

INSPECTIONS

Evolution and History:

1972 – 2001

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Evolution and History of Inspections.

1972 Walkthroughs/reviews common practice in IBM.

M.Fagan introduced inspection process based on experience from hardware development. Strong resistance to change. Spread in IBM was slow, but gradually gained momentum.

Inspections of requirements, design, code test plans/cases and user documentation were very successful.

1976 Paper on inspections in IBM System Journal, by M.Fagan. Various forms of inspection were practiced by IBM customers and others.

1979 Value of inspections acknowledged by IBM's largest individual award to M.Fagan. Promoted more widespread use.

Evolution and History of Inspections - continued.

- **-83** Evolution of the inspection process through use in regular development and experimentation. Many hypotheses to improve inspections evaluated through measurement of > 600 experimental events selected from 11,000 inspections.

1986 Paper in IEEE Software on inspections, by M.Fagan.
(Highlights of inspection process only, no experimental results.)

1989 Independently, M.Fagan commenced training software companies in inspections and process improvement.
(Clients used the terms Fagan Inspection and Fagan Methodology to differentiate from other forms.)

2001 >100 client organizations trained to date by Michael Fagan.

What initiated creation of inspections?

1972 Michael Fagan transferred into software development management (from hardware engineering).

The prevailing focus in software development was:

- Deliver function - critical,
- Deliver on committed* schedule - critical, and
- Quality of shipped product – important.

HOWEVER,

- Fixing defects in shipped product diverted effort from developing the next release, causing it to be delayed,

and
- Defects really disturbed customers!

What to do to succeed? Took the following views:

- **Used the following working hypotheses of current practice:**
 - > 50% of development effort was actually used for defect rework. (Defect rework effort was not being actively managed. Only the 'visible' work was being planned and managed.)
 - Effort to rework a defect increased in each phase by 10X up to 100X by end of the development cycle – and was higher in the field.
- **Recognized that creative original work often contains defects – and it is our business to do creative original work.
People make mistakes!**

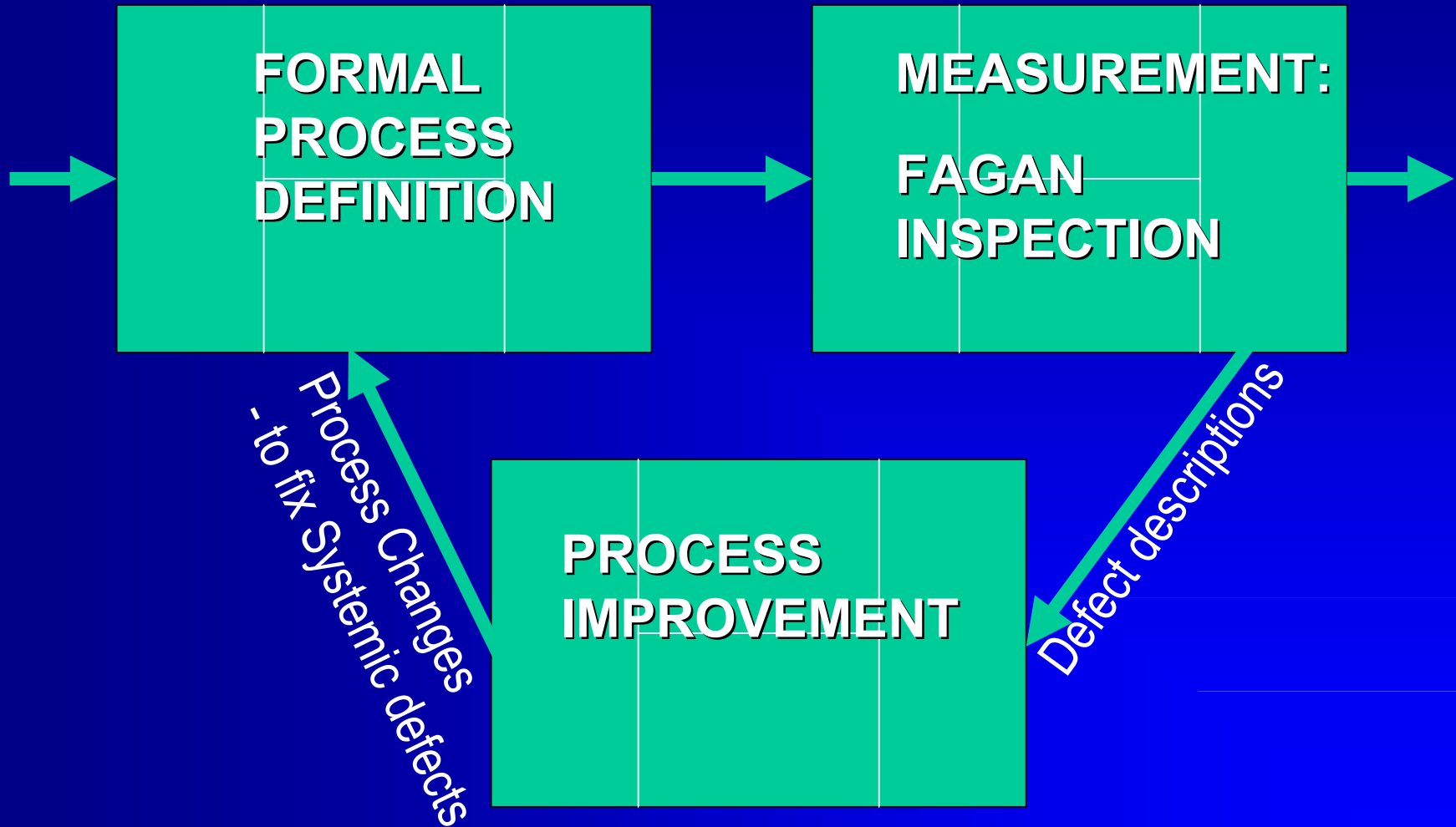
Took Action!

- **CREATED INSPECTION PROCESS to find defects as close to their point of creation as possible.**
- **Inspections applied to design, code and requirements.**

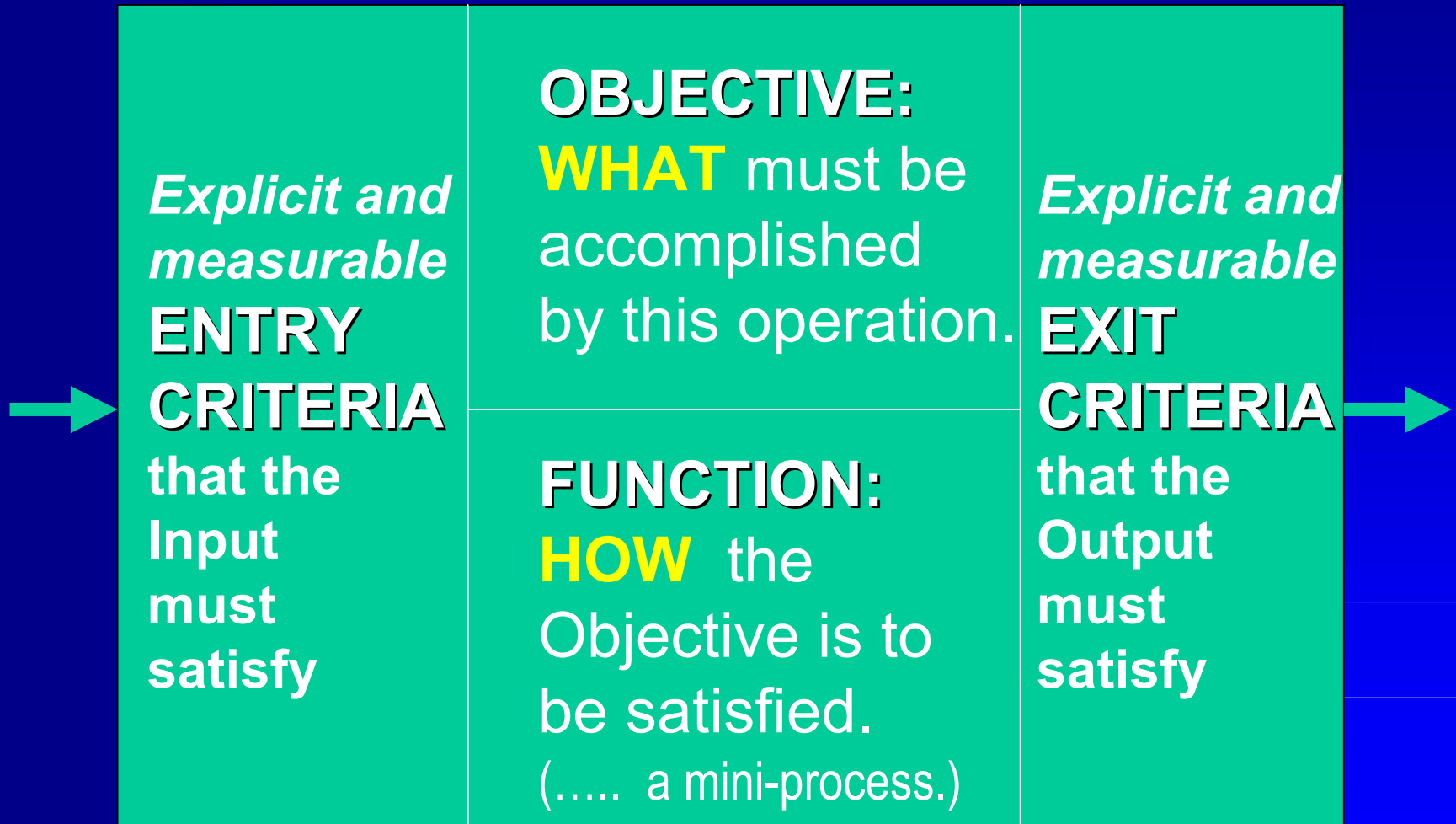
This also enabled:

- **Measurement of defects,**
- **Management of defect rework, and**
- **Removal of Systemic defects from the development process.**

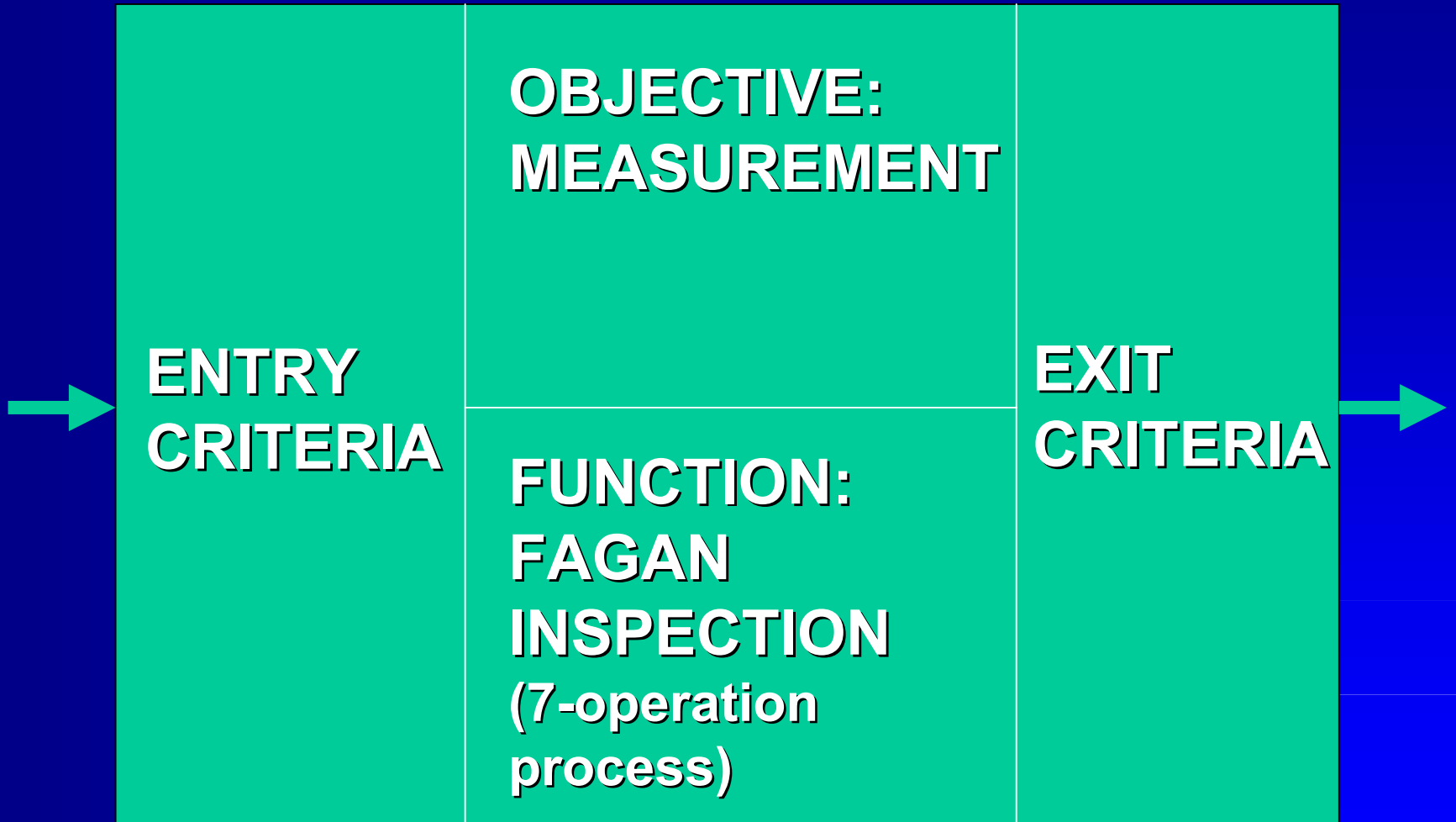
FAGAN INSPECTION PROCESS



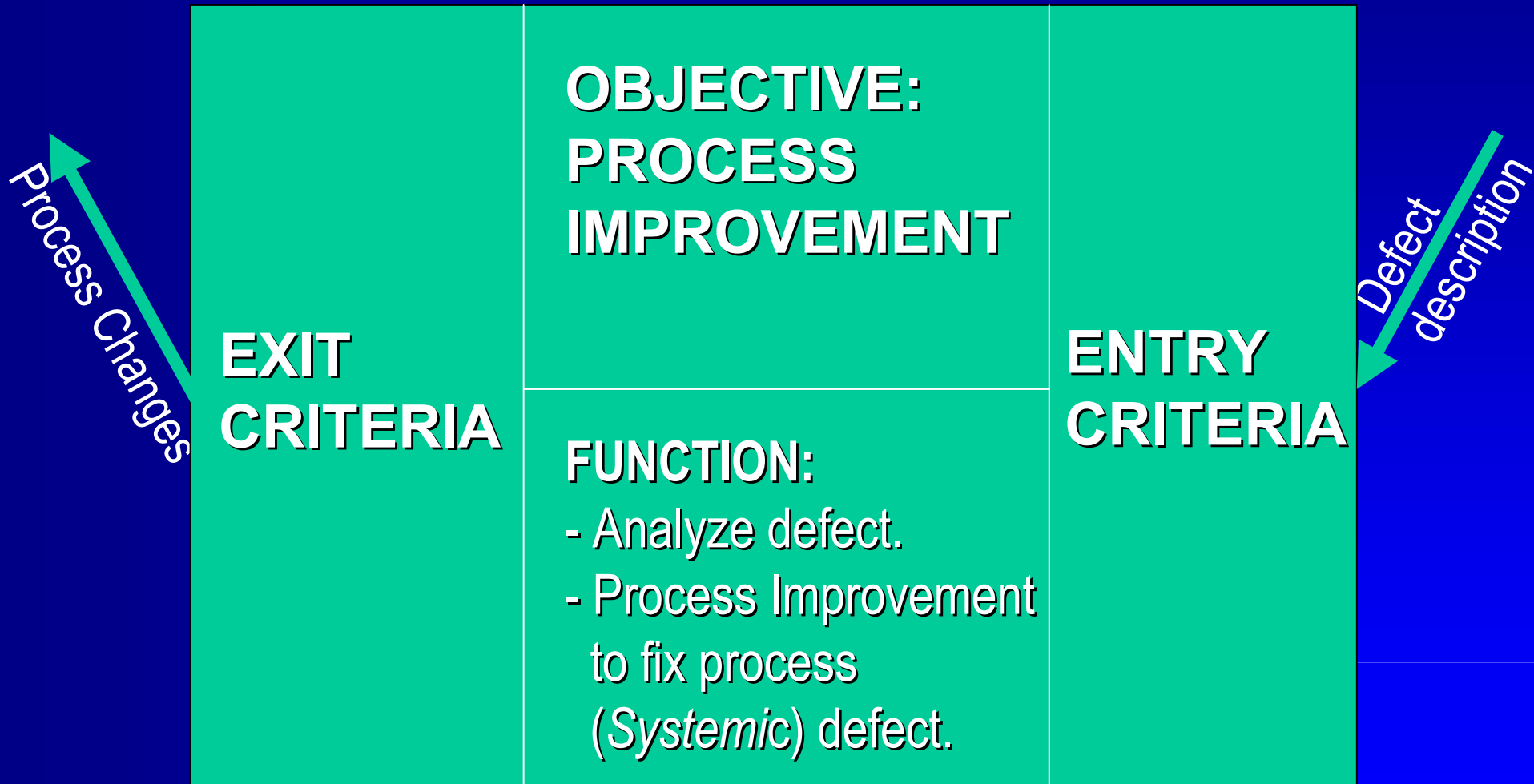
FORMAL PROCESS DEFINITION of an operation.



FAGAN INSPECTION (Measurement)

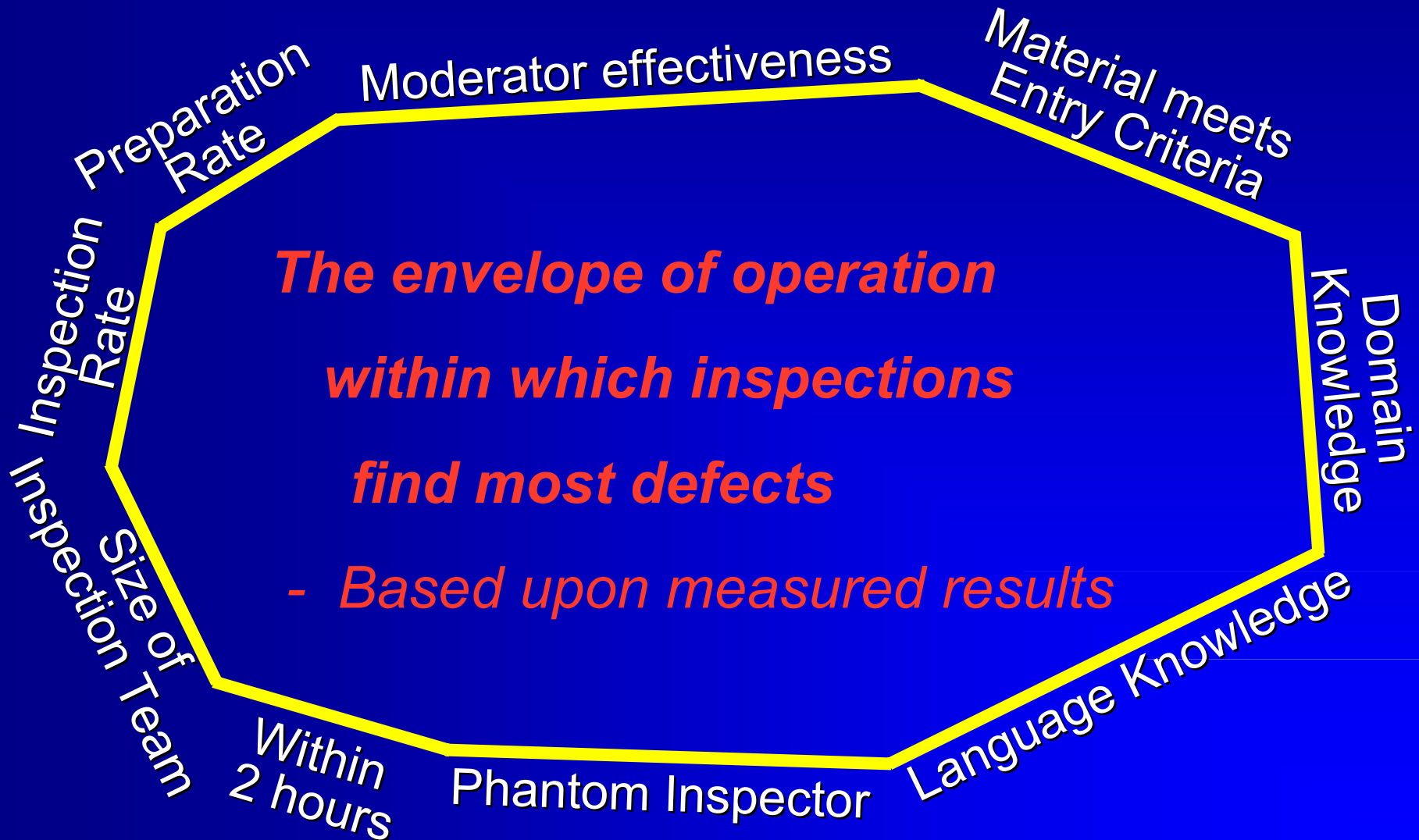


PROCESS IMPROVEMENT

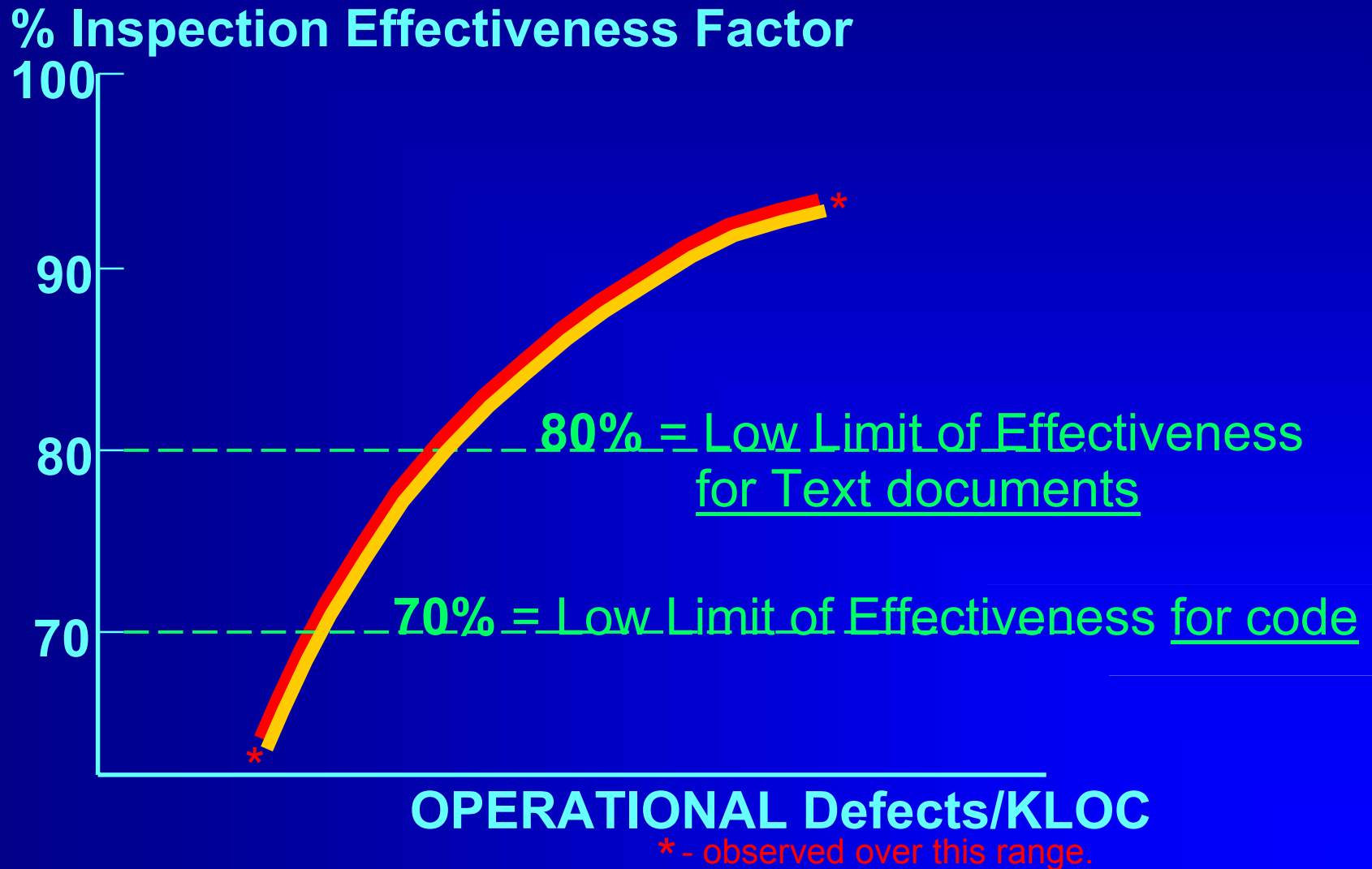


INSPECTION EFFECTIVENESS* FACTORS

* The effectiveness of inspection in finding defects that are present



INSPECTION EFFECTIVENESS FACTORS and OPERATIONAL DEFECTS/KLOC DETECTED



FAGAN INSPECTION PROCESS.

PROCESS OPERATION

1 PLANNING

2 OVERVIEW

3 PREPARATION

4 INSPECTION MEETING

5 PROCESS IMPROVEMENT

6 REWORK

7 FOLLOW-UP

OBJECTIVES

- Material, Inspectors, schedule.
- Present Overview.
- Learn material, prepare role, DO NOT focus on finding defects.
- **FIND DEFECTS!**
- Learn from last 4 operations to improve next inspection.
- Identify **SYSTEMIC DEFECTS** in the process and recommend fixes.
- Rework all defects.
- Verify all fixes.

INSPECTOR ROLES IN FAGAN INSPECTIONS.

The inspectors play complementary roles on the inspection team.
To be successful, this requires specific skills training.

MODERATOR.

AUTHOR.

READER.

TESTER.

The PHANTOM INSPECTOR

- Team synergy (due to cooperative team interaction) that cause identification of additional defects over and above the sum of defects found by individual inspectors.

	<u>Code</u>	<u>Requirements</u>
Additional Defects found by the PHANTOM INSPECTOR	55 %	28 %

Observations:

- Percent of Operational defects in the life-cycle found by inspection before any testing:

1972-76 50 - 65%

2001 75 - 85%, in exceptional cases > 90%.

- Practical removal of *Systemic* defects can reduce injected defects by 50%.
- Participation in inspections is the fastest way to learn new product or domain.
- Authors and other inspectors learn to avoid making defects.

Client results - 2 Years after initial Implementation:

- 15X Reduction in Customer Reported Defects;
- 2X Feature Content in releases through increased productivity;
- Improved meeting ship schedules 39%;
- 41% Increase in Customer Satisfaction; and
- Formal assessment at SEI/CMM Level 3.

Same Client – 2 Years Later:

- > 20X reduction in customer reported defects.
- 50X reduction in time to delivery.
- 55% improvement in Customer Satisfaction.
- \$45Million cost avoidance in coding defects alone.
- Initiated training in two software vendors.