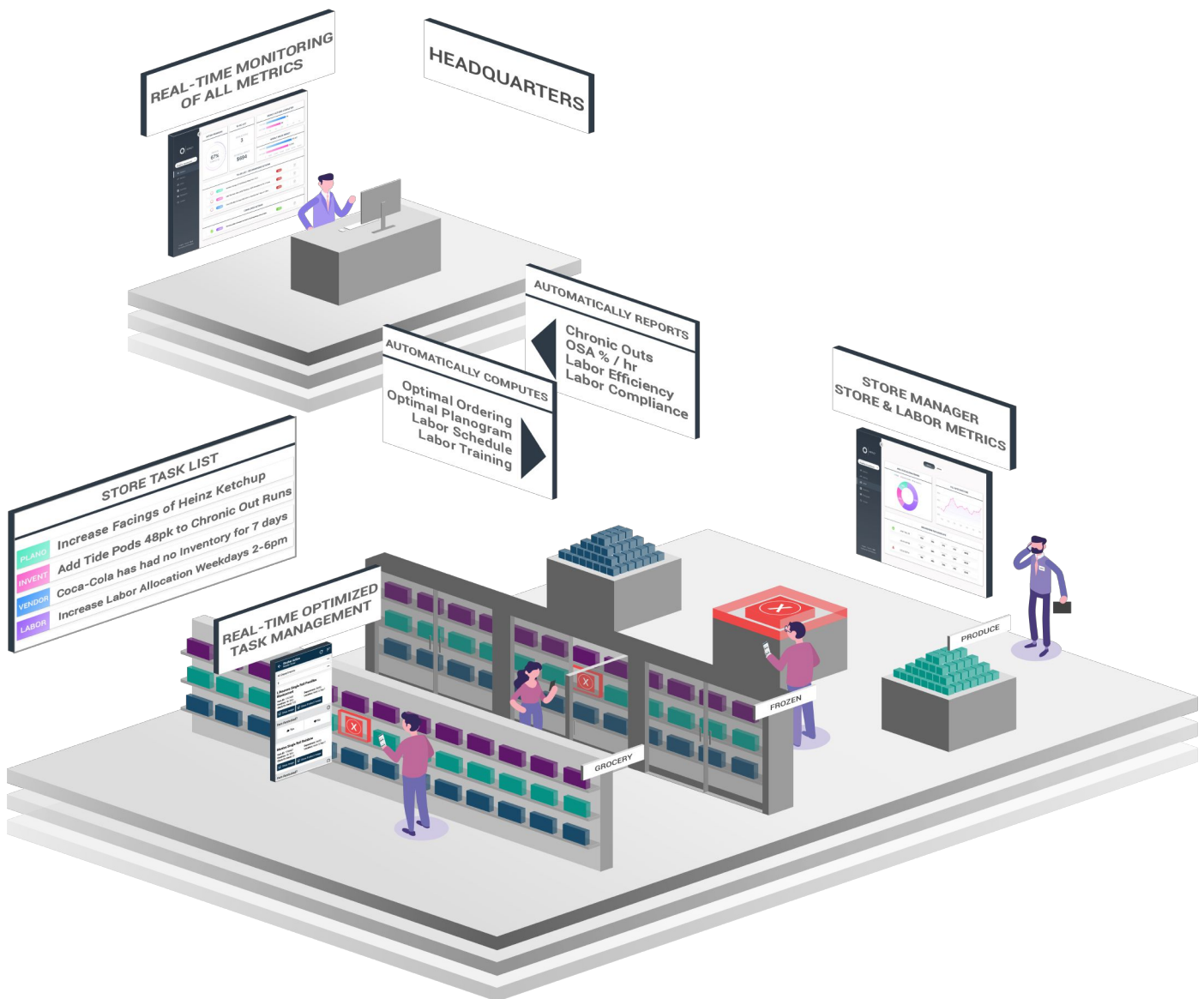


The End of Out-of-Stocks. The Start of Truly Data-Driven Stores.



About Focal Systems

Focal Systems was founded in 2015 with a very clear mission statement: use accurate and pragmatic AI to automate and optimize brick and mortar retail.

The Focal team is comprised of retail operations experts with decades of leadership experience at Walmart, Target, Smith's, Asda and Lowe's as well as AI experts with the same level of experience building AI for major technology companies. Together, they built the next generation operating system for brick and mortar retail.

We call it ***focalOS***.

This operating system leverages shelf-mounted cameras that constantly measure the state of your shelves and use that information to order quicker and smarter, planogram better, and schedule, direct, train, and manage your labor automatically. We have proven this in major retailers around the world with hundreds of stores deployed, providing higher on shelf availability, higher sales and lower inventory on-hand, with less labor.

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Retail Stores Today

Retail stores today are faced with numerous issues that cause inefficient operations, frustrated customers and ultimately lost sales. The resulting metrics are staggering. For example:

- A 1,000 store chain is spending >\$20M a year manually scanning shelves
- On average, retailers lose 4% of sales due to OOS
- 24% of Amazon revenue stems from customers who experienced a B&M OOS



Labor Dedicated to Manual Data Capture

A large number of valuable labor hours per day are spent manually scanning the store to identify OOS and low inventory, providing limited data points for crucial store operations metrics.



Inaccurate Data Lowers Profits and Productivity

Current systems work with imperfect data that does not (and cannot) account for accurate, current conditions of the shelf. As a result, profits are negatively impacted by issues such as mispicks and inaccurate onhands data.



Associates' Work Is Not Well Prioritized

With a lack of data and tools to prioritize tasks, stores struggle to maximize the impact of their labor hours and are likely to make bad prioritization calls, which can lead to issues like sales items & top movers not being replenished with priority.



Lack of Insightful Productivity Data

It matters not just if, but also how and when tasks such as restocking are completed. Currently there are at best proxy metrics to assess this and a store manager can't be everywhere to observe.



Lost Sales and Frustrated Customers Due to OOS

OOS are frequent and because of a lack of actionable data and tools there is uncertainty on how to tackle and prioritize the issues. OSA only hovers in the low 90s throughout the day.



Planograms are Designed to Be One-Size-Fits-All

Planograms are based on incomplete, inaccurate data and are designed as a one-size-fits-all solution across all stores, even though stores may exhibit significant variance in demand and demographics.

What Is the Solution for These Issues?

The best data, collected direct from the shelf, more frequently, efficiently, and accurately than ever before.

The best tools, intelligently leveraging this data by deriving actions to optimize the store and prioritize the resulting work automatically.

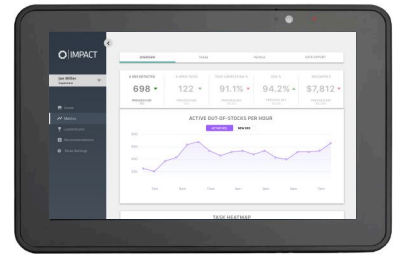
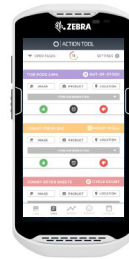
In short, **an operating system for retail**. This is where our strong expertise in deep learning & computer vision and focalOS suite of tools come into play.

Retail Stores Today with focalOS

A Focal retailer has access to highly accurate and timely data that is collected automatically around the clock through deep learning and computer vision performed by small cameras mounted on the store shelves. Smart algorithms that learn and understand the store better with every new data point power an advanced suite of management, analytics and productivity tools that deliver actionable insights and optimally prioritized tasks.



1. Focal's ShelfCams capture images of each shelf, which are then analyzed by Focal's deep learning algorithms



2. This data is then turned into smart actions for store associates and actionable insights for management



Automatic Data Capture Through Computer Vision

Focal's ShelfCams automatically capture a wealth of information directly from the shelf and they do so not just once a day, but around the clock.



Accurate Data Increases Profits and Productivity

Focal captures data directly at the shelf throughout the day, for true insights into the store's status. This increases data accuracy for all systems, productivity and ultimately profits.



Associates' Work is Optimally Prioritized

focalOS devises actions to optimize the store and calculates an optimal, rank-sorted workflow for the resulting tasks based on value, location and other factors. Tasks are delivered through the **focalOS Action Tool**, a mobile productivity tool.



Automatic Detailed Productivity Insights

All work associates complete is automatically logged through the focalOS Action Tool. With this, metrics such as task velocity, task accuracy and recouped sales are easily available on both the aggregate and per associate level.



OOS are Reduced and Addressed Swiftly

Aside from improving reactive measures such as replenishment through optimal prioritization, focalOS also suggests preventative actions, such as planogram and order quantity changes.

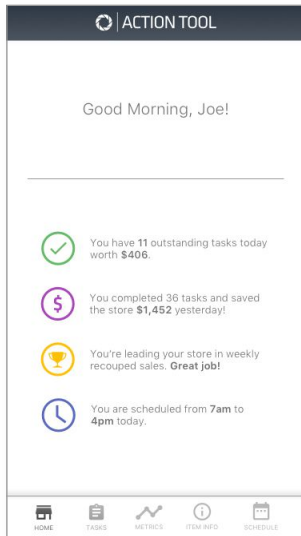


Planograms are Optimized for Each Store

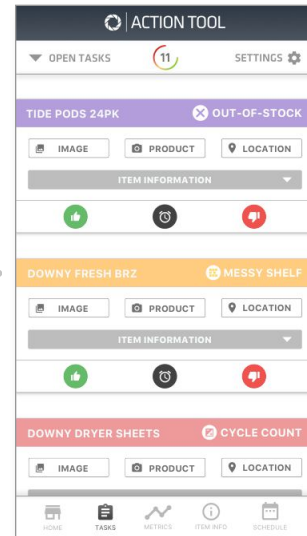
focalOS calculates the optimal planogram for each shelf in the store, based on detailed and accurate out-of-stock and compliance data measured directly at the shelf.

focalOS for Store Associates

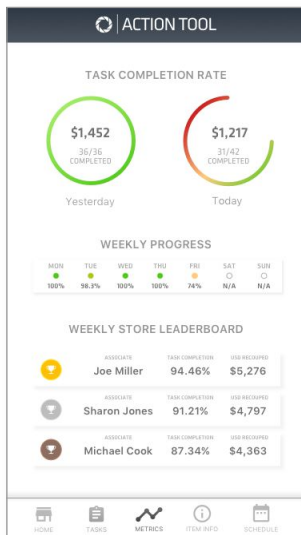
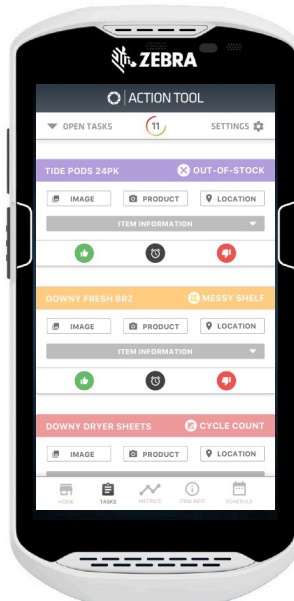
The focalOS Action Tool optimally presents the most important thing for your associate to do at any time. As the cameras collect more data every hour, the algorithms continually update the Action Tool to optimally spend the next hour of labor with the highest possible ROI.



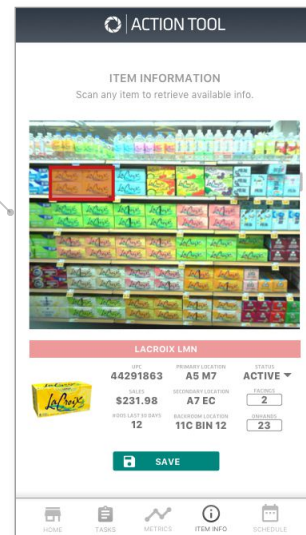
The Home screen. On login, each associate is greeted with high level metrics, information on open tasks, current performance and schedule.



The Tasks screen. Tasks are prioritized optimally and tailored to each associate. All information needed to complete a task is readily available.



The Metrics screen. Associates are able to get insights into their performance, the monetary value they have brought to the store and how they are stacking up against their colleagues.

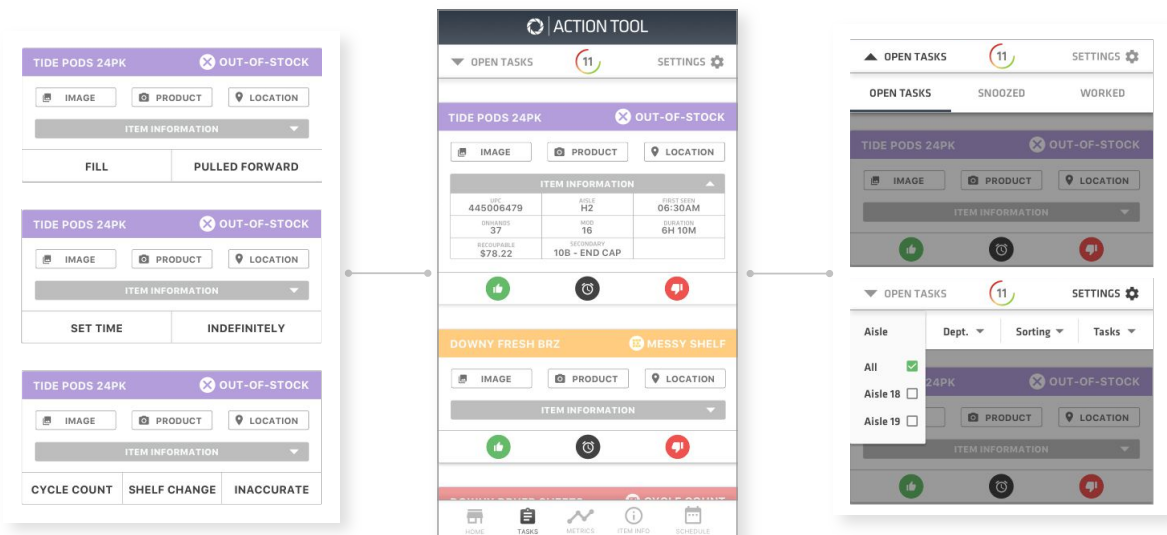


The Item Info screen. Detailed information for any item, which includes a current image of the shelf location, can be accessed & updated instantly through lookup by name, UPC or barcode scan.

Completing Tasks Has Never Been Easier

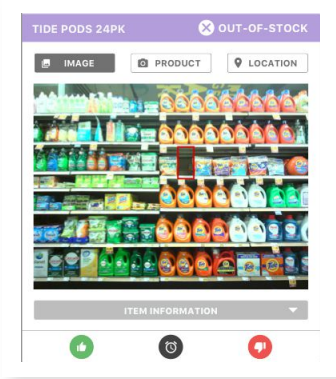
The Tasks screen is an associate's interface to tackle any task supported by focalOS. All tasks are updated in real-time and optimally sorted by value and location. Associates are shown only tasks that match their responsibilities and department to ensure they can fully focus on their job.

Each task card contains all necessary information to complete a task: item information, onhands data, primary, secondary and backroom location as well as images from the shelf highlighting the task. Task completion information and associate performance is visible in real-time to the store management team.

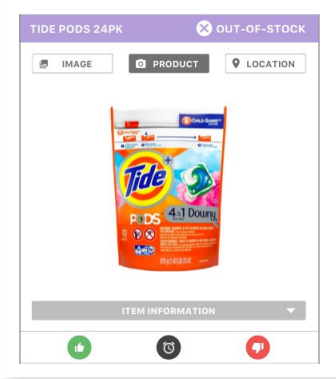


Completing tasks. When tasks are worked, they can be responded to positively, negatively or they can be snoozed. All response options are fully customizable.

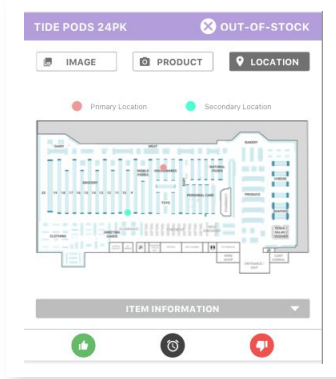
Lists and filtering. Besides open tasks, associates can easily access a list of worked and snoozed alerts. Further refinement of each list is made possible by detailed filter parameters.



Shelf images. Task cards display an image taken by a Focal ShelfCam that highlights the task that needs to be performed.



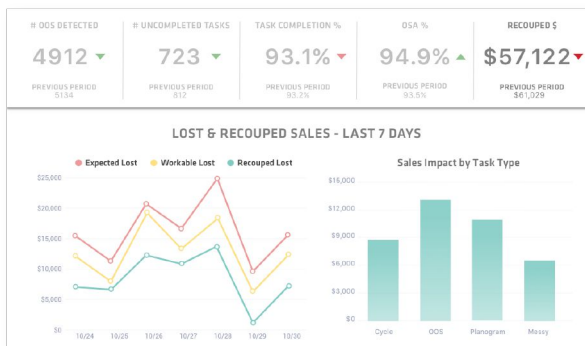
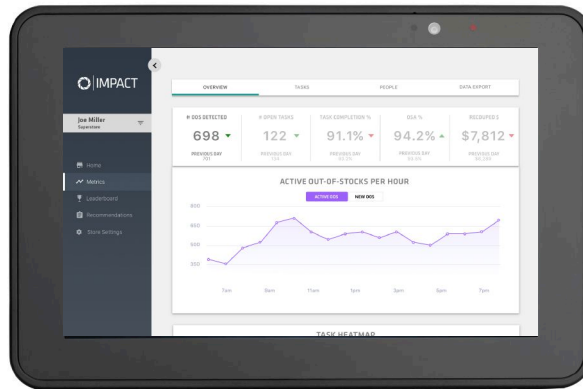
Product images. Task cards show images of the product(s) in question to make it easy for associates to know what needs to be done.



Location information. The locations of both task and item are shown on a digitized store map. If applicable, secondary location and backroom location are displayed as well.

focalOS for Store Managers

The focalOS Impact dashboard enables store managers to easily get actionable insights into their store's performance both in real-time and historically. Impact also includes powerful metrics tracking, associate performance dashboards, customizable email and text alerts, intelligent recommendations to improve store operations and more.

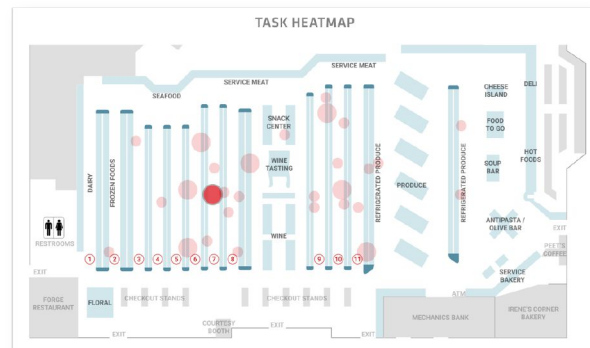


Detailed Metrics Tracking

Vital store performance metrics are always in view with Impact, including detailed charts on OOS counts, task completion, associate performance, OSA and recouped sales. Every metric can be filtered in detail, down to department and aisle. Time filters are also available, allowing for both a real-time and historical overview.

Visualize Where Issues Occur

focalOS Impact provides a digitized map of each store and maps issues to locations. This allows managers to see which parts of the store require the most attention, with bubble size indicating the number of open tasks. Clicking a bubble pulls up a detailed list of tasks for each location.



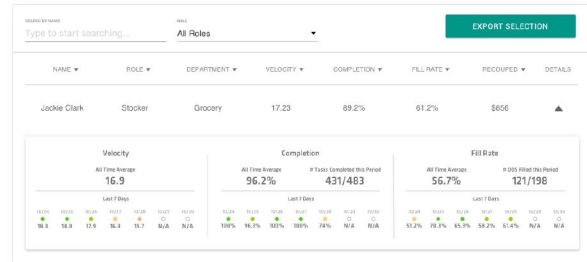


Item Level Detail and Timelines

For in-depth analysis, Impact provides a detailed filterable and searchable list of any item in the store and an overview of the status for each item throughout the day, including a visual timeline based on the images captured by Focal's ShelfCams

Associate Performance Insights

All tasks performed through focalOS are tracked which enables detailed insights into each associate's performance, including task velocity, task completion and reaction times in a filterable and searchable format.



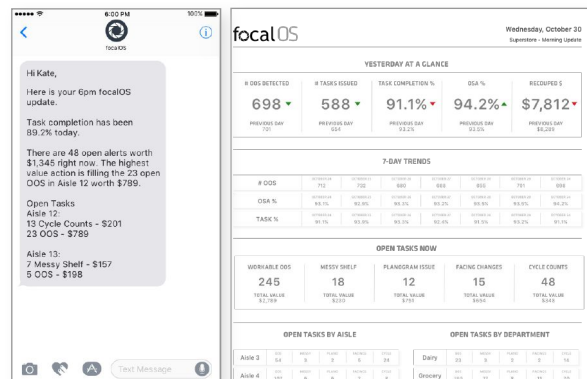
REGIONAL STORE RANKINGS				ASSOCIATE LEADERBOARD			
Superstore 101	26.12	94.46%	\$5,276	Joe Miller	26.12	94.46%	\$5,276
Superstore 331	24.22	94.06%	\$5,173	Sharon Jones	24.22	94.06%	\$5,173
Superstore 228	23.15	93.86%	\$4,876	Michael Cook	23.15	93.86%	\$4,876
Superstore 421	21.12	93.44%	\$4,779	Janet Meyer	21.12	93.44%	\$4,779
Superstore 671	20.97	93.46%	\$4,436	Diane Bolt	20.97	93.46%	\$4,436

Associate and Store Leaderboards

focalOS Impact includes a leaderboard feature that displays regional store rankings, associate performance rankings, open priority tasks and more. The leaderboard is tailored for TVs and monitors and is ideal to be displayed in breakrooms or the manager's office.

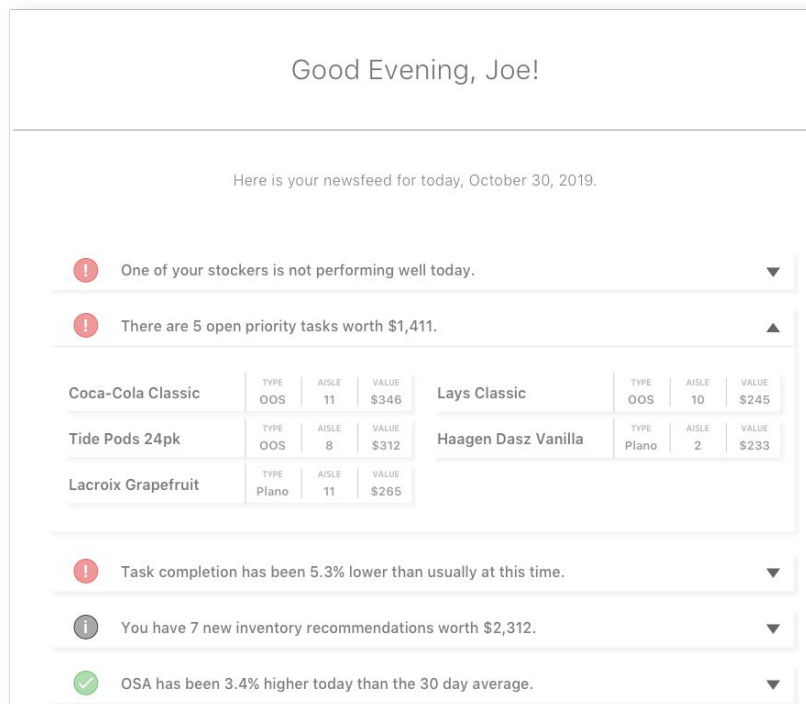
Customizable Email and Text Alerts

With focalOS Impact it's easy to set up fully customizable email and text alerts that inform about store status, issues, priority tasks and recommended actions. Recipients, timing and frequency can be easily adjusted through the Impact dashboard.



Actionable Insights and Recommendations

The focalOS Impact dashboard delivers distilled recommendations and insights that enable action to positively impact store performance. Associate performance issues, unusual drops in OSA, high value tasks, inventory recommendations and more are presented to store management on the home screen. Managers can issue corrective measures directly from there as well - any tasks that require work from an associate can be sent directly to the focalOS Action Tool.



The focalOS Home view. A list of actionable recommendations and alerts that enable action right from the home screen is presented to managers on login.

Chronic Out-of-Stock Reports

focalOS automatically detects items that are chronically out-of-stock (OOS frequently with positive onhands) and suggests ways to tackle these items strategically through measures such as scheduled replenishment runs or increasing the number of facings.

Associate Performance Alerts

If associates are performing worse (or better) than usual when it comes to task velocity, fill rate, reaction times and other metrics, focalOS automatically notifies the store manager accordingly.

Persistent Out-of-Stocks Reports

As persistent outs occur (OOS with no onhands for long periods of time or in regular intervals), focalOS suggests ways to tackle the issues, through measures such as investigating possible supplier issues or increasing the item's order quantity.

Store Performance Alerts

If a critical store performance metric such as OSA, active OOS or completed tasks falls below (or above) usual averages, focalOS notifies store management. Notifications are also sent in case of open high priority tasks, such as a top mover being out-of-stock.

focalOS for Merchandisers

Focal's ShelfCam enables the most accurate insights for merchandising teams and eliminates guessing the state of your shelves. Unlike manual methods of data collection, with Focal the actual state of the store is monitored directly at the shelf around the clock. focalOS turns this data into intelligent recommendations for store specific merchandising adjustments through focalOS FMR (Focal Merchandising Recommender). focalOS also delivers insights into any items' inventory performance on a store, regional or chainwide level with ease.



The screenshot displays a planogram of a shelf with overlaid data boxes. Two boxes are highlighted in red, indicating high lost sales items. The interface includes a search bar, a table of items with their respective lost sales values, and a section for recommended actions.

ITEMS	
Search...	\$ LOST
PEPSI	\$2386.67
DIET PEPSI CLSSC 6PK	\$768.75
LIPTON BRISK LEMON	\$575.39
SCHWEPES GINGER ALE	\$526.32
MUG ROOT BEER FRIDGE	\$317.51

RECOMMENDED ACTIONS	
+	Increase Facings of Pepsi to 3
-	Decrease Facings of Mug Root Beer to 1

The focalOS FMR view. The planogram is overlaid on images from the ShelfCam with high lost sales items highlighted in red. Detailed information for all items in view can be accessed through a filterable table and recommended actions are shown as well.

Item Performance Insights

To enable smarter inventory decisions, focalOS provides a detailed performance summary for any item across the chain, for a particular region or for individual stores. Reports include metrics such as per-item OSA, number of out-of-stocks and lost sales, all summarized into actionable tables based on selected filters with the ability to drill-down into granular detail.

TOP CHRONIC OUTS			
LAST 30 DAYS - NORTHEAST REGION			
Coca-Cola Classic	OSA %	# OOS	LOST \$
	56.7%	312	\$12,346
Lays Classic	OSA %	# OOS	LOST \$
	56.7%	312	\$12,346
Doritos Cool Ranch	OSA %	# OOS	LOST \$
	56.7%	312	\$12,346
Tide Pods Fresh Brz	OSA %	# OOS	LOST \$
	56.7%	312	\$12,346

focalOS for Corporate Users

The focalOS Impact dashboard provides corporate users with detailed insights into store performance across the board. Leverage the most accurate data available to quickly triage issues and deploy resources. With Impact's filtering system gathering information on how departments, stores, regions and chains are performing on its own and in comparison becomes an easy undertaking. Impact also enables easy exports of raw and aggregated data, powerful user management, a corporate email reporting system and the ability to configure and customize specifics of focalOS.



Detailed Aggregate Metrics

focalOS Impact enables corporate users to easily filter any part of the dashboard to show data for individual stores, regions or the entire chain, which enables insightful aggregate metrics such as the average OSA over time for an entire region.

Raw and Aggregate Data Exports

focalOS Impact also offers the ability to export raw and aggregated sets of data for use outside of focalOS Impact. Filtering functions the same way, which means that users can select a time range, departments, stores, regions and chains and then export datasets according to their selections at a click of a button.

The "GENERATE DATA EXPORTS" interface is divided into three sections:

- Raw Data:** Includes checkboxes for Lost Sales Report, OOS Report, OOS Timelines, Task Report, and Cycle Count Report.
- Aggregated Data:** Includes checkboxes for Lost Sales Over Time, OSA, Per SKU Breakdown, Chronic OOS, Persistent OOS, Stocker Efficiency, Department Performance, and Task Report.
- How to Generate Exports:** A numbered list of instructions: 1. Select the region and stores you would like to export data for. At minimum select a store. 2. Select the aisles, departments and time range for the export. 3. Select the reports you would like to generate. You can pick multiple raw and aggregated options. If multiple reports are selected the export will be a .zip file, single reports export as CSV files. 4. Click "Generate Reports".

A "GENERATE REPORTS" button is located at the bottom right.

The email reporting configuration interface shows two sections:

- MORNING UPDATE:** A toggle switch is turned ON. The "SEND AT" is set to 07:00AM. Below this, there is a list of recipients: Joe Miller (joe@superstore.com), Steve Smith (steve@superstore.com), and Jane Manning (jane@superstore.com). A text input field says "Type to add another recipient...".
- END OF DAY SUMMARY:** A toggle switch is turned OFF. The "SEND AT" is set to 10:00PM. Below this, there is a list of recipients: Jane Manning (jane@superstore.com).

A green plus button is located at the bottom center.

Customizable Email Reporting

focalOS Impact enables easily setting up email reporting tailored for corporate users. After specifying user groups, regions/stores to include and frequency, insightful aggregate reports are sent right to users' inboxes.

focalOS Wednesday, October 30
U.S. Northeast Region - Morning Update

# OOS DETECTED	# TASKS ISSUED	TASK COMPLETION %	OSA %	RECOUPED \$
3,698 ▼	3,588 ▼	91.1% ▼	94.2% ▲	\$27,812 ▼
PREVIOUS DAY 7/01	PREVIOUS DAY 6/54	PREVIOUS DAY 93.2%	PREVIOUS DAY 92.5%	PREVIOUS DAY \$5,283

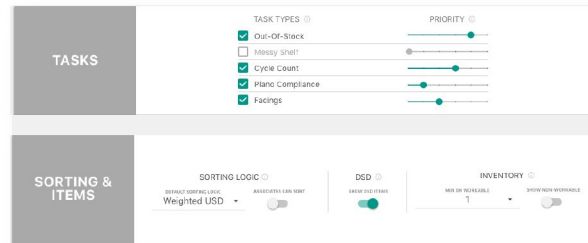
Store	# OOS	# TASKS	TASK COMPLETION %	OSA %	RECOUPED \$
SuperStore #221	712	732	93.2%	92.1%	\$4,212
SuperStore #738	312	433	95.7%	90.2%	\$2,132
SuperStore #315	552	507	88.2%	93.7%	\$1,655

Detailed Email Reports

Email reports contain data on vital metrics such as the number of out-of-stocks, OSA and recouped sales on both an aggregate level as well as broken down by store or region, depending on the selected filters, enabling corporate users to easily get insights into store & region performance.

Customizable System Configuration

Many aspects of focalOS can be configured directly from the focalOS Impact dashboard, including camera capture times, available task types, focalOS Action Tool sorting logic, filter settings and more.

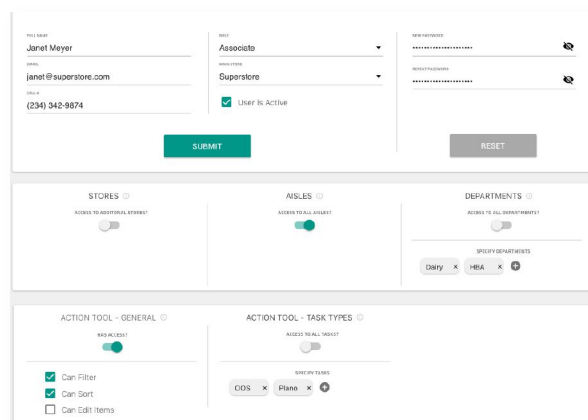


Detailed Task Configuration

The focalOS Action Tool task cards are almost entirely customizable for each task type, enabling in-depth control of the workflow associates follow when completing tasks. This includes settings such as action card choices per task type, snoozing logic, task card appearance and more.

Powerful Access Management

Each aspect of focalOS can be granularly access controlled through Impact's IAM tool. This enables store management and corporate users to set exactly what any user is able to see - which tabs are available, which settings can be modified, which aisles, departments and tasks a user can see - are all managed through a simple interface that allows for global settings by role and detailed settings for individuals.



Proven Around the World

Leading retailers around the world have partnered with Focal to operate smarter stores. With tens of thousands of cameras deployed to stores across three continents and partnerships with leading enterprise technology providers like Zebra and Nvidia, Focal has proven to be the best in class solution in retail store automation.

Quotes From Our Customers and Partners

"Zebra is investing in companies that accelerate our Enterprise Asset Intelligence vision to deliver exceptional value to our customers."

As a technology solutions provider to many of the world's leading retailers, we have heard our customers tout the benefits of Focal as an effective solution for solving out-of-stocks.

We believe Focal has superb talent and a deep understanding of the challenges retailers face, positioning them to be successful in this market."

Tony Palcheck
Managing Director of Zebra Ventures, Zebra Technologies

"Focal Systems' out-of-stock detection through computer vision and artificial intelligence has enabled us to automatically identify shelf gaps. [...]"

Our stores have seen time savings and operational improvements by incorporating the new information into their daily tasks. This early success has encouraged our members to opt into a 50 store pilot expansion."

Cheryl Williams
CIO, Wakefern Food Corp.

Comparison of OOS Solutions

	Manual Scans (Baseline)	Perpetual Inventory	Non-Camera Shelf Sensors	Shopping Cart Cameras	Robot	Shelf-Mounted Cameras	Drones
Description	Stockers walk the store 1-3 times a day, scanning all the gaps.	Uses on hand data, calculated by expected receipts from DC and sales, to predict what is in-stock and out-of-stock.	Light, weight or depth sensors on shelves that can alert the store when a void is "sensed".	Attaching cameras to a shopping cart and leveraging your shoppers to collect images of the shelves.	A robot that roams the store at a slow/safe pace and takes very high resolution images of the entire store once or twice a day.	Deployment of small fixed cameras on the shelves to provide real-time monitoring and automated data capture.	Drones that fly in the aisles to collect the imagery or sensor data to identify out-of-stocks SKUs.
Challenges	As wages have increased this solution has become cost prohibitive as it takes several hours a day to audit the full store. Humans are also prone to errors when performing this task.	System is not suitable as an accurate measure of OSA as inventory counts differ due to difference in receipts from supply chain and shrink. System also does not address product location. Requires frequent human cycle counts to maintain accuracy.	Requires significant infrastructure investment to support power and connectivity as an individual sensor is needed for every facing. No ability to do product verification.	Low image quality from carts in motion prevent accurate data collection. Requires frequent battery swaps to maintain power to cart mounted device. High rates of theft and/or damage of carts.	Only able to safely perform 1-2 scans a day as robots can't go down aisles that are full of customers. Prevents getting accurate OOS data during stores busiest hours which is when retailers need that data the most. Very expensive solution given the cost of the robot.	Need to provide power to the shelf or swap batteries every 6 months.	Very complex solution to manage. Drones can only safely be run when customers are not in the aisle. Battery life only enables scanning of 1-2 aisles/charge. Expensive to support due to costs of drone, high end cameras to capture images while in motion and charging stations.
Benefit of automated real time OOS	\$\$\$\$\$	\$\$\$\$\$	\$\$\$\$\$\$\$\$\$\$\$	\$\$\$\$\$	\$\$\$\$\$\$\$\$\$\$\$	\$\$\$\$\$\$\$\$\$\$\$\$\$	\$\$\$\$\$
Benefit of low shelf stock detection	\$	\$	\$	\$	\$	\$	\$
Benefit of planogram compliance and messy shelf tracking	\$	n/a	n/a	\$	\$	\$	\$
Benefit of stocker performance metrics	n/a	n/a	\$	n/a	n/a	\$	n/a
Benefit of promotion compliance	\$	n/a	n/a	\$	\$	\$	\$
Benefit of e-commerce and advanced merchandising	n/a	n/a	\$	n/a	n/a	\$	n/a
Annual Cost	\$\$\$\$\$	\$	\$\$\$\$\$\$\$\$\$\$\$	\$\$\$\$\$	\$\$\$\$\$	\$	\$\$\$\$\$\$\$\$\$\$\$
ROI	1	2	1.2	1.4	2.7	7.8	0.7

\$ = \$20,000

Ready to Deploy?

Simple and Quick Deployment

- Focal receives item and inventory data
- Focal performs the hardware install in 1 night; the cameras connect to in-store wifi
- Focal performs detailed training with each store to get them started
- ShelfCams are battery powered and last for 1.5 years without a battery swap
- No additional labor required to run the system, Focal handles everything!

What Focal Offers

- **The best data** so you can maximize efficiency and delight customers
- **The best tools** for associates to take the optimal next action
- **National, regional and store level insights** to solve the most pressing issues
- **A powerful recommendation engine** to optimize planograms, vendors, labor



The Focal ShelfCam. *The ShelfCam is small and unobtrusive, extremely robust, mounts on any shelf and offers a battery life of well over a year.*



An image captured by a ShelfCam. *Each ShelfCam is able to fully capture two shelf sections.*

focal

S Y S T E M S

🌐 focal.systems ✉ info@focal.systems