

# <u>connec</u>

## **PROCESS MONITORING & CONTROL**



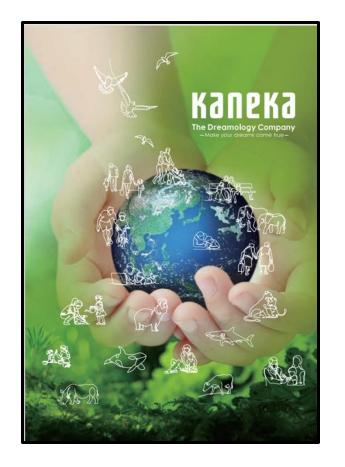


# Monitoring Fermentation Plant Batch Cycle Times in Real-Time

Ziyan Sheriff

Kaneka





- We are a Japanese multinational manufacturing company established in 1949 with a global revenues of \$5 billion. We manufacture chemical products including resins, pharmaceutical intermediaries, food supplements, synthetic fibers, fine chemicals, polymers, fermentation, biotechnology and electronics, and other fields.
- Our 8,400 employees are meeting our customer needs on all continents; Our company has operations in Japan, United States, Belgium, Germany, Singapore, Malaysia, Australia, China, Vietnam, India, Taiwan and South Korea.
- We started operations in the United States in 1984, our manufacturing facilities are located Pasadena, Texas; Benicia, California; & Cincinnati, Ohio.

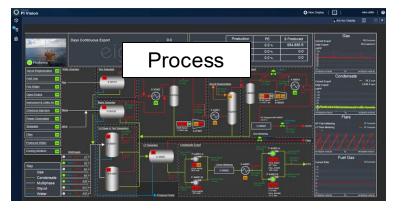
#### **Presentation Focus**: Real-time monitoring of a fermentation process



- Introducing the challenge & benefits
  - Real-time process monitoring
- Solution Development
  - Initial status: Manual monitoring
  - Initial solution: Monitoring using Excel macros
  - <u>Final solution</u>: Real-time monitoring using Seeq w/ auto-generated reports
- Solution Deployment
  - Seeq tool highlights, Tips for successful implementation
- Conclusion



- How many operate batch processes?
- Benefits of real-time monitoring of batch processes?
  - Overall visualization of plant operation and status
  - Identification of process anomalies
  - Quicker process troubleshooting
  - Predictive maintenance opportunities
  - Impurity identification and elimination
  - Proactive vs reactive action
- DCS is great for day-to-day operation, but overall plant visualization integrating data from multiple data-sources provides several benefits
- **Sample benefits**: 25% reduction centrifuge cycle time through filter washes, AI for translation / quicker implementation of tasks, reduction in DCS support

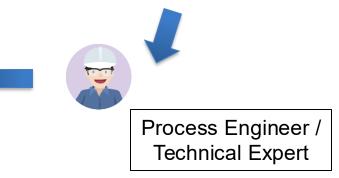


Source: https://www.aveva.com/en/products/aveva-pi-vision/

Lot No.	Start Time	End Time	Cycle Time	Threshold
230XX-				
XXXX		Excel Tracking Spreadsheet		



Source: https://www.aveva.com/en/products/aveva-pi-vision/



#### • <u>lssues?</u>

- Manual, tedious, time-consuming, resource intensive (expert), reactive rather than proactive
- Automation can aid fault detection & management (\$ savings) and save time

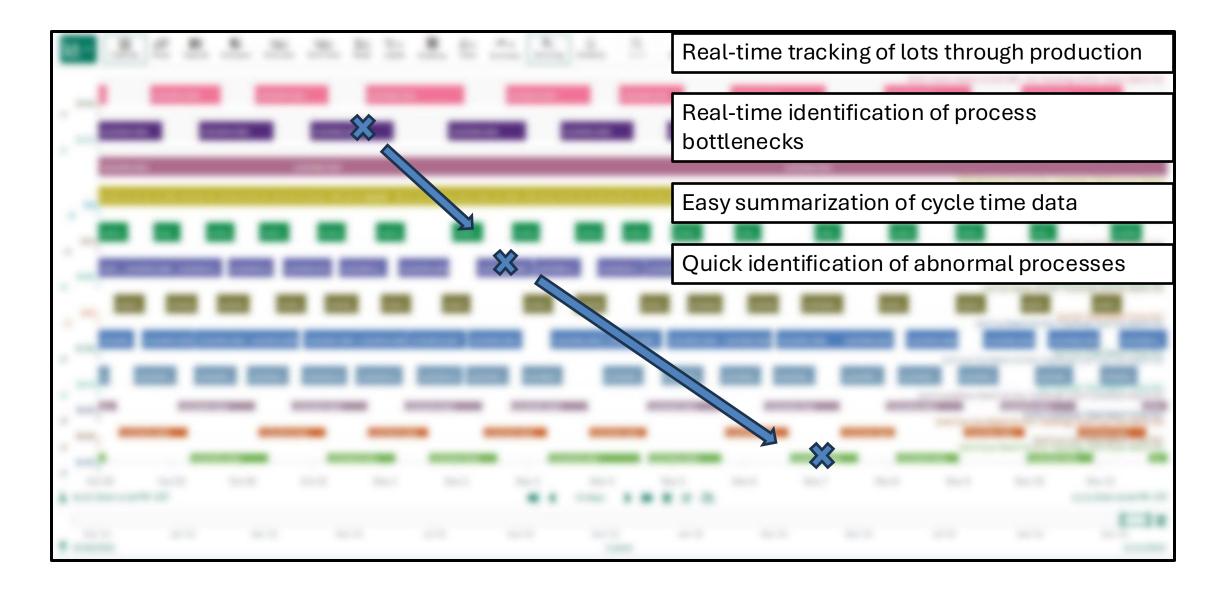


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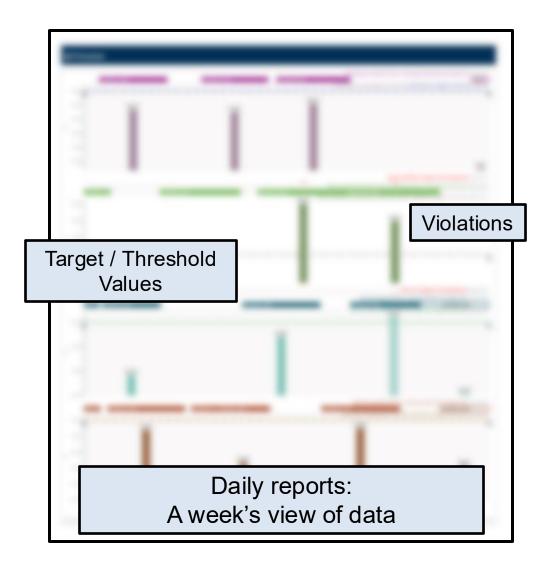


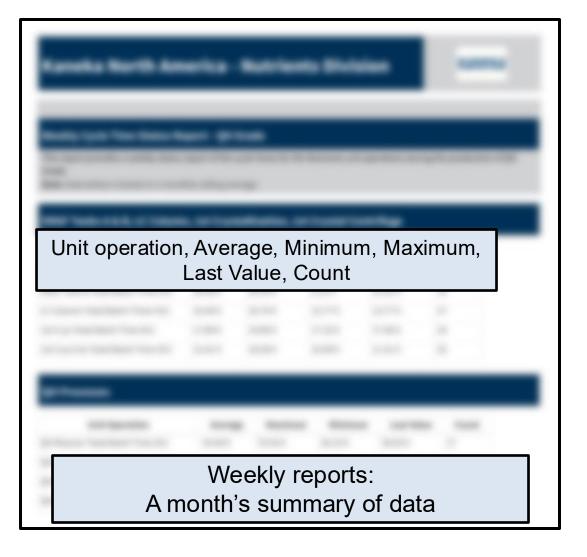
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- Not real-time, limited scalability and maintenance
- Limited overall plant visualization



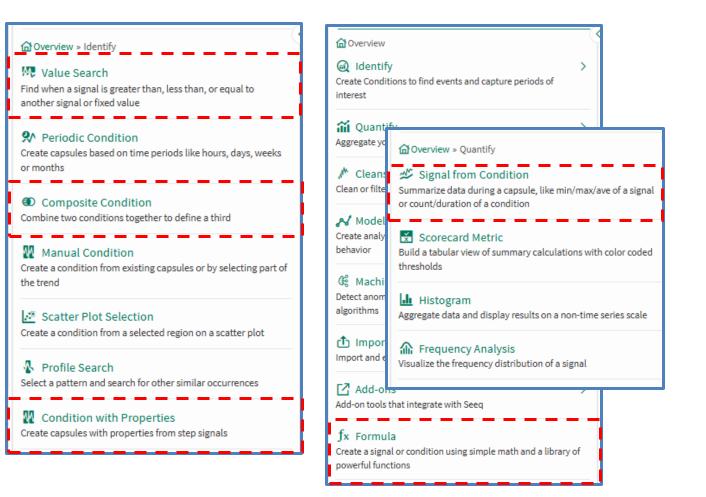
Make your dreams come true



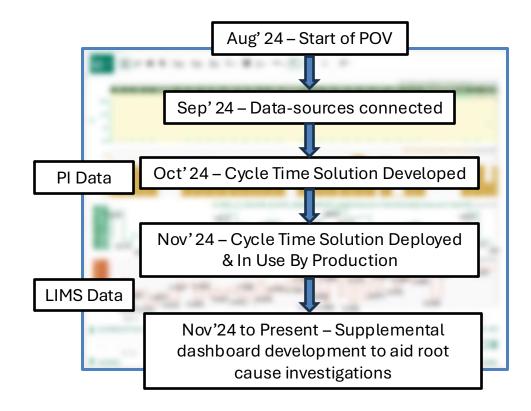


#### **Solution Deployment: Seeq Tools**

- Identify  $\rightarrow$  Conditions with Properties
  - Identify and keep relevant stages
- Identify  $\rightarrow$  Composite condition
  - Combine Batch ID and stage information
- Identify  $\rightarrow$  Value Search
  - Flag timer target / threshold violations
- Quantify  $\rightarrow$  Signal from Condition
  - Timer information and end-values
- Custom Formulas
  - Advanced data manipulation, e.g., merge etc.
- AI Feature: For translation and quicker implementation of tasks



- Deployment Timeline
  - Brainstorming: 2 weeks
  - Development: 1 week
  - Monitoring / Refining: 2 weeks
  - Go Live: 5 weeks from start
- Benefits of Seeq Solution
  - Quicker and increased access to data for end-users
  - Real-time plant status visibility and summary
  - Low maintenance requirement
  - Reduction in DCS support needs
  - Identification of bottlenecks / areas to focus
  - Further root cause investigations through separate dashboards



**Strategy**: Outcome-Driven End-User Centric Use Cases

#### Conclusion

#### **Challenge** Implement a real-time monitoring solution for a fermentation process

- **Solution** Develop a capsule-focused dashboard to provide end-users with a bird's eye-view of the production process
- **Results**Real-time tracking of process bottlenecks and identification of<br/>opportunities for improvementE.g., 15-20% reduction in batch cycle time for centrifuge, through<br/>opportunity to optimize filter washes

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# **Thank You!**

