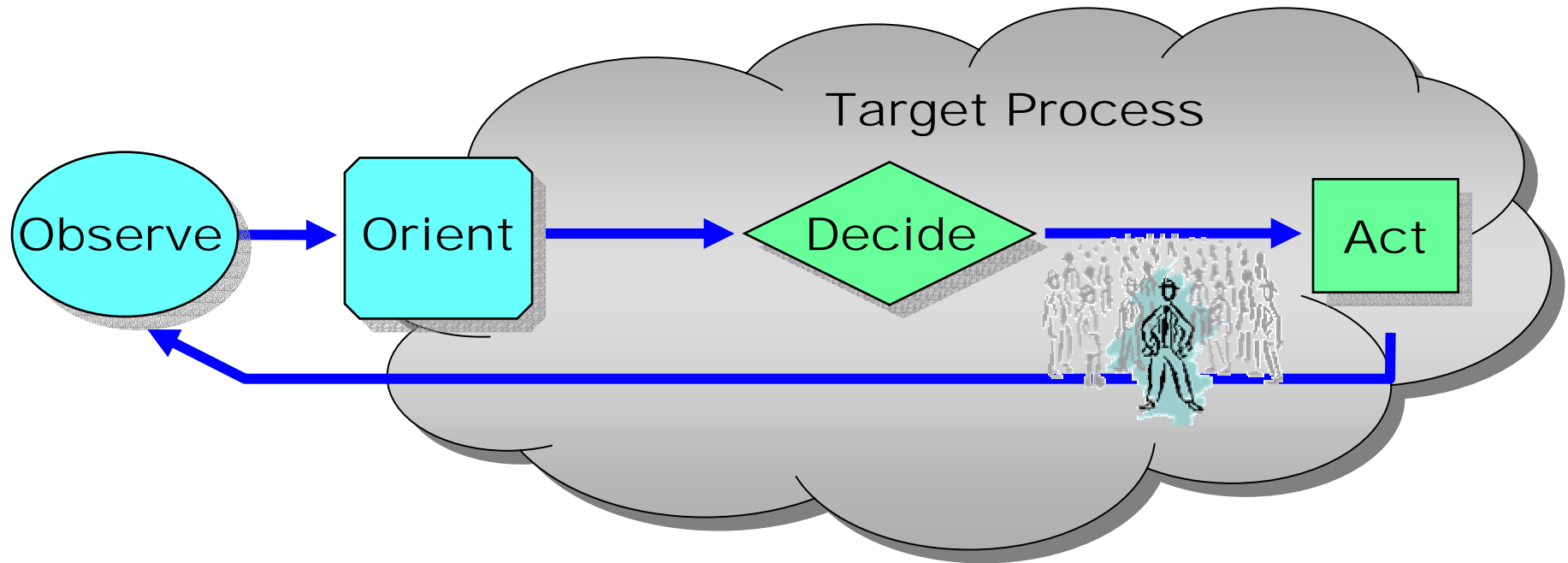
Stakeholders Decide and Act

- Avoid delayed decisions
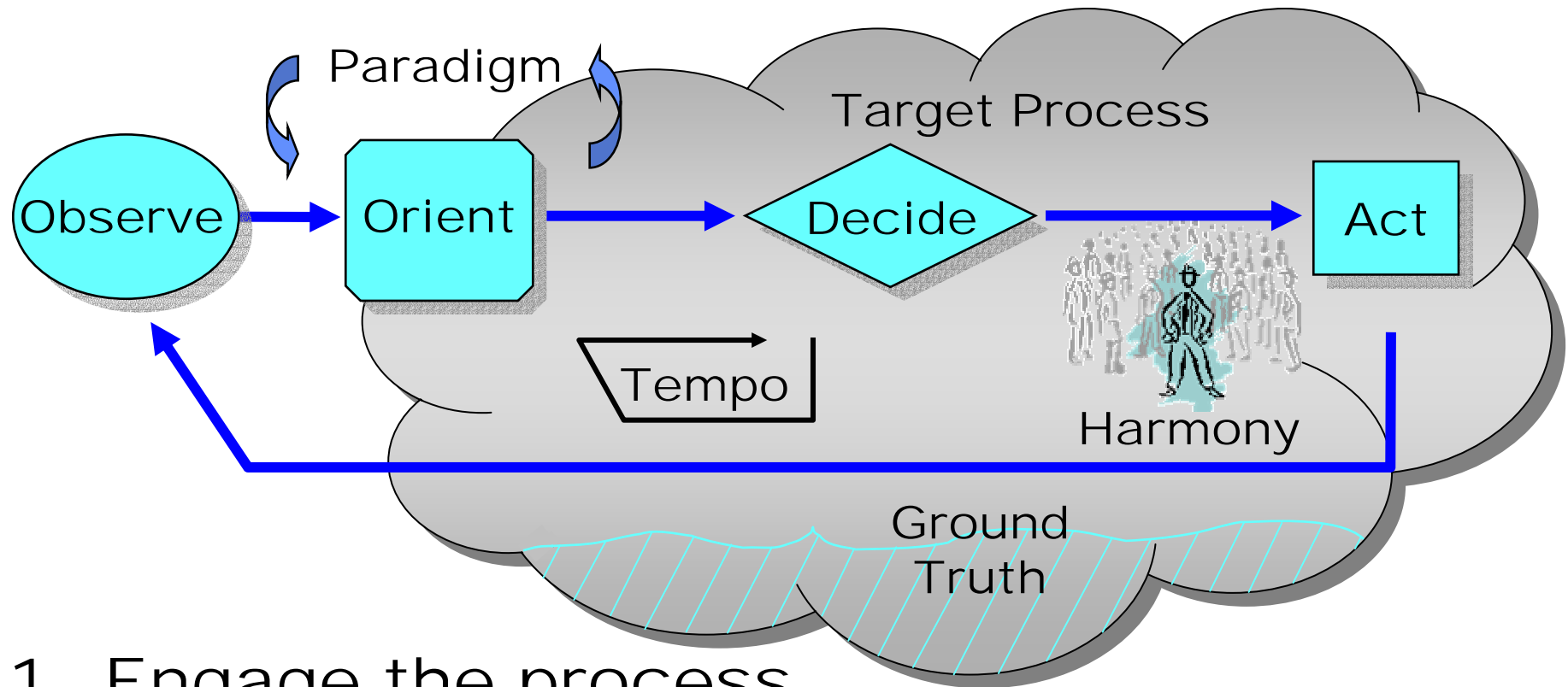- Proactively support decision/action

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Measure Like a Fighter Pilot

1. Engage the process
2. Drive corrective action
3. Enjoy the ride!

Back-Up Material

References for John Boyd

Articles

"Genghis John", Chuck Spinney, http://www.d-n-i.net/fcs/comments/c199.htm#Reference2003,1998, 1998 (suggested)

"John R. Boyd Colonel, United States Air Force", http://www.arlingtoncemetery.net/jrboyd.htm, 2002

"War, Chaos, and Business", http://www.belisarius.com/site_index.htm , 2003

"From Air Force Fighter Pilot to Marine Corps Warfighting: Colonel John Boyd, His Theories on War, and their Unexpected Legacy", http://www.d-n-i.net/fcs/boyd_thesis.htm , 2000

Books

Boyd: the Fighter Pilot Who Changed the Art of War, Robert Coram, 2003 (suggested)

The Mind of War – John Boyd and American Security, Grant Hammond, 2001