How to Build Quality 4.0 Transformation Roadmap

Author: Dr. Michael Mladjenovic

2023 ASQ SECTION 304 NORTH JERSEY'S VIRTUAL SPRING QUALITY CONFERENCE

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ASQ Statistics Division
Excellence Through Quality®

Presenter

Dr. Michael Mladjenovic

Data Science Interest Group

Statistic Division

Agenda

- Learn about the Quality 4.0 framework;
- Understand future opportunities and challenges;
- Anticipate the effects of upcoming changes in quality;
- Share your experience and knowledge with other ASQ professionals and guests.

Quality 4.0 Digital Transformation
Value Creation Analysis

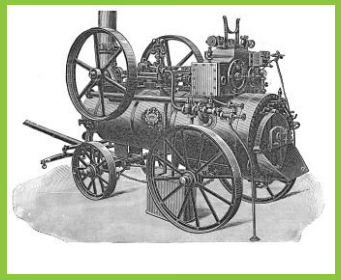
We need to explore and understand:

- Available technology
- VSM opportunities
- Sources of Digital Value
- Digital Value Chain Analysis
- Digital Transformation Opportunity Assessment
- Horizons of Digital Transformation

Industry 4.0 and Quality 4.0 Evolution

4. Industrial revolution
Based on cyber-physical-systems

3. Industrial revolution
Through the use of electronics and IT further progression in autonomous production



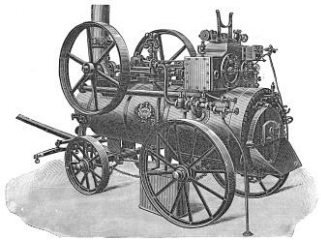
2. Industrial revolution
Introducing mass production lines powered by electric energy

1. Industrial revolution
Production machines powered by water and steam

Level of complexity

Industry 1.0	Industry 2.0	Industry 3.0	Industry 4.0
End of the 18th century.	Beginning of the 20th century	Beginning of the 70th	Today

Industry 4.0 and Quality 4.0 Evolution



	Industry 1.0	Industry 2.0	Industry 3.0	Industry 4.0
Quality	Quality 1.0	Quality 2.0	Quality 3.0	Quality 4.0
Complexity	Mechanical production	Mass production	Automation	IoT and Cyber-physical Systems
QMS	Self-inspection	QC, SPC, standards	QC,QA, QM, TQM and QMS software	Real-time data and IoT
Focus	Product inspection	Process control	Process and product Assurance	Data and Information Quality

Digital Quality Maturity Report

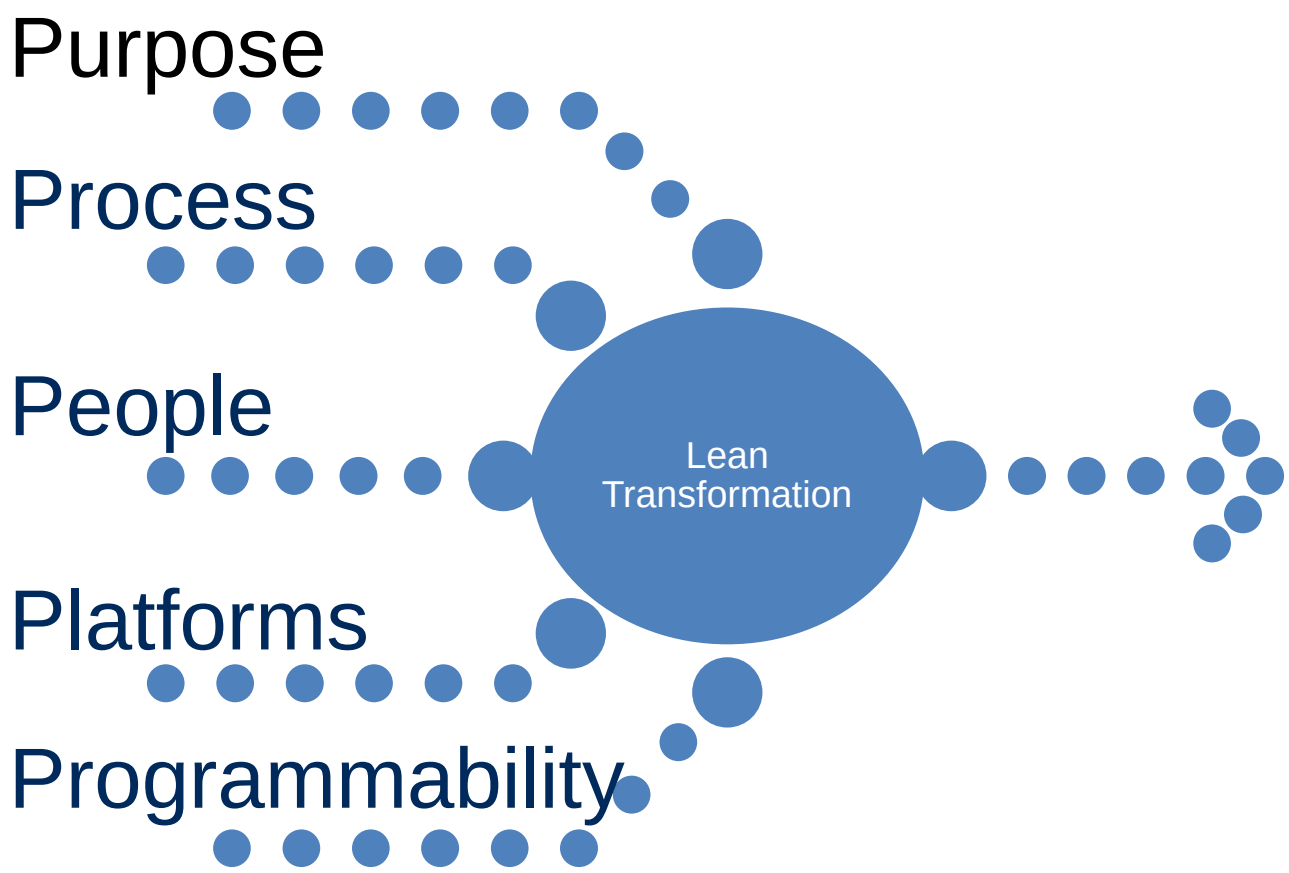
- Even though 85% of companies have a QMS, most of them are missing the benefits that come from a fully implemented QMS.
- The larger a company is, the more likely it is to prioritize digital transformation.
- The number one driver for digitization is that digital maturity is a competitive advantage, as cited by 58% of respondents.
- Only 42% of respondents have a formal quality digital transformation plan. The remaining 58% have ad hoc or informal plans, making their digital transformation journey more difficult than it needs to be.

Source:
https://www.mastercontrol.com/library/report/digital-quality-management-maturity-model-research/?utm_campaign=7013x000001zx3AAAQ&utm_medium=Email&utm_source=QD

Challenges – Personal and Organizational

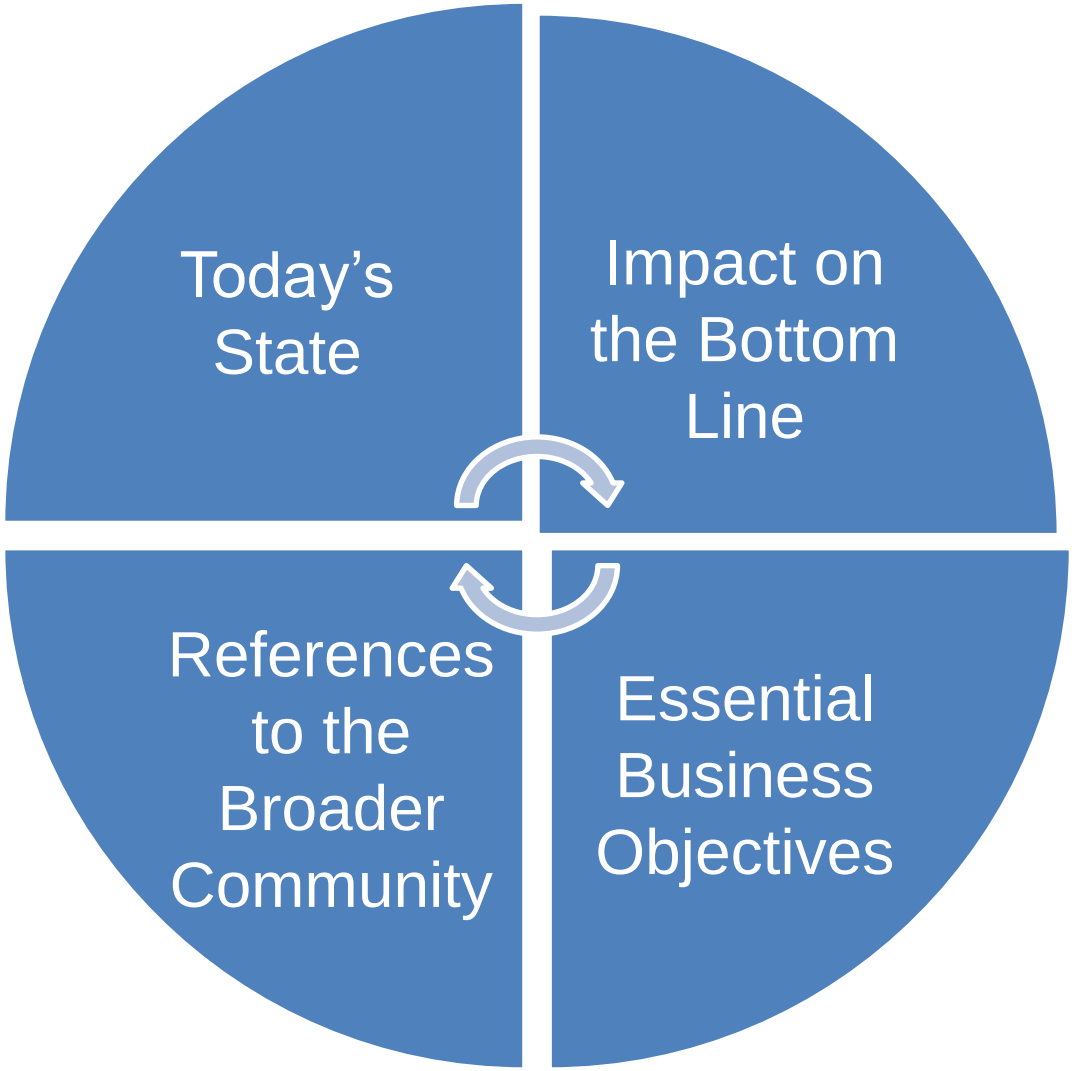
- Where to start?
- How much to invest?
- What is the solution?

Quality 4.0 Transformation



http://www.lean.org/whatslean
https://www.kaggle.com/getting-started/164960

TIER Framework



https://www.edb.gov.sg/en/about-edb/media-releases-publications/advanced-manufacturing-release.html

Digital Transformation – Value creation Analysis

We need to explore and understand:

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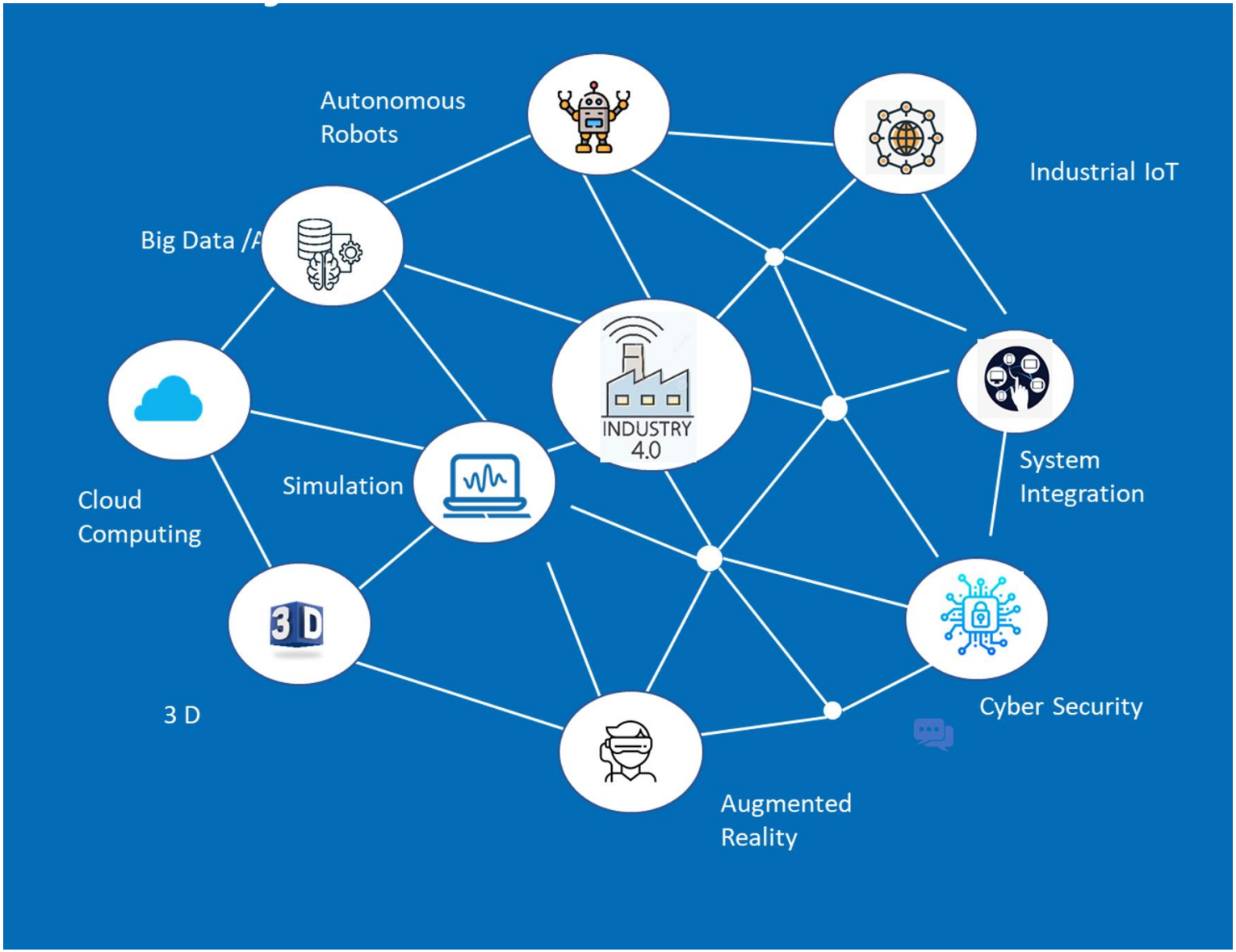
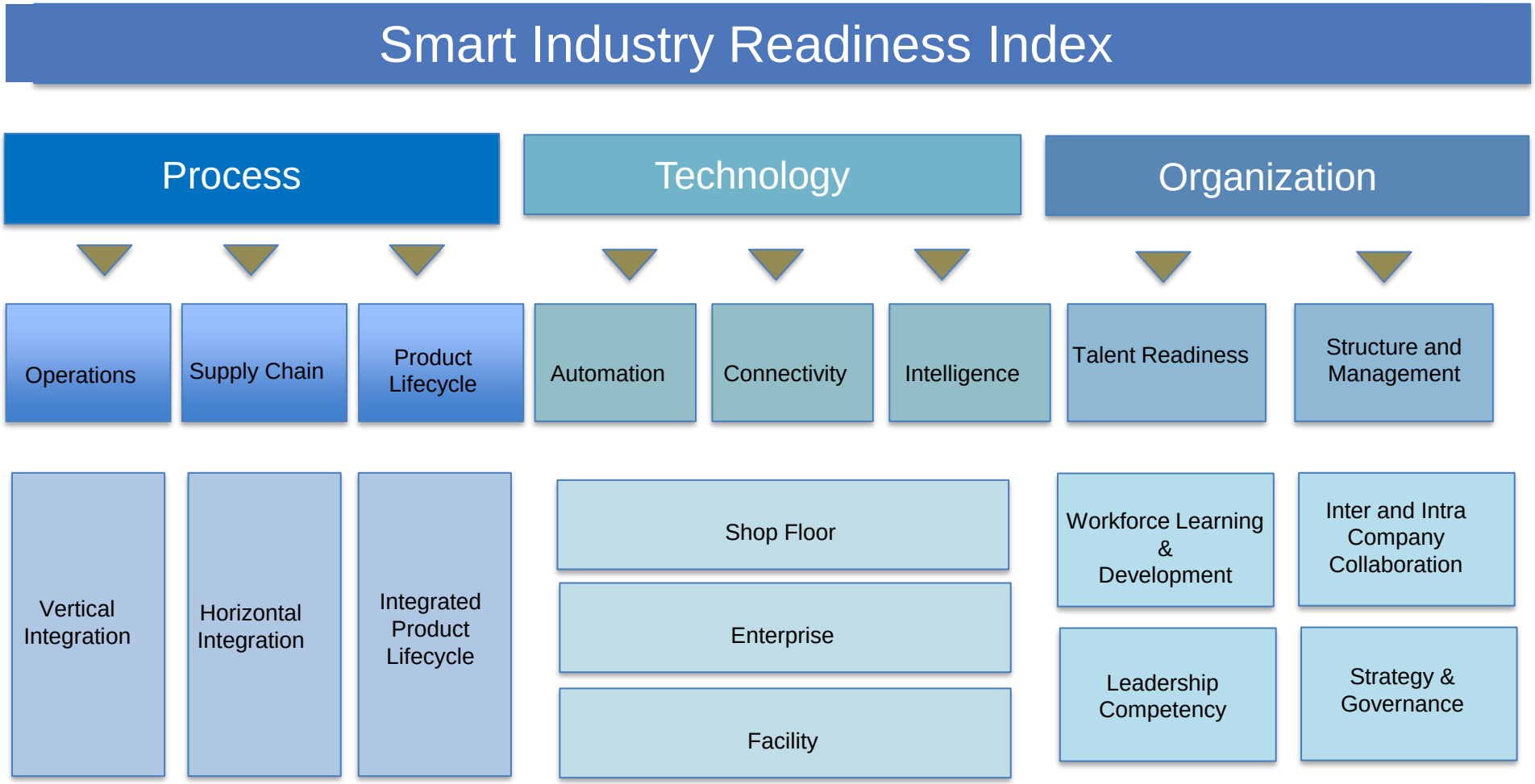
Industry 4.0 Technologies



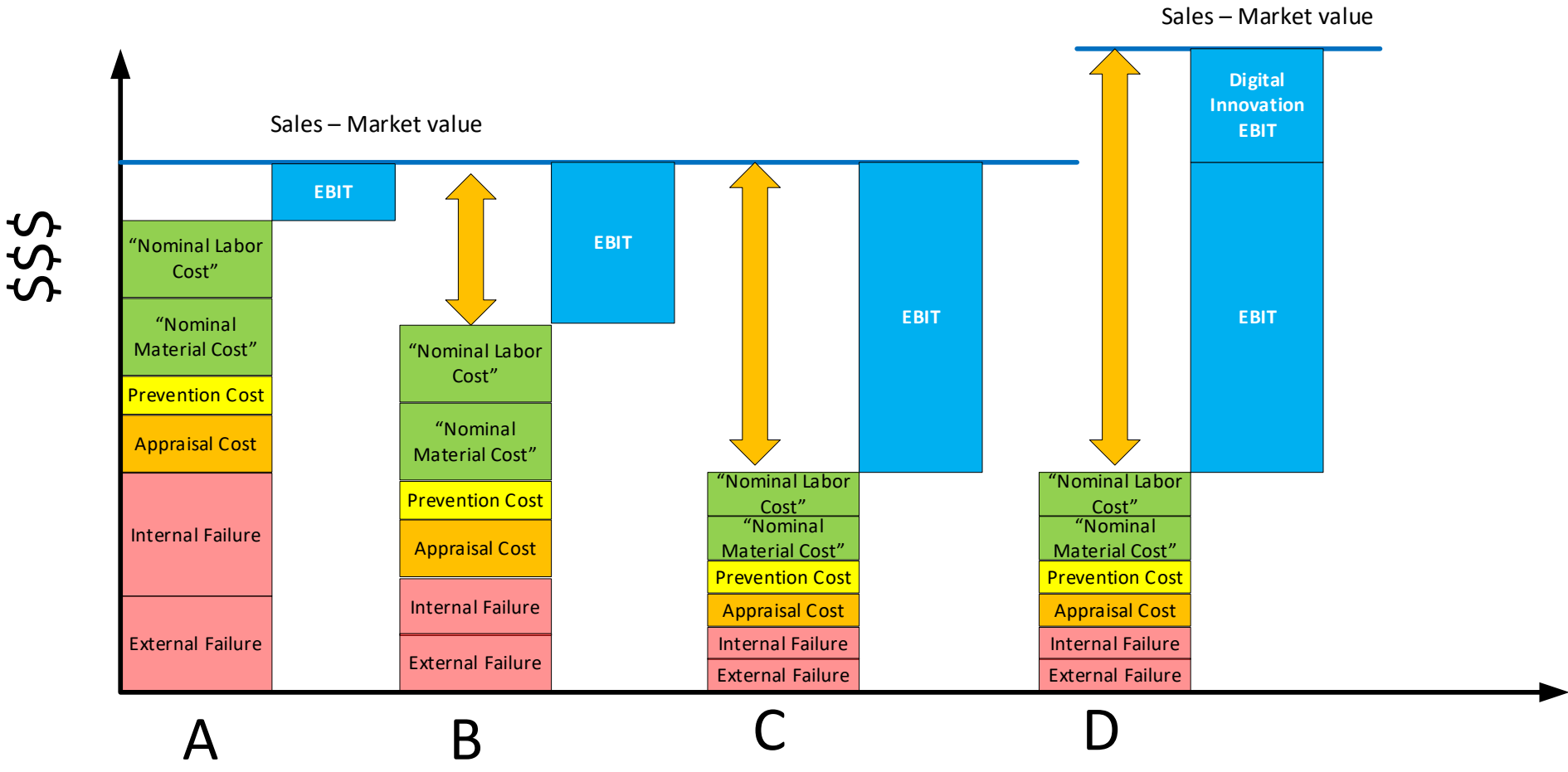
Manufacturing Apps-Work instructions

DOCUMENT MANAGEMENT

Smart Industry Readiness Index –Next Presentation



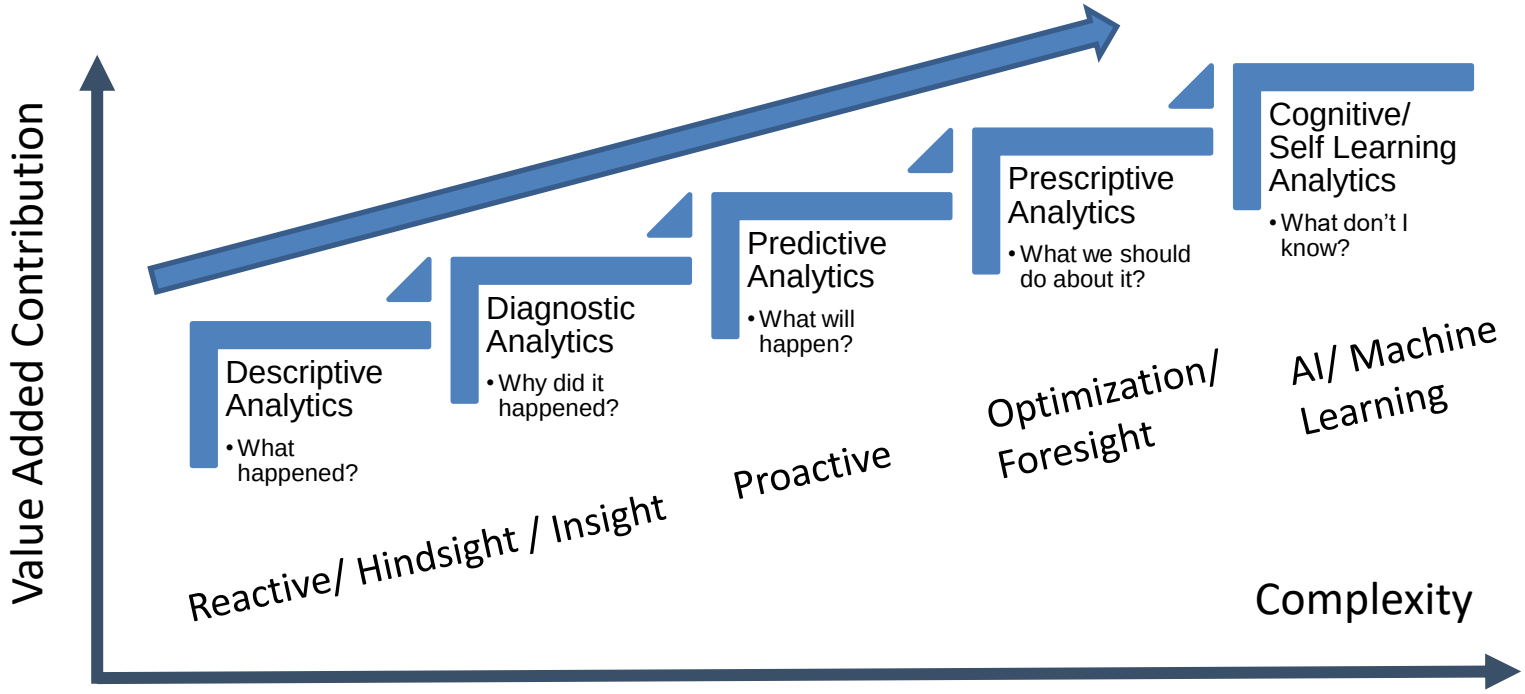
Why Quality 4.0



Analytics Maturity Model –Next Presentation

Analytics Maturity is a model for assessing an organization's ability to effectively practice data exploration and decision-making using levels or stages.

The Analytics Maturity model can be easily broken down into 5 simple segments – levels , or “Analytics Maturity Curve”.



Data Structure

Structured

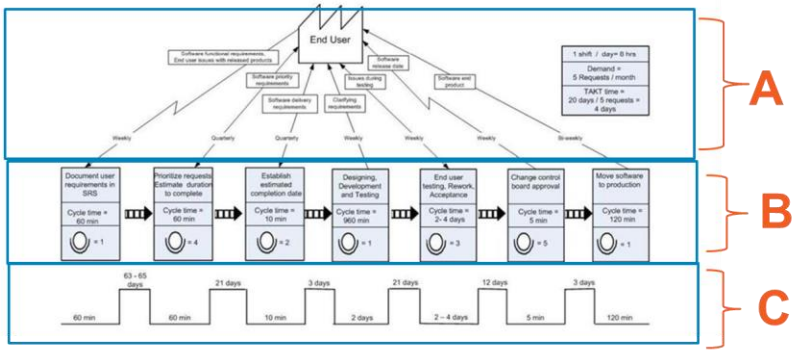
20%

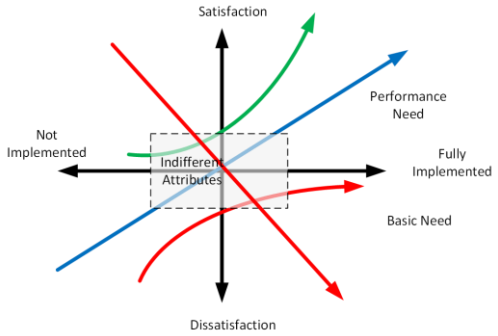
Unstructured Data

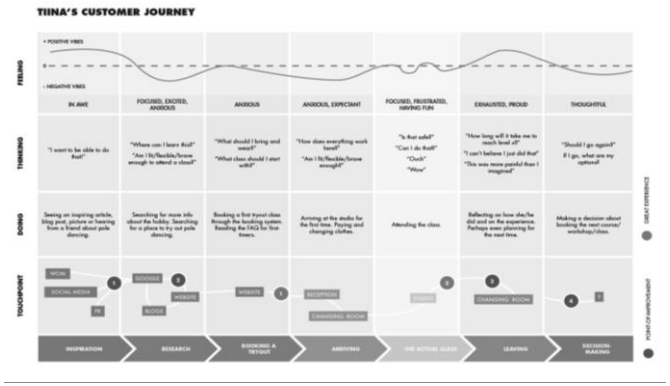
80%

System Integration – Next Presentation

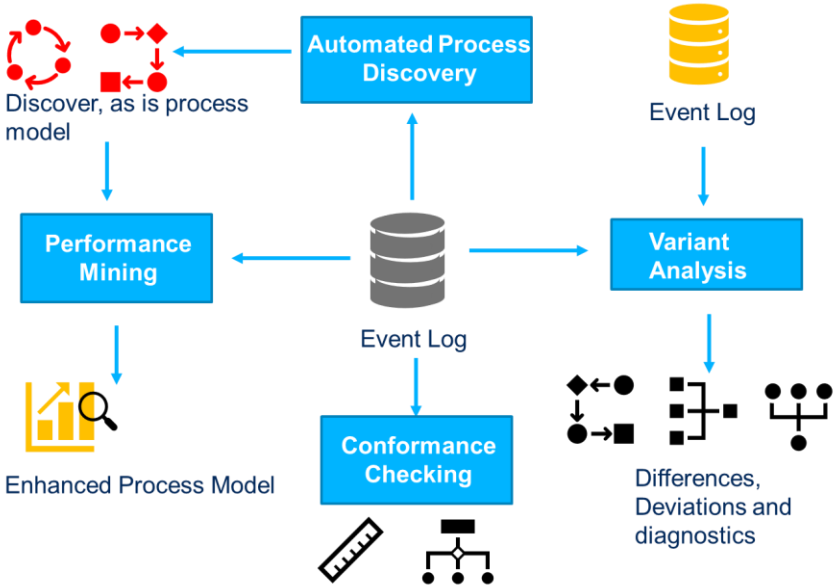
VSM

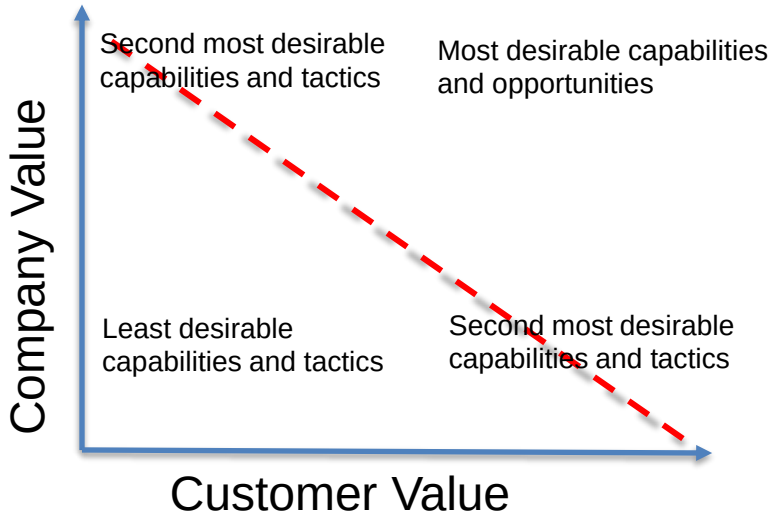






Process Mining





Thank You

datascience@asqstatdiv.org
Michael.Mladjenovic@TheSenseiGroup.com

Questions?