# EHSQ and 360-Degree Organizational Performance

**Nicole M. Radziwill, PhD, MBA**
VP Quality & Supply Chain, *Intelex* - ASQ Fellow - Editor, *Software Quality Professional*

**Graham Freeman, PhD**
Quality Systems Researcher, *Intelex*

INTELEX


INTELEX

Image Credit: Shawn Minter. https://www.theverge.com/2016/10/9/13218730/samsung-galaxy-note-7-fire-replacement-fourth-virginia

INTELEX

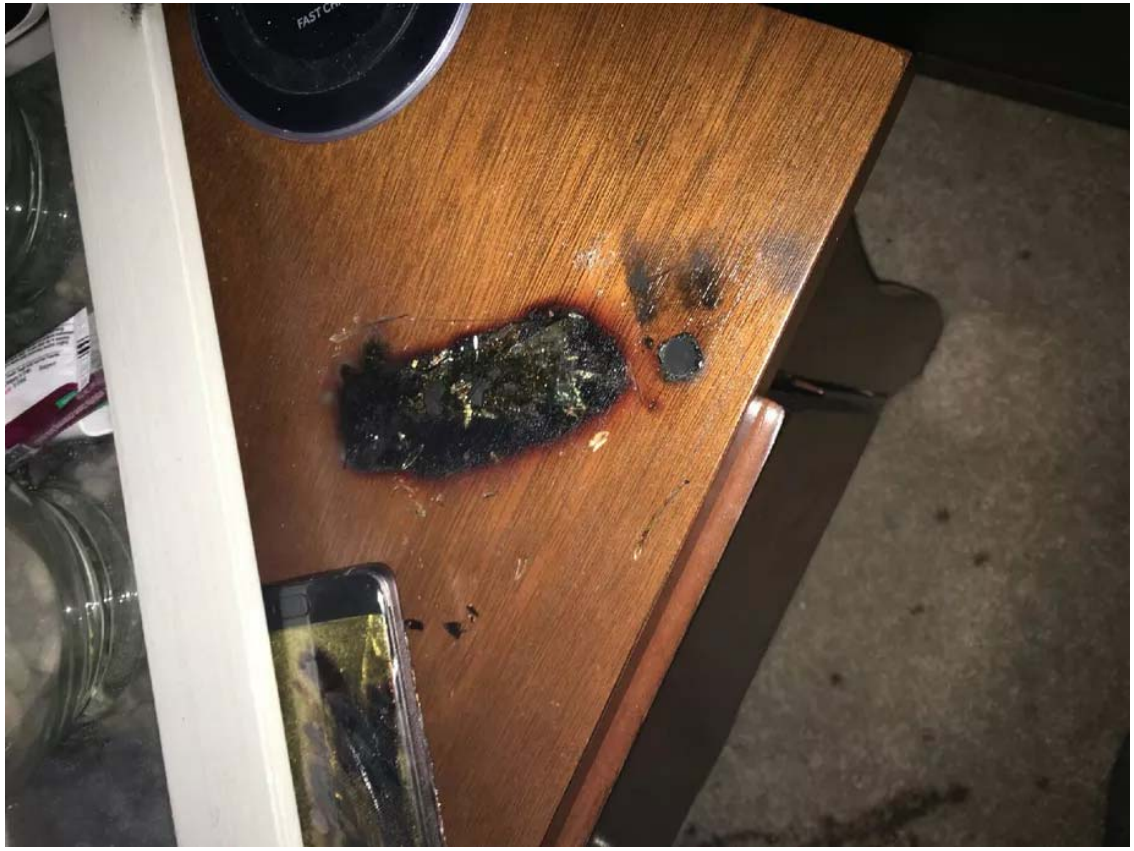


Image Credit: Shawn Minter. https://www.theverge.com/2016/10/9/13218730/samsung-galaxy-note-7-fire-replacement-fourth-virginia

INTELEX


Image Credit: https://www.consumeraffairs.com

INTELEX

# What is Performance?

"**Outputs** and their **outcomes** obtained from processes, products and customers that permit you to evaluate and compare your organization's results to performance projections, standards, past results, goal, and other organizations' results."

National Institute of Standards and Technology (NIST). (2019). Baldrige Excellence Framework (Business/Nonprofit): Proven leadership and management practices for high performance. Available from https://www.nist.gov/baldrige/publications/baldrige-excellence-framework/businessnonprofit

INTELEX

# Objectives

You will learn about:

1.What **EHSQ performance** means

2.The many layers of **performance management** in an organizational ecosystem

3.How **EHSQ performance contributes to business performance**

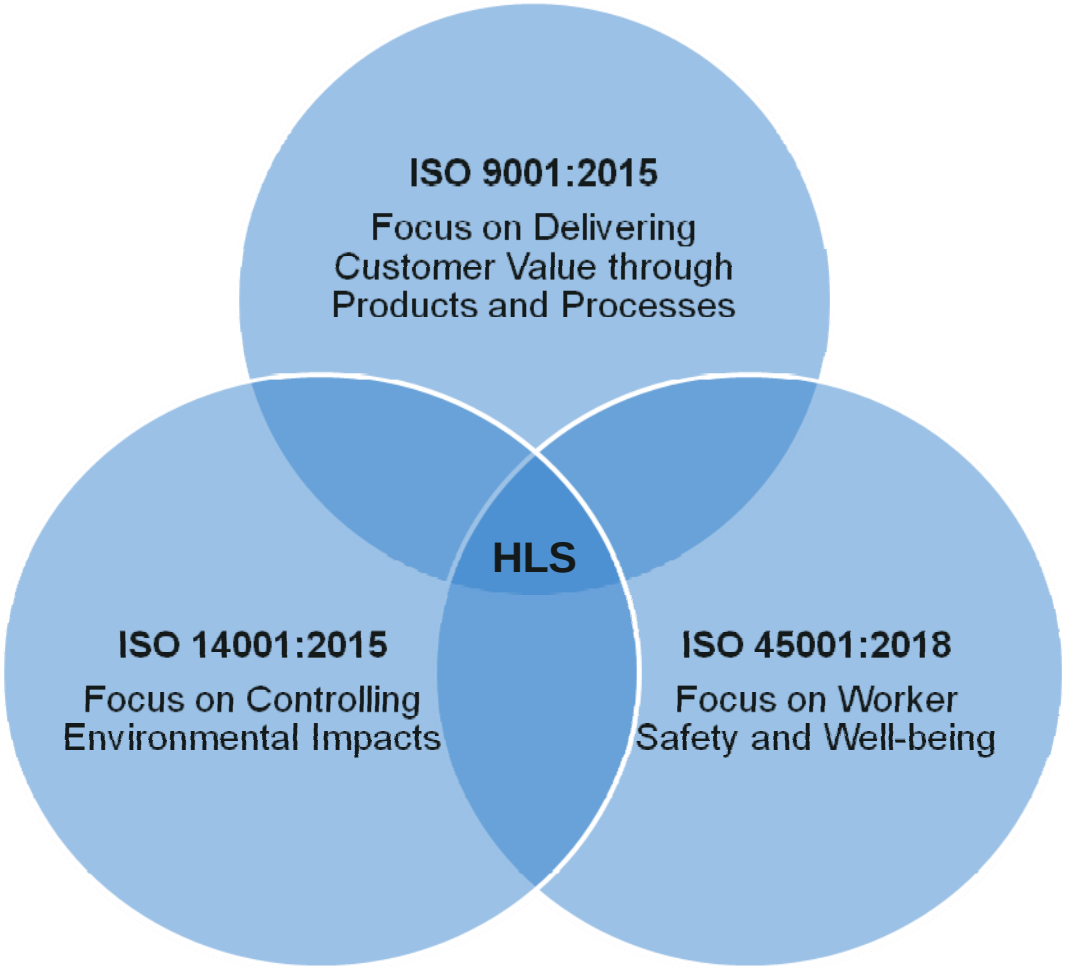
4.How you can connect EHSQ performance to business performance to **build a better business case to your CEO & CFO** for investing in better integrated management approaches (whether they involve software or not)

INTELEX

# 1: EHSQ Performance

assessing the utility of operational management systems

INTELEX


ISO 9001:2015
Focus on Delivering Customer Value through Products and Processes
HLS
ISO 14001:2015
Focus on Controlling Environmental Impacts
ISO 45001:2018
Focus on Worker Safety and Well-being

INTELEX

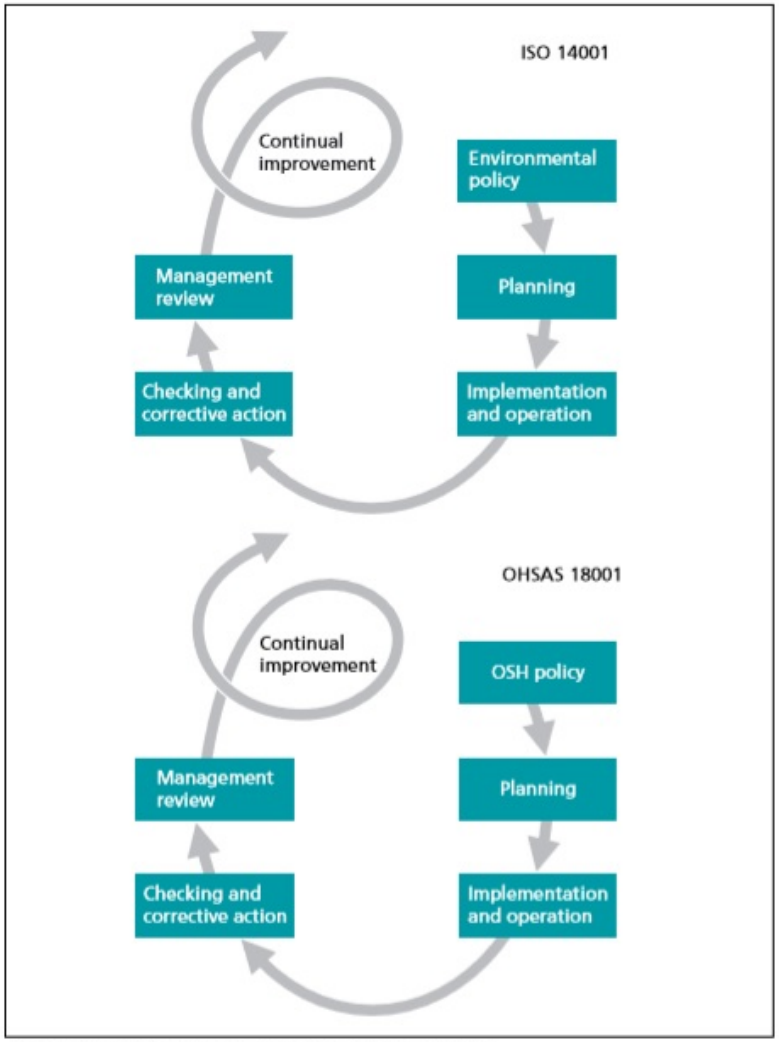



Figure 4: OHSAS 18001 and ISO 14001 models

From Institution of Occupational Safety and Health (IOSH UK) (2017). Joined-up working – an introduction to integrated management systems.

INTELEX

# Environmental Performance

| Actions | Outputs | Outcomes |
|---|---|---|
| • Asset maintenance<br>• Sustainable product and process design (ecodesign)<br>• Sustainable procurement<br>• Traceability<br>• Monitor impact on local/ regional environmental situation (e.g. noise, effluent discharge)<br>• Provide infrastructure/ management processes to sustain responsible practices | • Air, water, soil pollutants<br>• Emissions<br>• Noise<br>• Vibration<br>• Ecodesign efficacy metrics (Rodrigues)<br>• Resource utilization<br>  ◦ Raw materials<br>  ◦ Rare materials<br>• Energy use<br>• Fuel consumption<br>• Power consumption<br>• Water use<br>• Recycling<br>• Waste produced | • Community health/ wellbeing<br>• Efficient use of resources<br>• Minimizing waste<br>• Sustainable business practices<br>• Protect local environment<br>• Protect global environment |

Adapted from Ioana, A., Semenescu, A., & Preda, C. F. (2016). Analysis of the environmental performance indicators for the EMAS regulation. *Food and Environment Safety Journal*, 12(1).

Rodrigues, V. P., Pigosso, D. C., & McAloone, T. C. (2017). Measuring the implementation of ecodesign management practices: A review and consolidation of process-oriented performance indicators. *Journal of cleaner production*, *156*, 293-309.

INTELEX

# Performance Related to Occupational Health

**Common metrics** include lagging indicators like frequency of illnesses, lost workdays, Lost Time Injuries (LTI), and injury severity.

Recommended proactive approaches include:

- Conduct industrial hygiene exposure assessments
- Communicate health hazard assessments to employees in a timely manner
- Utilize continuous industrial hygiene monitoring where appropriate
- Implement medical surveillance for employees where appropriate
- Assessment of leadership competencies

Haas, E. J., & Yorio, P. (2016). Exploring the state of health and safety management system performance measurement in mining organizations. *Safety Science*, 83, 48-58.

INTELEX

# Safety Performance

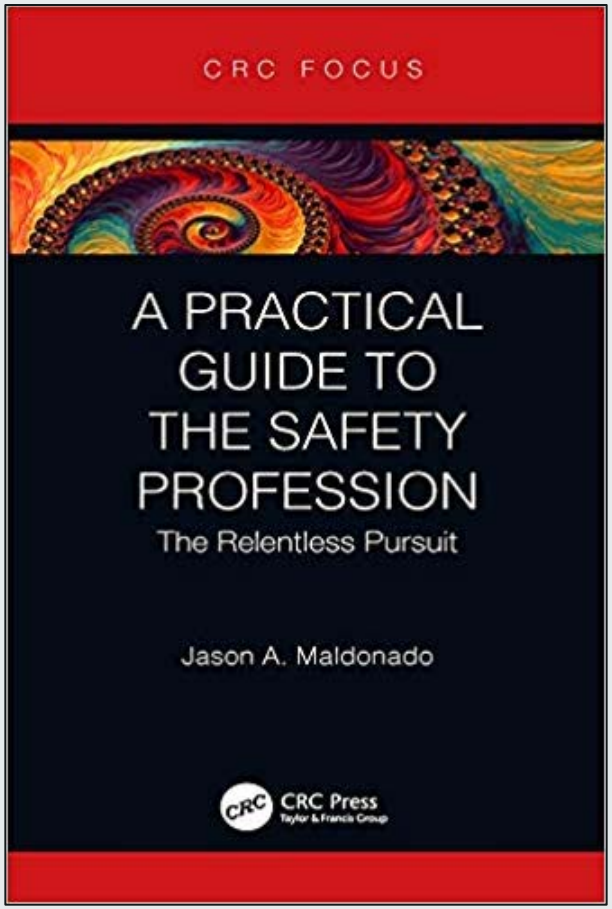
**Common metrics** include incident rates (TCIR, TRIR), completed inspections, behavior observations, completed training, overdue corrective actions (and time to close).

**Strong safety culture** decreases likelihood of accidents and injuries. Assess via:

- Management commitment
- Degree of collaboration
- Reported incidents as a proportion of actual incidents
- Frequency of communication about safety issues and conditions
- Commitment to safety
- Compliance outcomes
- Regularity of training

*From Reader, T. in Le Coze, J. C. (2014). The foundations of safety science. CRC Press, p. 23-28.*

INTELEX




Available at https://amzn.to/2nQxiYw

"We consistently, sometimes indignantly, aim toward the wrong targets and measure the wrong things without ever empirically proving we have any effect at all…

**We should be looking for solutions that make a difference** to our workers. We should think about the way our outlook and definition of the word 'safe' makes people devalue our goal."

- **Incident rates don't capture context** of unsafe scenarios, anticipated frequency, or availability of a corrective action… knowledge that could improve safety practice
- Instead of trying to pretend like human error doesn't exist (or can be trained out of people), **design the possibility of human error** into safer work systems

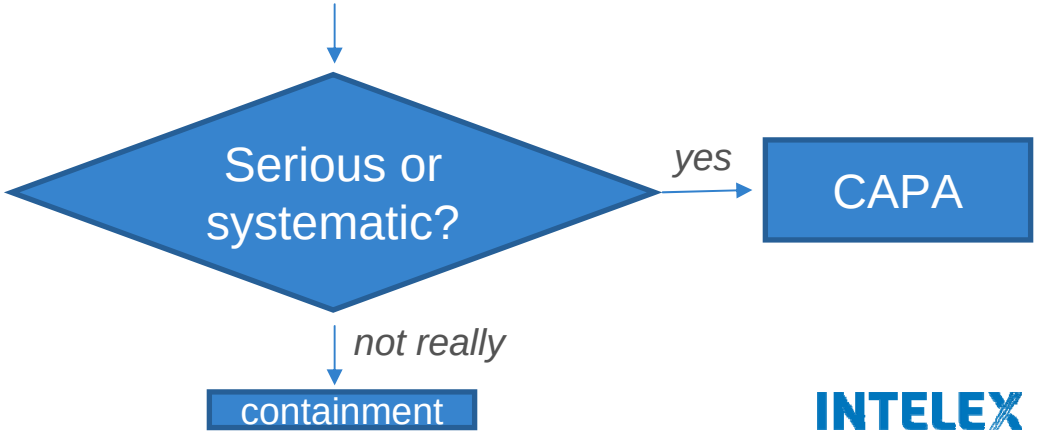
INTELEX

## Quality Performance

## Quality Events

**indicate that quality goals are not being met and action is needed**

- Nonconforming product
- Incidents/near misses
- Customer complaints
- Recalls/warranty calls
- Deviations (from SOP)
- Out-of-control Action Plans
- Industry-specific events (e.g. MDRs)




INTELEX

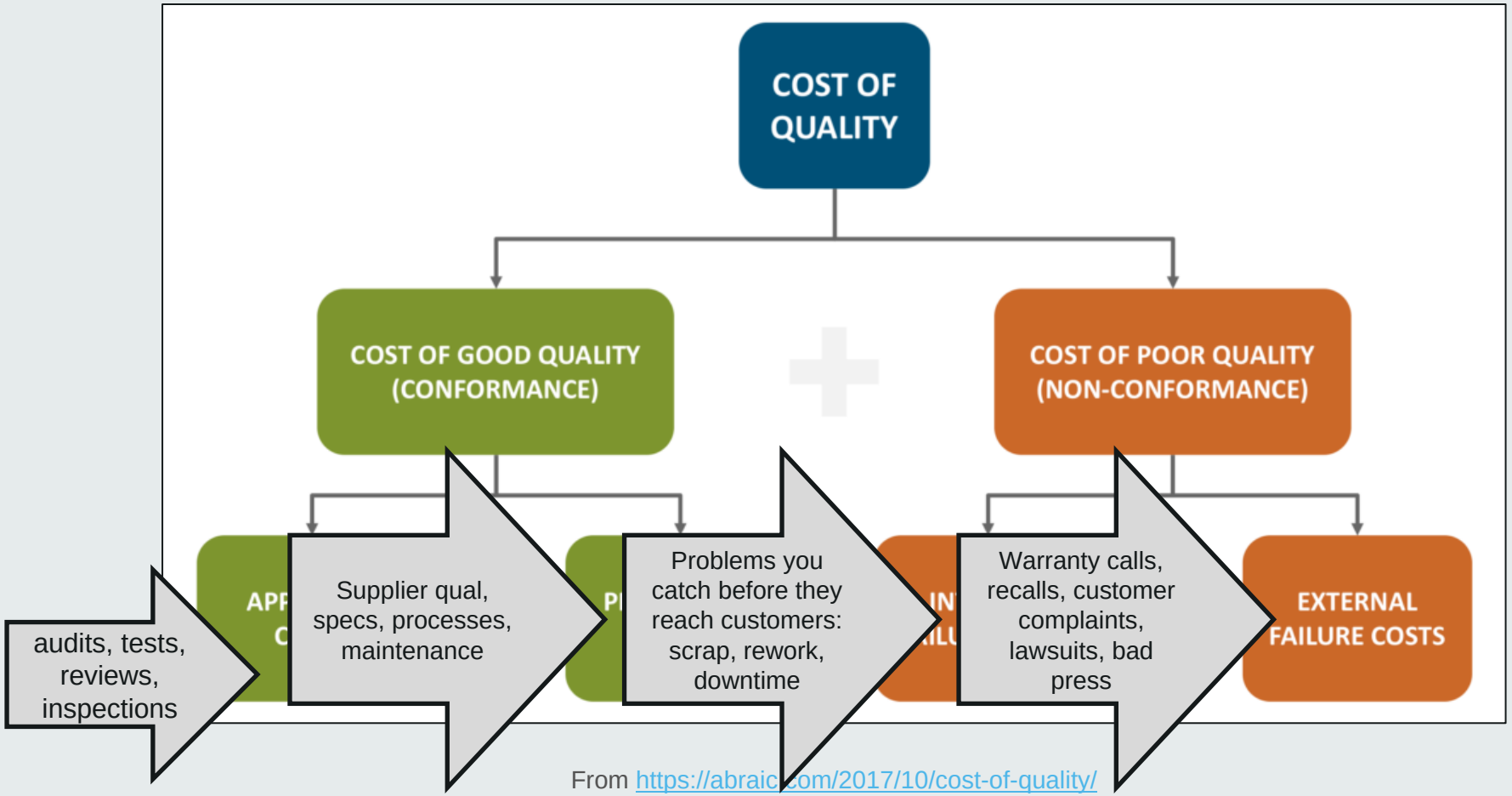
## Quality Performance

## Quality Controls

**prevent or correct unwanted or unexpected change → stability and consistency**

- Calibrations
- Maintenance
- Inspections
- Sampling incoming parts
- Process validation
- Mistake-proofing
- In-situ process monitoring
- Environment monitoring
- Professional testing/ competency assessment
- Training programs and reminders
- Corrective actions taken
- Information security/ network security

INTELEX



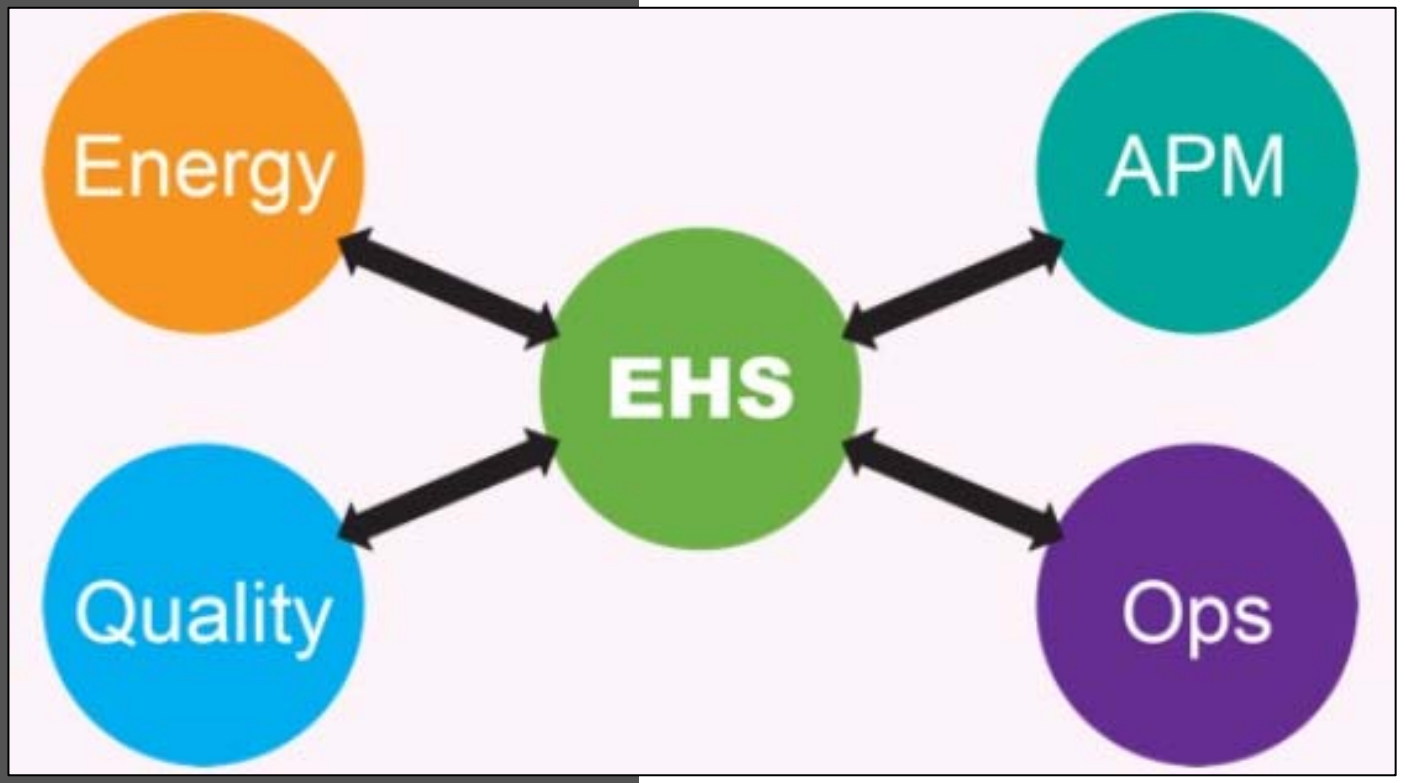

From https://abraic.com/2017/10/cost-of-quality/

INTELEX

# Cost of Quality (CoQ) Caution!

- There are *many* ways to measure it
- The values are dominated by *labor* so if the calculation is not connected to a timekeeping or time estimating system, CoQ will be underestimated
- Less than half of organizations surveyed in 1995, 2007, & 2011 actually use it
- Executives don't understand it unless expressed as % of total operating costs or % of sales
- It's the **distribution** – *not the magnitude of the CoQ estimate* – that reveals how well your QMS is performing!

INTELEX




OEE  Availability x Performance x Quality

Leavoy, P. & Littlefield, M (2015). DRIVING EHS PERFORMANCE WITH TECHNOLOGY: Enabling Operational Excellence with a Holistic Technology Framework.

INTELEX

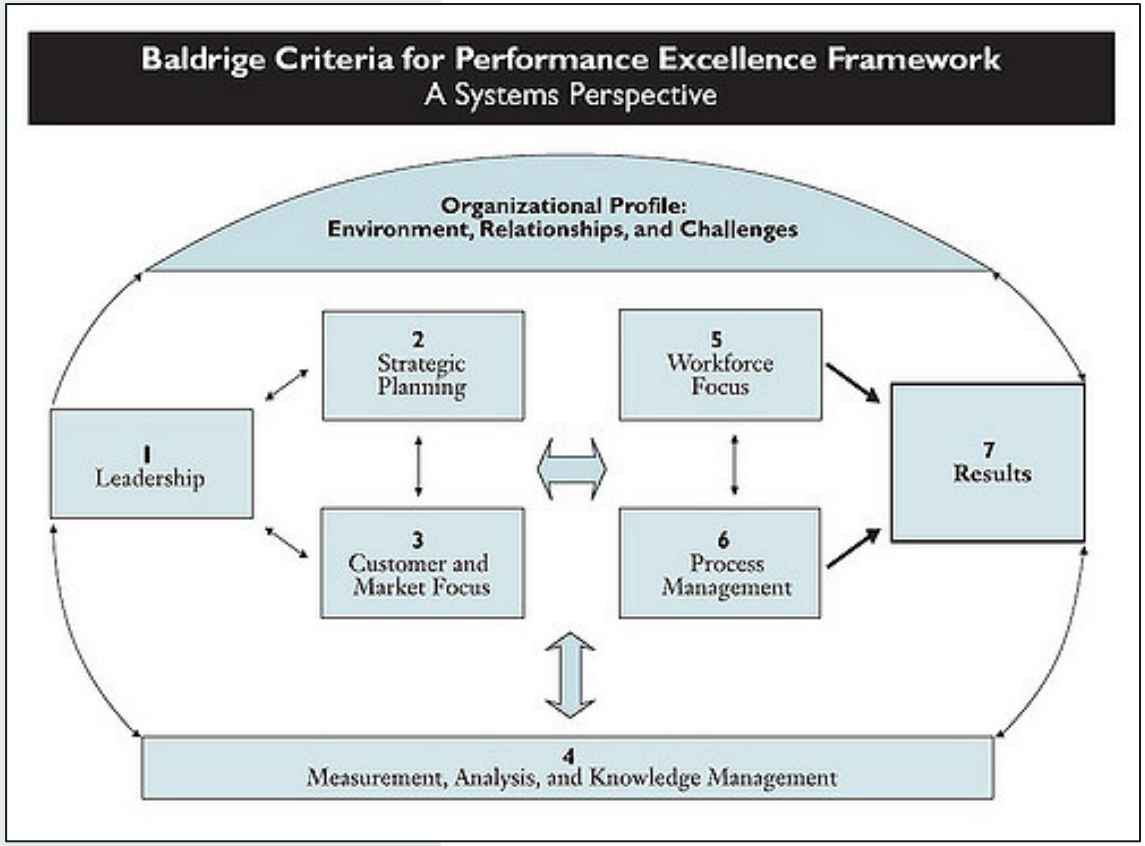
# 2: Holistic Performance

& how to address performance at all levels of your organization

INTELEX

# Business Risk Taxonomy
(Inherent within the Stratex framework)

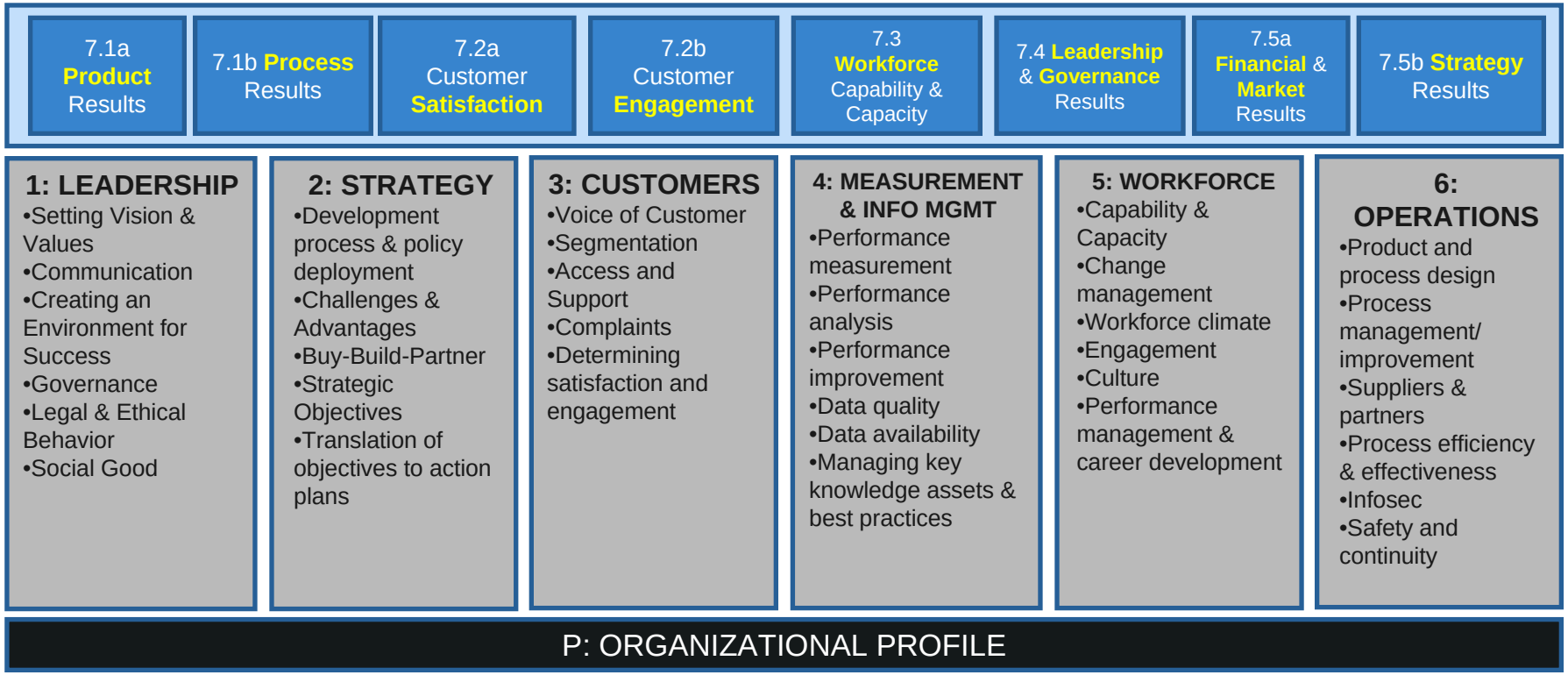

From http://ascendore.com



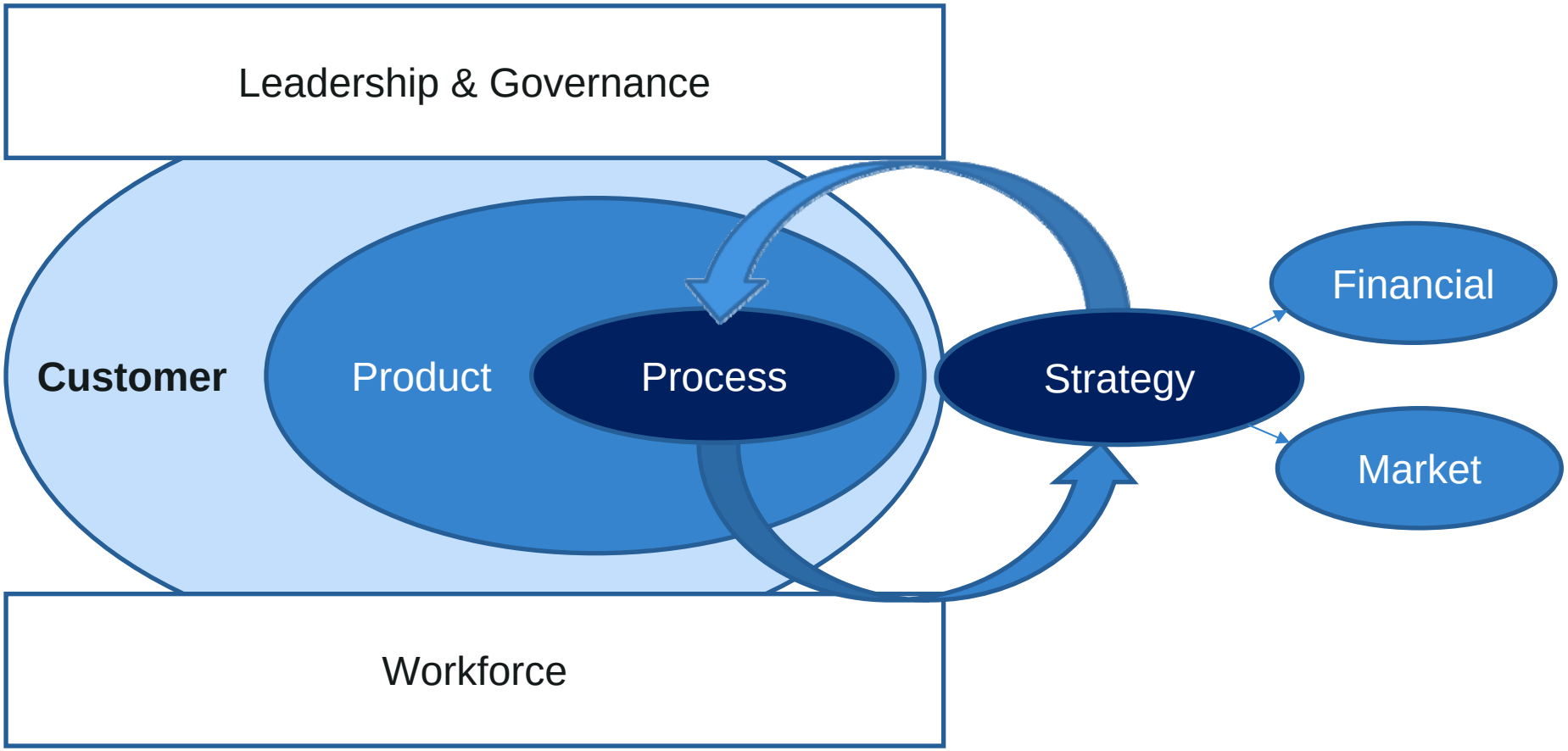

National Institute of Standards and Technology (NIST). (2019). Baldrige Excellence Framework (Business/Nonprofit): Proven leadership and management practices for high performance. Available from https://www.nist.gov/baldrige/publications/baldrige-excellence-framework/businessnonprofit

INTELEX

# Baldrige Criteria




National Institute of Standards and Technology (NIST). (2019). Baldrige Excellence Framework (Business/Nonprofit): Proven leadership and management practices for high performance. Available from https://www.nist.gov/baldrige/publications/baldrige-excellence-framework/businessnonprofit


Leadership & Governance
Customer
Product
Process
Strategy
Financial
Market
Workforce

INTELEX

# 3: 360-Degree EHSQ Performance

connecting EHSQ outputs & outcomes to the business

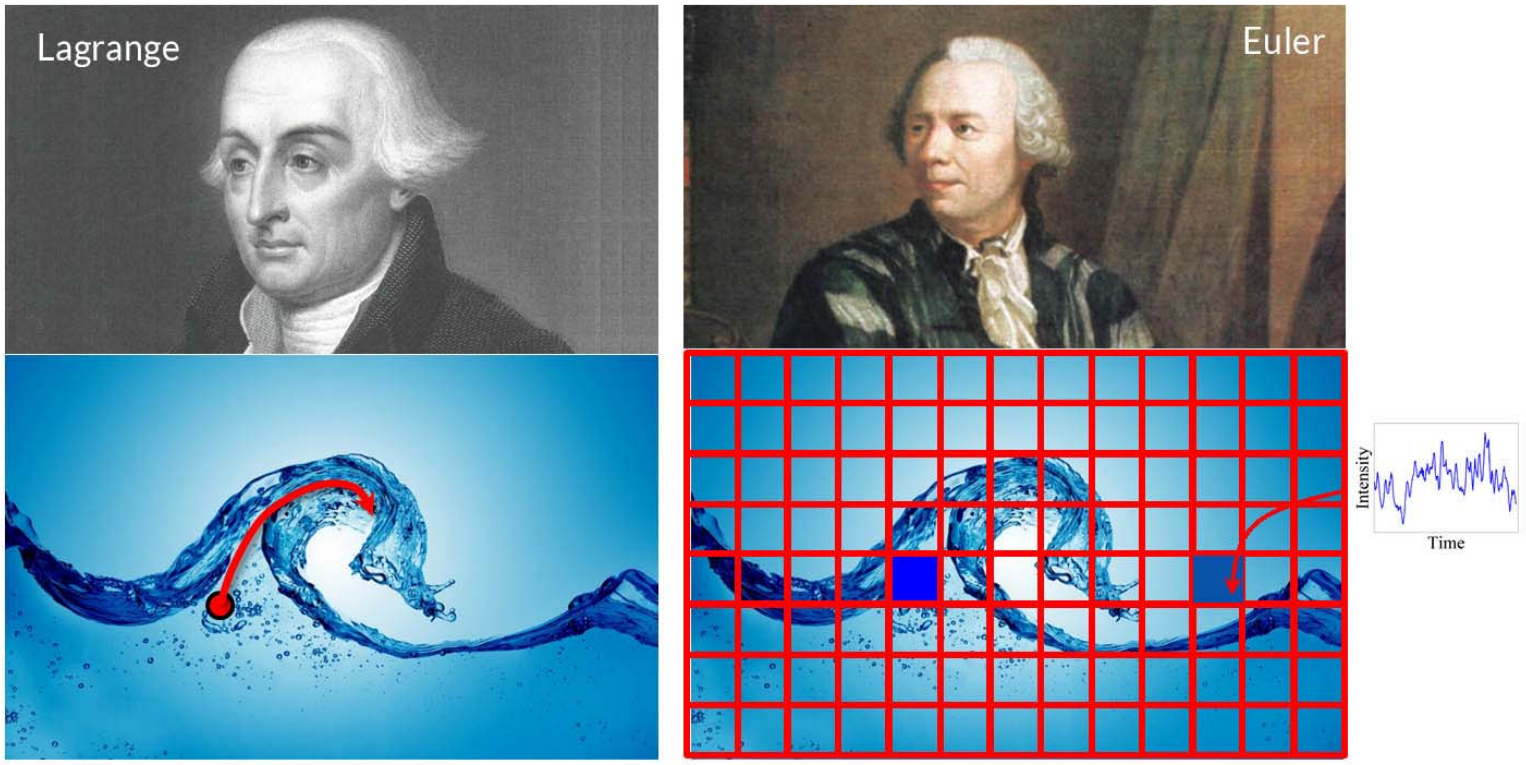
INTELEX

**Change**

**Transformation**

INTELEX

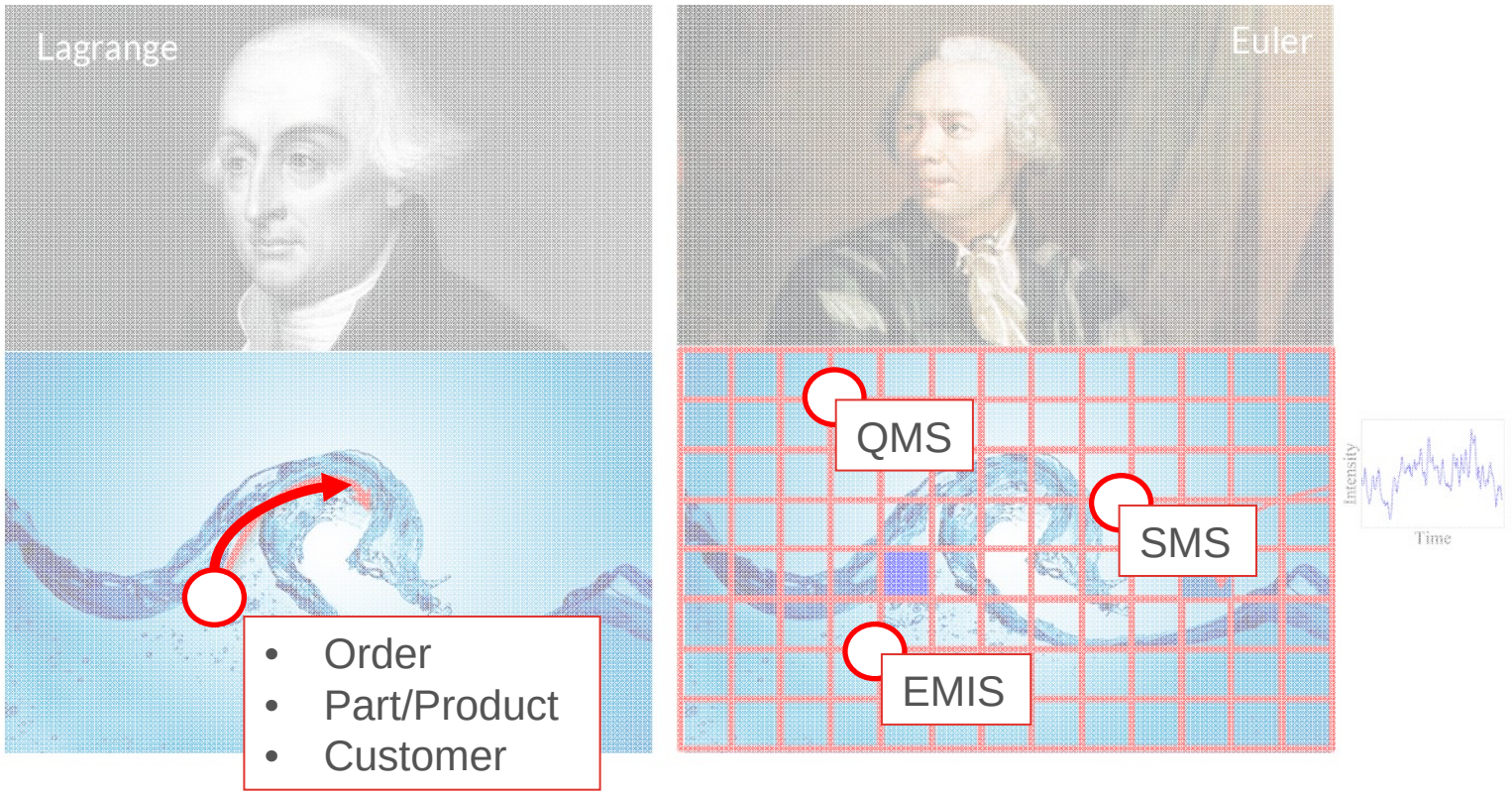
# Shifting Your Perspective




From http://hoskere2.web.engr.illinois.edu/cs445/finalProject/

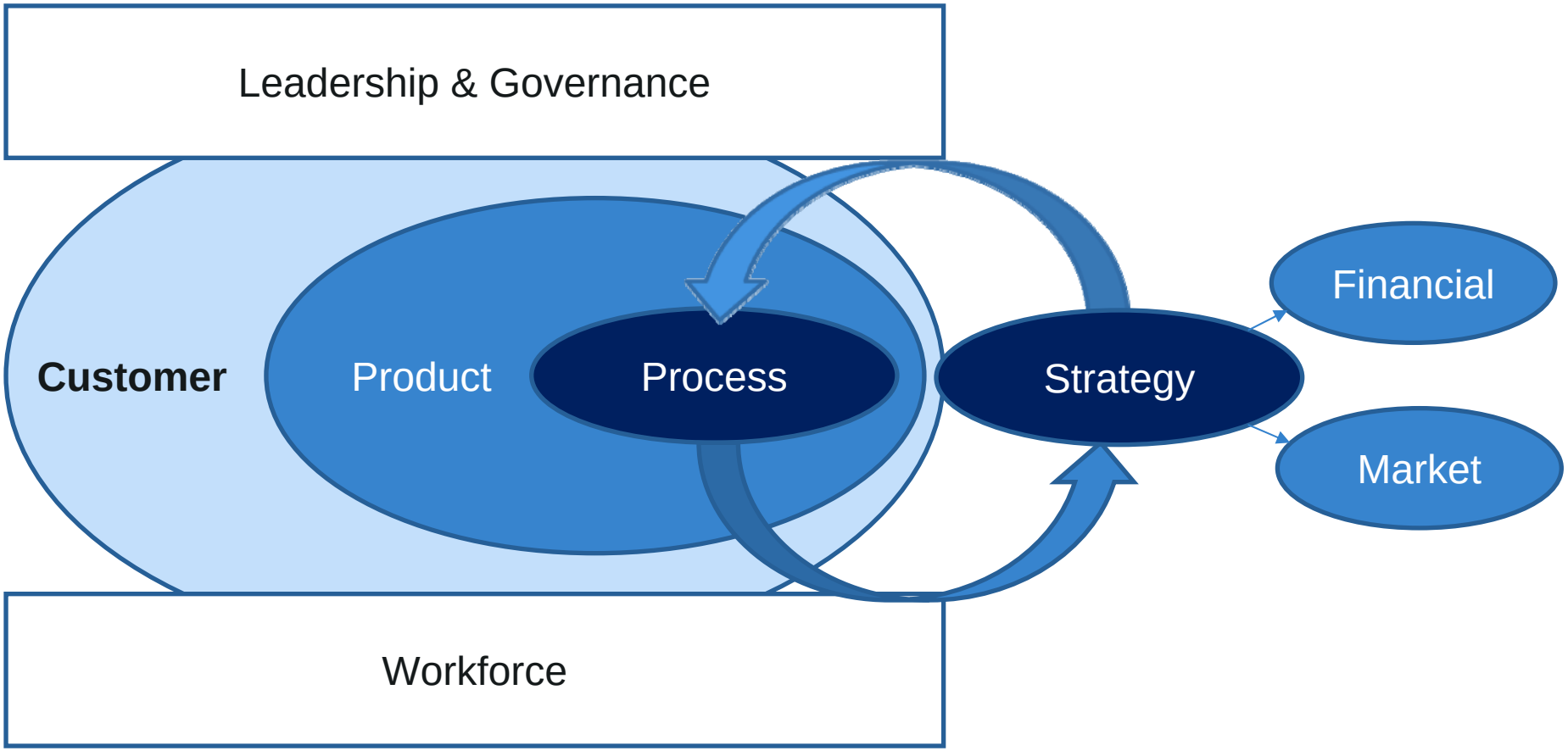
INTELEX

# Frames of Reference




From http://hoskere2.web.engr.illinois.edu/cs445/finalProject/

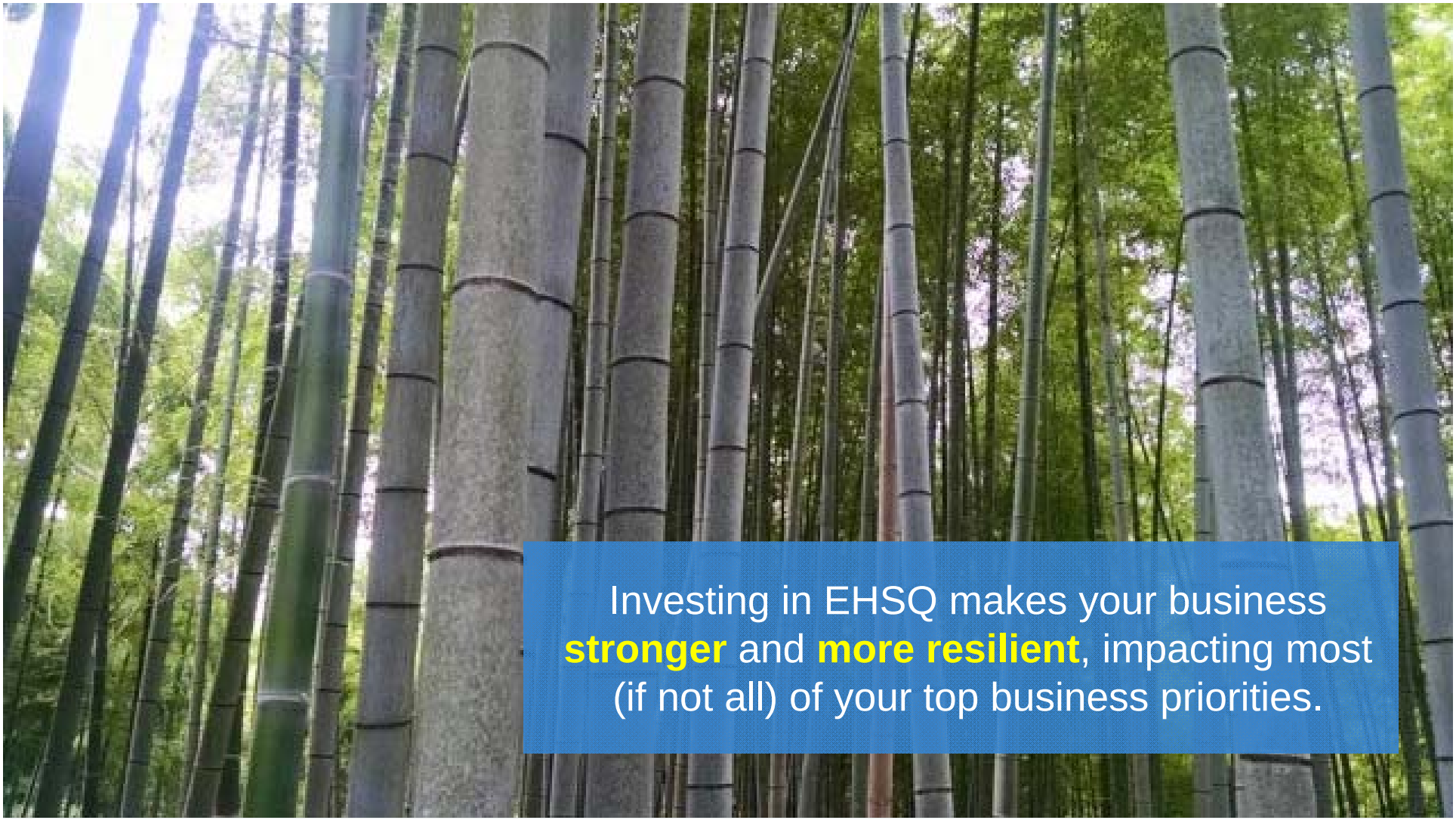
INTELEX


Leadership & Governance
Customer
Product
Process
Strategy
Financial
Market
Workforce

INTELEX

| Rappaport's Framework for Shareholder Value (1986) | Establish | Improve | Transform | How |
|---|---|---|---|---|
| Fixed Capital Investments | Monitor/ maintain equipment and facilities | Substitute assets with smart technology, building components, and software-defined systems | Virtualize; shift software/ processes/ maintenance/ monitoring to cloud | |
| Reduce Need for Working Capital | Measure/monitor resource productivity; consume less | Optimize resource productivity | Dematerialize; pursue zero waste/ circular economy | |
| Grow Sales/ Revenue | Ensure product safety; pursue environmental stewardship | Reduce product carbon footprint (etc.) to increase value to stakeholders | **Sustainable IT-enabled design** | |
| Improve Operating Margin | Standardize/ automate processes and **workflows** | Augment intelligence/ optimize processes | Substitution (telework/ outsourcing/ subsidiaries) | |
| Lower Cost of Capital | Demonstrate ability to comply with standards and regulations | Demonstrate ability to **manage risk**, protect business continuity | Demonstrate ability to anticipate risks and take intelligent risks | |
| Establish Long Term Value | Transparency into current operations; demonstrated improvement | Management systems support digitally-enabled product/process innovation | Business model transformation | |

| Rappaport's Framework for Shareholder Value (1986) | Establish | Improve | Transform | How |
|---|---|---|---|---|
| Fixed Capital Investments | Monitor/ maintain equipment and facilities | Substitute assets with smart technology, building components, and software-defined systems | Virtualize; shift software/ processes/ maintenance/ monitoring to cloud | Asset Performance Management (APM) |
| Reduce Need for Working Capital | Measure/monitor resource productivity; consume less | Optimize resource productivity | Dematerialize; pursue zero waste/ circular economy | Lean Management |
| Grow Sales/ Revenue | Ensure product safety; pursue environmental stewardship | Reduce product carbon footprint (etc.) to increase value to stakeholders | **Sustainable IT-enabled design** | Product Lifecycle Mgmt/ CSR |
| Improve Operating Margin | Standardize/ automate processes and **workflows** | Augment intelligence/ optimize processes | Substitution (telework/ outsourcing/ subsidiaries) | SaaS/ Quality 4.0 |
| Lower Cost of Capital | Demonstrate ability to comply with standards and regulations | Demonstrate ability to manage risk, protect business continuity | Demonstrate ability to anticipate risks and take intelligent risks | Risk-Based Thinking (9001:2015) |
| Establish Long Term Value | Transparency into current operations; demonstrated improvement | Management systems support digitally-enabled product/process innovation | Business model transformation | Digital Transformation |


Investing in EHSQ makes your business
stronger and more resilient, impacting most
(if not all) of your top business priorities.

# CONTACT


## Nicole Radziwill

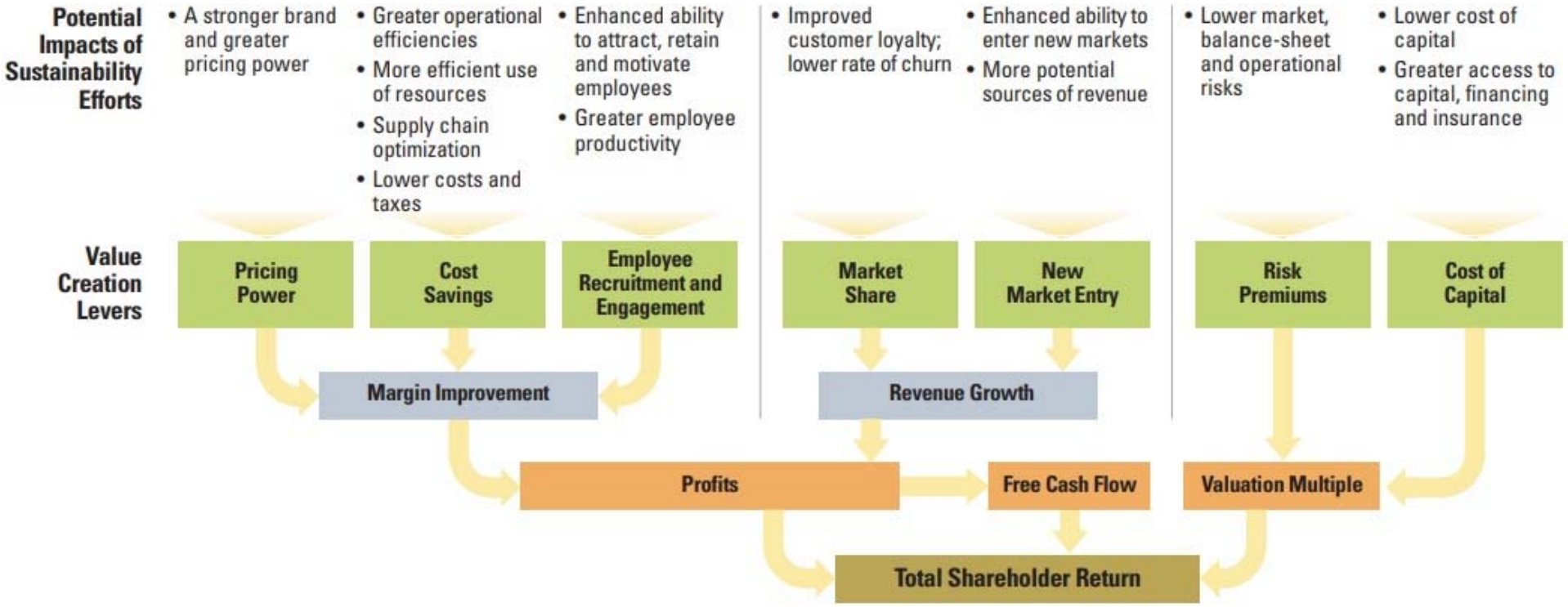
**VP Quality**, **Intelex**

Fellow, American Society for Quality (ASQ)
CSSBB #11962 & CMQ/OE #9583
Ph.D. Quality Systems, Indiana State
Editor, *Software Quality Professional*

nicole.radziwill@intelex.com


INTELEX

# Supplemental Slides




Hopkins, M. S., Townend, A., Khayat, Z., Balagopal, B., Reeves, M., & Berns, M. (2009). The business of sustainability: what it means to managers now. MIT Sloan Management Review, 51(1), 20.

INTELEX