IoT, Automation, and the Future of Food Safety

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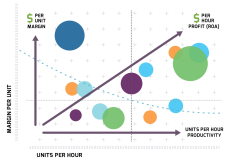
What's the Point?

get it on time

Goal:

Profitably produce and deliver product on time that is food safe and to specification.



Everyone is Responsible for the Finished Product

- Supply Chain
- Production
- Maintenance
- QA
- Sanitation
- HR
- Administration
- EVERYONE!

The Bottomline is One Number

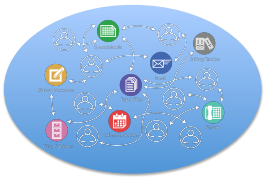
Food Safety Is More Than Sanitation

- Production Behavior:
  - GMP, product to specification, ingredients, wrapping, etc.
  - Operate equipment appropriately.
- Maintenance Behavior:
  - Equipment is maintained to specification.
  - Building is environmentally sound: positive air pressure, no gaps, hygienic design, and more.
- QA Behavior:
  - Monitoring ingredients, process, finished product, etc.
- Food Safety Behavior
  - Sanitation, change overs, allergens, pest management, etc.

Take the Time to Step Back

- What information is being gathered manually?
- What is data is already being gathered?
- What data isn't getting to people or processes that value it?

You don't have to be a hippie to be holistic.



A Lot of New and Great Tech is Available

- Sensors – from many manufacturers
- The ability to share and store data
- Artificial Intelligence
- Mobile Devices

Making it Real

Get past the marketing terms:

- Sensor = A thing that measures something (literally hundreds or thousands of them available)
- Cloud = The server is in someone else's datacenter
- Artificial Intelligence = Pattern Matching (really fast using a lot of data!)
- Edge Computing = Server in your building sends data to the cloud (because the internet really isn't that reliable all the time)
- Blockchain = Shared Data and Transactions that supposedly can't change once they are entered.
- Form & Report Builder = Data entry – It's your problem, good luck

What to Consider

- Review your Plant
  - Where is "Lack of Knowledge" hindering efficiency?
  - Where is Data being gathered manually?
  - Where is Data recorded manually (on forms, screens, etc.)?
- Review the logic
  - Where is there value in existing protocols?
  - Will updated or new protocols add value?
- Pick your priorities
  - What will best improve your operation?
  - What can be used multiple places (synergies count)?

Goals:

- Increase Sales
- Lower Cost
- Mitigate Risk

Definition of Success

- You must determine what a successful result looks like.
  - This is critical before starting any project.
  - Sounds obvious, but unless clearly defined, not everyone will be on the same page.
  - Be specific about what is automatic, what requires human intervention, where data goes automatically, etc.
  - Be clear about how the measures will provide a positive impact to your operation. Include all effected departments before starting the project.

Protocols & KPIs

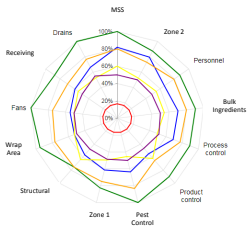
New Technology / Business Processes…Not All Positive?

- A proven example of something every company needs:
  - ERP rollouts: 50% fail with many over budget, canceled or lawsuits.
- Tangible vs Intangible
  - When buying equipment the goal is very clear, the results easily provable.
  - Most IT projects require a "cultural disruption" and a change in process before realization of results, even with clearly defined goals.

Vs.

IoT and Automation Projects

- Data = The measurements from the sensors and systems.
- Information = What you can do with the Data. *The More Actionable the better!*
- Automation = Intelligent flows between tasks, data, systems using any number of tools.
- Alerts = Emails or Text Messages triggered by rule-based data thresholds.



Making Sense of What to Automate

HOW LONG CAN YOU WORK ON MAKING A ROUTINE TASK MORE EFFICIENT BEFORE YOU'RE SPENDING MORE TIME THAN YOU SAVE? (ACROSS FIVE YEARS)

HOW MUCH TIME YOU SHAVE OFF	HOW OFTEN YOU DO THE TASK: 50/DAY	5/DAY	DAILY	WEEKLY	MONTHLY	YEARLY
1 SECOND	1 DAY	2 HOURS	30 MINUTES	4 MINUTES	1 MINUTE	5 SECONDS
5 SECONDS	5 DAYS	12 HOURS	2 HOURS	21 MINUTES	5 MINUTES	25 SECONDS
30 SECONDS	4 WEEKS	3 DAYS	12 HOURS	2 HOURS	30 MINUTES	2 MINUTES
1 MINUTE	8 WEEKS	6 DAYS	1 DAY	4 HOURS	1 HOUR	5 MINUTES
5 MINUTES	9 MONTHS	4 WEEKS	6 DAYS	21 HOURS	5 HOURS	25 MINUTES
30 MINUTES		6 MONTHS	5 WEEKS	5 DAYS	1 DAY	2 HOURS
1 HOUR		10 MONTHS	2 MONTHS	10 DAYS	2 DAYS	5 HOURS
6 HOURS				2 MONTHS	2 WEEKS	1 DAY
1 DAY					8 WEEKS	5 DAYS

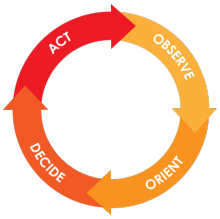
https://xkcd.com/1205/

Opportunities

- Food Safety Documentation
- Corrective Action Requests
- Maintenance Work Orders for Sanitation
- Addressing Root Causes of Consumer Complaints
- Manpower (Resource) Management
- Inspections
- Non-Compliance Alerts and Escalations
- Automation of Reporting
- Dashboards

Continuous Improvement

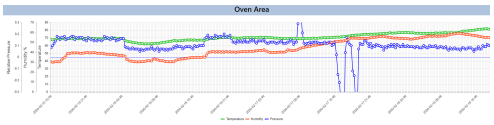
The OODA Loop (back again from 2019)



Example: Environmental Sensors

- Food Safety
- Maintenance
- Production

Humidity Temperature Air Pressure



Example: RFID on Vemag Carts

- Track Vemag Carts to ensure proper cleaning

Example: Assignment Completion Automation

- Supervisor Emailed Status

Work Pack: WP2197
Assigned to: GONZALEZ, JOSE [5528]
Scheduled for completion on 1/21/2019 - Monday

Task	Equipment/Area	Forecast	Status
Work Sheet	200130-Main Deck- Syrup & Topping System Line #1 (Bottom EOR CIP	0	Completed
Work Sheet	200140-Main Deck- System & Topping System #1 EOR CIP	0	Completed
Work Sheet	200689-Main Deck - Syrup & Topping System #1 EOR	0	Completed
Work Sheet	210641-Condiment Room- Sanitation Checksheet	25	Open
Work Sheet	240190-Salad Dressing Deck-CIP Mayo Line EOR	60	Completed
Work Sheet	240140-Salad Dressing Deck- CIP Salad Dresing Mix Tank EOR	60	Open
Work Sheet	240150-Salad Dressing Deck- CIP Salad Dressing Line #1 EOR	30	Open

Enter employee email address on the "User Account" screen.

Example: Communication Between Systems

- Sanitation Inspections generate Maintenance Work Orders
- Maintenance Inspections generate Sanitation Corrective Actions
- Maintenance Emergency Repair generate Sanitation "Clean and Sanitize" Documentation

Food Safety ⇄ Maintenance

Example: Sifter Tailing Checks

- Documentation
- Remind, Enforce and Escalate

Thank You!

Any Questions?

NEXCOR Food Safety Technologies

KLEANZ

CAMS-PM