Join 2nd Quality Revolution

Quality Management Working Group

- Engineering Leadership Training
- Systems Thinking / Tools Workshops
- Case Studies / Research Projects
- Networking and Collaboration

Join 2nd Quality Revolution

QualityManagementInstitute.com/INCOSE

Apollo Program

The Challenge for Leadership

- **Keeping the Promise to Our Customers**
  - **Quality Products and Services**
  - **Reliable Customer Service Reponses**
- **Hiring and Training Reliable People**

Quality Management

- An Educational Technology with:
  - Systems
  - Methods
  - Language
- To Reach Your Business Goals

Quality Management

- QM, in its orthodoxy, provides values-based and facts-driven solutions to a variety of issues affecting the design and production processes.

- Engineering managers must now be capable of functioning as effectively in team-building and values-based discussions as they are in task delegation and production management.

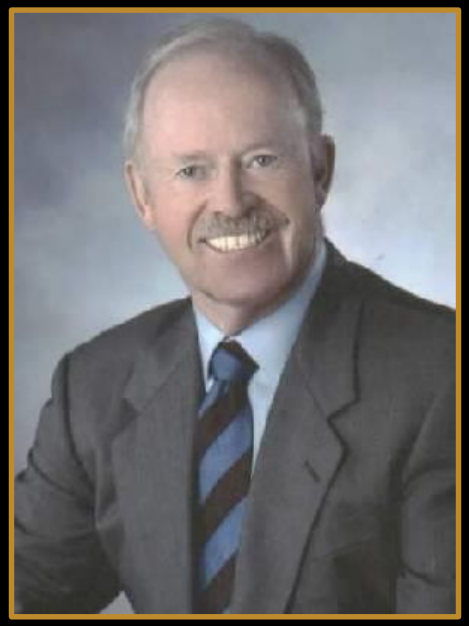
- "Human factors integration" is no longer limited to solving the problems of people interacting with machines. It has become the "code word“ for the vulnerabilities of a workforce with deficits in education, experience and work-ethic.

Join 2nd Quality Revolution

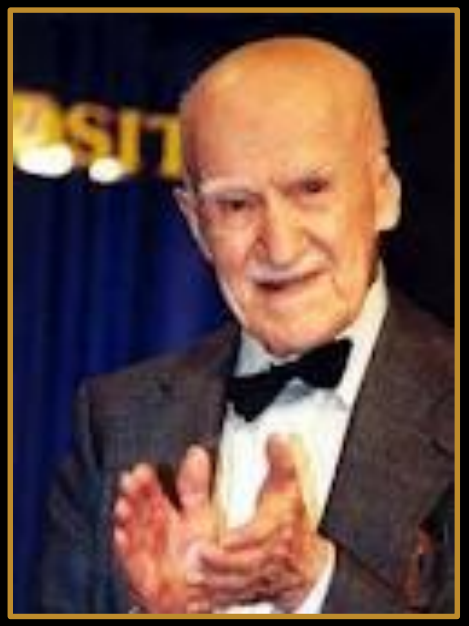
- **Restore the Skills and Values That Supported the Quality Revolution**

2QR

W. Edwards Deming



Philip Crosby



Joseph Juran

2QR Complete QM: Engineer, Manager and Leader

- Empowers the traditional goals of improving products and services, and reducing expense and waste.
- Provides the tools to evaluate and solve the people problems that threaten the success of our work and vision.

Quality Marketed

Definition of Quality



- **Conformance to Requirements: What the Customer Needs, Wants or Expects in a Product or Service**
- **Promises That Are Specifically Stated or Implied in Advertising**

Managing Quality Requires

- QM Methods
- QM Values
- Reasonable Discussions

System of Quality

- **Prevention:**

  Prevent Errors From Occurring and/or Reaching the Customer

- **An Ounce of Prevention is Worth a Pound of Cure**

Benjamin Franklin

QM Prevention Methods

- **Quality Control:** Taking Bad Things Out of Processes
- **Quality Assurance:** Putting Good Things Into Processes

QC - Taking Bad Things Out

Eliminates the Defects

- Editing
- Inspecting
- Testing
- Monitoring
- Auditing

QC: After Errors Occur

Quality Control (QC)

- Quality Control Has Its Limitations
- Too Expensive to Inspect Every Single Product or Service

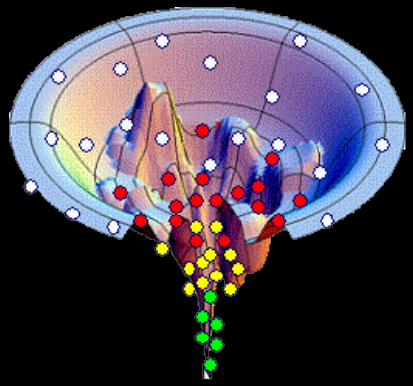
Capsule

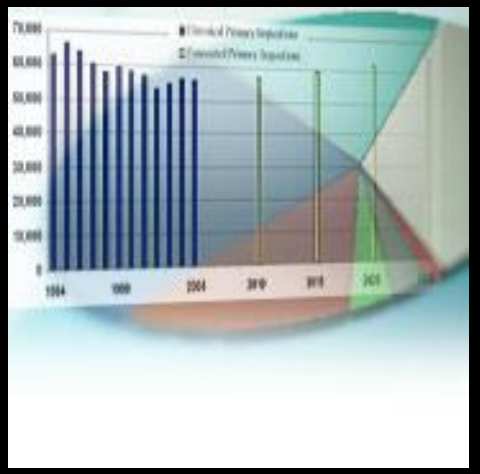
Zipper

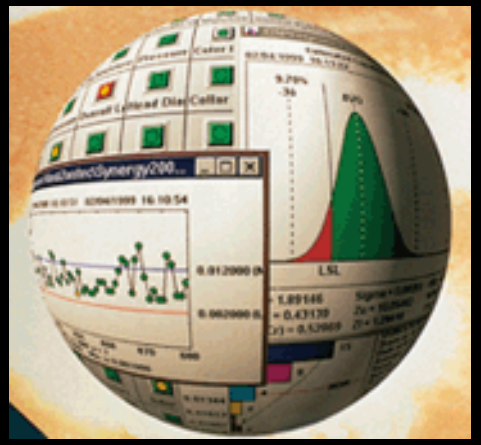
Repairs

Classroom

Statistical Methods







- Sampling
- Testing for Reliability

Testing for Reliability

- Testing Them Until They Fail
- Carefully Counting Repetitions
- Calculating the Failure Rate

Testing for Reliability




- Certified for Intended Purpose
- Routed to Reasonable Use
- Reliability = Quality Assurance

QM Prevention Methods

- **Quality Control:** Taking Bad Things Out of Processes
- **Quality Assurance:** Putting Good Things Into Processes

QA - Putting Good Things In

Eliminates the Causes

- **Reliable Human Resources**
- **Policies and Procedures**
- **Equipment and Training**

Quality Assurance (QA)



- QA – Reliability Engineering
- Calculate the Statistical Probability of Failure
- From Systems to Units to Components and Materials

Standard of Quality

- **Zero Defects: Not Satisfied With Any Defects Reaching Our Customers**

Zero Defects Attitude

- Pride of Workmanship
- Not Expecting Perfection
- Always Keeping the Promise

Good Experience Gone Bad

- Unsatisfied Hunger
- Lost Moment of Comfort

A Simple Question

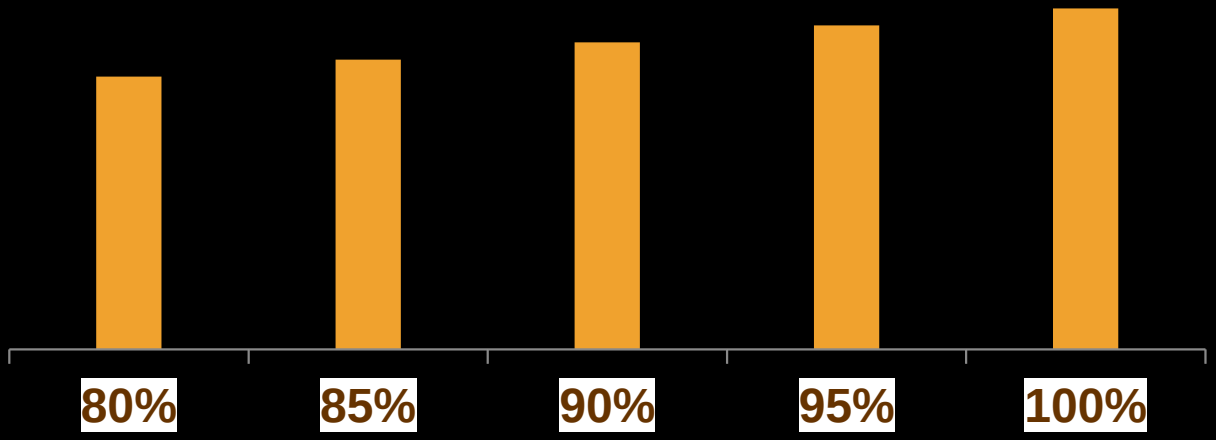
- How Many Worms Are Too Many?

A Simple Answer

- How Many Worms Are Too Many?

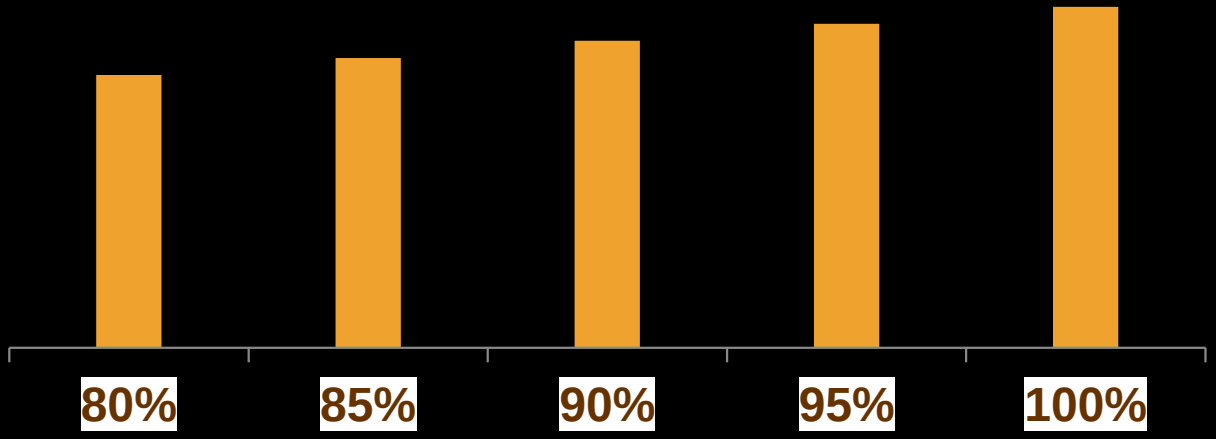
Acceptable Quality Level

- AQL's Are Designed to Give Relief From Work Pressure
- Avoid the Perceived Threat of a Standard of Perfection



The Problems With AQL's

- How Many Are Too Many?
- Humans Make Mistakes
- Incremental – Continuous



The Problems With AQL's

- **Processes Have Multiple Steps or Actions**






The Problems With AQL's

- Four Step Process: 90% AQL
- Right: 90 Times Per Hundred






Calculating AQL Defects

A Four Step Process With 90% AQL

- Step 1: 100 Actions X 90% =
  90 Defect Free Products or Services
- Step 2: 90 Defect Free X 90% =
  81 Defect Free Products or Services
- Step 3: 81 Defect Free X 90% =
  73 Defect Free Products or Services
- Step 4: 73 Defect Free X 90% =
  66 Defect Free Products or Services

How About A 98% AQL?

A Four Step Process With 98% AQL

- Step 1: 100 Actions X 98% =
  98 Defect Free Products or Services
- Step 2: 98 Defect Free X 98% =
  96 Defect Free Products or Services
- Step 3: 96 Defect Free X 98% =
  94 Defect Free Products or Services
- Step 4: 94 Defect Free X 98% =
  92 Defect Free Products or Services

Measurement of Quality



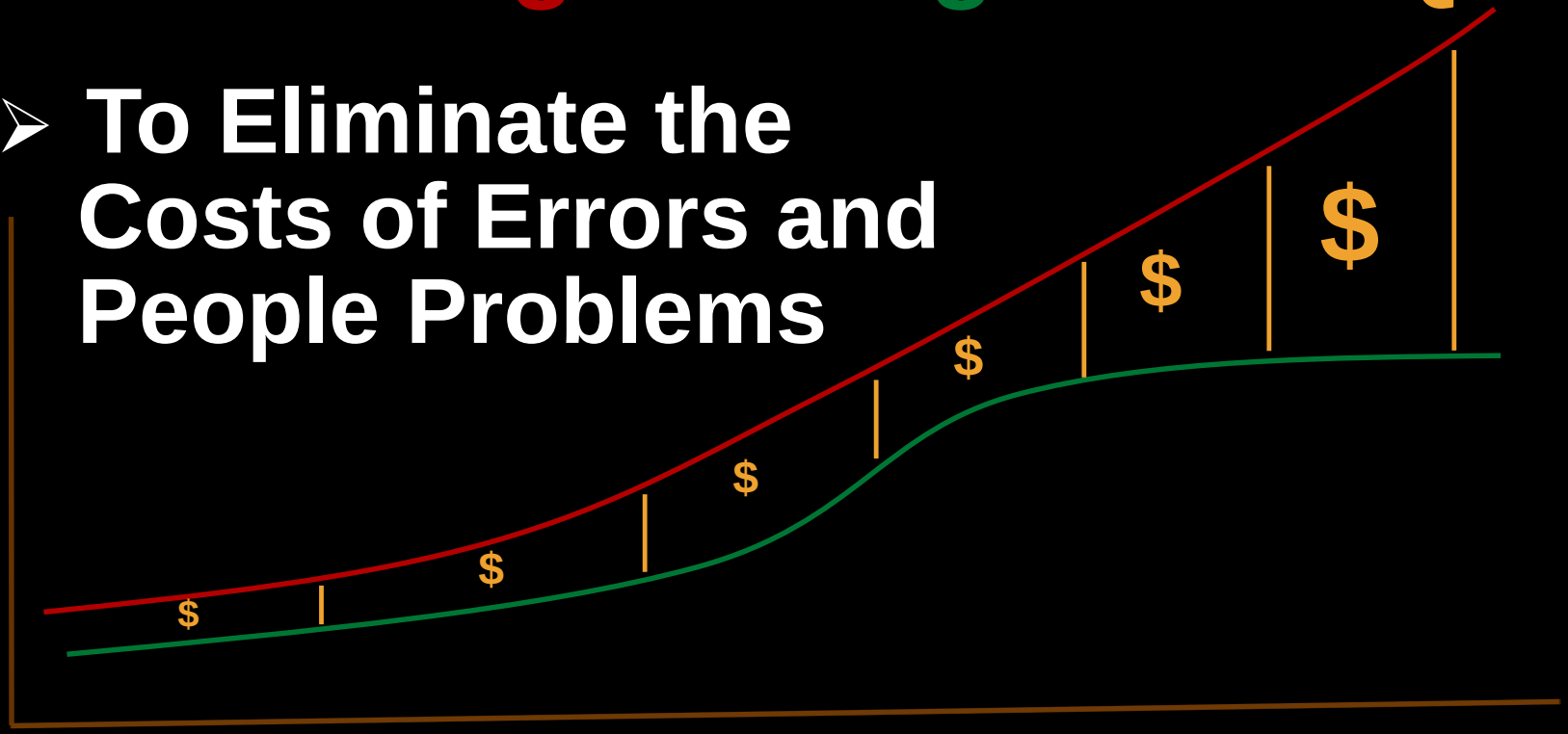
- **Price of Non-Conformance: What It Costs When We Do Things Wrong**
- **Dollars and Human Values**

The Cost of Quality

- **Cost of Doing Things Wrong**
  Warranties, Rework, Repairs, Replacement, Customer Loss
- **Cost of Doing Things Right**
  Inspections, Audits, Checking Human Resources, Procedures, Equipment, Training, etc.

The Cost of Quality

- **$$ Wrong - $$ Right = COQ**
- **To Eliminate the Costs of Errors and People Problems**



The Cost of Quality

- **$$ Wrong - $$ Right = COQ**
- **To Eliminate the Costs of Errors and People Problems**
- **QUALITY IS FREE**

Philip Crosby

Cost of Poor Quality

- A general rule of thumb is that the costs of poor quality *in a thriving company* will be about 10 to 15 percent of operations. Effective quality improvement programs can reduce this substantially, thus making a direct contribution to profits.

  American Society for Quality

- Philip Crosby said that companies lose as much as *20% of their operating budget* through errors, rework, customer service problems, etc. but often "choose to continue to pay for poor quality."

  Quality Digest (February 2001)

Errors, Defects, Re-Work and Failed Customer Service

Everyone Has A Story . . .

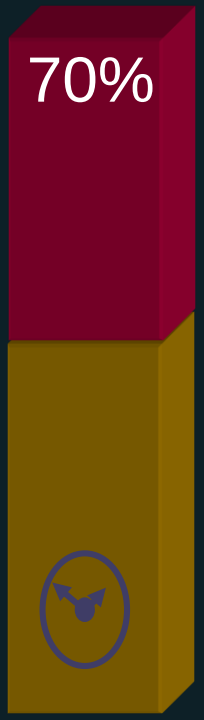
. . . about supposedly reliable people and companies who have failed to keep their promise.

- **Have you tried to update your cell phone or cable service lately; and had to sift through the confusing and often misleading facts?**

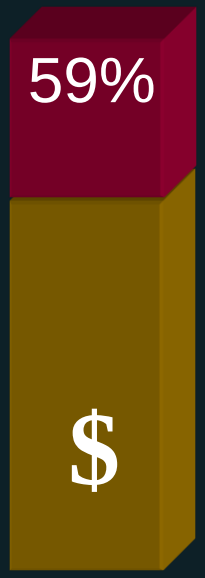
Lost Time, Money and Opportunities = Lost Profits

- **One in Six IT Projects Have a Budget Overrun of 200%**

Avg. Schedule Overruns



Avg. Budget Overruns



Features in Final Product

Harvard Business Review

Lost Time, Money and Opportunities = Lost Profits

All Projects Avg. Success = 29%

Success = On-Schedule, On-Budget and Fully-Featured

The Standish Group Chaos Manifesto

Lost Time, Money and Opportunities = Lost Profits

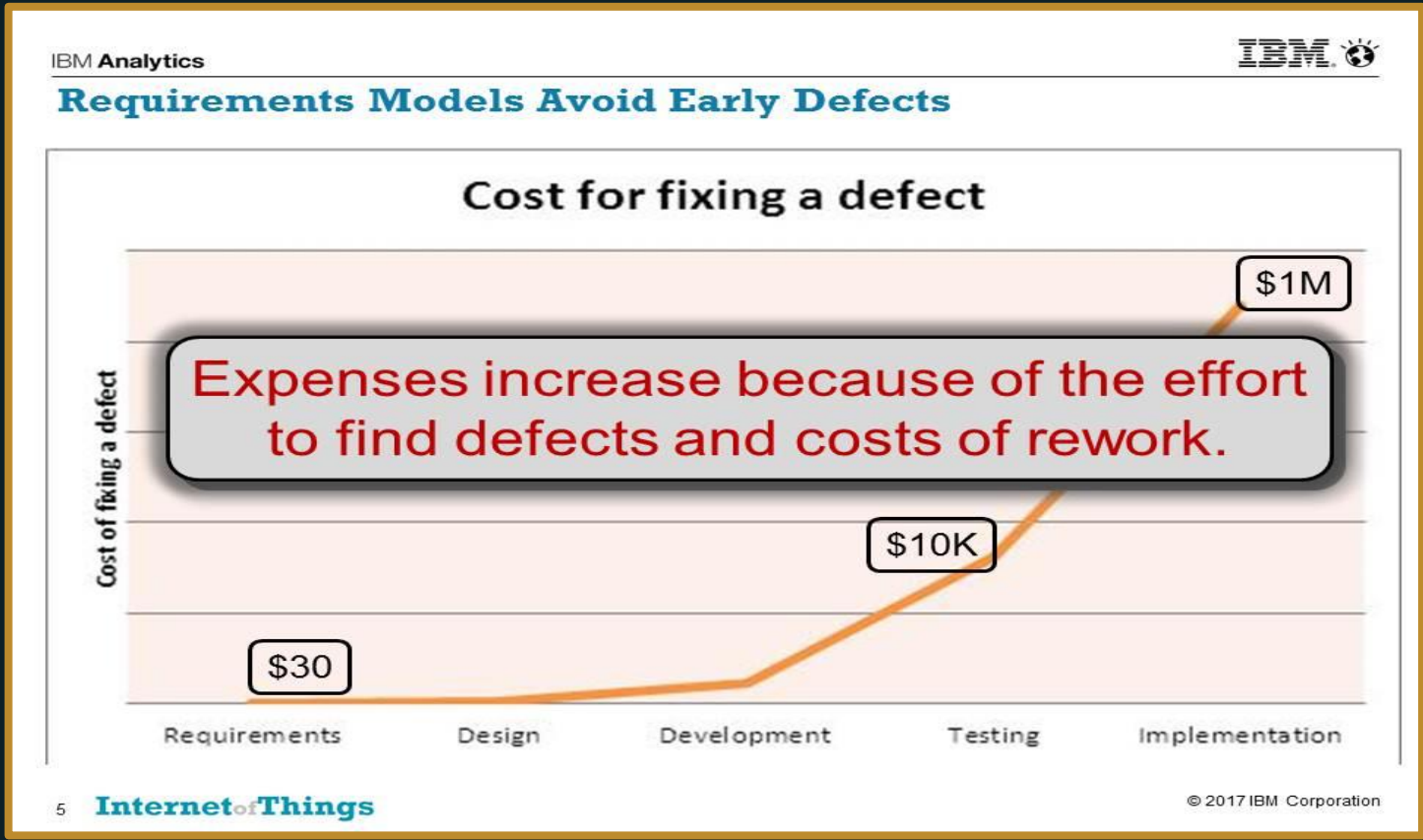
The Data Indicates Culture and Process are the Root Causes of Lost Profits NOT the Development Method

DEVELOPMENT METHOD	PROJECT SIZE	SUCCESS RATE
Agile	All Sizes	39%
Waterfall	All Sizes	11%
Agile	Large	18%
Waterfall	Large	3%
Agile	Small	58%
Waterfall	Small	44%

The Standish Group Chaos Manifesto

Lost Time, Money and Opportunities = Lost Profits

Failure to Document - Take Action



Everyone Has A Story . . .

. . . about supposedly reliable people and compani s w o have fai to ke p their ron se.

WHY?

70% Disengaged or Actively Disengaged

HATE THEIR JOBS

Gallup / Purdue University

- Disengaged employees shift the load to the engaged employees - frustrate high-performers.
- Organizations with high employee engagement.
  - 21% Higher Productivity
  - 22% Higher Profitability
  - 25%-65% Lower Turnover; 37% Less Absents
  - 28% Lower Shrinkage; 48% Less Accidents

Inc.com – The Cost of Unhappy Employees

Four-Year College Graduates

50% Lack Math Skills and Proficient Literacy

Two-Year College Graduates

75% Can't Summarize A Newspaper Article

American Institutes for Research

2QR® is Systems Thinking

An approach to problem solving, that considers and evaluates "facts and events" as parts of an overall system.

- **Avoids the failures created by reacting to specific parts, outcomes or events in isolation.**
- **Considers specific strategies and tactics to overcome known limitations.**

2QR® is the Scientific Method

Empowered by

Due Diligence

Facts-Driven Tool of Systems Thinking

2QR® is the Scientific Method

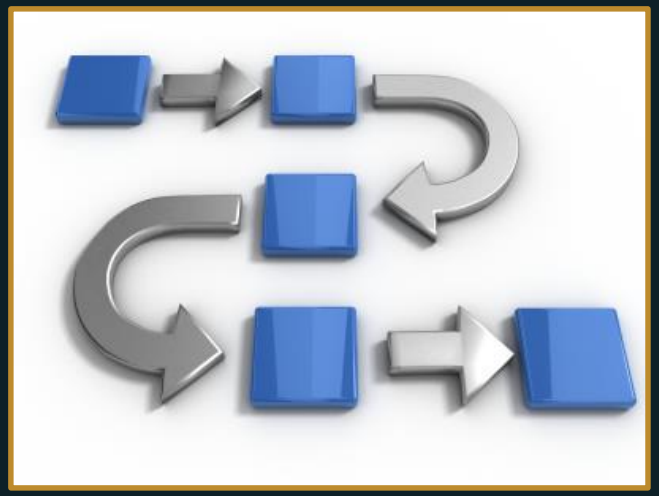
VS.

- **An Application of Systems Thinking That Discovers Best Practices**

2QR® is the Standard for Deploying Standards

Regulatory Compliance - Corporate Governance
Planning - Budgeting - Development

2QR® Complete QM is People, Processes and Tools



Work Culture

Team of Engaged, Well-Trained High-Performers

Policy / Procedure

Artfully Designed and Deployed Work Standards

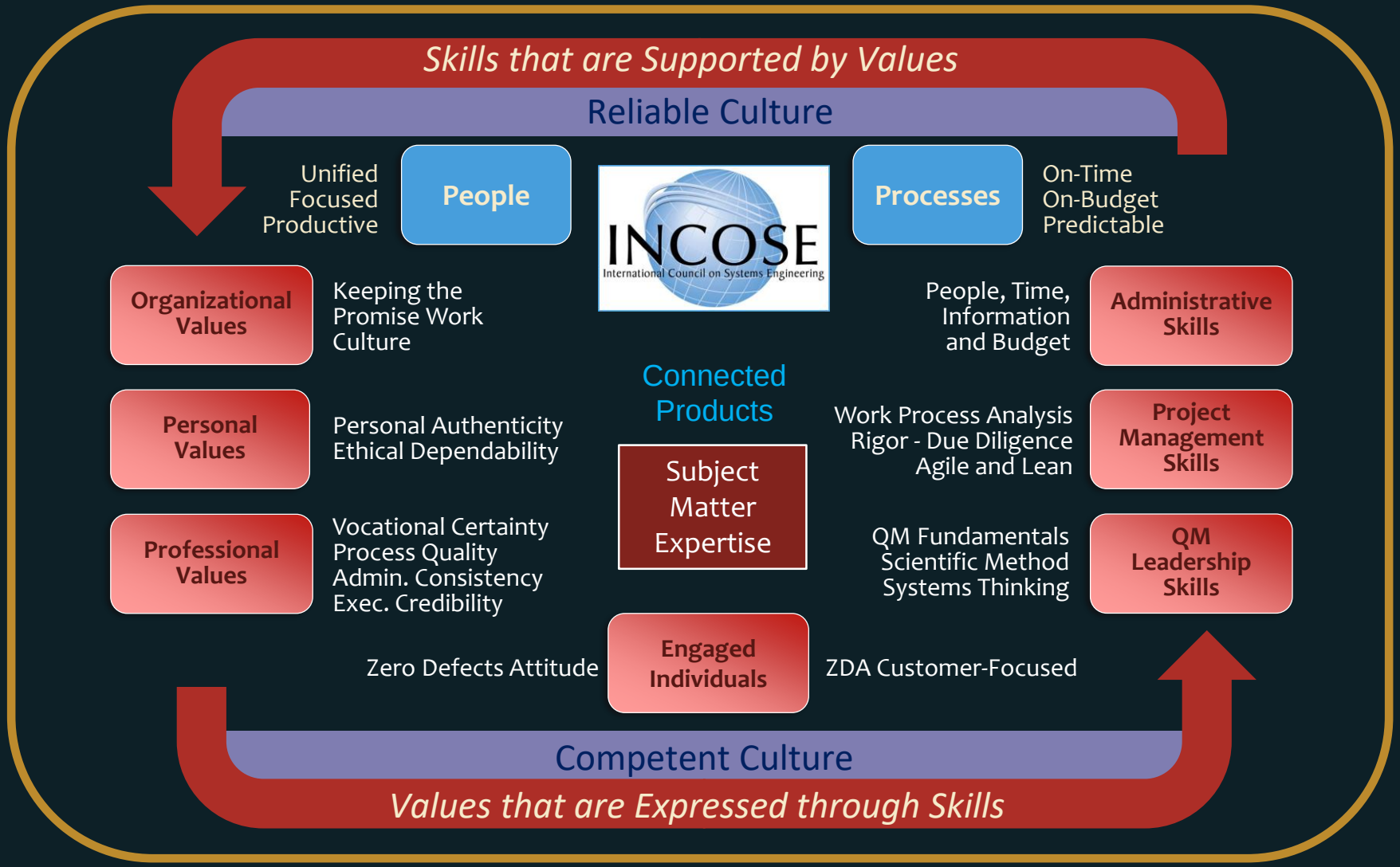
Technology

Fully-Utilized Tools and Efficiencies

2QR® Complete QM Culture

People • Tools • Processes

Integrated Values and Skills Development



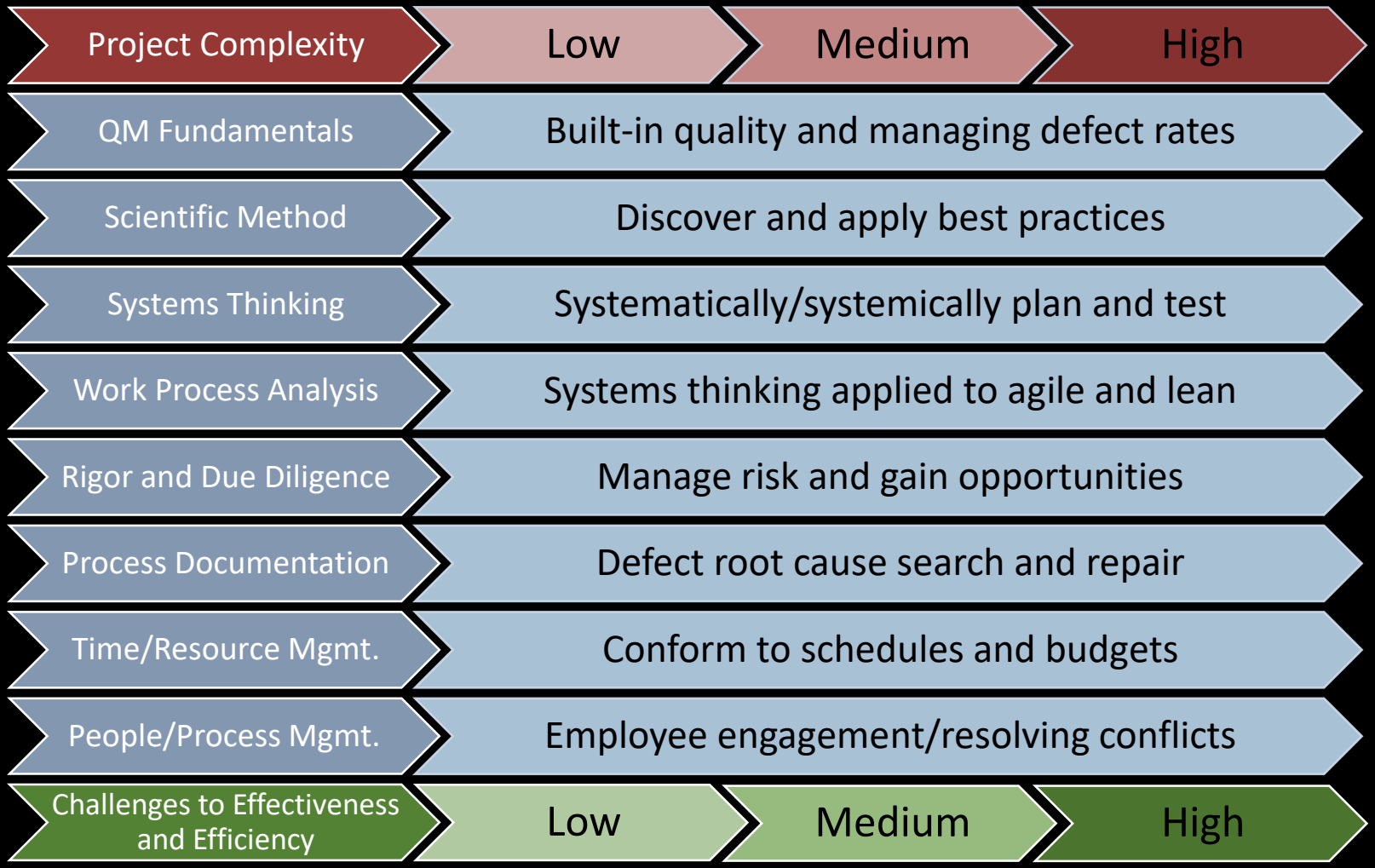
2QR® Complete QM Culture

The Definitions and Measures of the 8 Attributes/Values of a Quality Manager

1. Vocational Certainty	A measure of our faithfulness to our career agenda. QM's are disciplined about developing their skills and talents and acquiring earned confidence.
2. Zero Defects Attitude	A measure of our commitment to keep our promises and to initiate systems with the reliability goal of preventing even one defect from reaching our customers.
3. Process Quality	A measure of our mastery of planning and budgeting disciplines and how effectively we apply them to create viable work processes.
4. Admin. Consistency	A measure of our attention to details. QM's carefully listen to their customer's to identify and conform to their requirements and assure customer satisfaction.
5. Executive Credibility	A measure of our sincerity and skill with people. Sincerity comes naturally from the heart but skills can be sharpened and improved to gain reliable influence.
6. Personal Authenticity	A measure of our resolve to be consistent with our customers and co-workers. Authentic leaders work diligently to make exceptional service feel normal.
7. Ethical Dependability	A measure of our trustworthiness in practical matters. QM's are the people we turn to when we want things to work right, run on time and be there when needed.
8. Create a KTP culture	A measure of the mutual respect, accountability and professionalism in a work culture. These are the practiced values of effective leaders.

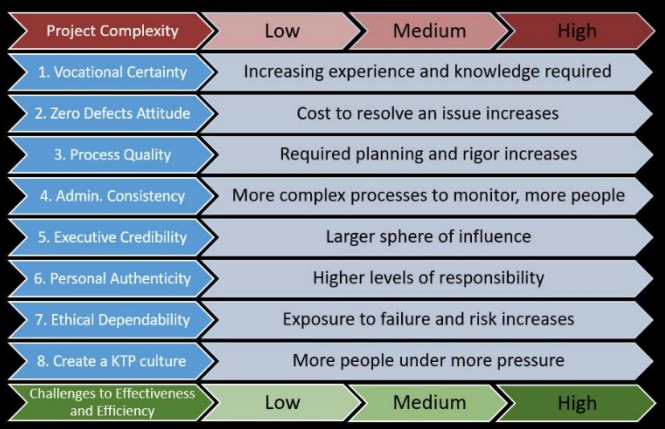
2QR® Complete QM Culture

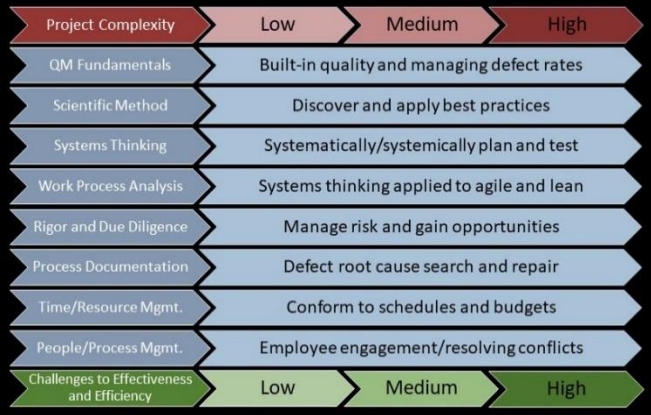
Skills Impact on Process/Productivity



2QR® Complete QM Culture

Values, Skills and Organizational Impact





Organizational Maturity

- Engaged High-Performers
- Agile and Lean Projects
- On-Schedule and Budget
- Less Defects and Rework
- Lean Human Resources
- Effective Communications
- Self-Correcting Culture
- Delighted Customers
- Stable Workplace

Profitability and ROI

2QR Work Culture
(Values and Skills)

2QR Corporate Environment
(Protocols and Enablement)

2QR® People are Engaged

- **Learn the Facts** and Take Action to Create Reliable Solutions
- **Within** the Scope of their Responsibility
- **Within** Available Resources

2QR® People are Productive

- **Fully Utilize** the Right Processes and Tools
- **Create** Reliable and Predictable Projects
- **Produce Outcomes** On-Time, On-Budget and Free from Chaos

A 2QR® Complete QM Culture is






- An Engaged Team Performing with Excellence
- It's Agile, Lean, Predictable and Profitable

Join 2nd Quality Revolution

Quality Management Working Group

- Engineering Leadership Training
- Systems Thinking / Tools Workshops
- Case Studies / Research Projects
- Networking and Collaboration

Join 2nd Quality Revolution

QualityManagementInstitute.com/INCOSE