AWS re:Invent

NOV. 29 – DEC. 3, 2021 | LAS VEGAS, NV

IOT304

Increase factory efficiency via real-time decision support management

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Working Backwards?

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OT operator pain points

- Manual critical processes
- Data locked in hubs at the edge
- Multiple protocols
- Key insights documented in spreadsheets, email, text, and minds of senior line operators
- Lack of transparency/ finger-pointing
- Declining morale
- OT expectation and IT outcomes not aligned

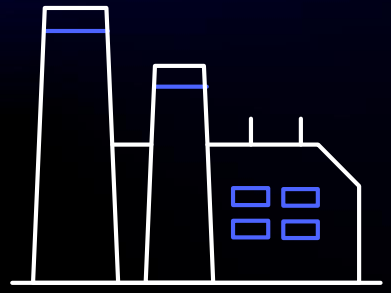
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Plant enterprise IT pain points

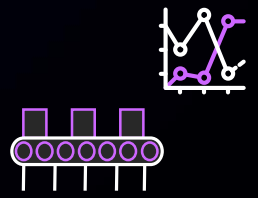
- Legacy manufactory execution systems (MES) difficult to access
- Millisecond compute needs
- Siloed data stores
- Systems can’t scale

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Use case–driven approach



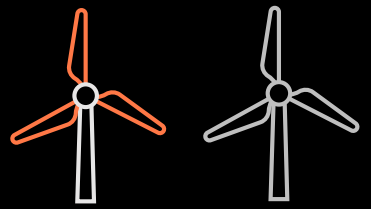
Production/process optimization



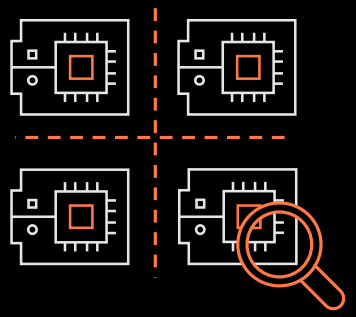
Preventive/predictive maintenance for machines



Machine as a service



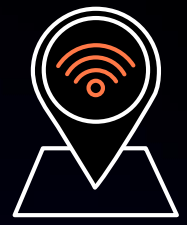
Digital twin



Computer vision for quality control



Automated material management



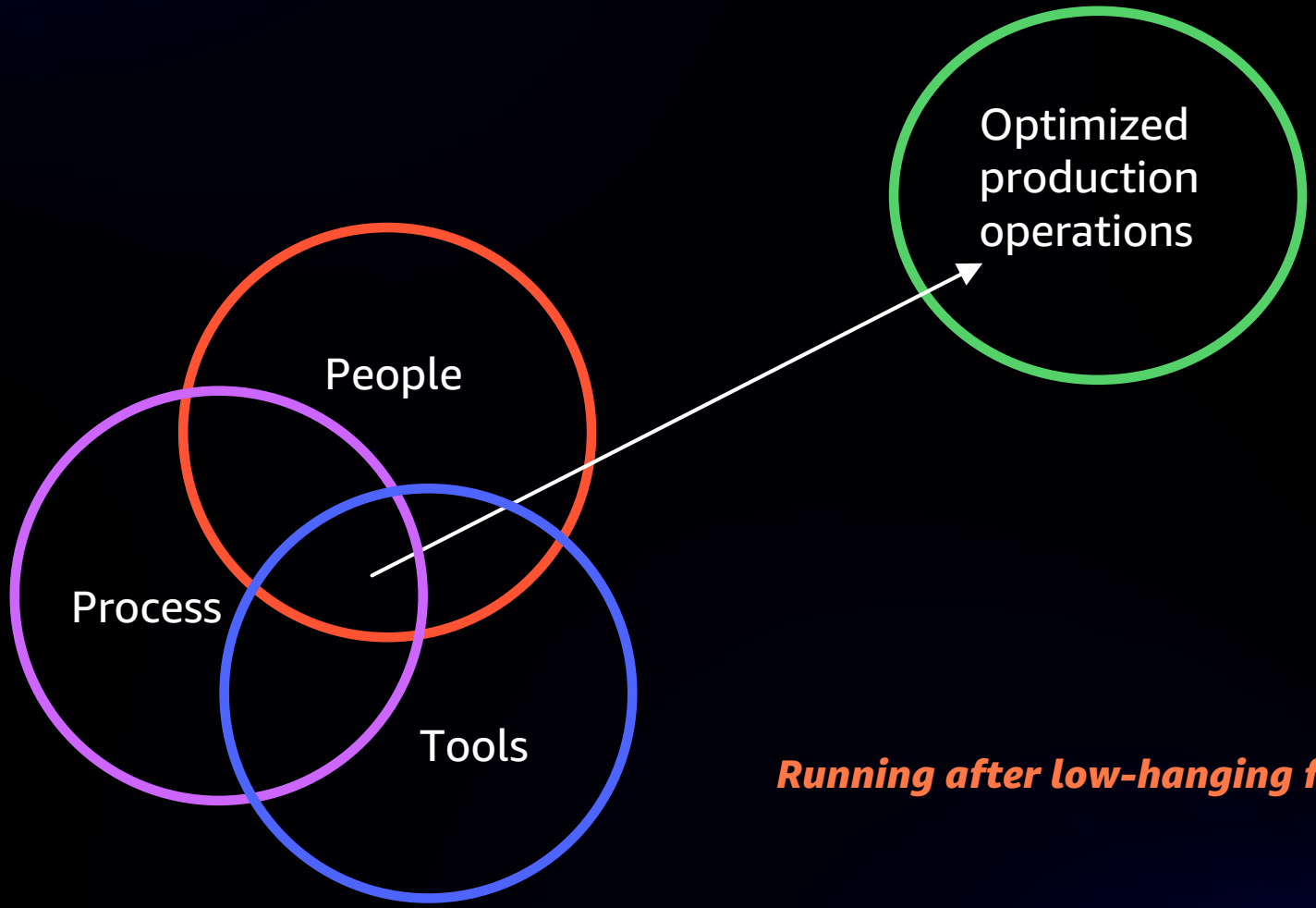
Track and trace



OEE visualization

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Digital transformation culture



Running after low-hanging fruit is a race to the bottom

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Customer-driven future

Working Backwards

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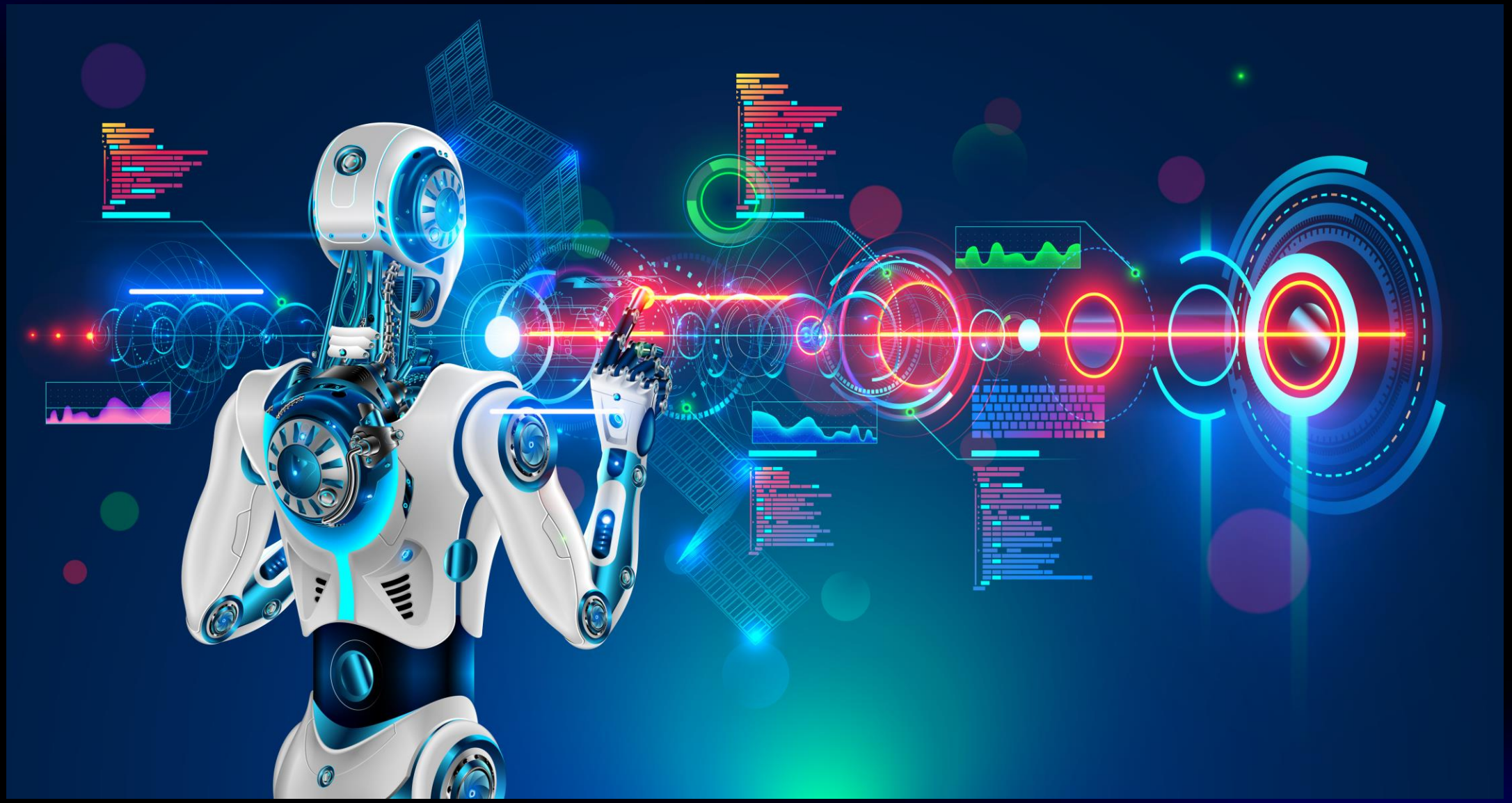
COVID-19

We need real-time insights, responses, and decisions to meet customer demands

Some manufacturers experienced 4x+ increase in product

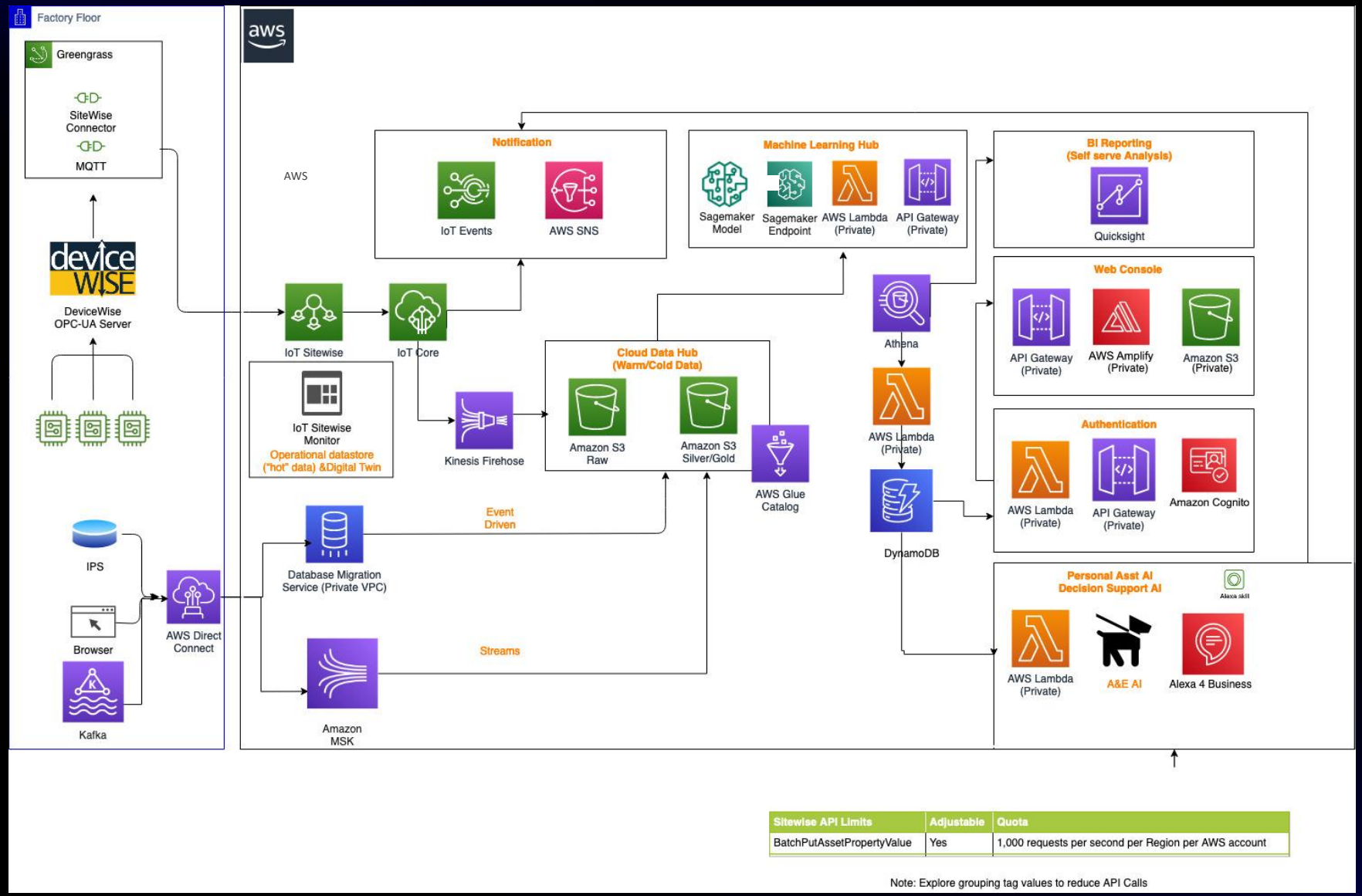
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Near real-time edge decisions



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Connected Factory



Sitewise API Limits	Adjustable	Quota
BatchPutAssetPropertyValue	Yes	1,000 requests per second per Region per AWS account

Note: Explore grouping tag values to reduce API Calls

Connect
- AWS Direct Connect

Collect and organize
- AWS IoT SiteWise
- Amazon API Gateway
- AWS Database Migration Service (AWS DMS)

Store and process
- AWS IoT SiteWise
- Amazon S3
- Amazon S3 Glacier
- Amazon Kinesis
- AWS Glue

Consume
- Amazon QuickSight
- AWS IoT SiteWise Monitor
- Amazon SageMaker
- Amazon Athena

Alerts and notifications
- Amazon SNS

Repeatable
- AWS CloudFormation

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Demo and Shop Floor Thought Leadership

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6 weeks of 2-pizza team development

- Serverless
- Event driven
- 100% private VPC

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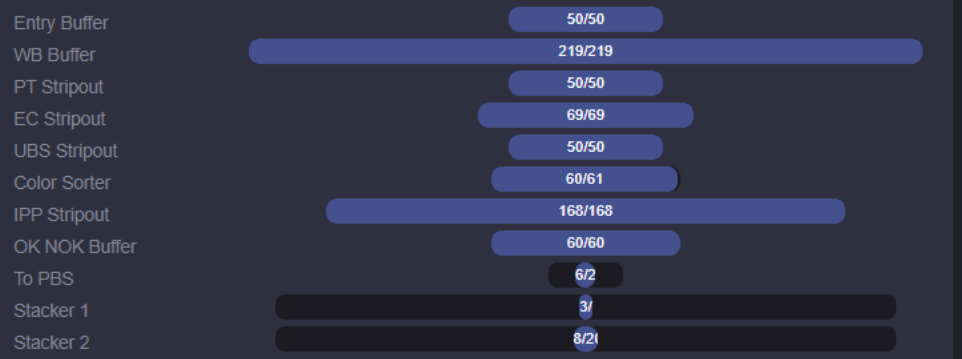
Shop Overview: Paint Shop South | Area: All

Welcome, Adam

Entry Volume:	Exit Volume:	Shop Fill:	Pass Rate:	Performance:	OEE:	Bottleneck:	Shift Change
187	187	650	85%	99%	85%	100	12:00
230	230		88%	99%	90	Sealer	450

Area	Target	Actual	Difference	Last Moved	Trending
Paint Entry	230	187	-43	0	
Pre Treat	230	188	-42	1	
E-Coat	230	187	-43	0	
Sealer	230	187	-43	1	
IPP Prep	230	187	-43	1	
IPP	230	187	-43	0	
Polish	230	188	-42	1	
FI	230	187	-43	0	
Wax	230	187	-43	0	
Exit	230	187	-43	1	

Area	Processed	Waiting	Units Ran	Last Moved	Trending
Major Repair	0	10	3	289	
Spot Repair	0	10	3	289	



Search...

- Vincent Porter — left 7 mins ago
- Aiden Chavez — online
- Mike Thomas — online
- Christian Kelly — left 10 hours ago
- Monica Ward — online

Aiden Chavez
Last seen: 2 hours ago

10:10 AM, Today

Hey Aiden, just wanted to remind you that the entry goal today for the shop is 600

10:12 AM, Today

Sounds good. Thanks for the reminder.

10:15 AM, Today

FYI item G50062 from the item watch list just entered my area. An email has been sent out and pre treat confirmed receipt of notification

Enter text here...

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Bottleneck Analysis: Paint Shop South | Area: All

Welcome, Adam

Entry Volume:	Exit Volume:	Shop Fill:	Pass Rate:	Performance:	OEE:	Bottleneck:	Shift Change
100	100	100	100	100	100	100	12:00
450	450	450	450	450	450	Sealer	450

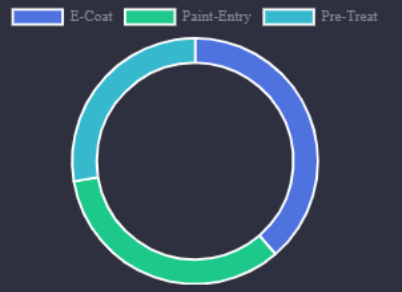
Start Time 11/24/2021 5:03:45 PM

End Time 12/2/2021 5:03:45 PM

UPDATE

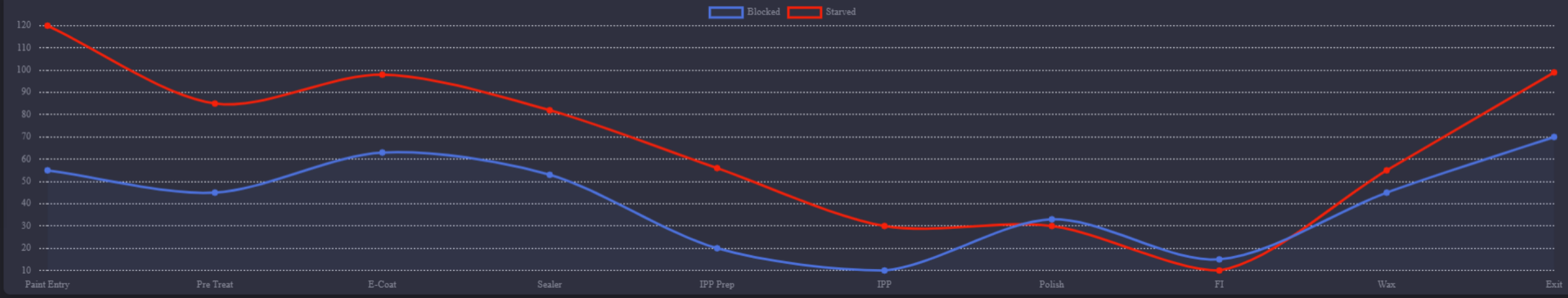
Area	Blocking Time	Starving Time
Paint Entry	55 Mins	120 Mins
Pre Treat	45 Mins	85 Mins
E-Coat	63 Mins	98 Mins
Sealer	53 Mins	82 Mins
IPP Prep	20 Mins	56 Mins
IPP	10 Mins	30 Mins
Polish	33 Mins	30 Mins
FI	15 Mins	10 Mins
Wax	45 Mins	55 Mins
Exit	70 Mins	99 Mins

Blocked



Starved





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Future Analysis: Paint Shop South | Area: All

Welcome, Adam

Shop Area:

Stacker 1

Prediction Duration: 4 Days

Break Runthrough

M T W T F S S

Over Time

10hrs 20hrs 30hrs 40hrs 50hrs 60hrs 70hrs 80hrs

Target UPH: 40

Pass Rate: 80%

Target Performance 80%

RUN

Stacker Fill

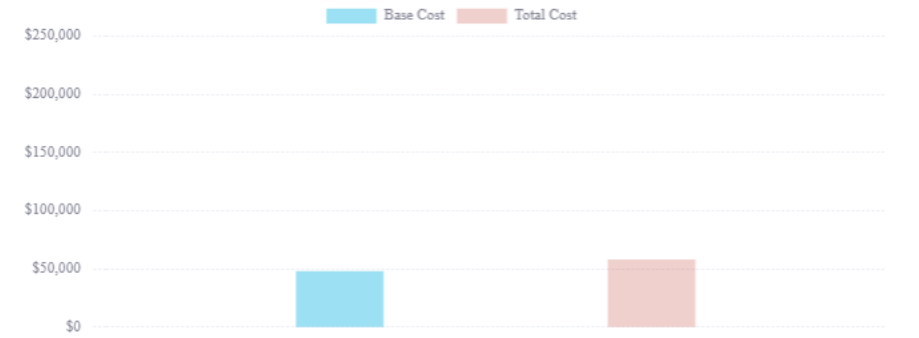


Results

In **4** days, Paint Shop South will **run through breaks on four days**, have a total of **40 Units Per Hour**, a **Pass Rate of 80%** and a **Target Performance of 80%**.

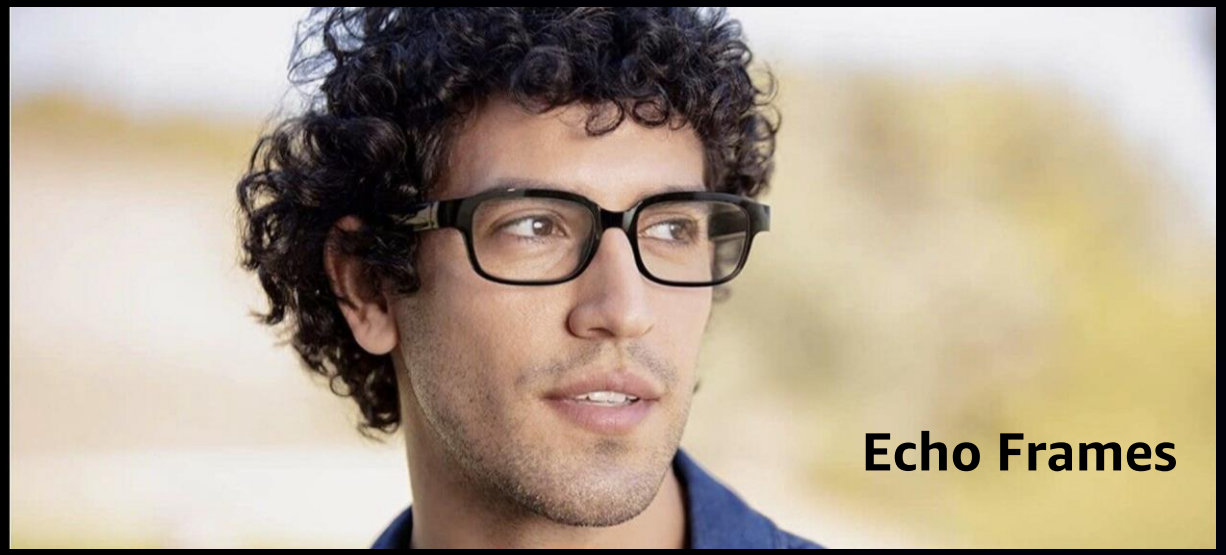
Calculations predict that **PB1C01** will contain approixmately **215** units with a minimum fill level of **207** units and a maximum fill level of **215** units.

Overtime



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Art of the possible





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Thank you!

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