ARROW | Internet of Things

(intel)

Retail Technology Solutions Guide

Five Years Out

Overview

The retail store is making a strong comeback. Despite significant store closings and retail restructurings, customers increasingly like the physical act of shopping in stores. It is not surprising that the retail industry's technology leader, Amazon, has not only been dabbling with physical stores, but has just acquired the grocery chain Whole Foods. Simultaneously, incumbent traditional retailers like Walmart are making big moves online to deliver a seamless omni-channel experience to customers. Across the globe, innovation has become a priority for traditional retailers and they are becoming smarter about competing in a disruptive digital age. Dramatic technology driven changes to the in-store experience, retail inventory management and customer interaction have all created a new opportunity for retailers to entice customers, satisfy new needs and enhance profitability. In effect, the future of retail is about delivering a shopping experience that is responsive to the presence and needs of its shoppers

Challenges In The Retail Industry

Inventory accuracy

By far the top challenge retailers consistently cite is product availability. Having items that meets a customer's exact need is crucial for retail success. It is not unusual that a supermarket may miss out on 5% of sales through out-of-stock situations. A 3% improvement in inventory accuracy can lead to a 1% sales lift. Several new technologies have the potential to dramatically improve inventory accuracy

Analytics

The ability to tailor in-store experiences to customers and make timely decisions on inventory, product placement and promotion requires customer insight. These insights need to be data driven. The challenge is in the ability of retailers to collect the right data and deploy analytical skills to derive insights that can improve the business economics
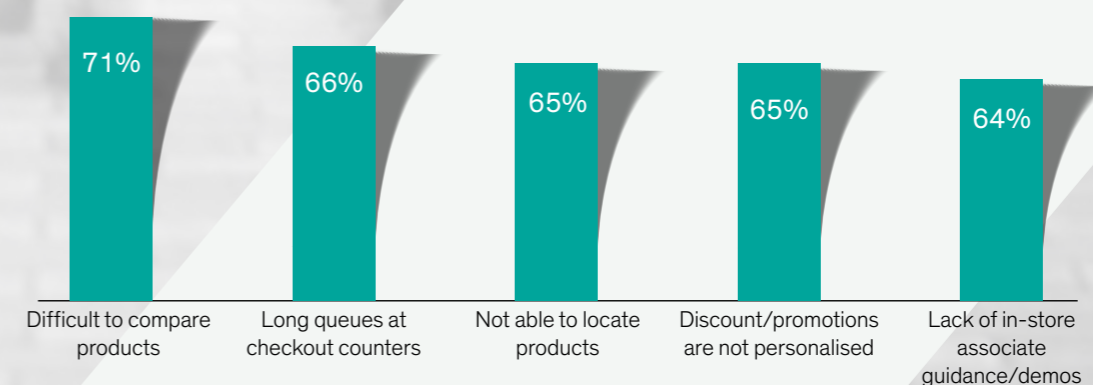
Human Capital

Hiring and retaining the right associates in the store to help customers has been an ongoing challenge for retailers. Characterized by high turnover, the retail industry has difficulties rapidly onboarding and managing people . To delivering reliably consistent experiences retailers can now employ various automated processes and even robots

Customer Engagement

Customers develop deep emotional connections with brands and store experiences. Successful retailers continuously find new ways to engage customers. Starting with interactive signage and responsive in-store experiences to seamless multi-channel connectivity, engaging the customer has proven to increase sales dramatically

Top Frustrations Consumers Face in Retail Stores*

Frustration	Percentage
Difficult to compare products	71%
Long queues at checkout counters	66%
Not able to locate products	65%
Discount/promotions are not personalised	65%
Lack of in-store associate guidance/demos	64%

*Source: Capgemini Future of Retail Store Survey
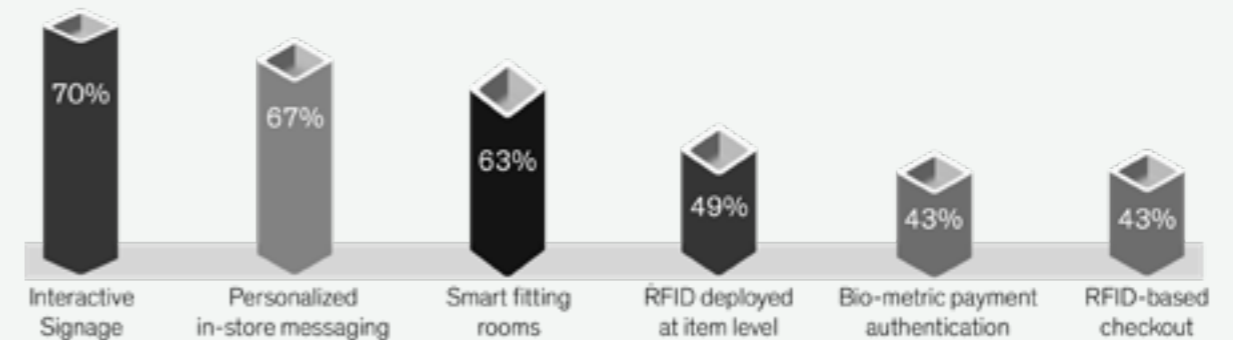
Top Predictions for Retail

- Mundane shopping will be easier and move more online, but the demand for a physical shopping experience will be stronger. Brick-and-mortar stores will continue to flourish

- Shoppers will demand more customization and personalization of products

- Customer expectations for Item availability will intensify towards shorter time – same day

- Mobile shopping experience will separate the successful retailers

- Robots will be deployed in retail settings to deliver consistent and reliable shopping experiences

- Retailers investing in digitization will engage and deliver superior customer satisfaction

- Data will be the basis of all retail decisions

- Healthy and environment-friendly lifestyles will be a focus for many consumers

- Retailers that step up their social media strategies will thrive

- In-home services, delivery, and consultations will pervade the market

- Augmented reality technology will get even more sophisticated
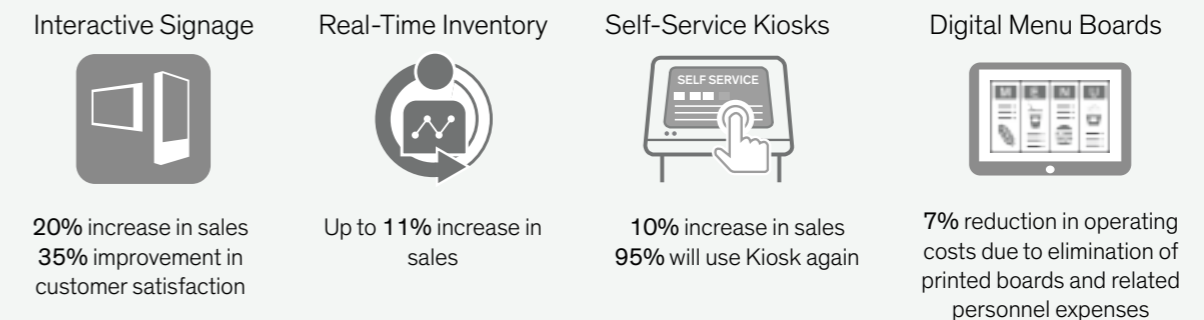
In-Store Shopping on the Rise

Percentage of customers shopping in-store every week

38%	36%	40%	41%
2014	2015	2016	2017

Technology Adoption in Stores by 2020

70%	67%	63%	49%	43%	43%
Interactive Signage	Personalized in-store messaging	Smart fitting rooms	RFID deployed at item level	Bio-metric payment authentication	RFID-based checkout

Business Benefits of Technology in Retail Stores

Interactive Signage	Real-Time Inventory	Self-Service Kiosks	Digital Menu Boards
20% increase in sales 35% improvement in customer satisfaction	Up to 11% increase in sales	10% increase in sales 95% will use Kiosk again	7% reduction in operating costs due to elimination of printed boards and related personnel expenses

The Retail Store of the Future

Management

Inventory
RFID sensors
Surveillance
Store Traffic
Cold chain
Facility Management
Loss Prevention
Remote management
Productivity optimization
Warehouse robots

Warehouse

Headquarters

Retail Store

Info kiosks
Interactive signage
Menus
Welcome robots
Auto checkouts
Customized marketing
Omni channel engagement

Engagement

50% OFF

Deep learning and AI
Pattern and trend recognition
Predictive maintenance of assets
Facial, gesture and mood recognition
New algorithms for precision targeting

Analytics

Sensors
Gateway
Data Results
RFID Tag

Technologies for Retail Transformation

Engagement

Customers' purchasing decision is the result of multiple subtle factors. From attractive signage, timely display of items to enticing promotional programs, engaging the customers' attention and affording tools to customize their shopping experience is key to turn visitors into customers. Retailers have several avenues to foster engagement - digitally interactive displays, mirrors and catalogs are just a start. Thanks to sophisticated technology powered by the cloud and sensor integrations retailers can now ensure that the customers' motivations and preferences are incorporated into in-store experiences.

Management

Inventory availability and avoiding stock out situations is paramount for any retailer. To drive efficient availability, tracking, locating, and managing inventory with precision is essential. Automating tasks and data analysis are key to discovering opportunities not only for cost reduction but also for greater customer satisfaction. A key element of effective store operation is also deploying seamless integration between enterprise management systems and store operations. This makes store associates effective and reduces time for fast on-boarding of new personnel. Implementing integrated store management platforms that become the central nervous system, connecting every part of the retail operation is an important first step. Further collecting and processing information from various parts of the operation and identifying inter-relationships is key to derive insights.

Analytics

Optimizing store layouts, responding to evolving customer demands and driving a modern retail operation requires broad digitization and new skill-sets. Next generation retail platforms are combining the intelligence gathered from store level devices and sensors eg. foot traffic, with powerful cloud-based data-analytics engines. These new paradigms enable predictive management of store demand, and identify the right points for promotions and displays. Immediate and accurate insights to transform in-store experiences on a near-real-time basis is now possible . Cost effective deployment of analytics is a crucial aspect of the store of the future.

Intel
Technology provider with a vast ecosystem, enabling secure and scalable solutions from the network edge to the cloud.

Core Technology

Advantech
Known market leader in retail, Advantech offers solutions to optimize store operation management, shopper engagement and business intelligence.

Solutions and Cloud Platform

E-Infochips
Offering comprehensive retail solutions from the storefront to the back office by leveraging an extensive portfolio of IPs and frameworks.

Technology Services for Retail

Arrow
Global provider of products, services, and solutions enabling retailers to accelerate digitization and adapt to changing customer needs.

End-to End Solution Provider

# Responsive Retail Sensor Platform

Intel® Responsive Retail Sensor Platform Delivers Near 100% Inventory Accuracy

Intel's Retail Sensor Platform provides an out-of-the box analytics platform. The platform manages RFID-based retail sensors through an Intel®-based gateway and supports analytics capabilities from the edge to the cloud. It provides an easily deployable cloud and big data analytics architecture with the ability to deliver applications that can boost retail profitability and provide new insights into product demand, consumer behavior and store logistics.

Solution Components

Giving customers "what they want, when they want", is key to increase customer satisfaction and brand loyalty. The Intel Responsive Retail Platform is an end-to-end retail analytics-based solution designed to help retailers ensures near 100% inventory accuracy. Platform consists of

1. Intel Responsive Retail Sensor: Low-cost, low-power sensors with RFID capability that provide 150-300 square feet of coverage per sensor at more than 600 tag reads per second

2. Intel–based Gateway: Gathers and filters sensor data, provides intelligent, trusted connectivity at the edge

3. Cloud Platform: Open source analytics Platform-as-a-Service (PaaS) for cloud applications
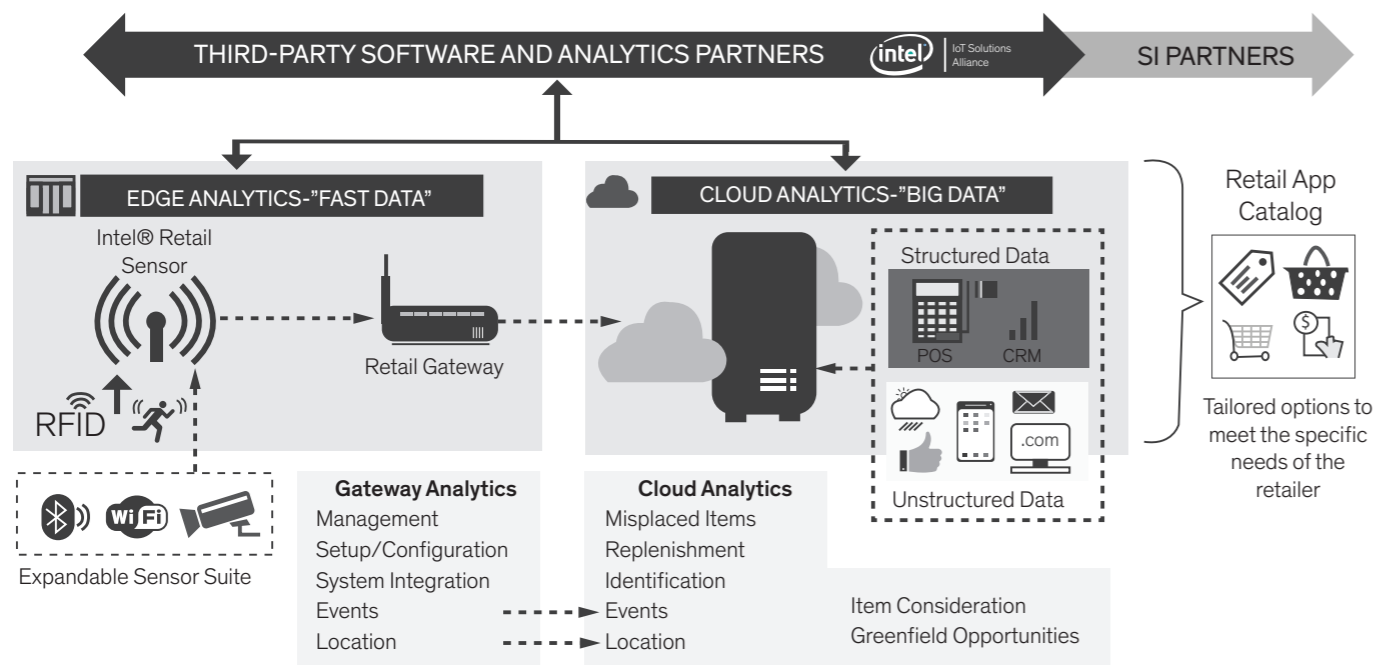
Benefits to Retailers
Retailers can proactively adjust to supply and demand dynamics. Delighting customers by making product available, retailers can build brand loyalty and increase sales. In addition, by being able to track and locate inventory, stores can reduce waste and loss of sales caused by misplaced items.

Customer Successes

A Levi's® store, fully equipped with Intel's Retail Sensor technology to track inventory in real-time through RFID tags

Interactive Digital Signage Solution

Advantech's Digital Signage Solution: Increase Shopper Engagement and Sales

Advantech's UShop SRP-130 interactive digital signage solution delivers dynamic & immersive multimedia content, and increases customer engagement by broadcasting content specifically targeted to the customer. Using a variety of IoT sensors, including facial detection cameras, RFID readers, and in-store heatmaps, UShop SRP-130 adds interactivity to a digital signage network.
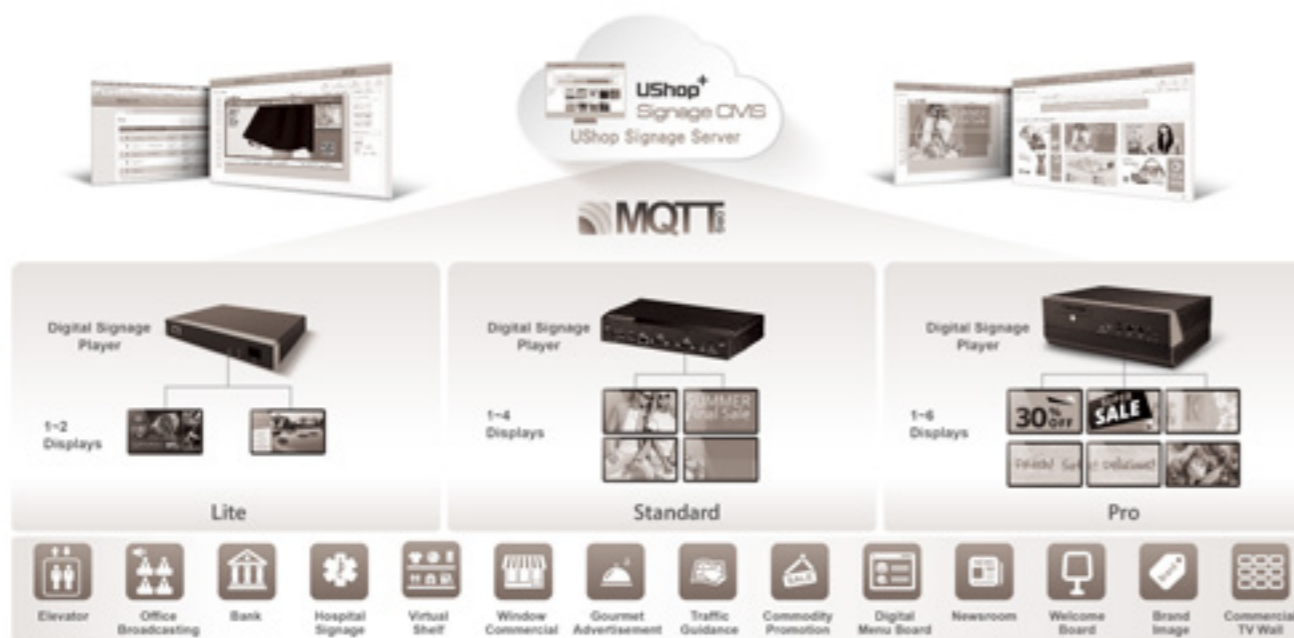
Solution Components

The solution combines industrial grade digital signage players with UShop+ SignageCMS, a web-based content editing/publishing software and remote management. Features include:

1. UShop Signage Players: Industrial-grade digital signage players based on Intel processors. Three hardware options support up to 6 displays

2. UShop+ SignageCMS: A web-based content management system to deliver high-resolution multimedia in diverse formats. Users can centrally layout, schedule, and dispatch signage contents up to 500 remote display clients. Platform allows for easy integration of 3rd party sensors for additional functionality such as facial recognition, RFID readers, etc.

Benefits to Retailers

Increase customer engagement and revenue by using intelligence provided by the platform and interactive multimedia to broadcast content targeted to the customer. Streamline operations and react rapidly to changes with remote management capabilities.

Customer Successes

Intelligent eMenu Board

Advantech Intelligent eMenu Board: Boost Sales with Dynamic and Appealing Content

Advantech's SRP-131 allows business owners to easily promote services and products via real-time advertisements. Managers can remotely edit and dispatch content to the eMenu board system, which then disseminates the content to multiple client devices (across stores). By integrating the eMenu board system with a restaurant's POS data, customers can make order updates using the POS system or mobile app, increasing engagement.

Solution Components

The solution combines industrial grade digital signage players with UShop+ SignageCMS, a web-based content editing/publishing software and remote management. Features include:

1. Ushop+ Signage Players: Industrial-grade digital signage players based on Intel processors. Comes with two hardware options with support for up to 3 displays.

2. UShop+ SignageCMS: UShop+ SignageCMS is a web-based remote content management system capable of delivering high resolution multimedia to UShop+ signage players, while also providing diverse menu templates for easy editing and real-time broadcasts.

Benefits to Retailers

Reduce operating costs by up to 7% by eliminating poster printing and decreasing human resource costs with remote management capabilities. Enable real-time advertising to promote services, products and limited-time offers.

Customer Successes

SUBWAY®

Advantech Intelligent Menus implemented at 16 Subway® franchise stores in Thailand. Using this solution, content is updated remotely for all locations. Special offers based on time of day can be easily promoted.

Store Traffic Analysis

Advantech's Digital Signage Solution: Increase Shopper Engagement and Sales

Advantech's UShop SRP-700 Store Traffic Analytics solution enables retailers to evaluate sales potential and establish customer service and marketing strategies for maximizing profit. UShop SRP-700 integrates 2D and 3D video analysis technology with POS transaction data for further analysis.

Solution Components

Solution combines smart cameras for people counting with software that integrates several capabilities that enables retailers to increase profitability. Solution components include:

1. 2D and 3D Cameras: Smart cameras with high counting accuracy. Easy to install, built-in human head identification capabilities, and many more.

2. Wi-Fi Analyzer: Senses shopper intent based on analyzing Wi-Fi signal of shopper mobile device within 5-15 meters. No Wi-Fi connection or APP installation needed.

3. UShop+ Store BI Software: Integrates several store analytic solutions, includes features like people counting, conversion rate, shopper's heatmap and dwell time analysis. It lets retail owners visually explore data and quickly discover patterns to make better, faster decisions.

Benefits to Retailers

Increase customer engagement and revenue by using intelligence provided by the platform and interactive multimedia to broadcast content targeted to the customer. Streamline operations and react rapidly to changes with remote management capabilities.

Customer Successes

![eInfochips An Arrow Company]

Services for Retail

Experts in both In-Store and Online Retail Technologies

eInfochips offers retailers a variety of services that harness data to drive customer engagement, satisfaction and the store bottom line. eInfoChips retail solution span the storefront and the back office by leveraging an extensive portfolio of IPs and frameworks. Implementations often involve deploying a variety of cloud-connected hardware systems that generate data on customer interactions. From tracking coupon use and customer footfall analysis to enhancing customers' experience with unique auto-checkout solutions, eInfochips is the leader in technology services for retailers.

### Services for the Retail Industry

eInfoChips specializes in deriving unique insights from data to drive store level decision making. Services span four key areas – Customer Experience, Marketing Effectiveness, Operational Efficiency and Loss Prevention. Examples of implementations include:

Hardware
- Auto checkout solutions
- Handheld scanners
- Digital shelves
- RFID-based tracking systems
- Loss prevention and monitoring cameras
- Temperature monitors and other sensing solutions
- IoT Gateways

Software and Applications
- Video analytics
- Online payment applications
- Shelf price auditing
- Inventory management
- Cart trackers
- Visual search algorithms
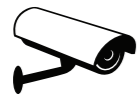
Developed in-store surveillance solution for the world's 4th largest grocery store chain

40% savings on operational costs for order and inventory management for largest retail grocery store in the US

Enabling image search for a large eRetail company. 10% growth in order conversion

"Top 10 retail security solutions provider"
- Retail CIO Outlook magazine 2016

Benefits to Retailers
- Integrating and harmonizing data to optimize retail activities across supply, marketing, and sales.
- Continuous measurement of in-store traffic and store interactions to derive insights on conversion rates, marketing effectiveness, customer satisfaction and replenishment cycles.
- Constant vigil on the freshness of food and preventive maintenance through remote analysis of equipment performance.
- Protection from thefts and threats, by preventing unauthorized control and deploying video analytics .

Customer Successes
Customer names cannot be revealed due to NDAs

Part Numbers and Ordering Information

Responsive Retail Sensor Platform

Type	Description	Part Number
Sensors	RRS, White Color, US Band	RSP9000W-SKU-ROW WHITE
	RRS, White Color, European Band (ETSI)	RSP9000W-SKU-EU WHITE
	RRS, Black Color, US Band	RSP9000-SKU-ROW BLACK
	RRS, Black Color, European Band (ETSI)	RSP9000-SKU-EU BLACK
Gateways and Software	Intel SW bundled with GW appliance, includes first year license	EL/MP9-GATEWAY
	Full SW, download only	RRS S3000
	Small format SW (five sensor limitation), download only	RRS S2000
	Yearly license fee for all aforementioned SW SKUs	RRS S1000
PoE Switches	Aruba 2530 8G PoE+ Switch	J9774A
	DLINK 10 port (8 POE+) Router	DGS-1100-10MP
	Aruba 2920 24G PoE+ Switch	J9727A
	Aruba 2920-48G-PoE+ 740 Switch	J9836A
Mounting Brackets	Bracket, Single Flange, Sheet Metal, Unit Mounting, White, RSP 9000	9220-03^HARD-WARE-NMO-20682
	Bracket, Single Flange, Sheet Metal, Unit Mounting, Black, RSP 9000	9220-02^HARD-WARE-NMO-20682

UShop SRP-130 Interactive Digital Signage

	UShop+ Signage Player	UShop+Signage Server
Solution Type	Hardware Part Number	Software Part Number
Lite	**UBX-310UDS1-G1E-C** J1900, 4 GB DDR, 500 GB HDD, 1 × VGA, 1 × HDMI	968SPUDSS0 (UShop+ SignageCMS) interactive functions included
	UBX-310UDS1-S1E-C J1900, 4 GB DDR, 64 GB SSD, 1 × VGA, 1 × HDMI	
Standard	**DS-570UDS1-G1E-C** J1900, 4 GB DDR, 500 GB HDD, GT730M, 1 × VGA, 2 × HDMI, 1 × DP++	
	DS-570UDS1-S1E-C J1900, 4 GB DDR, 64 GB SSD, GT730M, 1 × VGA, 2 × HDMI, 1 × DP++	
Pro	**DS-980UDS1-G1E-C** Core i7-6700TE, 8 G RAM, 500 GB HDD, GT730M, 3 × HDMI (GT730)	
	DS-980UDS1-S1E-C Core i7-6700TE, 8 G RAM, 64 GB SSD, GT730M, 3 × HDMI, 3 × HDMI (GT730)	

UShop SRP-131 Intelligent eMenu Board

	UShop+ eMenu Board Player	UShop+eMenu Board Server
Solution Type	Hardware Part Number	Software Part Number
Lite	**DS-080UDS1-G1E-C** J1900, 4 GB DDR, 500 GB HDD, 2 × HDMI	968SPUDSS0 (UShop+ SignageCMS) interactive functions included
	DS-080UDS1-S1E-C J1900, 4 GB DDR, 64 GB SSD, 2 × HDMI	
Standard	**DS-780UDS1-G1E-C** i3, 4 GB DDR, 500 GB HDD, 3 × HDMI	
	DS-780UDS1-S1E-C i3, 4 GB DDR, 64 GB SSD, 3 × HDMI	

UShop SRP-700 Store Traffic Analytics

	Edge Computing Device	Store BI Cloud Report	
Solution Type	Hardware Part Number	Public Cloud Part Number	Private Cloud Part Number
UCAM-2D	**UCAM-120A-U01**		**968SPUSTS0** Max. 25 channels
UCAM-3D	**9680016713**	**968SPUSTL0** (annual license fee)	**968SPUSTS1** Max. 50 channels **968SPUSTS2** Max. 300 channels
Wi-Fi Analysis	**968SPUSWL0** (Service activation fee)	**968SPUSWL1** (annual license fee)	**Private clouds not supported**

For Retail Technology Services email us at iot@arrow.com or contact your local Arrow office

Arrow Electronics: Your Retail Technology Partner

Arrow has been investing in a variety of capabilities that are aimed to help retailers adopt next generation paradigms for store management. With the recent acquisition of eInfoChips, Arrow has gained a strong portfolio of solutions to drive retailer success.

How Arrow Helps Retailers

1. Global provider of products, services, and solutions specializing in
   – Hardware and software development
   – Security, data analytics, and application development
   – Enterprise software support
   – Value-added services in design, integration, manufacturing, logistics, billing, and managed services
   – Sustainable technology and end of life cycle disposition
2. Large partner and supplier network consisting of global and regional solution providers
3. Successful customer deployments include leading retail brands in supermarket chains, shopping malls, the drink & beverage industry, and quick serve restaurants

Create
Things, platforms and solutions

Connect
Applications and networks

Analyze
Data streams from multiple sources

Manage
Devices and usage

Sustain
Asset disposition and recycling

Secure
Assets, data, IP and network

Arrow Worldwide Fact Sheet

2017 Sales: $26.8 billion

Worldwide Locations: over 345

Fortune 500 Ranking: 118

Employees WW: over 18,800

Customers WW: 150,000

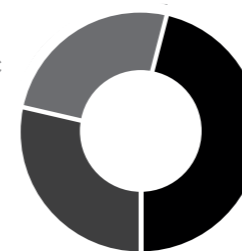**Industry:** Electronic Components and Computer Products Distribution

Founded: 1935

Incorporated: 1946

Public: 1961 (ARW)

2017 Sales by Region

25%
ASIA/PACIFIC
$6.7 billion

46%
AMERICAS
$12.4 billion

29%
EMEA
$7.7 billion

Engaging Arrow for Your Retail Technology Needs

From initial consultations to design expertise, Arrow brings technical depth and implementation expertise in digitization and business transformation. Arrow by bringing together partners like Intel and Advantech, can now help retailers deploy complete store ecosystems that span multiple domains including inventory management, digital signage, store checkout systems and cloud analytics. To know how Arrow can make an impact contact us at iot@arrow.com.

Contact us:
iot@arrow.com
www.arrow.com/intel-retail

Are You Five Years Out?

Most people live in the present. The world of now. But a handful of us work in a unique world that doesn't quite exist yet—the world of Five Years Out.

Five Years Out is the tangible future. And the people who live and work there know that new technologies, new materials, new ideas and new electronics will make life not only different, but better. Not just cheaper, but smarter. Not just easier, but more inspired.

Five Years Out is an exciting place to be. So exciting that, once you've been there, it's hard to get excited about the present. Because we know what's coming is going to be so much better.

Five Years Out is a community of builders, designers, engineers and imaginers who navigate the path between possibility and practicality. Creating the future of everything from cars to coffeemakers.

Are you one of them? Then you're probably working with us.

ARROW
Five Years Out

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