

# On-Premise PI System success and a future look at OSIsoft Cloud Services (OCS)

Mark Gutgesell – Process Engineer  
Unilever Kilbourn Facility

November 5, 2020

# About Unilever

*Slogan - "Feel Good, Look Good, and get more out of life"*

## Vision

Unilever has a simple but clear purpose – to make sustainable living commonplace.

## Value & Principles

To succeed requires "the highest standards of corporate behavior towards everyone we work with, the communities we touch, and the environment on which we have an impact."

## Strategy

To achieve our purpose of making sustainable living commonplace



# Who We Are

161,000 employees

28 Sustainable Living brands

49% of management are women

€51 billion turnover in 2018

**400 brands in 190 countries**

No. 1 employer of choice in 50 markets in 2018

2.5 billion people use Unilever products to feel good, look good and get more out of life





*S y s t e m s I n t e g r a t o r*

Marc Gallant, VP: Digital Transformation

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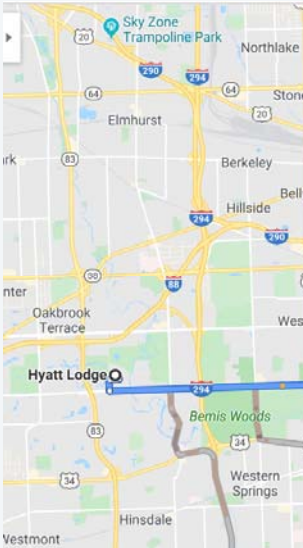


@Stone\_Tek

# On-Premise PI success Agenda

- Unilever Kilbourn Site Overview
- PI Project Overview
- Strategy Future

# Unilever Kilbourn Site Overview



# Unilever Kilbourn Site Overview

- What do we make?
  - 5 product Formulas
  - 7 Lines, 14 Product Sizes
    - 0.32 Oz Portion Packs to 2,000 Pound Totes
- 196k Sq. Ft – Production and Packaging
  - Minimal warehousing onsite
- Largest Unilever Dressings Factory in the World



 OSIsoft. Virtual Industry Summits



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# Project Overview

- Project Scope
  - Data & Visibility Before PI
  - Justification
  - Quick Wins
    - Sucrose Silo
    - Inventory Sheet Digitalization
  - Packaging Analytics
  - Plant Mass Balance



# Project Overview

- Lacked Processing Data Visibility
- Insufficient Packaging Data Flexibility
  - Difficult to manipulate data
  - Did not have desired visibility
  - Multiple data platforms
  - Contractors needed to add/manipulate our data
- Waste Tracking needs
- Highly Integrated Plant
  - Gathering Data to one source is relatively simple

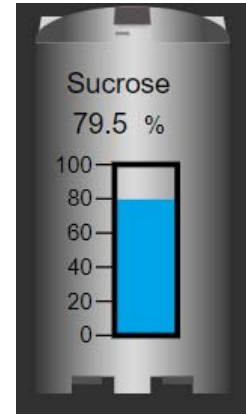


## Project Overview – Quick Wins – Sucrose Silo

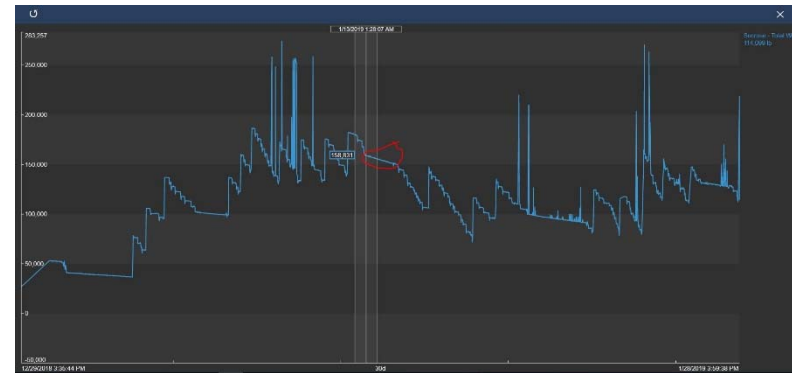
### Visibility of Process

Waste treatment load was increasing

- Silo level values were imported into PI
- Over weekend, saw level drop incrementally
- Discovered leak in tank



400k lb loss prevented  
Annually  
(2 full Silos)



# Project Overview – Quick Wins – *Inventory Sheet*

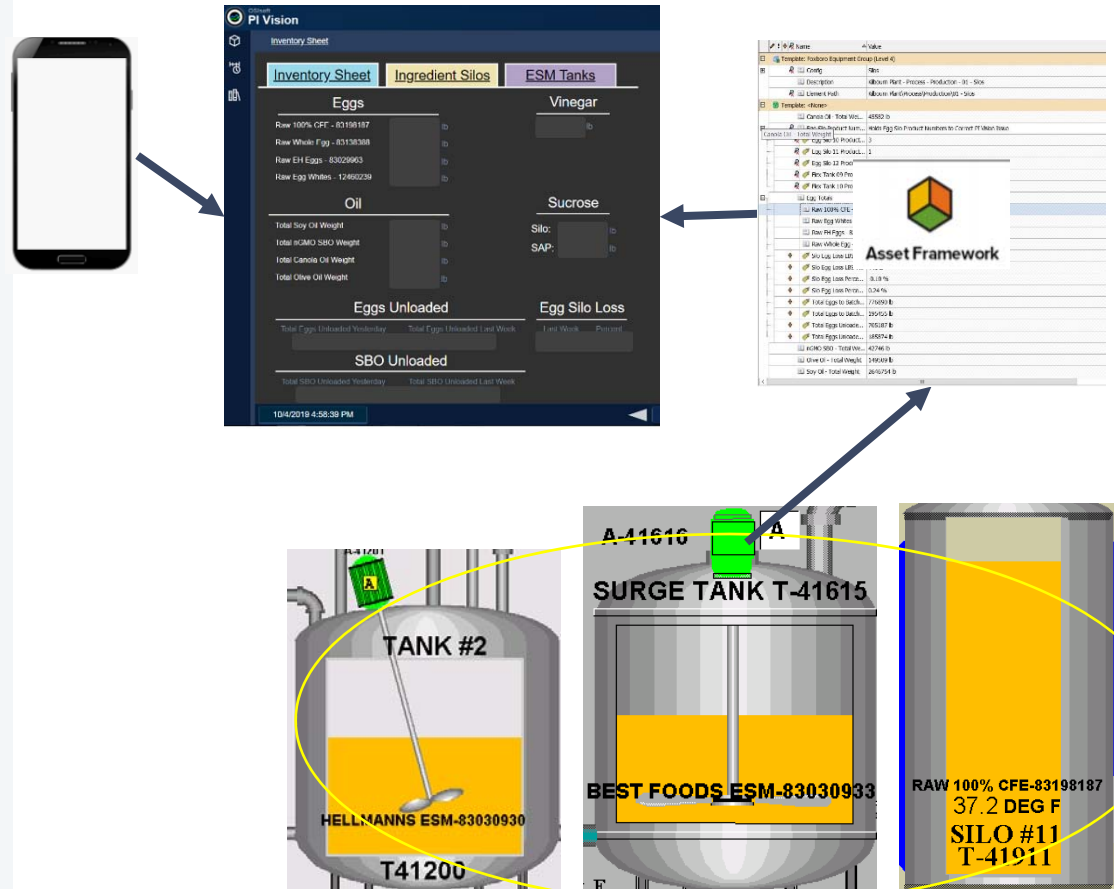
## *Visibility of Process - Analytics*

### Before - Midnight Manual Entry Sheet

- Inconsistent and inaccurate
- Paper sheet sent to planning team
- Manual Calculations to convert % Tank level to pounds of material

### Now - Real Time Digital Sheet

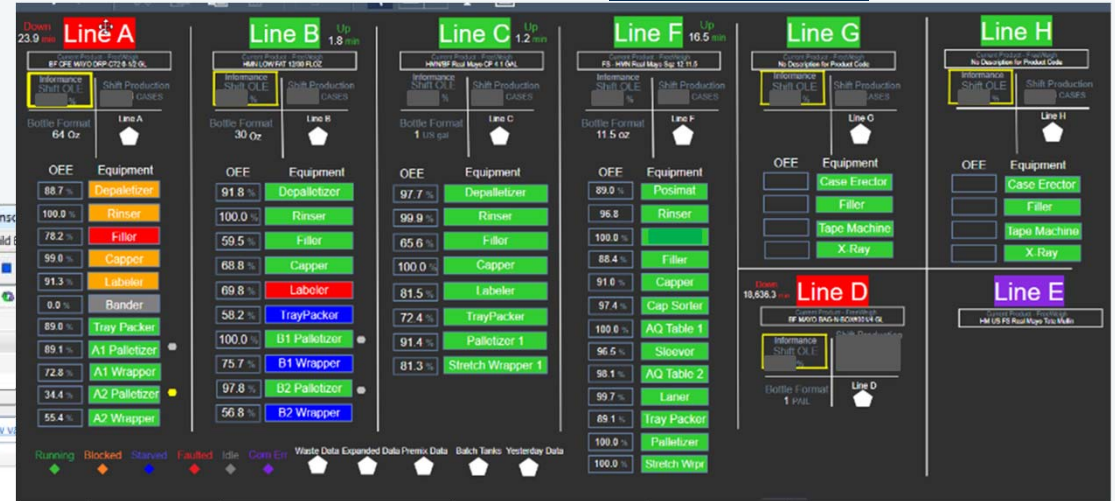
- All data calculated into one location for total weight of each material



# Project Overview - Packaging Analytics



- Rejects and Alarms
- Uptime/Downtime
- OEE/OLE
- Cases Produced



OLE Stats	Value	Description
Current Shift		
Information OLE	73.9 %	Line OLE Based on Production Rates
Information Plan Percent	105.6 %	
Shift OLE	68.3 %	OLE for Line Based on Filler Downtime



01 - Bottle Unsc...  
General Child E...  
Add a new v...  
Name  
ShiftOEE

```

else if ('*' >= 't + 14' and '*' < 't + 22')
then 100 * (0.1 + TimeEq('FaultCodeValue|Fault Code','t + 14','*',0)) / ( ShiftOEE
ELSE if ('*' >= 't + 22' and '*' < 't + 24')
then 100 * (0.1 + TimeEq('FaultCodeValue|Fault Code','t + 22','*',0)) / (
Else 100 * (0.1 + TimeEq('FaultCodeValue|Fault Code','t - 2','*',0)) / (
    
```

*OLE – Overall Line Effectiveness*  
*OEE – Overall Equipment Effectiveness*

# Project Overview - Plant Mass Balance

- Using PI Datalink to create a Mass Balance of entire plant for waste visibility & Tracking

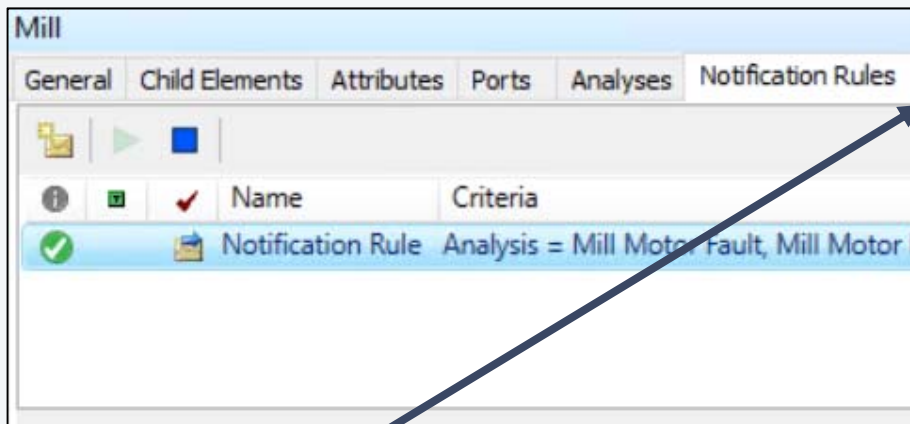


Microsoft Excel ribbon: File, Home, Insert, Page Layout, Formulas, Data, Review, View, Help, **PI Datalink**, PI Builder, Tell me what you want to do

PI Datalink ribbon: Current Value (Single Value), Archive Value, Compressed Data (Multiple Value), Sampled Data, Timed Data, Calculated Data (Calculation), Time Filtered

Plant Waste Report									
Start	Oct-01-2019 12:00 AM								
End	Oct-18-2019 12:00 AM								
Waste - % of Production	xx %								
Waste Report - Ingredients									
	Eggs	Oil	Sugar	Vinegar	Starch	Brine	Water	Misc.	Total
In									
Out									
Accumulation									
Known Waste									
Unknown									
Waste Report - Packaging									
	Line A	Line B	Line C	Line D	Line E	Line F	-	-	Total
In - Real									
In - Starch									
Line E									
Out									
Line Waste									
Reject Waste									
Known Waste									
Giveaway									
Unknown									

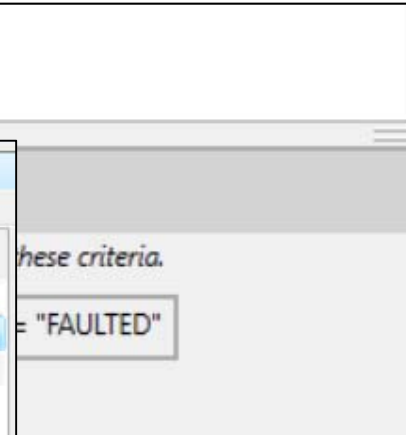
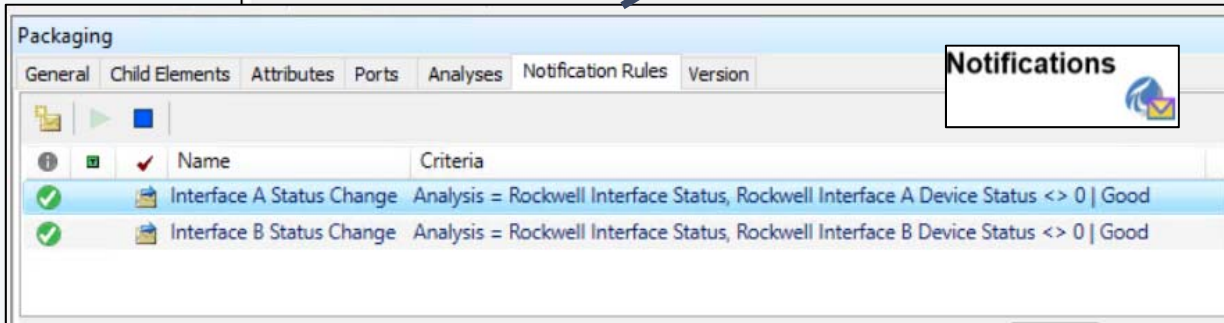
# Project Overview - Email Notifications for Alarm information



Rockwell Interface A Status has changed!

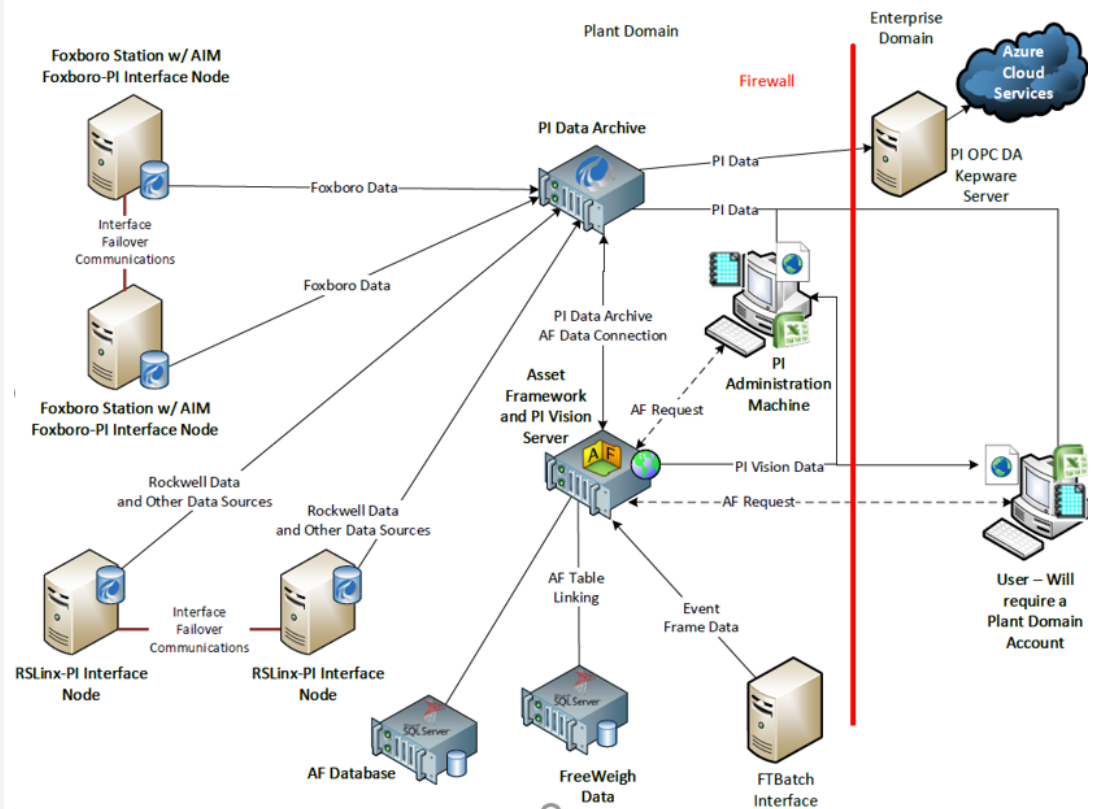
[PI\\_Notification@kilbournunilever.com](mailto:PI_Notification@kilbournunilever.com)  
To: [PI\\_Notification@kilbournunilever.com](mailto:PI_Notification@kilbournunilever.com)  
Retention Policy AutoDelete after 5 years (5 years)

**Event:** Rockwell Interface Status  
**Name:** Interface A Status Change  
**Start Time:** 8/6/2019 7:24:06 AM Central Daylight Time (GMT-05:00:00)  
**Interface A Status:** 95 1 Device(s) in error  
**Interface B Status:** 0 Good  
**Duration:** 0 minutes



## Current PI System - Overview

- 20,000 tag system
- 6,000 currently in use
  - 2000 Foxboro tags
  - 3000 Rockwell tags
  - 1000 Calculated tags
- 40 active Users
- Architecture
  - Redundant Interface Nodes
  - Standalone SQL Standard
  - Standalone PI Data Archive Server
  - Asset Framework and PI Vision Server
- MettlerToledo Quality data
- FTBatch Event data







# OSIsoft Cloud Service(OCS)

A future look

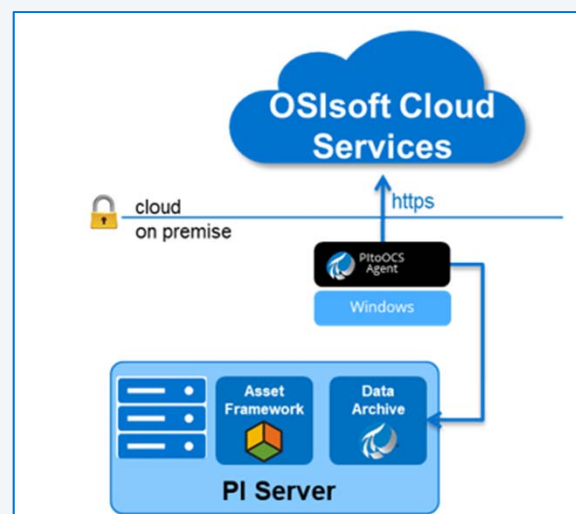
Hunter Mathews – System Engineer and PI Admin, Unilever  
Kilbourn Facility

November 5, 2020

## OCS Lighthouse Agenda

- Quick Access
- Contextualization
- Visualization

# DATA PATH



# Quick Access - Sequential Data Store

**Sequential Data Store**

**Storage Explorer**

- Production
- Types
- Streams
- Data**
- Stream Views

Stream Id: PLULKIPISR-13\_7534

Query Type: Get Range Values

Start Index: 8/15/2020

Count: 100

Reversed: False

100 Total Events

Timestamp	Value	IsQuestionable	IsSubstituted	IsAnnotated	SystemStateCode	DigitalStateName
Aug 14, 2020, 7:05:29 PM	328	false	false	false		
Aug 14, 2020, 7:05:26 PM	573	false	false	false		
Aug 14, 2020, 7:05:23 PM	600	false	false	false		
Aug 14, 2020, 7:05:20 PM	308	false	false	false		
Aug 14, 2020, 7:05:17 PM	426	false	false	false		
Aug 14, 2020, 7:05:11 PM	600	false	false	false		
Aug 14, 2020, 7:05:08 PM	684	false	false	false		
Aug 14, 2020, 7:05:05 PM	778	false	false	false		
Aug 14, 2020, 7:05:02 PM	608	false	false	false		
Aug 14, 2020, 7:04:59 PM	364	false	false	false		
Aug 14, 2020, 7:04:56 PM	312	false	false	false		
Aug 14, 2020, 7:04:53 PM	426	false	false	false		
Aug 14, 2020, 7:04:50 PM	552	false	false	false		
Aug 14, 2020, 7:04:47 PM	434	false	false	false		
Aug 14, 2020, 7:04:44 PM	515	false	false	false		
Aug 14, 2020, 7:04:38 PM	600	false	false	false		
Aug 14, 2020, 7:04:35 PM	669	false	false	false		
Aug 14, 2020, 7:04:32 PM	693	false	false	false		
Aug 14, 2020, 7:04:29 PM	600	false	false	false		
Aug 14, 2020, 7:04:26 PM	530	false	false	false		

Page 1 of 2

**Details Information**

**Data Trend**

X Axis: Timestamp Y Axis: Value

# Contextualization - OCS Assets

OSisoft Cloud Services

Production - Search for Assets... Assets found: 6

Bottle Rate Fault Codes Line A - Fault Codes Line A Quality Line B Quality Line F Quality

Bottle Rates for equipment centers a... Detailed Faults for Equipment Center Line A Quality Tags Line B Quality Tags Line F Quality Tags

Asset: Test Asset Line A Acid

Asset Type: <None>

Description: Asset Description

Id:

Attributes | Measurements

+ Add an Attribute.

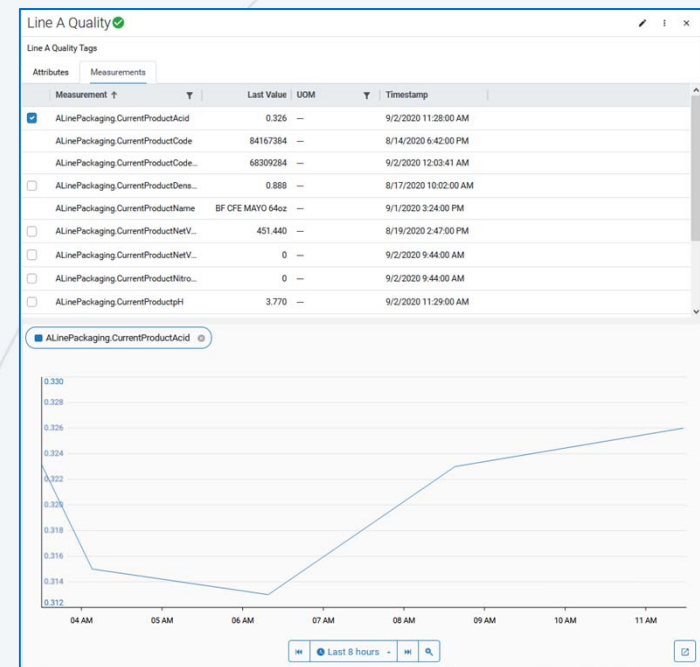
Attribute	Value	Type	UOM
Target Acid	.37	Double	none

Attributes | Measurements

+ Add Streams to Configure Measurements. Configure Preview

Stream References

ALinePackaging\_CurrentProductAcid



# Visualization - Trending in OCS



# Visualization – OCS API to Power BI

From OCSConnector\_Sample.Contents

OSIsoft Cloud Services URI

API URI Path (optional)

Timeout (optional)

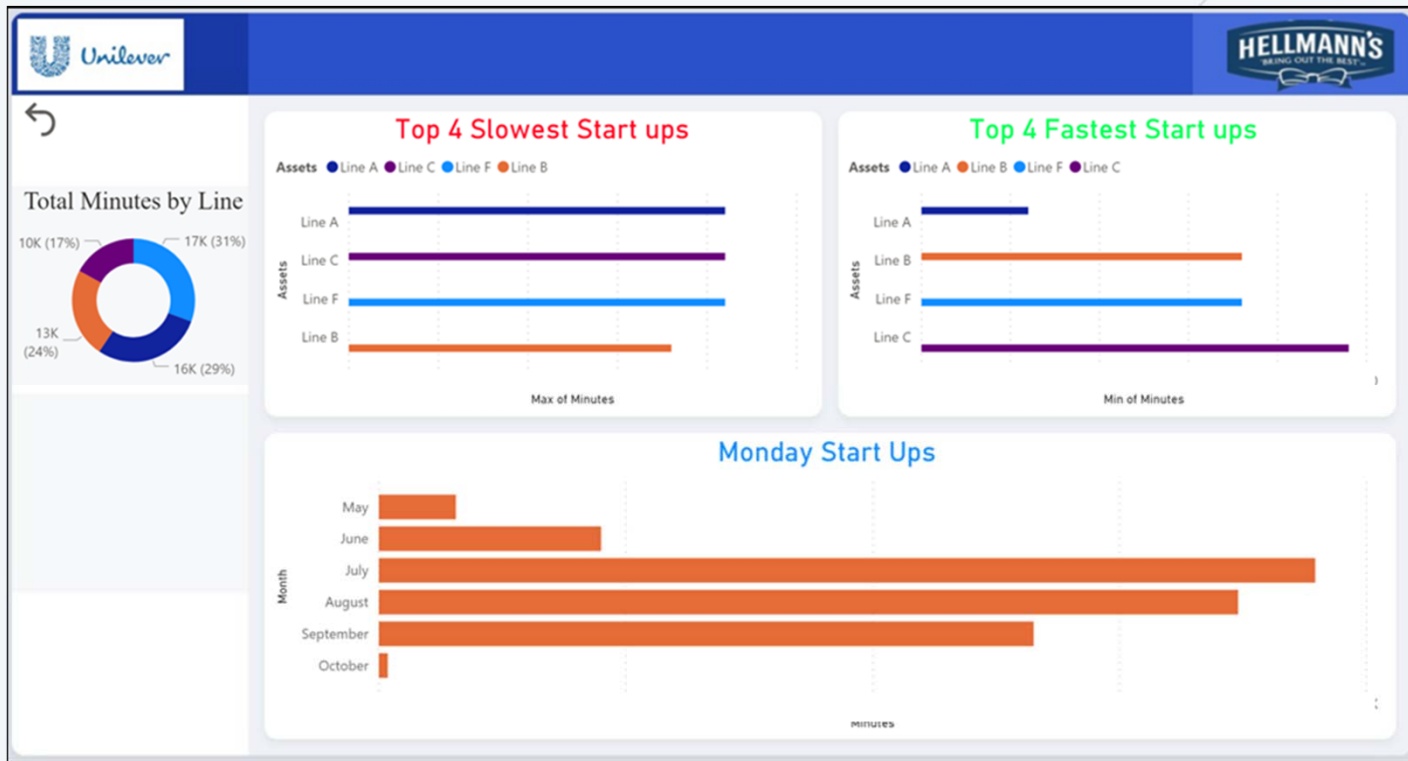
Line
1 Record
2 Record
3 Record
4 Record
5 Record
6 Record
7 Record
8 Record
9 Record
10 Record
11 Record
12 Record
13 Record
14 Record
15 Record
16 Record
17 Record
18 Record
19 Record
20 Record
21 Record
22 Record
23 Record
24 Record
25 Record
26 Record
27 Record
28 Record
29 Record
30 Record
31 Record

Timestamp 2020-08-17T09:11:39Z  
Value MACHINE NOT SELECTED

Line	Machine Name	FaultName	Minutes	Se
Line A	Line A Capper	25B4 - Low Level In Chute 70 83 100mm	106	30
Line A	Line A Capper	Blocked	90	6
Line A	Line A Capper	Starved	499	33
Line A	Line A Depalletizer	ACCUMU. BED SELECTED OFF	0	15
Line A	Line A Depalletizer	Blocked	308	55
Line A	Line A Depalletizer	EMPTY PALLET CONVEYOR FAULT	0	30
Line A	Line A Depalletizer	NOT IN AUTO MODE	11	57
Line A	Line A Filler	Blocked	115	59
Line A	Line A Filler	CATCH ALL	0	54
Line A	Line A Filler	PRODUCT TANK LOW LEVEL - HOPPER	70	24
Line A	Line A Filler	Starved	320	29
Line A	Line A Filler	TURRET STOP BUTTON	7	39
Line A	Line A Labeler	Blocked	31	55
Line A	Line A Labeler	CATCH ALL	13	36
Line A	Line A Labeler	Infeed Gap Fault Reset Required	70	6
Line A	Line A Labeler	Table Guard Door 1.1 Open Back #1	60	2
Line A	Line A Labeler	Table Guard Door 3.2 Open Front #2	0	48
Line A	Line A Labeler	Upstream	60	45
Line A	Line A Palletizer 1	Auto mode switch at discharge control station is not in auto message enable	4	42
Line A	Line A Palletizer 1	Blocked	31	15
Line A	Line A Palletizer 1	Load too high to discharge alarm relay	0	30
Line A	Line A Palletizer 1	Starved	631	13
Line A	Line A Palletizer 2	INFEED BELT STOP WITH CASE	0	6
Line A	Line A Palletizer 2	Missing Empty Pallet At Elevator	2	6
Line A	Line A Palletizer 2	U/S: INFEED SELECTED OFF	582	2
Line A	Line A Palletizer 2	U/S: LACK OF CONTAINER	111	3
Line A	Line A Rinser	Blocked	196	31
Line A	Line A Rinser	CLEAR-OUT/CHANGE-OVER	448	21
Line A	Line A Rinser	Starved	39	57
Line A	Line A Stretch Wrapper 1	Access Gate 1 Open/Unlocked	13	9
Line A	Line A Stretch Wrapper 1	Blocked	5	48
<b>Total</b>			<b>32,894</b>	<b>7</b>



# Pulling Cloud Data into Power BI



## OCS Benefits

- **Improved** ability to drill into line data to understand fault code details across equipment and shifts to aid improving performance
- **Maintained** site security, by sharing data externally
- **Drove** continuous improvement efforts (OEE)
- Unplanned benefit: Covid-19 efforts

謝謝  
 DZIĘKUJĘ CI  
 NGIYABONGA  
 TEŞEKKÜR EDERİM  
 DANKIE  
 TERIMA KASIH  
 SPASIBO  
 GRAZIE  
 PAKMET CIZGE  
 GO RAIBH MAITH AGAT  
 БЛАГОДАРЯ  
 GRACIAS  
 ТИ БЛАГОДАРАМ  
 TAK DANKE  
 RAHMAT  
 HATUR NUHUN  
 CẢM ƠN BẠN  
 WAZVIITA  
 TAPADH LEIBH  
 KEA LEBONA  
 БАЯРЛАЛАА  
 MISAOTRA ANAO  
 WHAKAWHETAI KOE  
 DANKON TANK TAPADH LEAT  
 MATUR NUWUN  
 ХВАЛА ВАМ  
 MULŢUMESC  
 KÖSZÖNÖM  
 GRAZIE  
 고맙습니다  
 GRAZIE  
 شڪرا  
 HVALA  
 FAAFETAI  
 ESKERRIK ASKO  
 HVALA  
 TEŞEKKÜR EDERİM  
 OBRIGADO  
 MAHADSANID  
 DANK JE  
 EΥΧΑΡΙΣΤΩ  
 GRATIAS TIBI  
 OBRIGADO  
 AČIŪ  
 SALAMAT  
 MAHALO IĀ 'ŌE  
 TAKK SKALDU HA  
 MERCİ  
 DI OU MÈSI  
 ĎAKUJEM  
 GRAZZI  
 PAKKA PÉR  
 ありがとうございます  
 SIPAS JI WERE  
 TERIMA KASIH  
 FALEMINDERIT  
 UA TSAUG RAU KOJ  
 TI БЛАГОДАРАМ  
 СИПОС