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## The Role of Quality



- Facilitator
- Establish What's Important
- How to Measure it
- Ensure its effective use for continuous improvement

**Champion the Mind Set of Zero Defects**

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## Industry 4.0.... Data Collection Today





Optical 3D Coordinate Measuring Machine





Augmented Reality Quality Inspection

**Real-time data is available from anywhere at any time**

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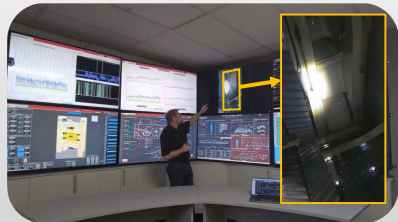
## The Power of Industry 4.0

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## A Real-Life Example





Live telemetry gave early warning to a failure -- avoiding 4 to 8 weeks of unscheduled downtime

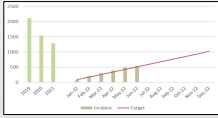
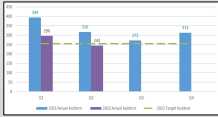
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## Implications for the Quality Discipline



- > 90% of our time is facilitating continuous improvement
- Quality is now "owned" by every person in the organization
- 60% to 70% reduction in lead time to solve issues





**Industry 4.0 is a game-changer**

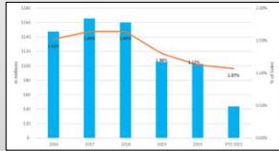
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## Results for Magna and its Customers



- 126 Customer Quality awards in the last five years
- Successfully launched 800 programs in the last five years
- Reduced our failure cost of quality by 45%




**50% reduction in customer incidents**

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### Summary



- I4.0 enables real-time analysis of high-quality data
- Frees quality experts to focus on continuous improvement

**Data  
Collection**

➔

**Analytics &  
Improvement**

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10/21/2022

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# Q & A



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## Maintaining Quality Standards When Supply is Low & Demand is High


Kush Shah  
CEO  
Global Organizational Excellence  
Solutions, LLC




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### Quality - Past

- **Focus on parts:**
  - Conformance to requirements
  - Defects / deficiencies
  - Within specifications
- **The Goal was acceptance**



### Quality – Present

- Today, the Customer assumes all parts will work as a given
- Less than 50% of issues reported by the customer are hard failures
- **The Goal is to surpass customer expectations without unpleasant surprises**



➔

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### Customer-Centric Approach to Automotive Quality



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### Why Has the Automotive Industry Been Hit So Hard by Chip Shortage?



- Global demand for vehicles rebounded more strongly than anyone anticipated
- Auto giants compete with the consumer electronic space for wafer starts at the foundries, which have been at full capacity
- Auto OEMs rarely buy chips themselves, instead ordering modules from suppliers that deal with chip vendors. That gives them less leverage to persuade foundries to produce chips
- Auto OEMs have tight profit margins, leaving semiconductor companies less room to bid up prices for wafer starts

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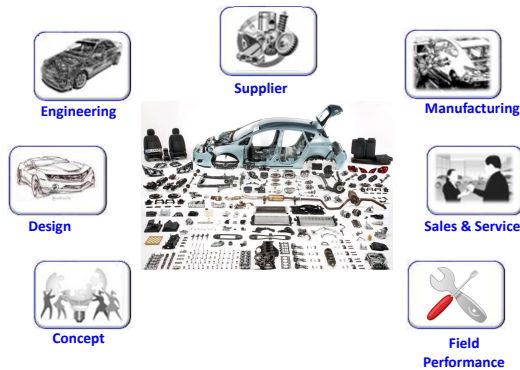
### How Do We Maintain Quality Standards with High Demand and Low Supply?



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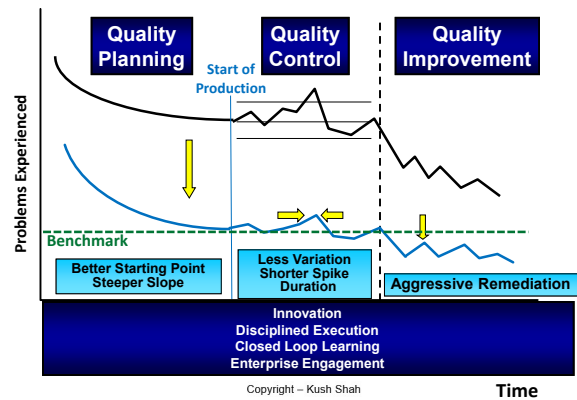
### Enterprise-wide Engagement in Quality



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### Focus on Quality across Product Lifecycle



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### Essential Implementation of Quality Tools, Techniques, and Practices

| Quality Approach   | Illustration | Key Points  | Key Enablers   |
|--|--------------|---|--|
| <b>Reactive Quality</b><br>(Fire Fighting)<br><br><small>Organizations that are always putting out fires will eventually get burned.</small> |              | <ul style="list-style-type: none"> <li>• Low Leverage</li> <li>• High Visibility</li> <li>• High Cost</li> <li>• Customer Dissatisfaction</li> <li>• Easiest to Measure Performance</li> </ul>  | <ul style="list-style-type: none"> <li>• Structured Problem Solving                             <ul style="list-style-type: none"> <li>• PDCA / PDSA</li> <li>• Kepner-Tregoe</li> <li>• Lean Six Sigma</li> <li>• Shainin Red X</li> </ul> </li> <li>• Standard Work</li> </ul> |
| <b>Proactive Quality</b><br>(Fire Prevention)  |              | <ul style="list-style-type: none"> <li>• High Leverage</li> <li>• Low Visibility</li> <li>• Low Cost</li> <li>• Customer Enthusiasm</li> <li>• Difficult to Measure Performance</li> </ul>  | <ul style="list-style-type: none"> <li>• APQP</li> <li>• Design for Six Sigma</li> <li>• DFMEA / PFMEA</li> <li>• Innovation / Design Thinking</li> </ul>  |
| <b>Predictive Quality</b><br>(Fire Prediction)   |              | <ul style="list-style-type: none"> <li>• Data-driven insights accelerate discovery of issues and risks</li> <li>• Faster and more confident decisions</li> <li>• Better understanding of customer</li> <li>• Faster and more confident real-time decisions</li> </ul> | <ul style="list-style-type: none"> <li>• Integrated Big Data</li> <li>• Data Analytics</li> <li>• Artificial Intelligence (AI)</li> <li>• Machine Learning</li> </ul>  |

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### Risk Management

- **Risk Identification**
  - Identification significant risks based on organization's risk appetite
- **Risk Analysis**
  - Measure risks consistently with respect to enterprise objectives
  - Prioritization and quantification
  - Assignment of specific responsibility for controls to mitigate risks
- **Risk Response**
  - Scenario development
  - Action Plan Implementation
- **Risk Control**
  - Hold the gains through monitoring and controls

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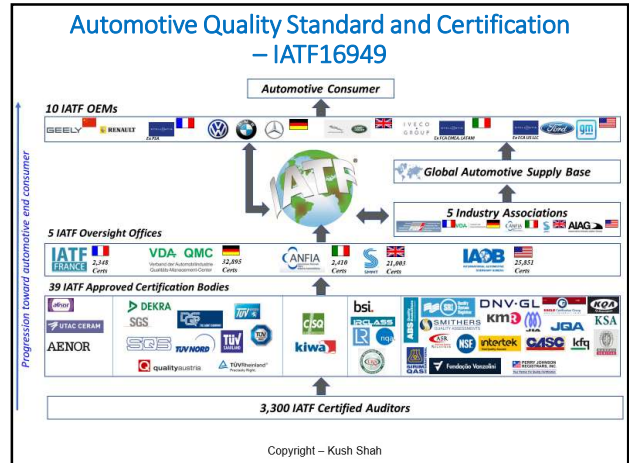


### Integrated Approach to Data Analytics

- Types of business data – Sales, Marketing, Operational, Quality, Service, HR
- Benefits of integrated approach of data analytics:
  - Better understanding of customer
  - Make faster and more confident decisions
  - Proactively drive improvement projects
  - Unprecedented resolution of field reliability
  - Influence the design for next generation of products
- Factors to be Considered in Big Data Analysis:
  - **Automation** - Analysis and complex computations
  - **Reproducibility** - Analysis results can be reproduced
  - **Flexibility** - Data repository can organically expand and extend
  - **Robustness** - Less error prone

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### Quality From an Employer Standpoint

Moderator:

- **Dan West**, President, Livonia Chamber of Commerce

Panel:

- **Tracy DiSanto**, Assistant Director DEI Workforce Design, General Motors
- **Todd Latouf**, Group General Manager, Magna
- **Chuck Dardas**, President & COO, Alpha USA
- **Steve Balder**, Owner, SB Precision

Schoolcraft College

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# Q & A

Schoolcraft College

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### Connecting Students with the Real World & the Importance of Quality

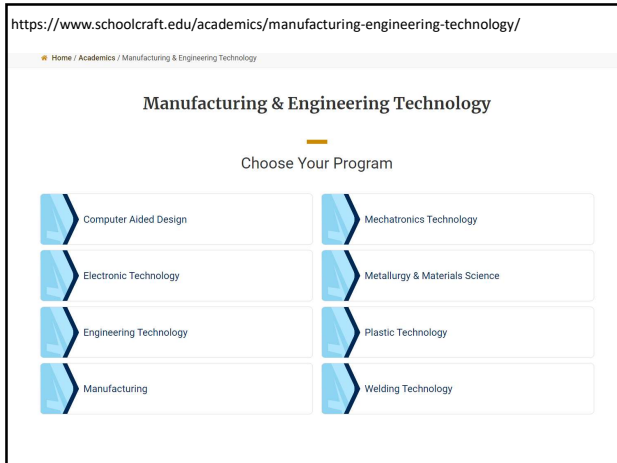
Moderator:

- **Rob Leadley**, Executive Director, Business Relations & Talent Development, Schoolcraft College

Panel:

- **Dennis Fohey**, Faculty, Schoolcraft College
- **Barb Stevens**, Faculty, Schoolcraft College
- **Laurie Kattuah-Snyder**, Chief Student Services Officer, Schoolcraft College
- **Michael Quattro**, Director of Educational Outreach & Transfer Initiatives, Wayne State University
- **Karen Maxton**, Employment & Internship Coordinator, Schoolcraft College

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## AIAG Quality Summit 2022

Purpose: Assess the value of the conference in conjunction with the Quality Institute and share a few key points from what they heard.

### Impressions:

- Seven Outstanding Students Representing Schoolcraft College
  - Well spoken, Fearless, Responsible
- Executives from Continental, Bosch, IAQB, AIAG, IPC and others
  - Impressed, need Talent like this, Flexible job opportunities available now!
- Future is bright
  - Sponsorships, Internships, Jobs



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## AIAG Quality Summit 2022

### Participants – Session Report

- **Allison VanHouten & Staneisha Chambers** – *Invest in People*
- **Liam Fahey** – *Automotive Core Tools*
- **Colton Schaefer** – *No Trouble Found*
- **Sara Bales** – *Why system audits are not driving performance*
- **Mimi Tran** – *Zero Defects*
- **Bella Metcalf** – *Panel Q&A*



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## GET TO KNOW ME!

- Second ever and first woman Woodwork Manufacturing Specialist Apprentice
- Completing customized coursework in manufacturing and CAD; pursuing CAD certificate
- Coming from a background in education. A total 180!



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## QUALITY PEOPLE AND SYSTEMS

Allison VanHouten

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## WHAT MAKES A QUALITY PERSON?

- We all have a unique set of experiences and interests to share.
- Simply, a passion for something; for a profession, for a product

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## RECRUITMENT/RETENTION

- Quality problem usually boils down to labor shortage
- Top three ways to retain employees (as stated by Tony Mariucci, Supplier Engagement Unit Lead at Honda):
  1. Company identified as top place to work in community
  2. Flexibility in positions
  3. Effective front-line leadership

Additionally, talent wants to understand why they are needed.

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## QUALITY SYSTEMS

- "The more complex the process becomes, the more difficult it is to diagnose the problem."
- Create simple systems that reduce clutter and cost
- Recruit labor and ensure preparation for technological changes
- Ensure machinery is ready for technological changes
- The ultimate goal: quality people creating simple, quality systems

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## APPLICABILITY FOR THE ANGLERI QUALITY INSTITUTE

- Embed quality training coursework into each degree program related to manufacturing and engineering (e.g., Computer Aided Design (CAD), Engineering, Electronics, Advanced Manufacturing, Mechatronics, Metallurgy, Plastic Technology, Robotics)
- Highlight Schoolcraft College as a top higher learning institution for trade careers in community
- Emphasis on need for highly-skilled workers in trades
- Develop a quality system, SOP, specific to Schoolcraft College

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## Liam Fahey

### Student

- Current: Engineering Associates (Schoolcraft College)
- Future: Electrical Engineering (University of Michigan)

### Professional

- Level one machinist (LOC Performance)
- President (Manufacturing and Engineering club - Schoolcraft)

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## Automotive Quality Tools

- ❖ What are they?
- ❖ Why are they important?

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## What Are They?

- ❖ Advanced Product Quality Planning & Control Plan (APQP)
- ❖ Production Part Approval Process (PPAP)
- ❖ Failure Mode and Effects Analysis (FMEA)
- ❖ Measurement System Analysis (MSA)
- ❖ Statistical Process Control (SPC)

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## Why are they Important?

- ❖ Establish more effective communication
- ❖ Catch and prevent potential errors
- ❖ Creates a faster and more reliable process
- ❖ Creates a more reliable and cheaper product

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## Colton Schafer

**Program of Study at Schoolcraft College:** CAD Mechanical Design AAS

**Status as a student:** Part time student, expected graduation in winter 2023.

**Current work experience:** CAD designer under the full-time material science instructor of the MEC Schoolcraft building.

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Colton Schaefer (CAD Mechanical Design AAS)

## No Trouble Found (NTF) Issues From Electrification In Vehicles

What I learned; what does it mean to Schoolcraft?

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### What I learned

- **No Trouble Found** issues in vehicle repairs will increase safety hazards and decrease the chance of Fixing-it-right the first-time or NRFT. When problems are resolved quickly and efficiently the first time, customer satisfaction goes up.
- **NTFs arise** when components interact and lead to system-level failures, but no single component is found to be the root cause. The component that's flagged as the problem in the diagnoses, gets sent back to manufacturing, where nothing is found to be wrong in the end.
- **Data analysis issues** have made the software at fault here, not a single physical "part" of the vehicle. Effectively pulling information from all factors of the issue, to create a larger pool of data is essential to search for patterns within it and try to find useful clues.
- **Compacting sensor data** from the vehicle and categorizing it as much as possible and using different co-occurrence techniques, will increase the likelihood of diagnosing the problem and resolving it the first time.

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### Why is it important?

- Along with many other things I learned from AIAG's quality summit, this increased the scope of what I knew was possible in manufacturing and production. Going into CAD Mechanical Design I find it very important to understand quality practices, standards, and how they all fit into the end result of a successful project.
- Quality control is essential for a business to deliver effective product solutions that meet the expectations of the customer, or exceed it. It reduces waste and pollution, while simultaneously saving money and increasing the safety of everyone involved.

Thank you for your time.

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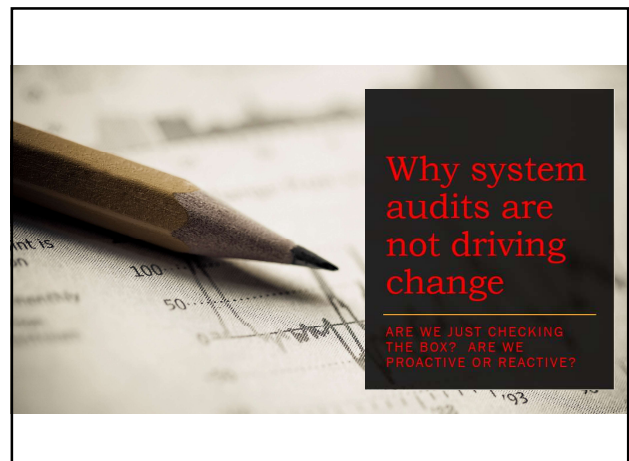
**Name:** Sara Bales

**Program of Study:** Prior - Metallurgy /  
future - quality program

**Status as student:** BA graduate, working on  
continuous improvement

**Current work experience:** Supplier Quality  
Engineer with Torsion Control products  
a division of Timken

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## Management of the Data

- Use the data and speak to it with actions. Every process indicator tells the truth.
- Pay attention to the details and understand the causal factors that created the failure(s).
- Make sure concerns get closed out timely, failure to do this will create a repeat.

Think RISK

- R (read the data)
- I (In-control processes – closed loop)
- S (seek alternatives – set stretch goals)
- K (KPI's – always track your performance)

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## Summary

- For audits to be effective, we must remove the limitations imbedded within our organizations that represent the check box mindset.
- We must navigate and utilize the QMS system which is effective when owned by the entire organization.
- Successful auditing is not just one time a year, our system must drive audit activity with the expectation that change is not optional but required.
- Audit failure can only take place when the system is not utilizing the data.
- Data is the gate that opens the way to eliminating recurrence, mitigating risk, and permanent corrective action.

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## Mimi Tran

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**Program of study at SC:** Engineering (I don't specifically have one at Schoolcraft as I'm just transferring credit hours to Wayne State)

**Status:** Full time, expected to graduate from WSU Dec 2024 with BS in Mechanical Engineering Technology

**Current work experience, as it relates to pathway,** if applicable: N/A

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# Zero Defects

AIAG 2022 Quality Summit  
Mimi Tran

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## Quality Sessions

Achieving Zero Defects in Electronics Dependent Systems, *Brian O' Leary, Debbie Carboni, Brian Chislea, & Tracy Riggan*

- Convergence of factors in industry: EV's increased voltage, increase in sophisticated PCBAs, supply chain, retiring knowledgeable workforce, struggle to meet standards
- Best Practices: Material alignment, the WHY, collaboration

The Drive Towards Zero Defects, *Robert Brimm*

- **Quality Circles:** Team discussing corrective & preventive action

|  |   |
|--|---|
| <p><b>Focus:</b><br/>Product improvement<br/>Customer satisfaction<br/>Efficiency savings/ Cost reduction<br/>Improve company<br/>Reduce waste &amp; error</p> | <p><b>Result:</b><br/>Change in attitudes<br/>Self Development<br/>Improvement in team spirit<br/>Improved work culture</p> |
|--|---|

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## Conference Feedback & Future Applicability

Insightful, collaborative, & stimulating

**Applicability:**

- Strive for a strong understanding of each aspect in industry, cross functionally working as a team
- Implement quality circles in the program to ensure results in industry

Understanding, Communication, Problem-solving, Education

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Panel Discussion  
Audience Q&A

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**Tabletop Discussion**

Moderator: **Laurie Kattuah-Snyder**, Chief Student Services Officer,  
Schoolcraft College



**20:00**



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**Report-out & Conclusion**



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**Thank you for participating!**

Tours of MEC available now



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