



## Enhancing OT Security at CHS

Abdibasid Mohamed

Jahnee Brevard

Priyadarshini Sharma

8/14/2024

# Enhancing OT Security

**IT Group Project Work**

# Introductions

# Jake Parnell

**Project Lead - Enhancing Ot security**

**Position: Analyst, IT Security Expert**

**Team: CRP IT Security Data**

**Reporting to: Beth Singer**



# Priyadarshini

**Position: Business System Analyst Intern**

**Team: DSMP**

**Reporting to: Julie Best**

**University: The University of Texas at  
Dallas**

**Degree: MS ITM**



# Jahnee

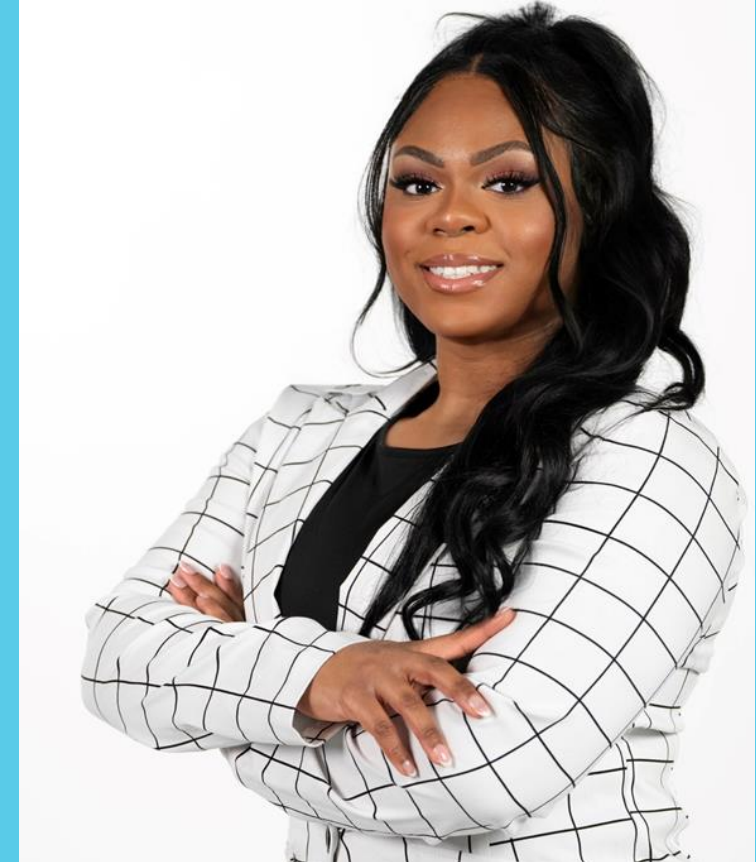
**Position: IT Data Quality Intern**

**Team: Data Quality COE**

**Reporting to: Kurt Hughes**

**University: Metro State University**

**Degree: Computer Science**



# Abdibasid

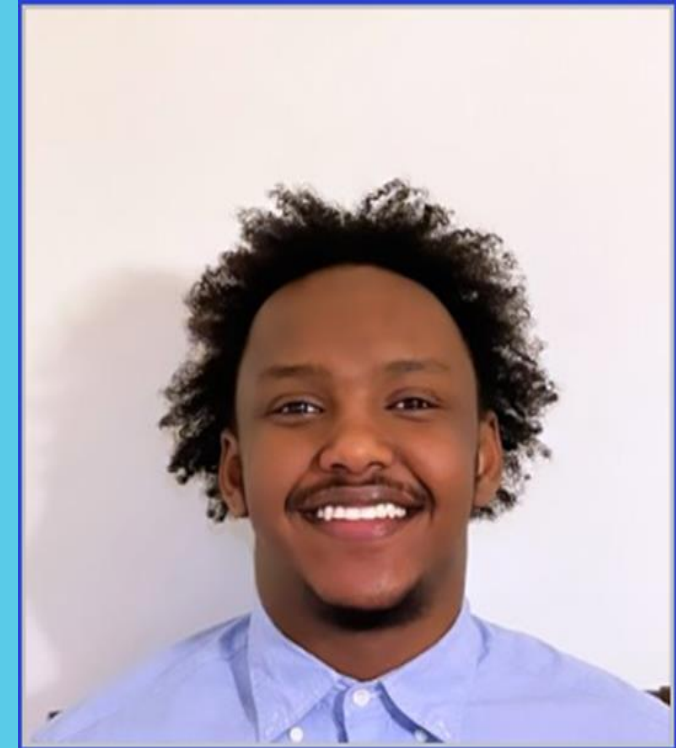
**Position:** SWE intern

**Team:** Customer Identity & Application  
Security

**Reporting to:** Travis Jenniges

**University:** University Of Minnesota

**Degree:** Computer Science



# Project Introduction



# What is OT Security?

The CHS OT Security Program is designed to protect critical infrastructure and industrial control systems from cyber-attacks, unauthorized access, and other security threats.

## What is OT?

Operational Technology (OT) is used to control and monitor industrial equipment that moves physical product across a CHS facility. Examples of OT are DCS, ICS, SCADA, PLC, HMI.

# Need of OT Security

Cyber risks and external expectations are evolving. Our diverse business capabilities and widespread locations make risk management crucial.

Industrial control systems require remote access, analytics, and reporting but weren't designed to handle modern cyber-attacks.

Strengthening IT and OT partnerships is essential to protect and enhance our cyber defenses for critical infrastructure.

# Challenges in OT Security

**Integration with existing processes:** OT systems often operate within established industrial environments, making it challenging to integrate new security measures without disrupting existing processes.

**Legacy systems:** Many OT systems were not designed with security in mind, and updating these systems to meet modern security standards can be difficult and costly.

**Lack of visibility:** OT environments can be complex, with many interconnected devices and systems. Gaining full visibility into all components to monitor for security threats is a significant challenge.

**Skill shortage:** There is a shortage of professionals who have expertise in OT security, which can make it difficult to manage OT security.

**Regulatory compliance:** OT systems may be subject to various regulations and ensuring compliance while also maintaining security can be a complex task.

**Vendor dependencies:** OT environments often rely on proprietary systems from various vendors, which can complicate the implementation of uniform security measures.

# What did we solve? & Results

# OT FAQs

Abdibasid

# Support the Organization Change Management (OCM) strategy of answering common OT Security questions.

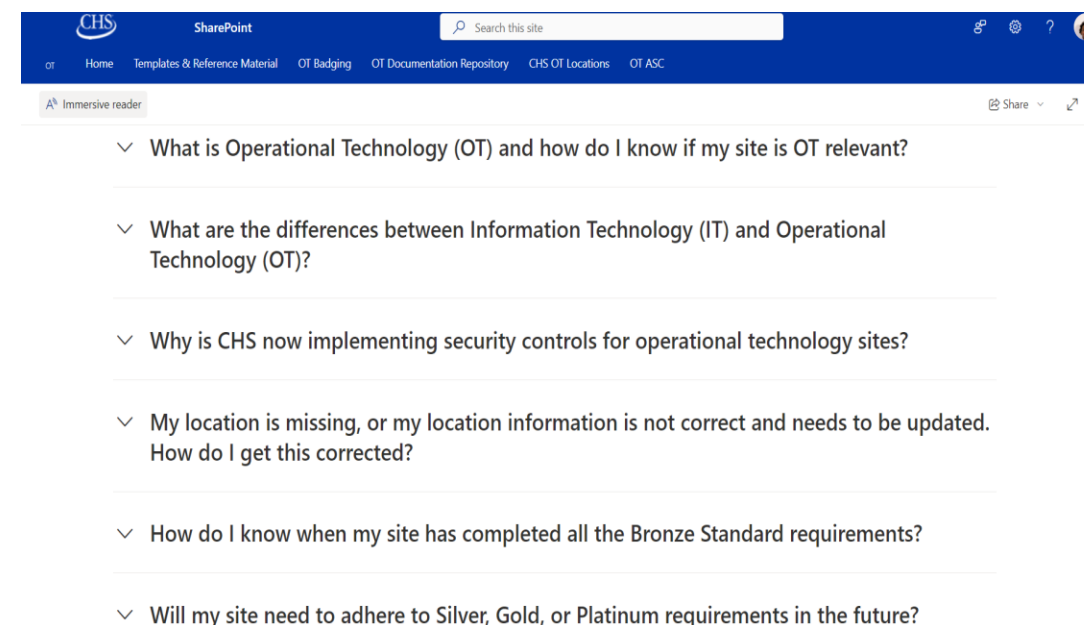
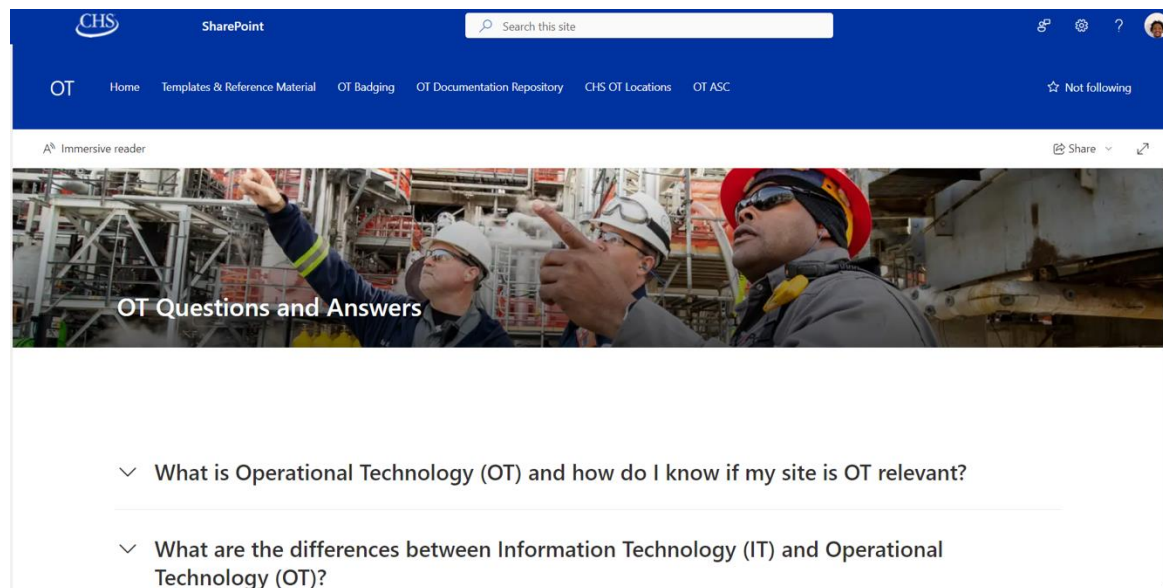
This is completed by interviewing several OT stakeholders and enhancing the OT Security SharePoint page's FAQ.

**Skill Shortage:** Creating a comprehensive FAQ by interviewing OT stakeholders enhances understanding and knowledge transfer, helping to bridge the skill gap.

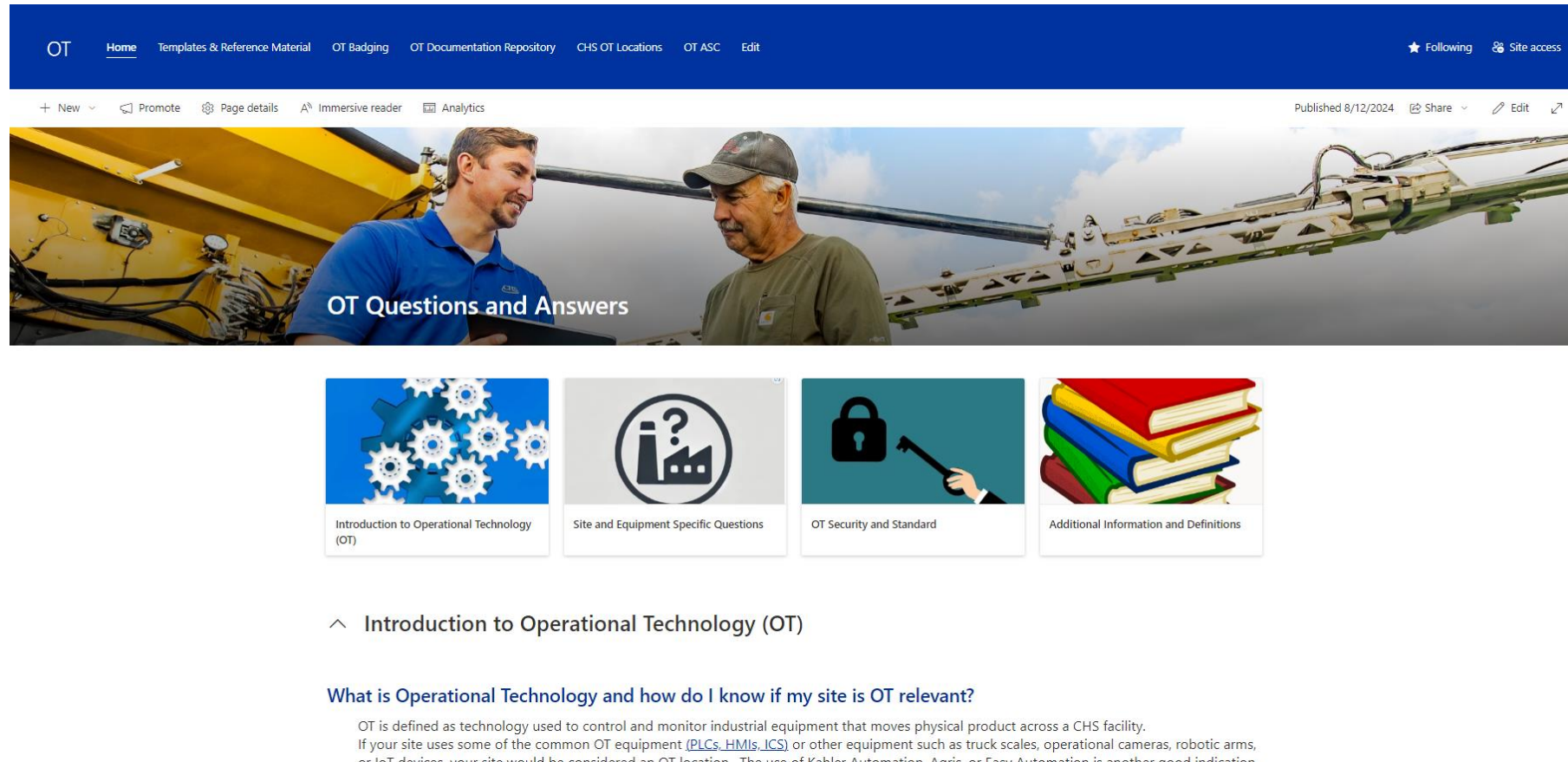
Updated SharePoint side pages for OT FAQs

Making it easier for users to access information.

# FAQ page before



# FAQ page after



The screenshot shows a SharePoint page for 'OT Questions and Answers'. The top navigation bar is blue with links: OT, Home, Templates & Reference Material, OT Badging, OT Documentation Repository, CHS OT Locations, OT ASC, and Edit. On the right, it says '★ Following' and 'Site access'. Below the navigation bar, there's a secondary bar with '+ New', 'Promote', 'Page details', 'Immersive reader', and 'Analytics'. The main header image shows two men in an industrial setting with the title 'OT Questions and Answers'. Below the header, there are four tiles: 'Introduction to Operational Technology (OT)' with a gear icon, 'Site and Equipment Specific Questions' with a factory icon, 'OT Security and Standard' with a padlock icon, and 'Additional Information and Definitions' with a stack of books icon. The 'Introduction to Operational Technology (OT)' section is expanded, showing the heading 'What is Operational Technology and how do I know if my site is OT relevant?' and a paragraph defining OT as technology used to control and monitor industrial equipment that moves physical product across a CHS facility. It also mentions common OT equipment like PLCs, HMIs, and ICS, and other equipment like truck scales, operational cameras, robotic arms, or IoT devices.

OT Questions and Answers

Introduction to Operational Technology (OT)

Site and Equipment Specific Questions

OT Security and Standard

Additional Information and Definitions

Introduction to Operational Technology (OT)

What is Operational Technology and how do I know if my site is OT relevant?

OT is defined as technology used to control and monitor industrial equipment that moves physical product across a CHS facility. If your site uses some of the common OT equipment (PLCs, HMIs, ICS) or other equipment such as truck scales, operational cameras, robotic arms, or IoT devices, your site would be considered an OT location. The use of Kahler Automation, Agrie, or Easy Automation is another good indication.

## [OT Questions and Answers \(sharepoint.com\)](#)



# Vender List Report

Jahnee

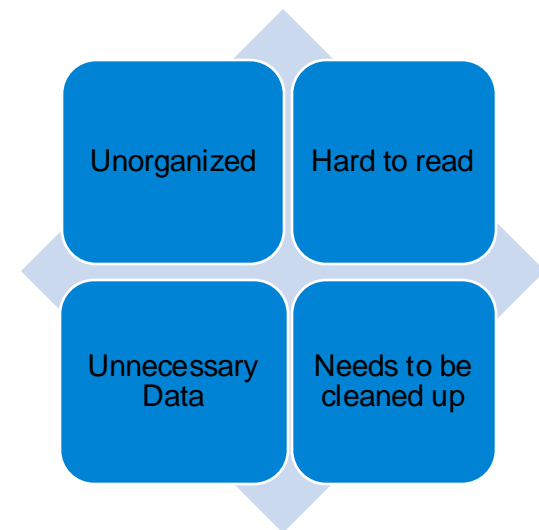
# Support the OT Security program's development and utilization of vendor across the enterprise.

This was completed by taking OT Bronze data from SharePoint and working to upload into ServiceNow, before building visuals that show the OT vendor landscape.

**Integration with Existing Processes:** Uploading OT Bronze data into ServiceNow and building visuals of the OT vendor landscape will streamline the integration of new security measures. It provides a clear overview of the vendor landscape, helping to manage and coordinate efforts without disrupting current processes.

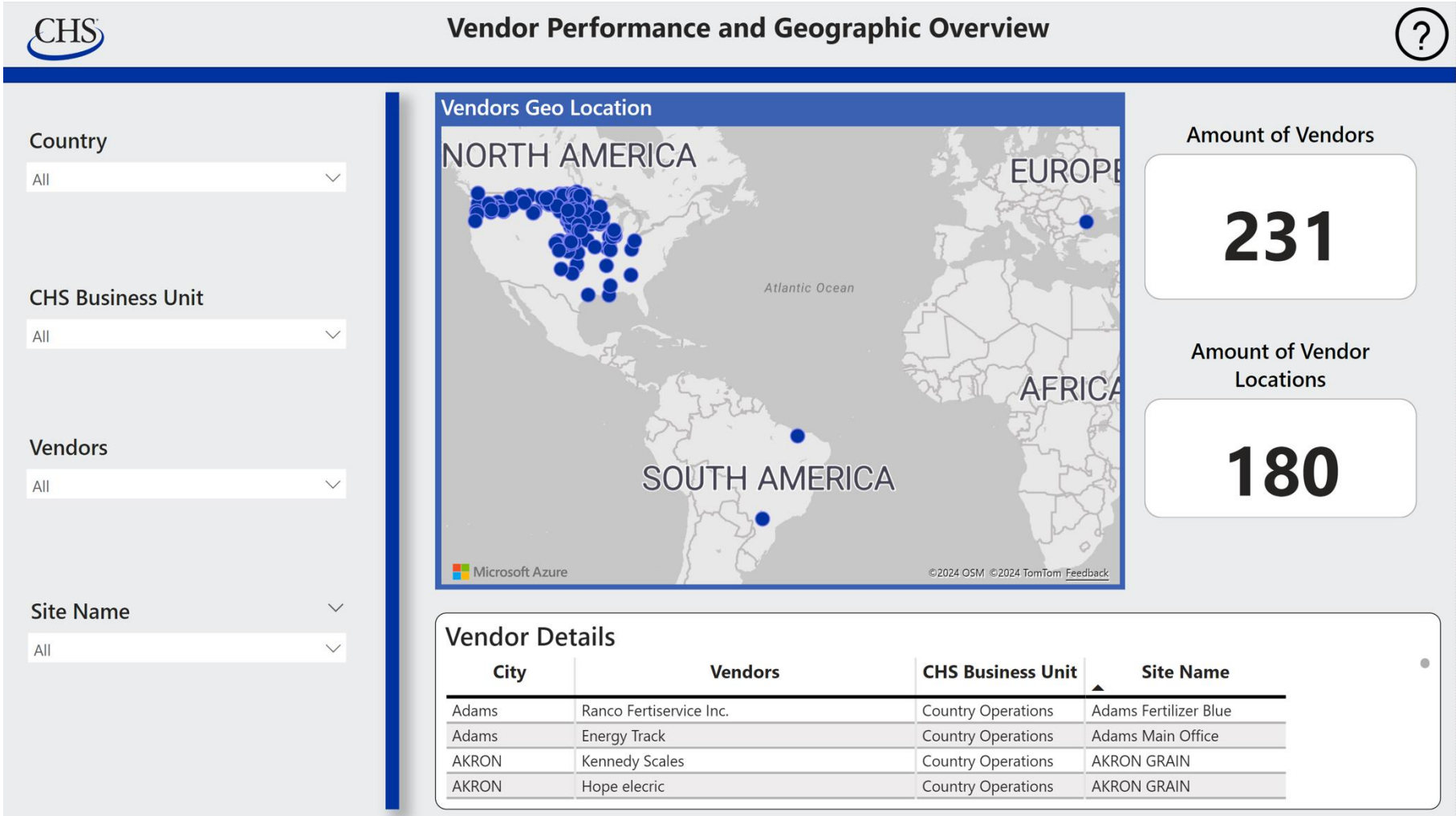
**Legacy Systems and Lack of Visibility:** By centralizing data in ServiceNow, it becomes easier to monitor and manage legacy systems, improving visibility across the enterprise.

# Vendor List Before



	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V	W	X	Y	Z	AA	AB	AC	AD	
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3	2023	Qtr 4	December	13	Ryan.Ande	*****	TRUE	Oslo Cene	1	CHS AG Se	[]	Country O	Oslo	US	*****	Ryan Kazr	Sam Alton	Ryan.Ande	108 2nd Av	2024	Qtr 2	April	1	IT Service Desk			TRUE	Otto data	218-695-2511		
4	2024	Qtr 1	March	22	Daniel.Ols	*****	TRUE	Lamoure	1	CHS Dakol	[]	Country O	LAMOURE	US	*****	Jacob Ols	Sam Alton	Daniel.Ols	10246 Higl	2024	Qtr 1	March	22	IT Service Desk			TRUE	AFD (fuel	701-883-5108		
5	2024	Qtr 2	April	17	Daniel.Ols	*****	TRUE	Milnor Pun	1	CHS Dakol	[]	Country O	MILNOR	US	*****	Nathan He	Sam Alton	Daniel.Ols	603 Main S	2024	Qtr 1	March	28	IT Service Desk			TRUE	AFD (tank	7.01E+09		
6	2024	Qtr 1	March	19	Daniel.Ols	*****	TRUE	Forman	1	CHS Dakol	[]	Country O	FORMAN	US	*****	Malvin (So	Sam Alton	Daniel.Ols	9137 HIGH	2024	Qtr 1	February	28	IT Service Desk			TRUE	Agellum	701-724-3238		
7	2024	Qtr 1	January	16	Ryan.Grotz	*****	TRUE	Pocahontz	1	CHS Illinois	[]	Country O	POCAHONTA	US	*****	ryan grotel	Sam Alton	Ryan.Grotz	168 IL ROL	2024	Qtr 1	January	16	IT Service Desk			TRUE	AGI			
8	2023	Qtr 4	October	20	Danielle.C	*****	TRUE	Edmore	1	CHS Devils	[]	Country O	EDMORE	US	*****	Eric Eversi	Eric Eversi	Danielle.C	402 VIKINC	2023	Qtr 4	October	11	IT Service Desk			TRUE	Agris	701-644-2271		
9	2024	Qtr 1	February	8	Jacob.Klim	*****	TRUE	Glenwood	1	CHS Herm	[]	Country O	GLENVOC	US	*****	Jacob Klim	Sam Alton	Jacob.Klim	1511 11TH	2024	Qtr 1	February	27	IT Service Desk			TRUE	Agris	320-634-3028		
10	2024	Qtr 1	March	4	Dennis.No	*****	TRUE	Kindred	0	CHS Dakol	[]	Country O	KINDRED	US	*****	Jeremy Sai	Sam Alton	Daniel.Ols	5324 165T	2024	Qtr 1	March	4	IT Service Desk			TRUE	Agris	701-428-3134		
11	2024	Qtr 1	January	5	Brad.Danik	*****	TRUE	Morris MN	1	CHS Herm	[]	Country O	MORRIS	US	*****	Brad Danik	Sam Alton	Brad.Danik	11 W 5th S	2024	Qtr 2	April	1	IT Service Desk			TRUE	Agris	320-589-1581		
12	2024	Qtr 2	April	11	Joseph.Sc	*****	TRUE	Lewiston n	1	CHS Prime	[]	Country O	LEWISTON	US	*****	ken.blaker	ken.blaker	Joseph.Sc	1200 Snak	2024	Qtr 1	March	25	IT Service Desk			TRUE	Agris	800-456-8551 Ext 138		
13	2024	Qtr 2	April	15	Joseph.Sc	*****	TRUE	Moscow	1	CHS Prime	[]	Country O	MOSCOW	US	*****	mason.noi	mason.noi	Joseph.Sc	2555 High	2024	Qtr 1	March	26	IT Service Desk			TRUE	Agris	208-791-2640		
14	2024	Qtr 2	April	25	Joseph.Sc	*****	TRUE	Craigmont	1	CHS Prime	[]	Country O	CRAIGMONT	US	*****	brent.chaj	brent.chaj	Joseph.Sc	15 East Me	2024	Qtr 1	March	20	IT Service Desk			TRUE	Allied	208-924-5281		
15	2024	Qtr 2	April	23	Kory.Jacot	*****	TRUE	Callaway	1	CHS North	[]	Country O	CALLAWAY	US	*****	Jason Star	Kory Jacob	Kory.Jacot	106 CSAH	2024	Qtr 1	February	29	IT Service Desk			TRUE	Arriv			
16	2024	Qtr 1	February	8	Jacob.Klim	*****	TRUE	Glenwood	1	CHS Herm	[]	Country O	GLENVOC	US	*****	Jacob Klim	Sam Alton	Jacob.Klim	1511 11TH	2024	Qtr 1	February	27	IT Service Desk			TRUE	ASI	320-634-3028		
17	2024	Qtr 1	March	26	Brian.Mart	*****	TRUE	CHOKIO	1	CHS Herm	[]	Country O	CHOKIO	US	*****	Doug Olso	Sam Alton	Brian.Mart	408 W 1st	2024	Qtr 1	February	23	IT Service Desk			TRUE	Bayer	320-324-2477		
18	2023	Qtr 4	October	20	Danielle.C	*****	TRUE	Langdon G	1	CHS Devils	[]	Country O	LANGDON	US	*****	Ron Borge	Ron Borge	Danielle.C	418 3rd St,	2023	Qtr 4	October	11	IT Service Desk			TRUE	Bayer	701-256-2462		
19	2023	Qtr 4	November	6	Daniel.Var	*****	TRUE	Superior	0	CHS Inc - S	[]	Global Gra	SUPERIOR	US	*****	Daniel Var	Sam Alton	Daniel.Var	41 DOCK S	2023	Qtr 4	December	7	IT Service Desk			TRUE	Benson El	715-392-4734		
20	2024	Qtr 1	February	16	Dustin.Rhc	*****	TRUE	Alma Elev	1	CHS Holdr	[]	Country O	ALMA	US	*****	Dustin Rhc	Christoph	Dustin.Rhc	603 W 10T	2024	Qtr 1	February	23	IT Service Desk			TRUE	Boyd's Ele	308-999-3002		
21	2023	Qtr 4	December	6	Michael.C	*****	TRUE	Lismore	1	CHS Branc	[]	Country O	LISMORE	US	*****	Michael L	(Austin Koll	Michael.C	265 S 3rd S	2023	Qtr 4	December	20	IT Service Desk			TRUE	Brad Sieve	Electric		
22	2023	Qtr 4	October	20	Danielle.C	*****	TRUE	CHS Devils	1	CHS Devils	[]	Country O	DEVILS LAI	US	*****	Kenneith V	Kenneith V	Danielle.C	3919 14TH	2024	Qtr 2	April	1	IT Service Desk			TRUE	C & A Scal	701-662-5051		
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24	2024	Qtr 2	April	9	Branden.H	*****	TRUE	Holdrege A	1	CHS Holdr	[]	Country O	HOLDREG	US	*****	Brandon H	Sam Alton	Branden.H	901 W HW	2024	Qtr 1	March	20	IT Service Desk			TRUE	Case	308-325-5146		
25	2023	Qtr 4	November	21	Matthew.K	*****	TRUE	Fairmont	1	PFI	[]	Global Gra	FAIRMONT	US	*****	Brandon N	Terry Kars	Nick.Lindt	1833 130th	2023	Qtr 3	July	13	Anders Fallt	Mike Reiser	Eric R	TRUE	CDW			
26	2024	Qtr 2	April	15	Joseph.Sc	*****	TRUE	Moscow	1	CHS Prime	[]	Country O	MOSCOW	US	*****	mason.noi	mason.noi	Joseph.Sc	2555 High	2024	Qtr 1	March	26	IT Service Desk			TRUE	CHS Payn	208-791-2640		
27	2024	Qtr 1	March	19	Joshua.Ha	*****	TRUE	Meredith F	1	CHS Illinois	[]	Country O	MAPLE PAI	US	*****	Paul Ramm	Sam Alton	Joshua.Ha	2N374 MEI	2024	Qtr 1	March	20	IT Service Desk			TRUE	CMC	630-365-9491/630-36		
28	2023	Qtr 4	December	21	David.Milt	*****	TRUE	Glendive S	1	CHS Farm	[]	Country O	GLENDIVE	US	*****	Brady Babi	Kalli Fowde	David.Milt	320 HIGHW	2024	Qtr 1	February	20	IT Service Desk			TRUE	Compuwe	406-377-8312		
29	2024	Qtr 1	March	1	Ryan.Seve	*****	TRUE	Gwinner G	0	CHS Dakol	[]	Country O	GWINNER	US	*****	Bill Illies	(g Sam Alton	Ryan.Seve	13219 HIG	2024	Qtr 1	March	1	IT Service Desk			TRUE	Compuwe	701-678-7220		
30	2023	Qtr 4	November	6	Daniel.Var	*****	TRUE	Superior	0	CHS Inc - S	[]	Global Gra	SUPERIOR	US	*****	Daniel Var	Sam Alton	Daniel.Var	41 DOCK S	2023	Qtr 4	December	7	IT Service Desk			TRUE	Compuwe	715-392-4734		
31	2024	Qtr 1	February	16	Christophi	*****	TRUE	Oberlin	1	CHS Holdr	[]	Country O	OBERLIN	US	*****	Christophi	Christophi	Christophi	708 E FRO	2024	Qtr 1	February	26	IT Service Desk			TRUE	Control St	785-475-3116		
32	2024	Qtr 1	March	1	William.Hz	*****	TRUE	Fergus Fal	1	CHS Herm	[]	Country O	FERGUS F	US	*****	William Hz	Sam Alton	William.Hz	22327 138	2024	Qtr 1	March	1	IT Service Desk			TRUE	Converge	2187318347 - call ph		
33	2024	Qtr 2	April	10	Dan.Hunst	*****	TRUE	Hannaford	1	Hannaford	[]	Energy	Hannaford	US	*****	Elizabeth V	Dan Hunst	Dan.Hunst	711 109th	2024	Qtr 2	April	23	IT Service Desk			TRUE	CRP IT RP	701-769-2885		

# Vendor List After



# Service Now Vendor List

Location  
BRPIBOJ2

Name

BRPIBOJ2

Alias Name

BOM JESUS elevator

Business name

South America

Street

Rodovia Transcerrados, sem número, Sala 01, Zona Rura

City

BOM JESUS

State / Province

PI

Zip / Postal Code

64900-000

Country

BR

PCI

OT

☒

Current OT Security Badging Level

-- None --

Target OT Security Badging Level

-- None --

Comments

OT for grain elevator storage; truck in and truck out. Slagrl

Active

☒

Contact Name

Phone

EC Location Code

BRA\_BJS

CHS Subnet

10.225.196.0/24

Region

CHS International

Parent

Global Grains

Latitude

Longitude

Documentation URL

https://chsin.sharepoint.com/sites/IT/CMDP%20Site%20Repository/Shared%20Documents/BRPIBOJ2

CHS OT subnet(s)

Update

Save

Locations

Buildings

Circuit (1)

Computers (4)

Configuration Items (31)

Network Gear (7)

Printers (1)

Servers

Users (11)

IP Phones

PCI Devices

IP Cameras

Vendors

Regulatory Compliances

Vendors

Search

Locations = BRPIBOJ2

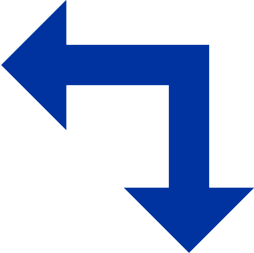
Vendors

No templates are available

Create A New One?

Site Name

Vendor Tab



Update

Save

Locations

Buildings

Circuit (1)

Computers (4)

Configuration Items (31)

Network Gear (7)

Printers (1)

Servers

Users (11)

IP Phones

PCI Devices

IP Cameras

Vendors

Regulatory Compliances

Vendors

Search

Locations = BRPIBOJ2

Vendors

No records to display

future list of vendors

# OT Examples

Priyadarshini

# Support the Organization Change Management (OCM) strategy of communicating ‘what is OT?’.

**This was completed by enhancing the OT Security SharePoint with various OT images from across the enterprise.**



**Enhancing the SharePoint page with OT images, device information, fostering a better understanding of the physical implications of OT security breaches.**



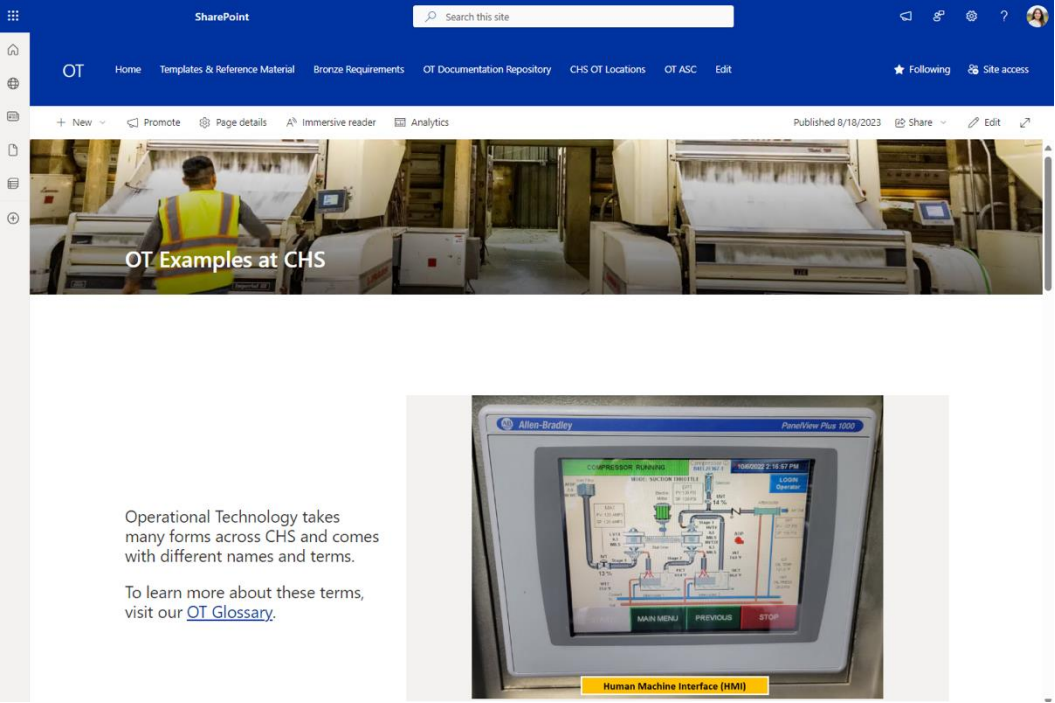
**Categorized OT devices photos by business units allowing showcase related information for targeted audience.**



**Utilized the SharePoint list and document library to showcase OT device photos and types offers a visual and organized reference, enhancing understanding and accessibility of OT device examples.**



# SharePoint site before



## OT Examples at CHS



1 of 5



1 of 3

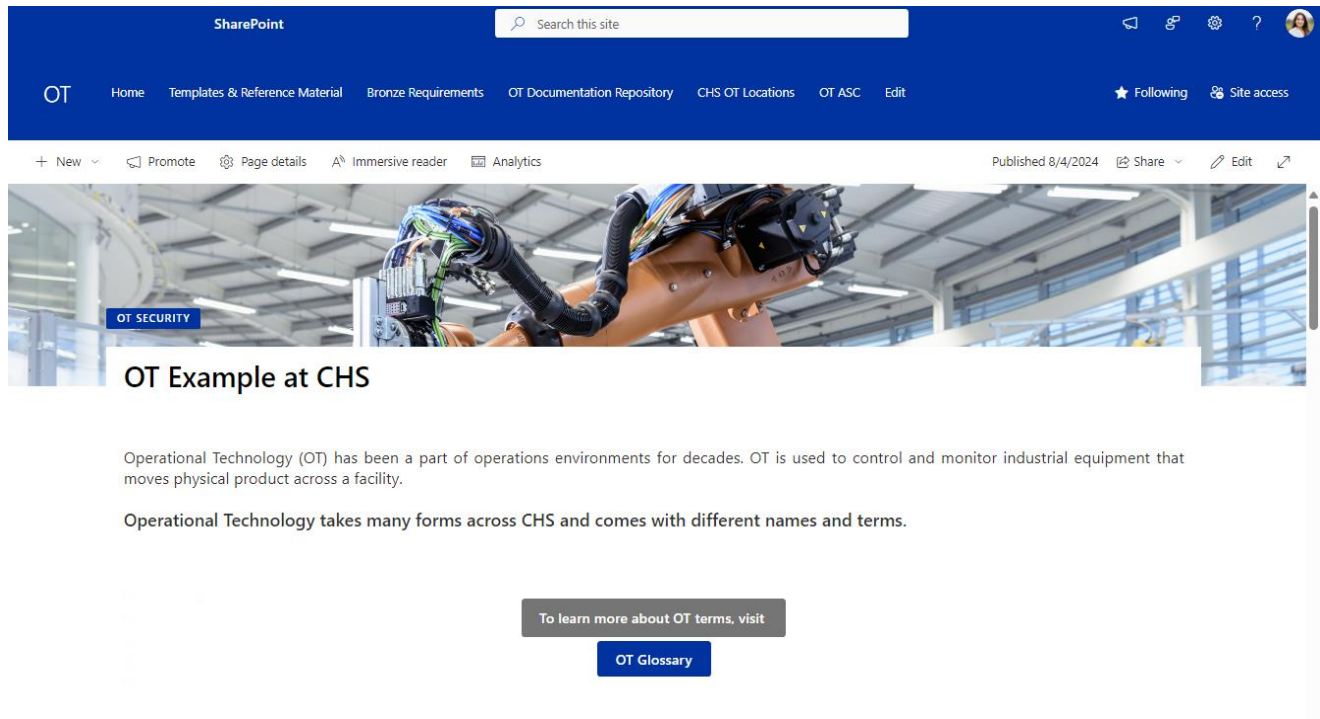


1 of 4

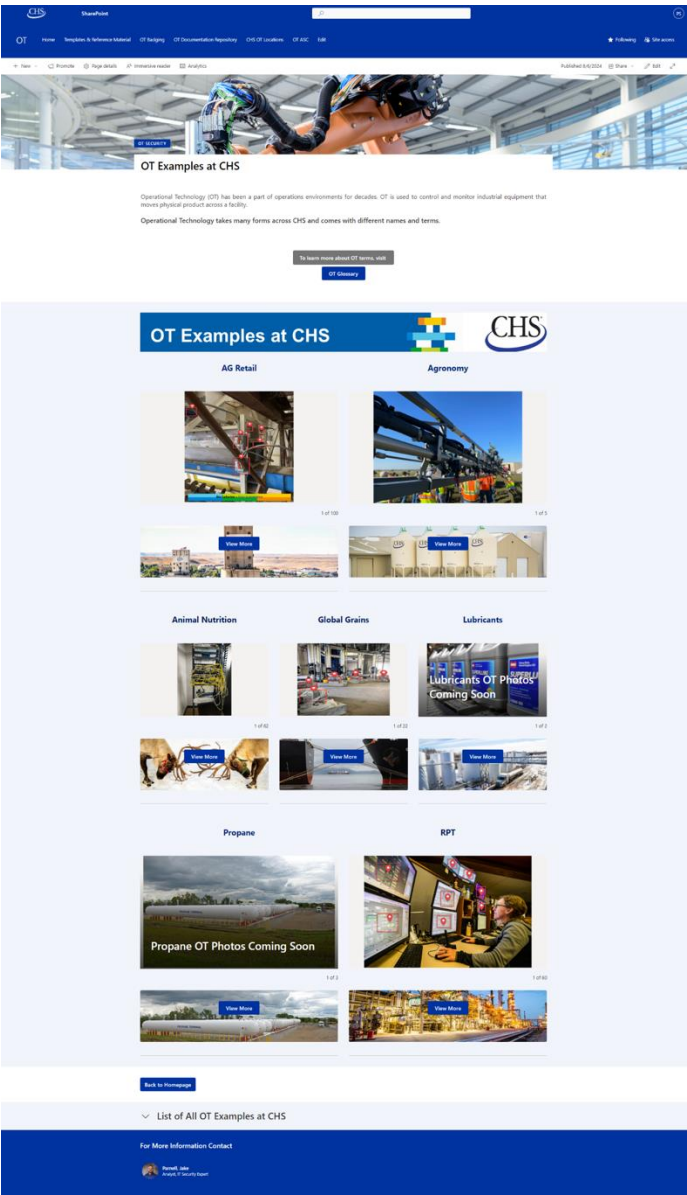
[Back to Homepage](#)



# SharePoint site after



[OT Example at CHS \(sharepoint.com\)](#)



# OT Examples at CHS by business units

SharePoint


Search this site

OT Home Templates & Reference Material OT Badging OT Documentation Repository CHS OT Locations OT ASC Edit

Following Site access

+ New Promote Page details Immersive reader Analytics

Published 8/6/2024 Share Edit



### AG Retail





**AG Retail Business Unit**  
It is involved in supplying crop nutrients, seed, crop protection products, precision ag technology, agronomy services, animal feed and nutrition services, refined fuels, propane, lubricants, automated refined fuel delivery, and other energy programs. Additionally, it provides grain marketing services, farm supply products, and more.

This page contains examples of OT Devices pertinent to AG Retail.

View all OT Photos in AG Retail Gallery

AG Retail OT Examples List

OT Device Examples at CHS - AG Retail



See all

Quick Links

Home

Agronomy

Animal Nutrition

Global Grains

Lubricants

Propane

RPT

Agronomy

**Agronomy Business Unit**  
The Agronomy business unit at CHS is part of the company's global agribusiness operations. It focuses on providing a range of services and products including crop nutrients, seed, crop protection products, precision ag technology, and agronomy services.  
This page contains examples of OT Devices pertinent to Agronomy.

Quick Links

Home

Animal Nutrition

**Animal Nutrition Business Unit**  
The Animal Nutrition business unit at CHS is involved in providing animal feed and nutrition services. It is part of the CHS Country Operations division, which serves over 400 communities by supplying a variety of products and services, including those related to agronomy, energy, and animal nutrition.

Quick Links

Home

Global Grains

**Global Grains Business Unit**  
The Global Grains business unit at CHS is part of the company's core businesses, which include energy, agronomy, and global grain & processing. This unit is focused on connecting grains and oilseeds produced by farmer-owners with food and feed customers globally. CHS involvement in global grains includes sourcing grain for domestic processing, feeding livestock, and producing renewable fuel.

Quick Links

Home

Lubricants

**Lubricants Business Unit**  
The Lubricants business unit at CHS is involved in various aspects of lubricant production and marketing.  
This page contains OT Devices examples pertinent to Lubricants.

Quick Links

Home

Propane

**Propane Business Unit**  
The Propane business unit at CHS is part of the Energy Propane division, which is involved in various activities related to propane services.  
This page contains OT Devices examples pertinent to Propane.

Quick Links

Home

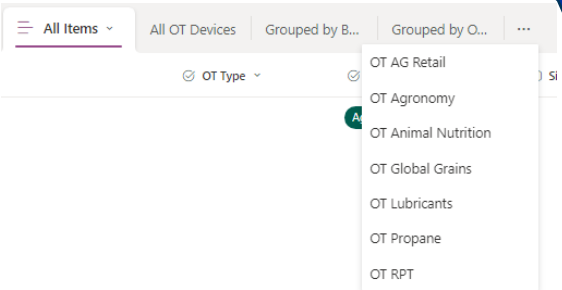
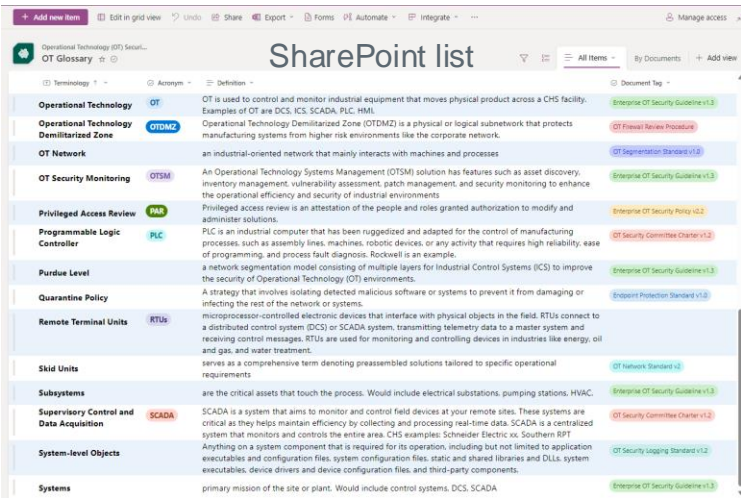
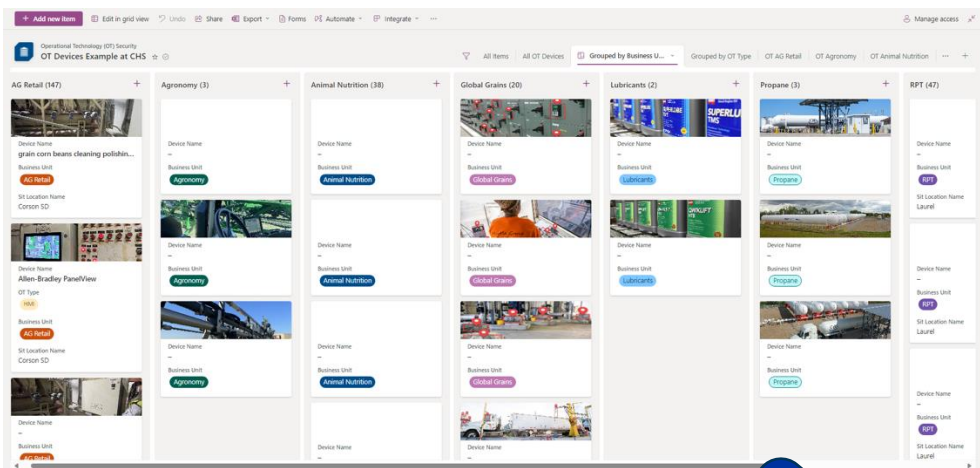
RPT

**RPT Business Unit**  
RPT at CHS refers to the Refineries, Pipelines, and Terminals. It is associated with operational technology (OT) devices and is a part of the broader operational infrastructure at CHS. The RPT business unit is involved in activities related to the management and reporting of data and performance metrics for CHS's refineries, pipelines, and terminals.

Quick Links

Home

# SharePoint List - OT devices and OT Glossary



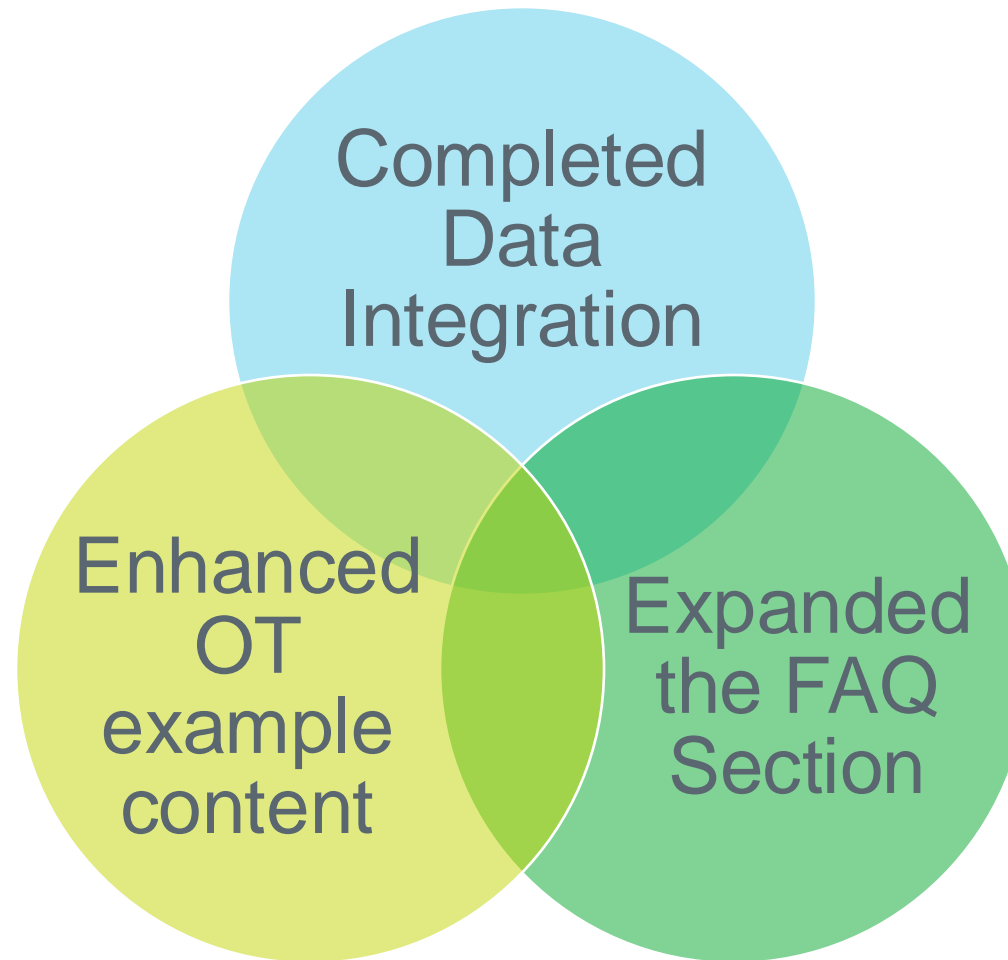
Separate view for each business units



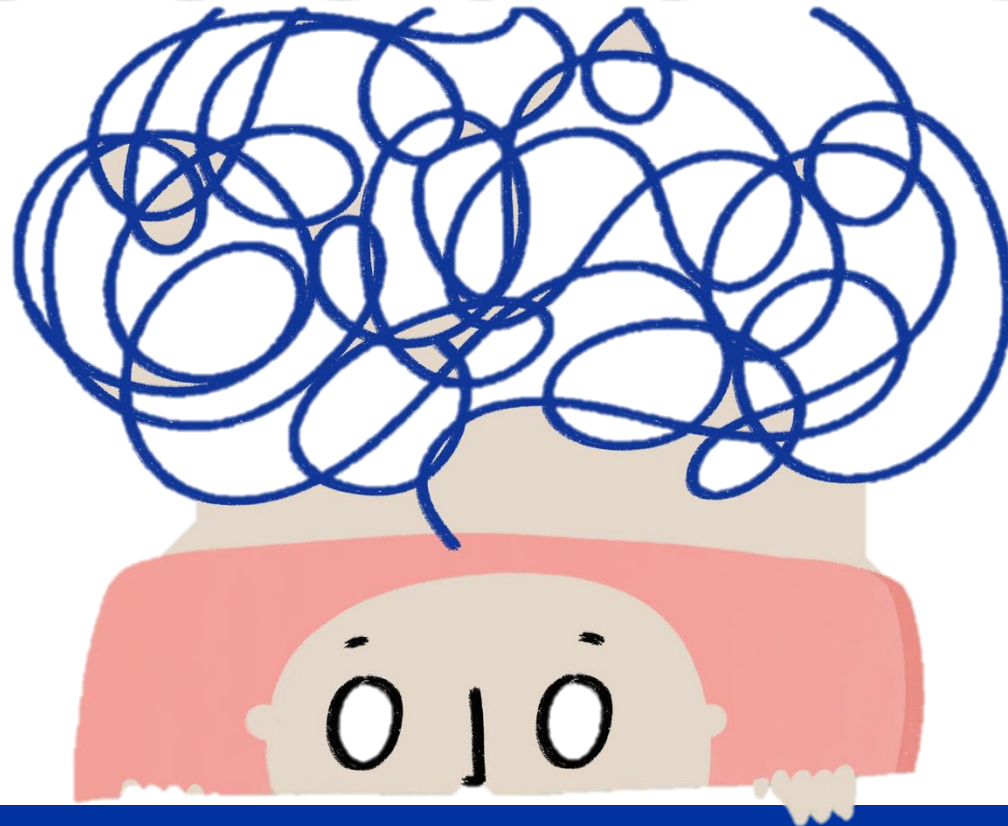
# Conclusion



# Conclusion



# Questions?



# Thank You