SOLUM

JOIN OUR JOURNEY WITH SOLUM

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I. ABOUT SOLUM
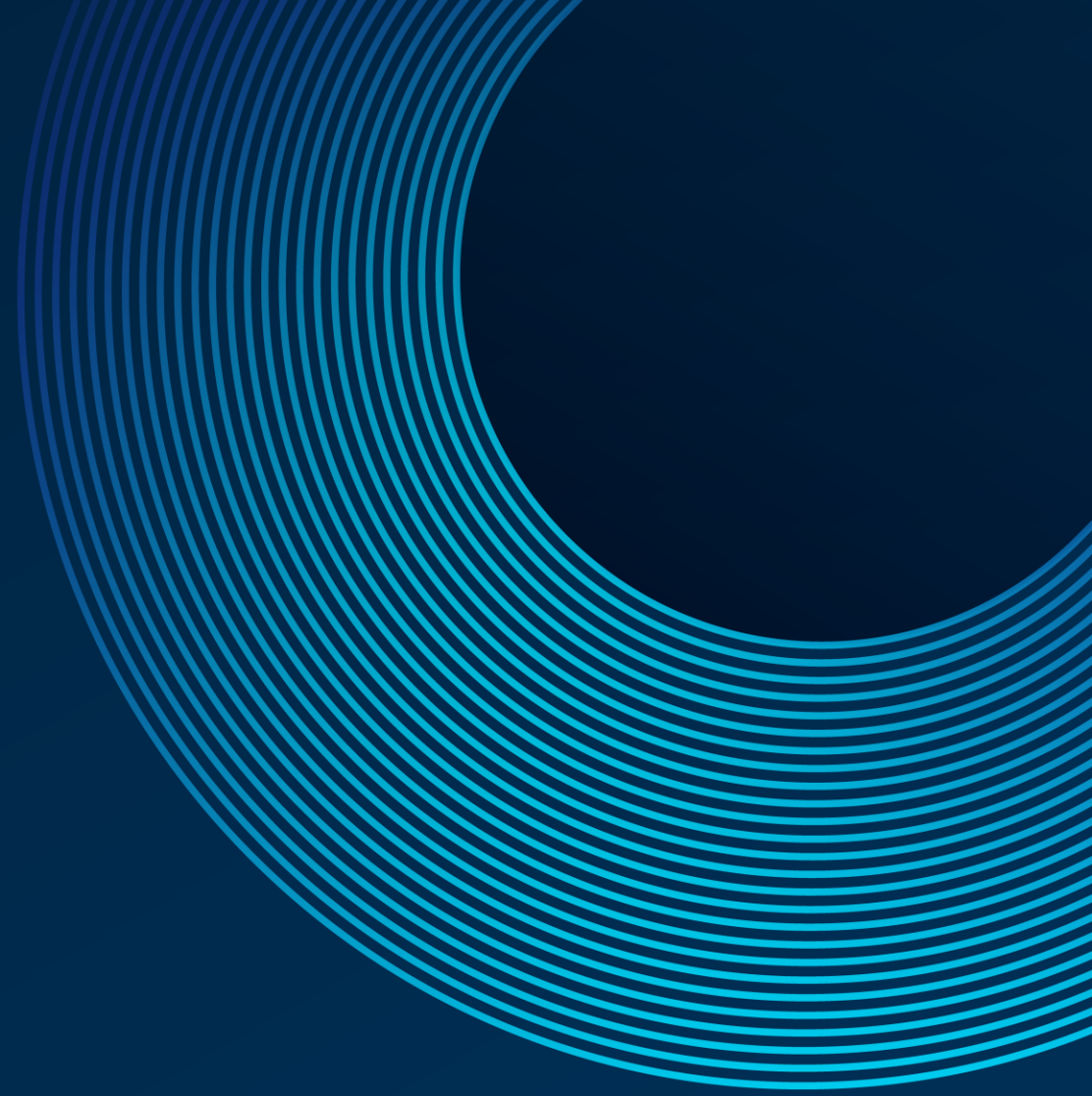
GLOBAL NO.1 SOLUTION PROVIDER

SOLUM has its own infrastructure for hardware & software development and design, manufacturing, quality control
Also, global marketing team delivers the best quality and integrated solution

Strategic partner   Specialist   Efficient organizational capabilities   Unique technology   Market innovator

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LEAPFROG

1996
· General Adapter
· Mobile Charger
· TV SMPS

2014
· 3 Color
  Graphic ESL

1973
· TV Tuner
  SET – Top Box

2012
· Power + Driver
  for LED TV
· 1st graphic ESL

GROWING SEASON

2017
· LoRa Module GPS
  Tracker Item Label
· Bluetooth Item Finder
  Stripe Display

2021
· Public Offering in Korea
  KOSPI

2015
· Spin-Off
  from SAMSUNG

2019
· 3 Port Charger
· Air Quality Checker
· WBG Power Supply
  MS No.1 in North America
  in ESL
· Newton Launching

2022
· Motion & Air condition
  detector
· Healthcare Item
  Digital Signage
· True Wireless Stereo
  (Bio TWS)

SOLUM DETAILS

Specialized in wireless communication technology business with 50 year-experience

ESTABLISHMENT   2015.07.02 / 2021.02.02 (flotation)   MAIN BUSINESS   Electronic manufacturing

WEB   www.SOLUM-group.com

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Rapid Growth and Global Deployment

SOLUM started supplying ESL to Global Top
retailers such as LOWE'S, MACY'S, LOBLAW,
ShopRite, ROGERS, ALTICE, IKEA, LIDL, REWE,
and METRO. Over the past 12 years, we have
grown at a rapid pace and have now installed
over 150 million ESL throughout 45 countries,
totaling 50,000+ stores worldwide.
We have gained a reputation as one of the best
ESL vendors in all markets (grocery, department
stores, electronics, factory, warehouse & apparel
stores) with our server and management software
solutions, diverse and differentiated product
lineup, and prompt and active customer service

300 million

Target ESLs shipped by 2023
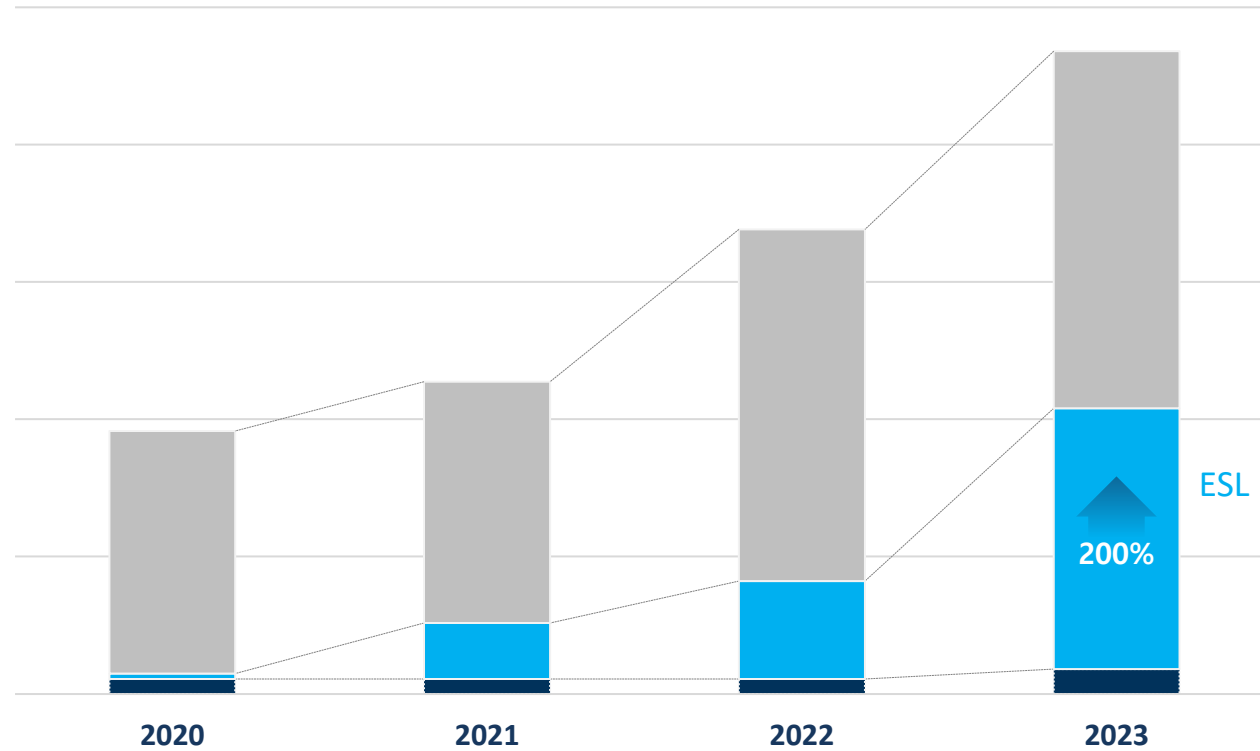
150+
MILLION TAGS

45+
COUNTRIES

50K+
STORES

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EU H.Q. (GERMANY)

US H.Q

US WEST

MEXICO FACTORY

HEADQUARTERS

JAPAN (TOKYO)

CHINA FACTORY
SALES (SHENZHEN)

INDIA FACTORY

VIETNAM FACTORY

R&D INDIA

04 SOLUM Production Sites

06 Sales Offices

60% R&D Specialists

611 Global patents

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ESL

200%

| 2020 | 2021 | 2022 | 2023 |

· SOLUM has very strong business portfolio, mobile charger, television module business, power module, IoT device and Electronic Shelf Label

· SOLUM has the global leading customers such as Samsung, Sony and Intel in modular business and REWE, Metro, Loblaw, Lowe's, Macy's and Alibaba in ESL business.

· The financial stability enables SOLUM to invest a huge amount of money on R&D every year which makes us to be the innovation leader in ESL market

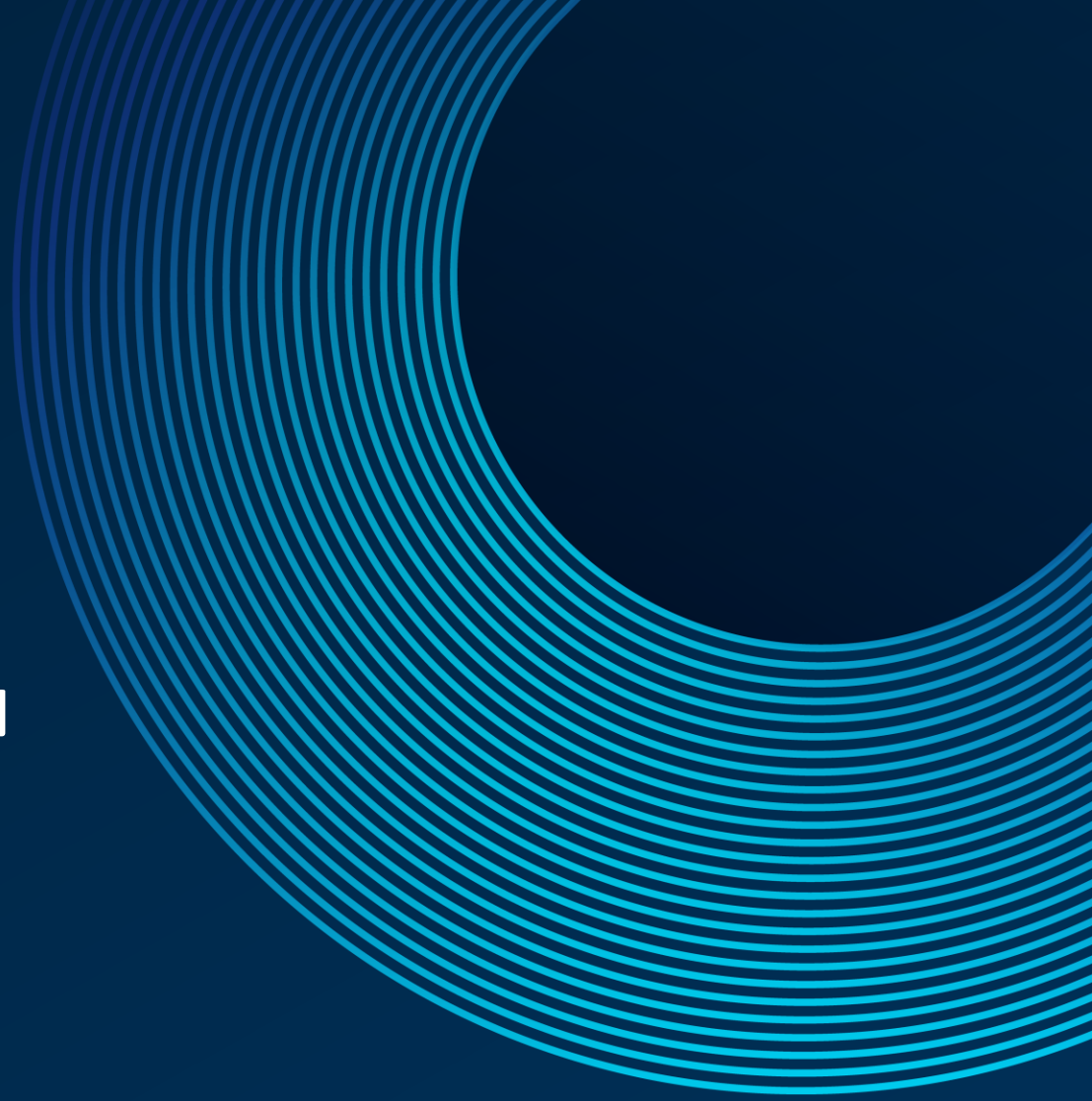Electronic Shelf Label　　　IoT　　　Mobile Charger　　　Power Module　　　Healthcare

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	2016	2017	2018	2019	2020	2021	2023
IoT		KEYCO Mini & Card	KEYCO GPS Tracker	KEYCO Air	SKT Smart Jikimi	Industrial GPS Tracker	Roommate · Trace Tag · SOLUM GPS Tracker · Slim Smart Tag
Power & MD			KEYCO Adapter / KEYCO 3in1 Multi Adapter			Jelly Wireless Charger / Smart Warmer Cup Gen.1	Smart Warmer Cup Gen.2 · SAR Adapter Line-up · Power Bank With Wireless Charger · Foldable Charger · Duo Wireless charger
Health care						Healthcare Smart Ring	Healthcare MINDY Band · Bio TWS
ESL	M2 Character Snap-on / M2 Snap-on	Security Tag 3in1 / Blinking Tag 2.9 / 4.2 / 13.3inch HomeDepot / Smart ESL Tag Macy's	2.6inch Security Tag	M3 Newton	ESL Beeper / IKEA NFC Label / Newton Lite / Circle type ESL For Macy's	Newton USB Gateway / Newton X 1 inch / 4.3inch LED Picking Label	Lidl Tag 5.85 / 9.7 / 12.2 inch / Newton X Peg Hook / Newton X 2.2inch Fashion Tag
							Newton Core · Newton S · Newton Eye / Newton Dual Screen · Newton Solar · Newton Link

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Ⅱ. ESL PRODUCT INTRODUTION

ABOUT ESL

PAPER LABEL

Inconvenience of removal and changing the stickers when need to update information

· Removal of stickers (environmental issues)

· Inconvenience of paper price tag removal and
  replacement when updating > work loss

· Reducing work efficiency when loss the work instructions

SMART LABEL

ESL LABEL

2.9" electronic shelf label product

· Real-time process check function

· Real-time stock check

· Available for up to 10 years (E-paper solution)

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ABOUT NEWTON

Newton

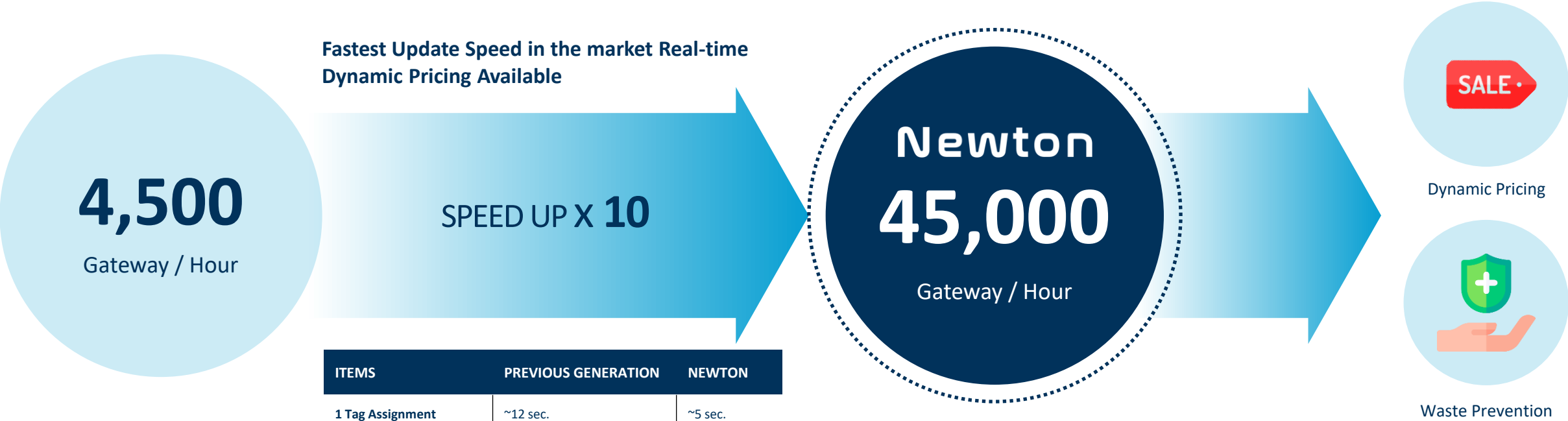## New definition, unlimited possibilities.

Please refer to the YouTube link for the full scale of Newton Introduction Video
https://youtu.be/EGkapvamwVo

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ESL | PERFORMANCE

Fastest Update Speed in the market Real-time Dynamic Pricing Available

4,500
Gateway / Hour

SPEED UP X **10**

Newton
45,000
Gateway / Hour

Dynamic Pricing

Waste Prevention

ITEMS	PREVIOUS GENERATION	NEWTON
1 Tag Assignment	~12 sec.	~5 sec.
LED Blinking Response	~12 sec.	~5 sec.

BENEFITS OF NEWTON'S REAL-TIME SPEED

· Faster installation and easier deployment

· Less risk for updates during store hours

· Shorter delta duration between ESL and POS

· Faster LED response for efficient Pick-by-Light application

SAMSUNG 65"
2 Year Guarantee included
★★★★☆ 4.5 / 4 reviews
749.00

SAMSUNG 65" 4K HDR TV
2 Year Guarantee included
★★★★★ 5.0 / 68 reviews   SAVE 150.00
BLACK TAG DEAL 599.00

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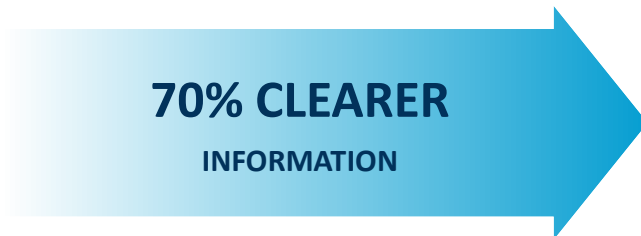
ESL I RESOLUTION PERFORMANCE

Industry leading display resolution with up to **30%** increased resolution for more crisp and sharper image

H Company 2.9"

112 dpi

(296*128)

70% CLEARER

INFORMATION

Newton 2.9"

144 dpi

(384*168)

Newton

1.6": **188 dpi** (vs 140 dpi)
2.2": **156 dpi** (vs 111 dpi)
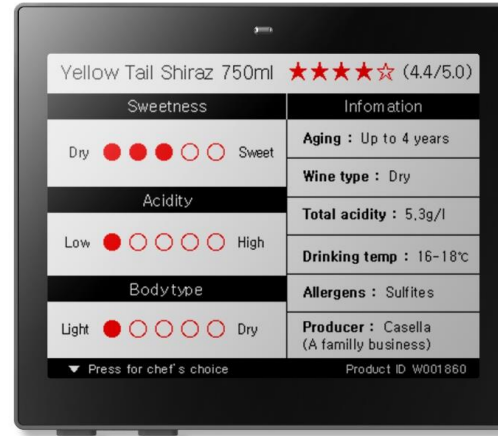2.6": **152 dpi**
2.9": **144 dpi** (vs 112 dpi)

Newton Lite

1.6": **188 dpi** (vs 140 dpi)
2.2": **130 dpi** (vs 111 dpi)
2.6": **152 dpi**
2.9": **144 dpi** (vs 112 dpi)

* Increased resolution is for the listed smaller size tags only, and is not for all tag sizes

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ESL I 7PAGES DETAILS

7 Pages

Product Details and Reviews

Allergen Information

Out of Stock Notification

· Up to 7 pages of storage

· Each page can have different layouts: additional product information, special promotions, inventory information, etc.

· Page flip via Newton Remote, PDA App, built-in buttons, or the server

· Page flipping can also be scheduled in advance through the server to prepare for flash sales or updates

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NEWTON I LINE-UP

INTERNATIONAL
DESIGN
EXCELLENCE
AWARDS

reddot award 2020
winner

11.6"

7.5"

6.0"

SAMSUNG
2.42 Cu. Ft. 3-Door French Door Family Hub Refrigerator

SPECIAL
VALUE

Customer Reviews ★★★★☆ 4.0 (297)
RF 258378EAEDR OLD 0.02-4.2B-422

Features
Cool Select Pantry™
Full-width pantry drawer that provides optimal temperature control
for your food storage needs with Deli, Fresh and chilled options.
Twin Cooling Plus®
Independent fridge and freezer controls keep food fresher longer.

Protection Plan
5 Years for 479.6 €

YOU SAVE 712
(20%) UNTIL 10/16

2398 €

PRICE AFTER DEDCOLINT

2.2"

2.6"

2.9"

1.6"

4.3"

Gateway

10 🔋

Up to 10 years battery life

Superior energy efficiency
for longest battery life in the market

10x

x10 faster update speed
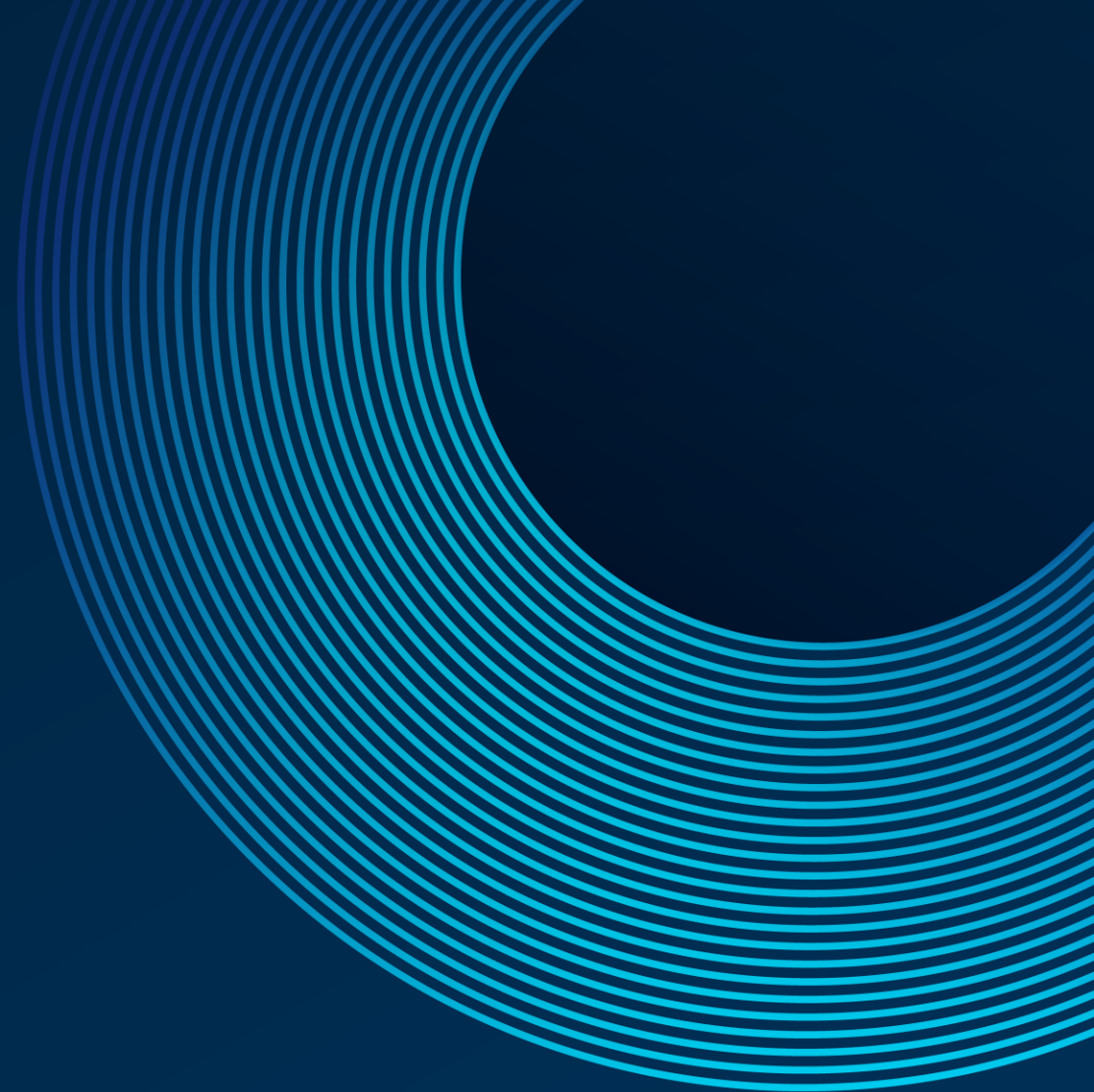
Average 5 seconds update speed

Multi-Function

· Button
· LBS

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Ⅲ. ESL PRODUCT LINE-UP

N E W T O N I B W R

Newton 3.52"

Newton 6.0"

Newton 4.2"

Newton 2.2"

Newton 2.7"

Newton 1.6"

Newton 2.6"

Newton 2.9"

Newton 4.3"

Newton 7.5"

Newton 11.6"

SOLUM
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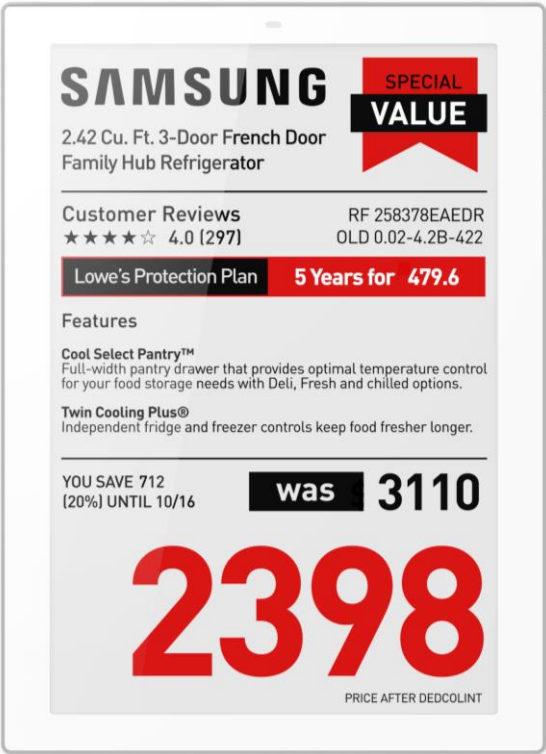
NEWTON I BWRY

Newton 1.6"

Newton 2.4"

Newton 2.9"

Newton 4.4"

Newton 6.0"

Newton 8.2"
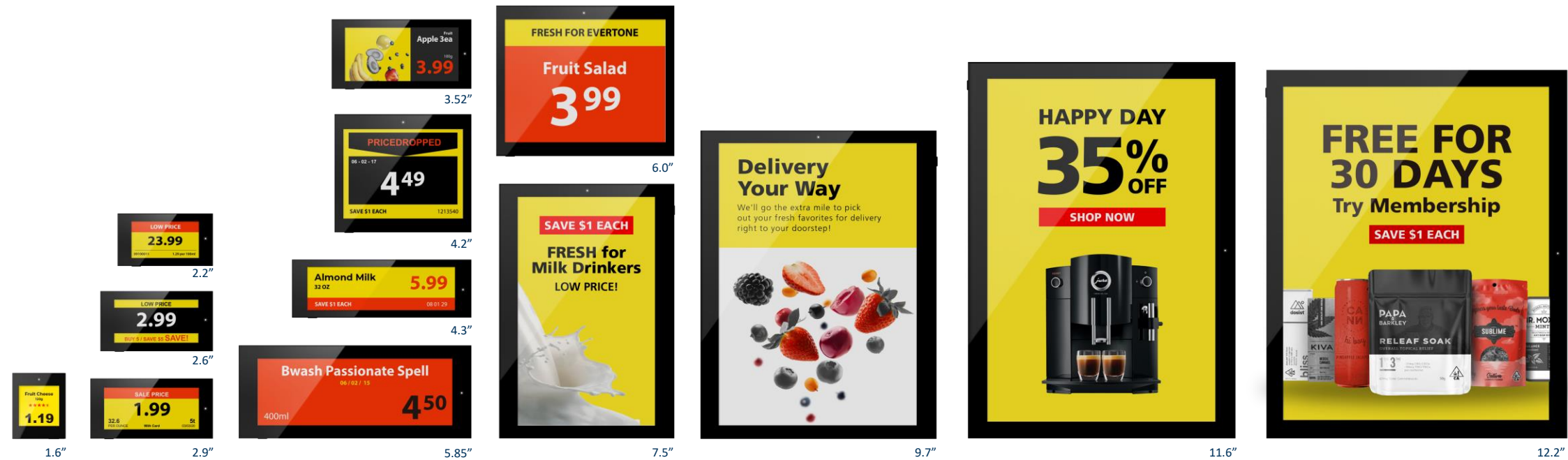
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NEWTON I SNAP ON COVER

CHEESE SNACK
Office and Kids Snacks, Variety Pack

0.11

GLUTEN-FREE

Almond Breeze Original
Almondmilk, 64 oz

0002777

2.29

BIO

Snack Pack Chocolate
4 Count Pudding Cups

Serving Size   92g

2.89

VEGAN

3.52"

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NEWTON I SNAP ON COVER 3.52"

3.52"

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NEWTON I PROTECTION COVER 2.9"

2.9"

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N E W T O N   S | 4 C O L O R   S L I M   B E Z E L   1 . 6 " ~ 1 2 . 2 "

1.6" 2.2" 2.6" 2.9" 3.52" 4.2" 4.3" 5.85" 6.0" 7.5" 9.7" 11.6" 12.2"

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NEWTON I 5/6/7 COLOR
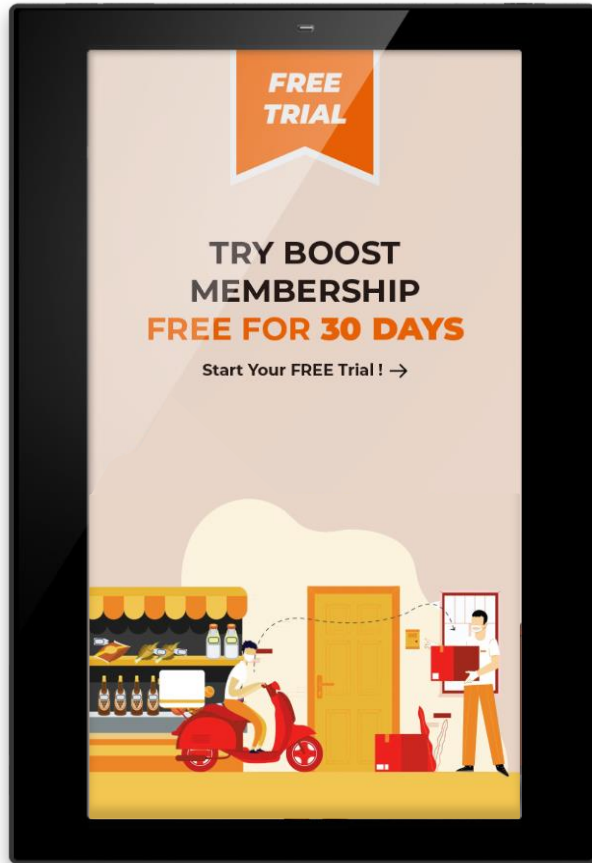
8.2" 5 COLOR (B/W/R/Y/Orange)
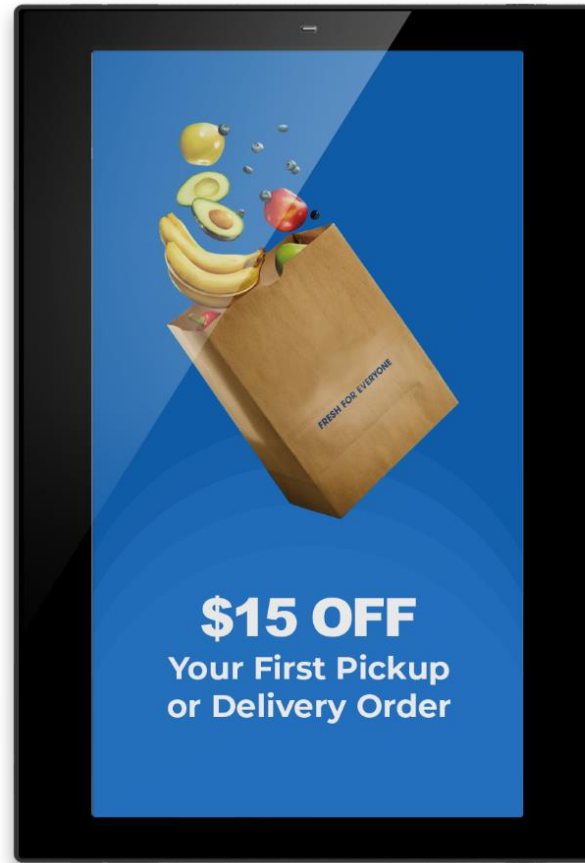
8.2" 6 COLOR (B/W/R/Y/G/Blue)
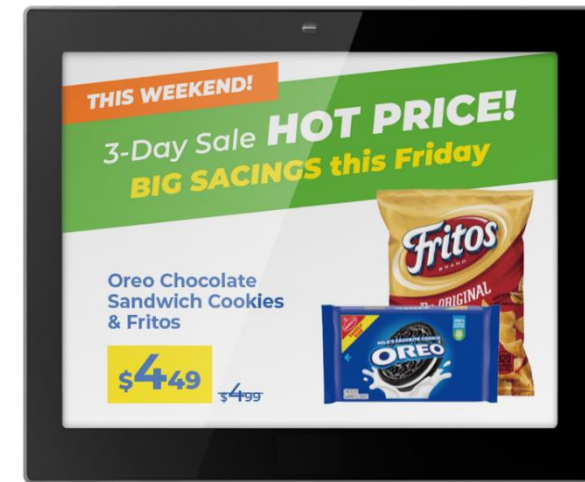
6" 7 COLOR (B/W/R/Y/O/G/B)
* Operating temperature is limited in 15℃ ~ 30℃

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NEWTON X | 1", 1.3", 2.2"

Experience a more seamless itemized product labeling with Newton X

This latest innovation from SOLUM puts Newton's unparalleled power and speed in

an extremely lightweight and compact package.

"Truly the world's smallest ESL"

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NEWTON DUAL SCREEN I BWRY 8.2", BWR 11.6"

BWRY 8.2"

BWR 11.6"

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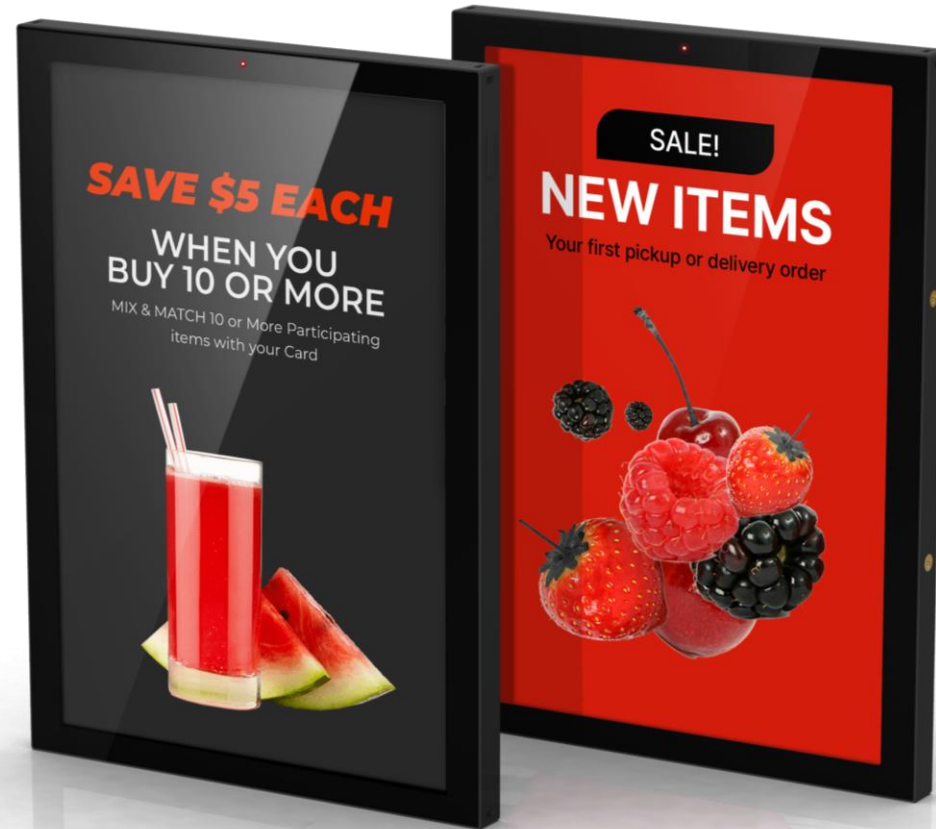
NEWTON DUAL SCREEN I APPLICATION 8.2", 11.6"

NEWTON DUAL SCREEN I APPLICATION 11.6"

NEWTON CORE I BWR

Fruit Cheese
120g
1.19

1.6”

Low price
1.69
SAVE!

2.2”

LOW PRICE
2.99
BUY $ / SAVE $$ SAVE!

2.6”

SALE PRICE
1.99
32.6 PER OUNCE   With Card   03/10/20

2.9”

FRESH FOR EVERTONE
Fruit Salad
3⁹⁹

2.7”

FRESH FOR EVERTONE
Greek Salad
6⁹⁹

3.52”

FREE TRIAL
TRY FREE FOR 30 DAYS!
Fruit Elements
MUESLI FRUIT & NUT

4.2”

Almond Milk
500g
5⁹⁹
SAVE 1 EACH

4.3”

SAVE $1 EACH
FRESH for
Milk Drinkers
FOR MILK DRINKERS

7.5”

Bwash Passionate Spell
06 / 02 / 15
400ml
4⁵⁰

5.85”

FRESH
FOR
MILK
DRINKERS
EMERALD
GLAZED PECANS
FRESH
FOR
PASGHETTI
LOVERS
HOT
Cajun

9.7”

BEST!
WEEKLY
DIGITAL
DEALS
Use each coupon 1time
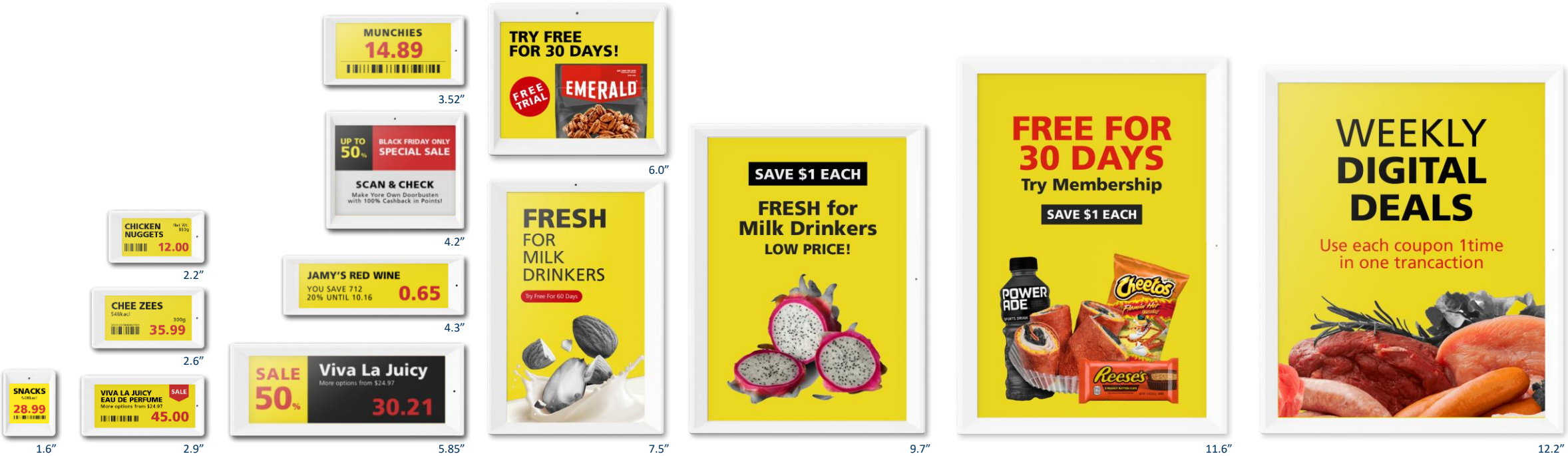in one trancaction

11.6”

FREE FOR
30 DAYS
Try Membership
SAVE $1 EACH

12.2”

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NEWTON CORE I BWRY

MUNCHIES
14.89

3.52"

TRY FREE
FOR 30 DAYS!

FREE
TRIAL

EMERALD

6.0"

UP TO **50**% | BLACK FRIDAY ONLY
SPECIAL SALE
SCAN & CHECK
Make Yore Own Doorbusten
with 100% Cashback in Points!

4.2"

CHICKEN
NUGGETS   Net Wt. 850g
12.00

2.2"

JAMY'S RED WINE
YOU SAVE 712
20% UNTIL 10.16   **0.65**

4.3"

CHEE ZEES
548kcal
300g
35.99

2.6"

FRESH
FOR
MILK
DRINKERS
Try Free For 60 Days

7.5"

SAVE $1 EACH
**FRESH for
Milk Drinkers**
LOW PRICE!

9.7"

FREE FOR
30 DAYS
Try Membership
SAVE $1 EACH

POWER
ADE
SPORTS DRINK

Cheetos

Reese's

11.6"

WEEKLY
DIGITAL
DEALS
Use each coupon 1time
in one trancaction

12.2"

SNACKS
548kcal
28.99

1.6"

VIVA LA JUICY
EAU DE PERFUME
More options from $24.97   SALE
45.00

2.9"

**SALE
50**%   Viva La Juicy
More options from $24.97
30.21

5.85"

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NEWTON CORE I APPLICATION 2.2"

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NEWTON CORE | APPLICATION 2.9"

NEWTON CORE | APPLICATION 5.85"

NEWTON CORE Ι APPLICATION 9.7"

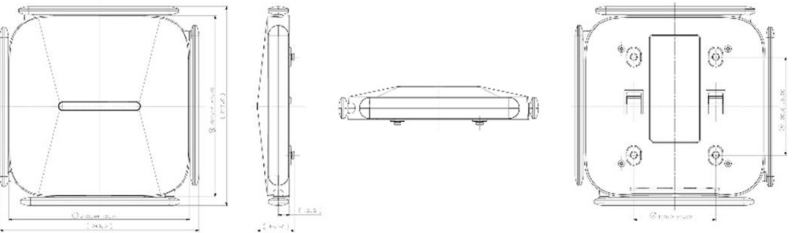# NEWTON SOLAR BATTERY-LESS I 2.9", 4.2"

*concept scene

Greek salad
100g / 130 Kcal

000100998
6.99

2.9"

Simple Truth Organic
Honeycrisp Apples Bag
Organic Produce / 2lb

$5 99

4.2"

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NEWTON GATEWAY I SPECIFICATION

Newton Gateway digital numbering system gives it a modern and digitized look
But more importantly, this makes it easier for managers to identify the Gateway's ID for internal device management purposes

Another improvement with Newton Gateway is that it has a tag and load-balancing system which means that the number of connected labels will always be evenly distributed

DIMENSION	9.56 × 9.56 × 1.79 inch
CPU	Quad Cortex-A53
FLASH MEMORY	4GB
RAM	2GB
RF INTERFACE	2.4 GHz SOLUM Proprietary
INTERFACE	Ethernet(10/100/1000 Mbps)
POWER CONSUMPTION	PoE (Power over Ethernet IEEE802.3af) / AUX DC Input (5-12V, 10W)
CAPACITY (2.9" BWR)	50,000 Labels
COVERAGE (INDOOR IN RADIUS)	UP to 30m
TRANSMIT FREQUENCY	2401MHz - 2480MHz
RECEIVE FREQUENCY	2401MHz - 2480MHz
ANTENNA TYPE	External Antenna
ANTENNA GAIN	External 3.5dBi
CHANNELS	80CH
OPERATING TEMPERATURE	0°C to +40°C
WEIGHT	650 g / 23 oz
ENCLOSURES	Plastic (ABS)

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NEWTON USB GATEWAY I SPECIFICATION

The USB Gateway is a stand-alone system
However, it can also be an extension to the Newton Gateway
It can offer additional capacity, memory, range, among others, without the added infrastructure

With Newton's Gateways, you can achieve a more seamless and automated data exchange between your electronic shelf labels and your command system

DIMENSION	7.79 × 0.53 × 1.18 inch
CPU	Quad Cortex-A53
FLASH MEMORY	4GB
RAM	2GB
RF INTERFACE	2.4 GHz SOLUM Proprietary
INTERFACE	USB 2.0
POWER CONSUMPTION	2.5W
CAPACITY (2.9" BWR)	50,000 Labels
COVERAGE (INDOOR IN RADIUS)	UP to 25m
TRANSMIT FREQUENCY	2401MHz - 2480MHz
RECEIVE FREQUENCY	2401MHz - 2480MHz
ANTENNA TYPE	Antenna (external type) 2EA / Antenna(internal type) 1EA
ANTENNA GAIN	External : 3.2dBi / Internal : 2dBi
CHANNELS	80CH
OPERATING TEMPERATURE	0°C to +40°C
WEIGHT	50 g / 1.75 oz
ENCLOSURES	Plastic (ABS), Aluminum

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AP&GW INTEGRATED SOLUTION GLOBAL AP COMPANY PARTNERSHIP

CISCO   **aruba**   **HUAWEI**   **+**   **SOLUM** Solution provider.

Software Management   Partnership   Infrastructure Management

Server
Interface with Customer Legacy Server (Customized)

Procedure Module
Tuning Performance

WiFi AP + Newton GW
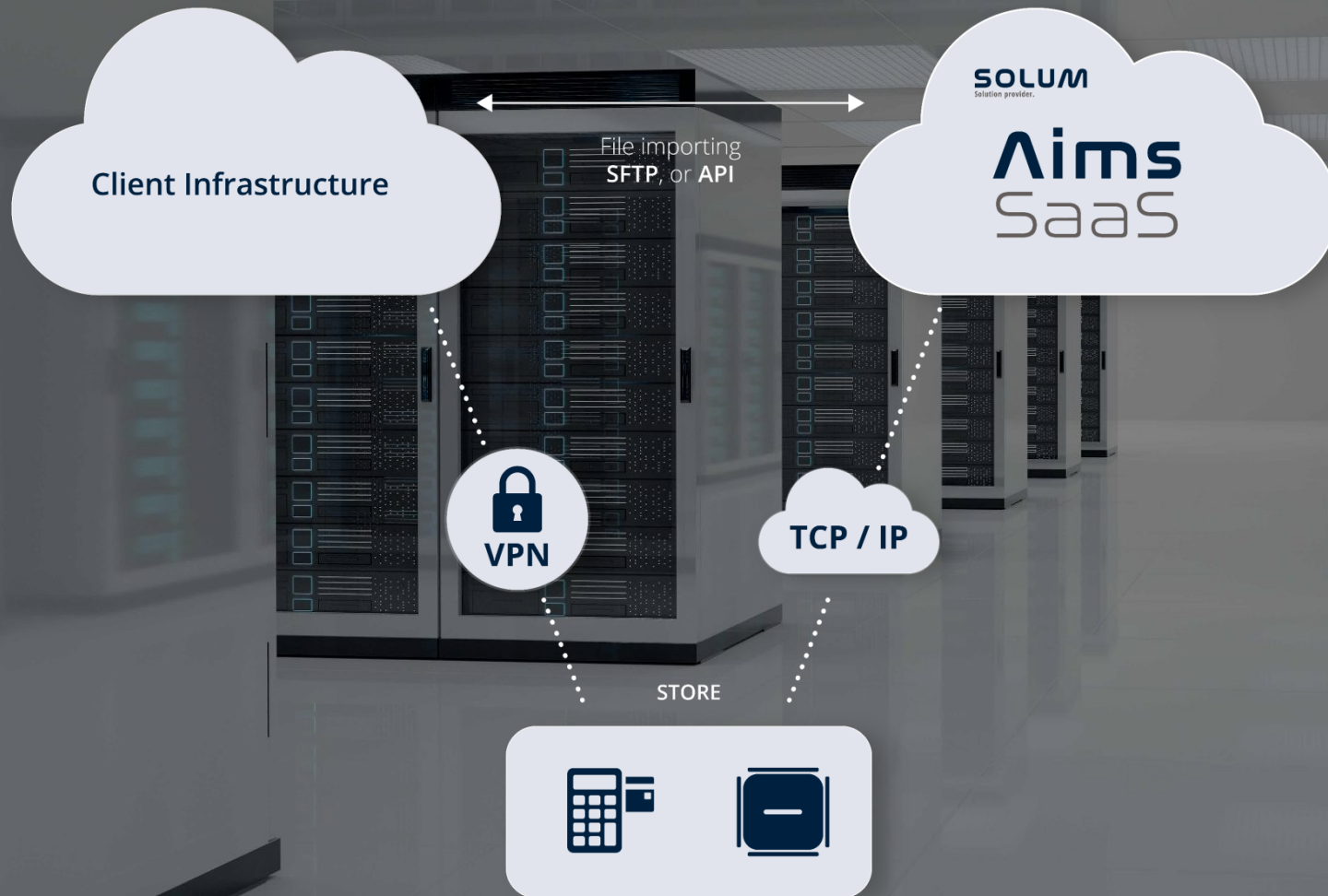TAG ASSIGN | SIGNAL | TAG UPDATE | TAG STATUS CHECK

Huawei AP
+ Built in IoT Card

Aruba AP
+ Newton USB GW

CISCO AP
+ Newton USB GW

ESL Labels

Energy Saving · Massive Network Capability · Easily Applicable Data · Infrastructure Cost Down

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Aims
SaaS

Advanced Information Management System

Client Infrastructure

File importing
SFTP, or **API**

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Aims
SaaS

🔒
VPN

TCP / IP

HTTPS and MQTT

STORE

HOW DOES AIMS SAAS WORK?

SOLUM AIMS SaaS can be integrated with any
kind of client ERP platform
(public cloud, private cloud/data center or a store server)

Aims SaaS is not requiring a particular
infrastructure for Cloud communication and just simply operated with
a standard SOLUM Newton Gateway

"HTTPS" and "MQTT over Web Sockets" using
security tokens known as Shared Access Signature (SAS) tokens over
TLS/SSL are used between AIMS SaaS and SOLUM Newton Gateway

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COSTCHART I ON − PREMISVSAIMSSAAS

Server operating and maintenance		$
Operational up-front costs (In-store set-up, BO file transfer, VPN, etc.)		$
Software maintenance (OS/DB upgrades, back-up and recovery system, etc.)		$$
Aims License		$$$
Hardware server investment (Lifetime 5 years)		$$$$
ESL IT resources (software installation, system monitoring, store registration, gateway registration, etc.)		$$$$$

Aims SaaS

$

$$$

COSTCHART (ON-PREMISVSAIMSSAAS)

With Aims SaaS, the cost of software can be spread over time and,
as it is hosted in the cloud, the upfront implementation costs
(e.g. CAPEX) are significantly lower than with more traditional methods.
On-premise software and SaaS can have significantly different long-term
costs. By examining how these costs are determined, you can identify
major savings

Store infrastructure preparation
(SaaS-GW Access)

Aims SaaS Subscription Fee for
Five Years*

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AIMS SAAS I SERVICE

SERVICE	ON-PREMISE SERVER	AIMS SAAS SERVER
Server Hosting (Scaling, Monitoring, and Maintenance)	Client	SOLUM
Software Installation	Client	Not Required
Server Hardware Cost	Client	Not Required
Server Hardware Maintenance	Client	Not Required
Data Security and Backup	Client	SOLUM
ESL System Management and Monitoring - Software installation and upgrades - Store registration and deletion - Gateway registration, deletion, configuration&upgrades - Status monitoring of Software, Gateway and Labels	Client	SOLUM or Client
Hotline service availability (Level 1 support - store-based operation support)	Not Available	Available
Server Level 2 & 3 Support (Support for IT Department)	SOLUM	SOLUM
Service Level : Resolution Time	Resolution is only available after DB access permission is given to SOLUM	Resolution can be done right after a failure report is given to SOLUM

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AIMS SAAS I SERVICE

SOLUM invests significantly in security, backups, and maintenance, ensuring that all business data is secured 24/7 from potential threats and attacks

IDENTITY MANAGEMENT
Authenticated and allowed access based on Microsoft Azure Active Directory Seamless and Secure access to the data to deliver effortless experience

API AUTHENTICATION AND AUTHORIZATION
Different permission levels can be provided for different users Continuously authenticate API calls registered users track users' requests - to block or throttle any request base on levels

APPLICATION DELIVERY CONTROL
Secure Sockets Layer termination End-to-end SSL/TLS encryption protocols WAF_v2 (by Azure) - Centralized protection

PRIVACY
All information stored on Azure storage and Azure SQL Database Both encrypt data at rest by default using Azure Disk Encryption

LOGGING AND AUDITING
All logging data is stored on the internal location Retention period is configurable to ensure compliance with data protection laws

BACK UP RECOVERY
Postgres SQL and MongoDB Atlas backup with recovery point objective of 6 hours

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SECURITY CERTIFICATIONS

**The security and privacy of your data in our cloud-based technology is an absolute priority for us
SOLUM guarantees you excellent service, unconditional security for your data and outstanding quality
of our systems as proven by renowned test procedures and certificates**

CSA-STAR

Aims SaaS is CSA-STAR certified

ISO9001

Our SOLUM Headquarters in Korea is ISO9001 certified

ISO27001

SOLUM fulfills the ISO 27001 certification of information security controls for any kind of digital information

ISO27017

SOLUM fulfills the ISO 27017 certification of information security controls based on ISO/IEC 27002 for cloud services

GDPR

The GDPR (General Data Protection Regulation) was developed to strengthen and standardize data protection for individuals in the
EU SOLUM is 100% DSGVO-compliant and treats all your data securely and confidentially

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AIMS SAAS I DISASTER RECOVERY

Disaster recovery strategies available to you within Aims SaaS can be broadly categorized into four approaches, ranging from the low cost and low complexity of making backups to more complex strategies using multiple active Regions

For a disaster event based on disruption or loss of one physical data center for a well-architected, highly available workload, you may only require a backup and restore approach to disaster recovery. If your definition of a disaster goes beyond the disruption or loss of a physical data center to that of a region or if you are subject to regulatory requirements that require it, then you should consider pilot light, warm standby, or multi-site active/active

Backup & Restore	Pilot Light	Warm Standby	Multi-Site active
RPO / RTO: **Hours**	**RPO / RTO:** **10s of minutes**	**RPO / RTO:** **Minutes**	**RPO / RTO:** **Real-time**
• Lower priority use cases • Restore data after event • Deploy resources after event • Cost $	• Less stringent RTO & RPO • Core Services • Start & and scale resources after event • Cost $$	• More stringent RTO & RPO • Business Critical Services • Scale resources after event • Cost $$$	• Zero downtime • Near zero loss • Mission Critical Services • Cost $$$$

Low → High

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AIMS SAAS SPECIFICATION

ITEMS	AIMS SAAS
Scalability	Automatic scalability
Capacity	Unlimited and flexible
SLA 24/7	Included
Performance (image generation)	1 million within 5 minutes
Multi-tenant (economies of scale)	Yes
Single Sign-On	Yes
Data Lake	EFK(Elasticsearch, FluentDand Kibana)
Cloud Service Provider	Azure
Security & Backup	Yes
Uptime	99.95%
Recovery Time	2 hours
Certification	ISO9001(HQ), ISO27001, ISO27017, GDPR, CSA-STAR

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Ⅳ. SMART STORE ORETAION

SOLUM CAMERA SOLUTION

AS-IS : TRADITIONAL WAY IN STORES

Hard to respond to planogram issue in real-time
(product misplacement, out of stock)

> Inefficiency of store management

TO-BE : BENEFITS WITH NEWTON TRAM
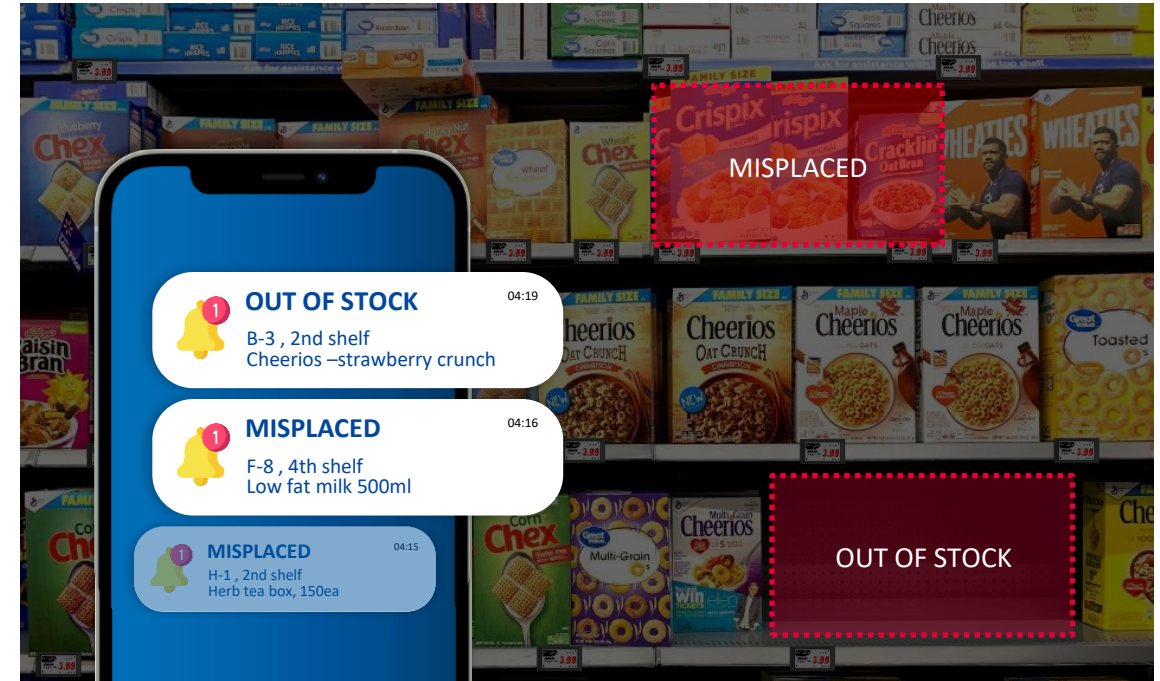
Push the alert to the staff from the dashboard,
possible to response to planogram issue

> Increase work efficiency

MISPLACED SOLUTION
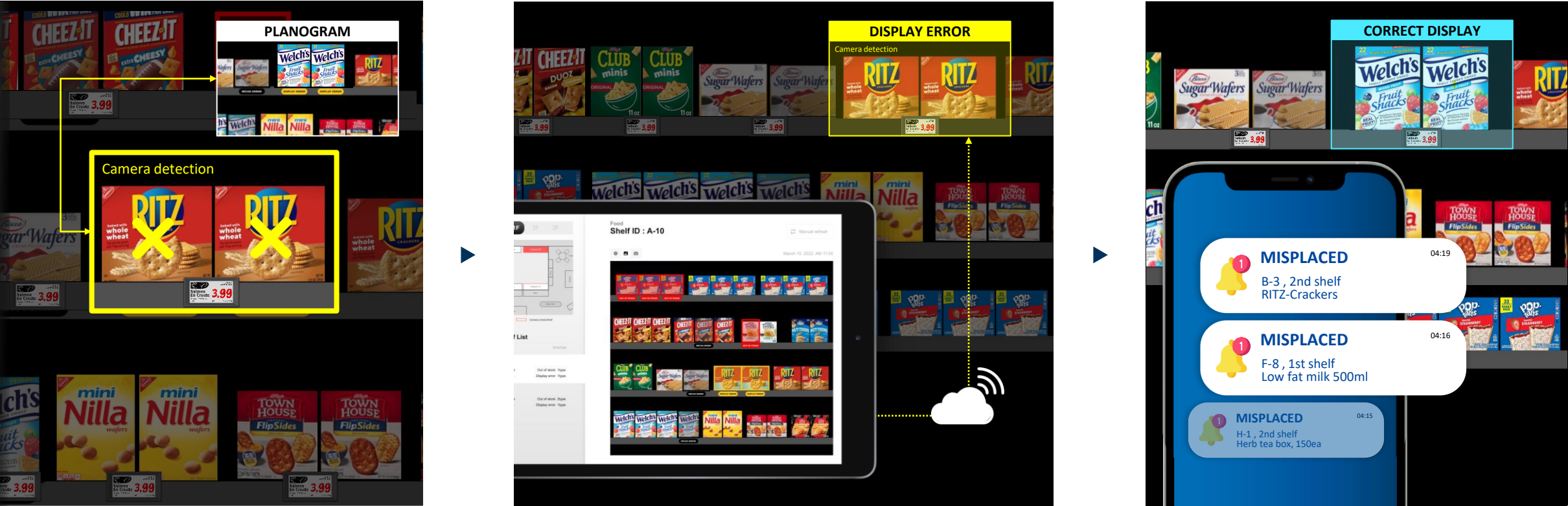
1. DETECTING MISPLACED

In case of product misplaced by shoppers, Newton camera can capture the scene

2. SOLUM NEWTON DASHBOARD

The captured scene was sent to the dashboard right away and analyzed which products with misplaced issues were based on the planogram

3. ALERT MESSAGE TO STAFF

Push the alert to staff to notify the current issue to solve the misplaced issue

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OUT-OF-STOCK SOLUTION

PLANOGRAM

Camera detection

OUT OF STOCK

OUT OF STOCK

Camera detection

Food
Shelf ID : A-10

REPLENISHMENT

OUT OF STOCK   04:19
B-3 , 2nd shelf
RITZ-Crackers

OUT OF STOCK   04:16
F-8 , 1st shelf
Low fat milk 500ml

OUT OF STOCK   04:15
H-1 , 2nd shelf
Herb tea box, 150ea
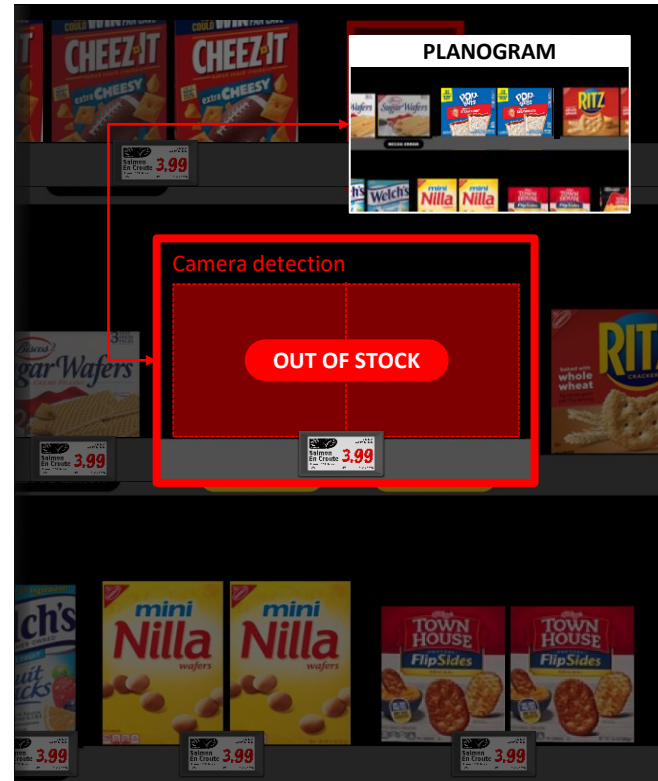
1. OUT OF STOCK

In case of out of stock,
Newton TRAM can capture the scene
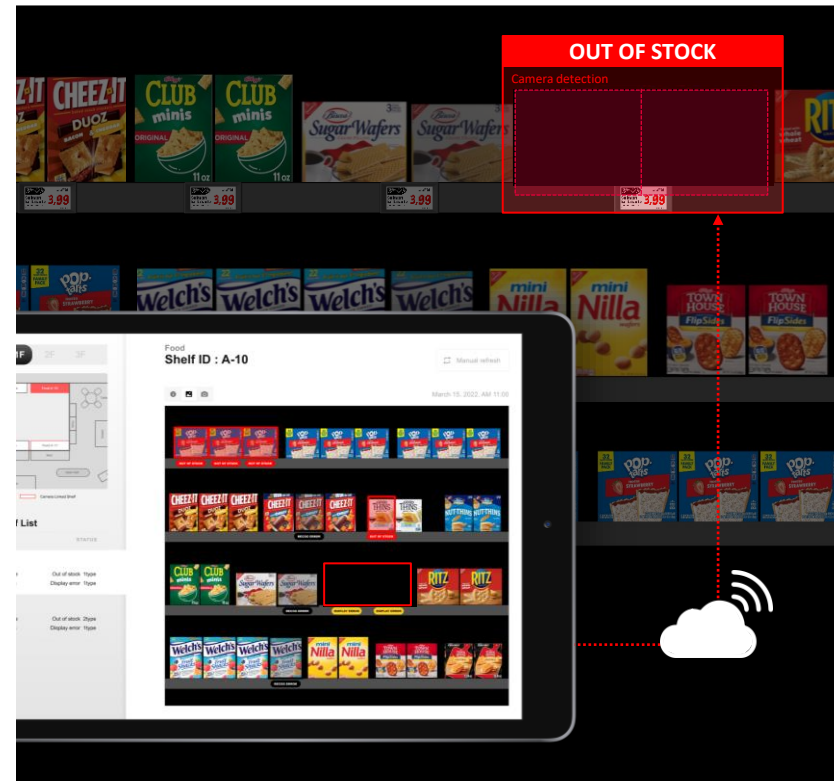
2. SOLUM NEWTON TRAM DASHBOARD

The captured scene sent to the Dashboard right away and analyzed which products with low stock or out of stock
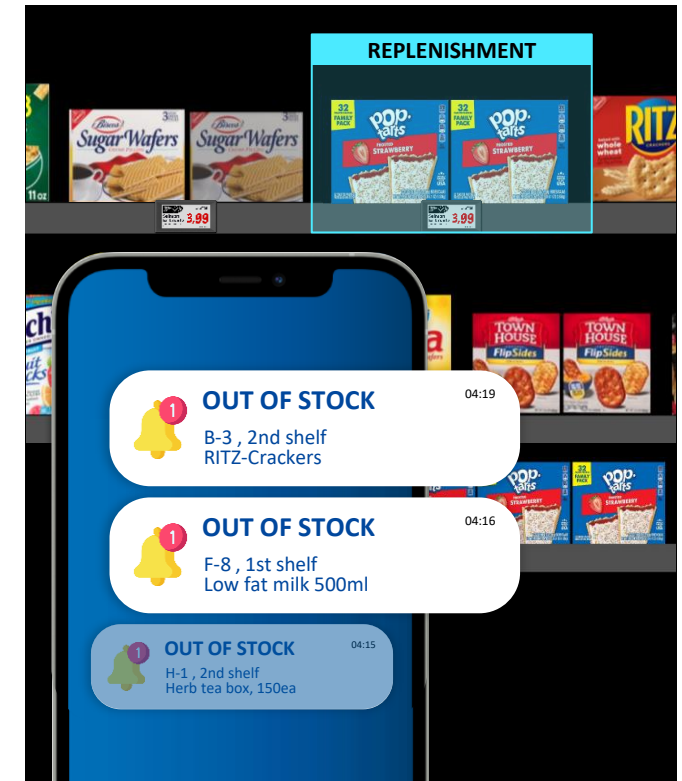
3. ALERT MESSAGE TO STAFF

1) Stock replenishment by staff
2) Smart ordering : In case there is no available stock in the store, staff requests for the delivery order to warehouse

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KPI MANAGEMENT

SOLUM

Dashboard

| Mapping | ROG creation |

18 USER1

POG   Camera solution

OOS	Misplaced	Mapping error	Detecting error
13	**3**	**2**	**0**

Report / monthly

Section

Camera solution

Section	Error	Result	Time
A	OOS	Completed	Error : 2022-08-18, 13:23:33 Completed : 2022-08-18, 13:35:58
B	MP	On going	Error : 2022-08-18, 13:23:33 Completed : 2022-08-18, 13:35:58
C	Error	Completed	Error : 2022-08-18, 13:23:33 Completed : 2022-08-18, 13:35:58

Report / weekly

Management

staff

Community

Report

Setting

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NEWTON EYE CAMERA I FIX VIEW
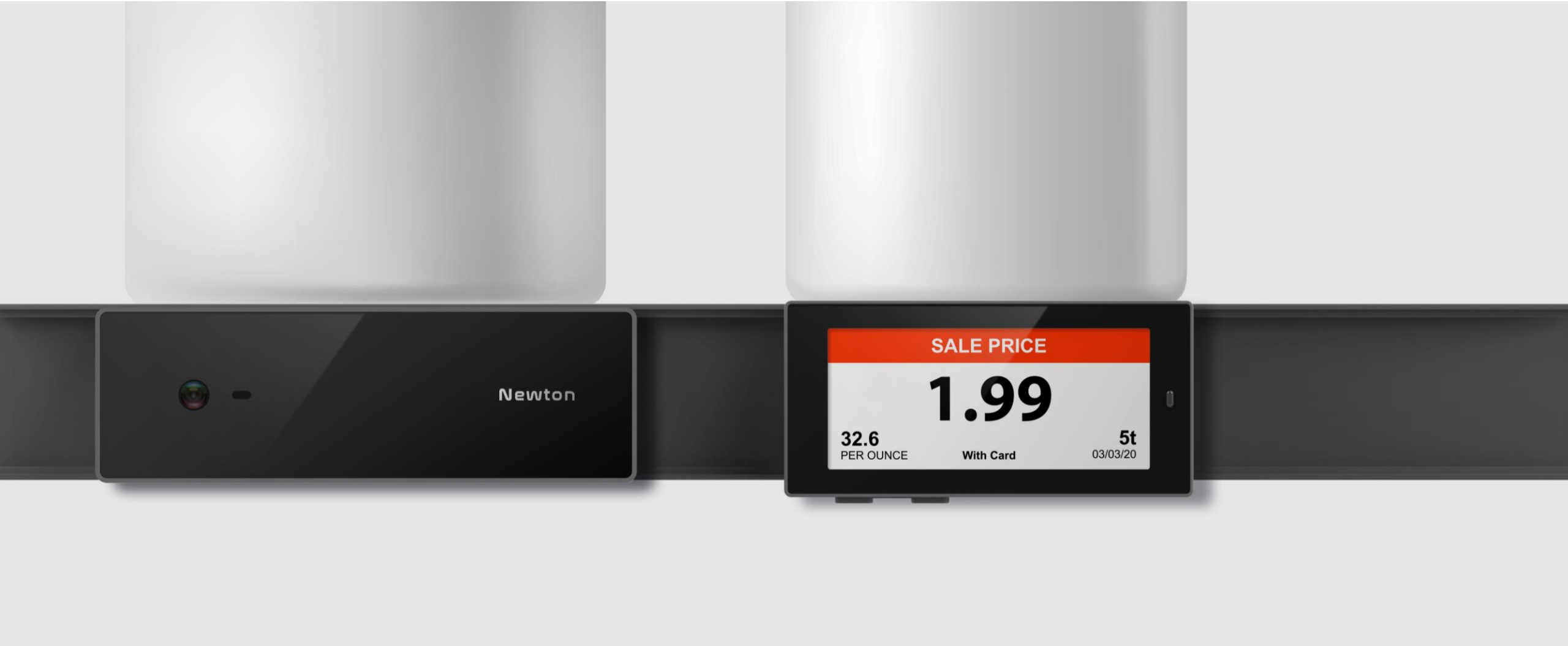
NEWTON EYE CAMERA I ACC VIEW

* Design to be changed

SALE PRICE

1.99

32.6
PER OUNCE   **With Card**   **5t**
03/03/20

Newton

Tilting

Top 20°

Bottom 20°

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Solution provider.
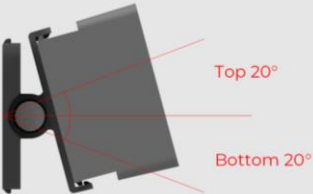
NEWTON EYE CAMERA I SPEC.

MODEL	TBD
FLASH MEMORY	(External) 128Mbit
RAM / ROM	512KB / 768kB
Wireless communications	IEEE 802.11 a/b/g/n compatible + 2.4 GHz SOLUM Proprietary Protocol on BLE
CHANNELS	BLE(Unlicensed) : 80CH WiFi: 14CH + 24CH
TRANSMIT FREQUENCY	2.4/5 GHz
RECEIVE FREQUENCY	2.4/5 GHz
ANTENNA TYPE	FF 5M Pixel(2592*1944) resolution for JPEG encoding
ANTENNA GAIN	Max 80º
RESOLUTION	Min 80cm
ANGLE OF VIEW	1.5M ~ 3M
FOCAL LENGTH	2.5M / 1.87M (W / H)
NFC	NFC Forum Type3 for assign
DIMENSION	113.8mm * 37.0mm * 24.4mm
POWER SOURCE	AA Battery 4EA
COVERAGE (INDOOR IN RADIUS)	UP to 25m
INTERFACE	USB type C
OPERATING TEMPERATURE	0°C to +40°C
WEIGHT	147.7g
ENCLOSURES	Plastic (PC)
ETC	Built-in face masking with AI engine

※ This specification May varies depending on the installation environment and user scenario.

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NEWTON CAMERA I LBS SOLUTION (1/2)

| AS-IS : TRADITIONAL WAY IN STORES | TO-BE : BENEFITS WITH NEWTON EYE |

DIFFICULTY OF RESPONSE IN REAL-TIME

When customers and staff face with planogram issues, it is difficult to solve them right away
Because customers need to find staff first and then staff can help them out to meet their needs
After all, it takes time to take action for it
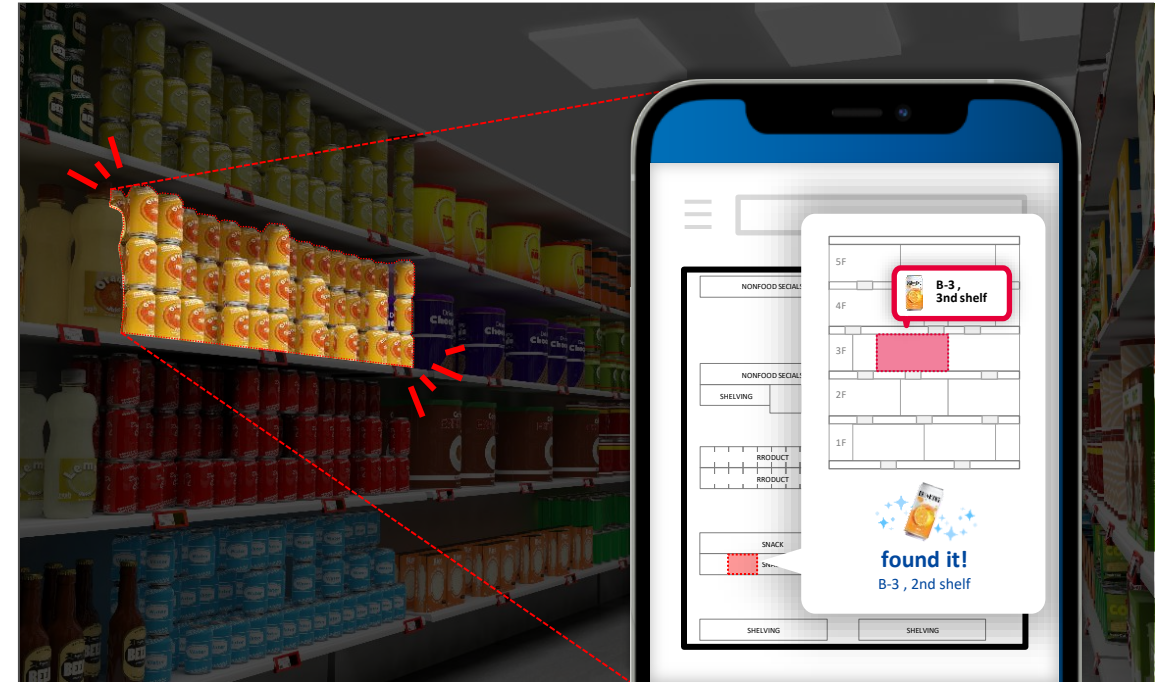
HELPERS FOR BOTH CUSTOMERS AND STAFF

In case of planogram issues such as out of stock and misplacement product, both customers and find
the product on their mobile device (which shows where it is located on) thanks to the
tag assigned to the product. Therefore, customers don't need to ask the assistance and staff
can replenish products, and replace items to the right place

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NEWTON CAMERA I LBS SOLUTION (2/2)

TAKE TIME TO SOLVE PLANOGRAM ISSUES

Even though staff checks planogram regularly, it is difficult to solve the planogram issues right away because they don't know what/where the product is located on
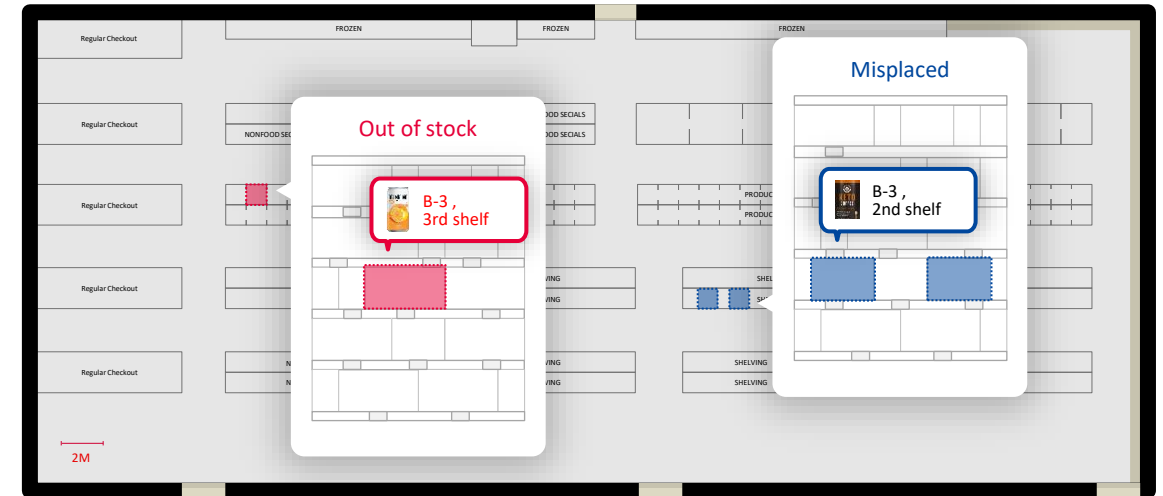
TAKE PROMPT ACTION

Newton eye can capture the products assigned to each tag so in case of out of stock, and misplaced products, staff can know where the issues come out. Accordingly, they replenish items and replace products to the right place

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AUTO-ASSIGN I REAL-O-GRAM SOLUTION (1/2)
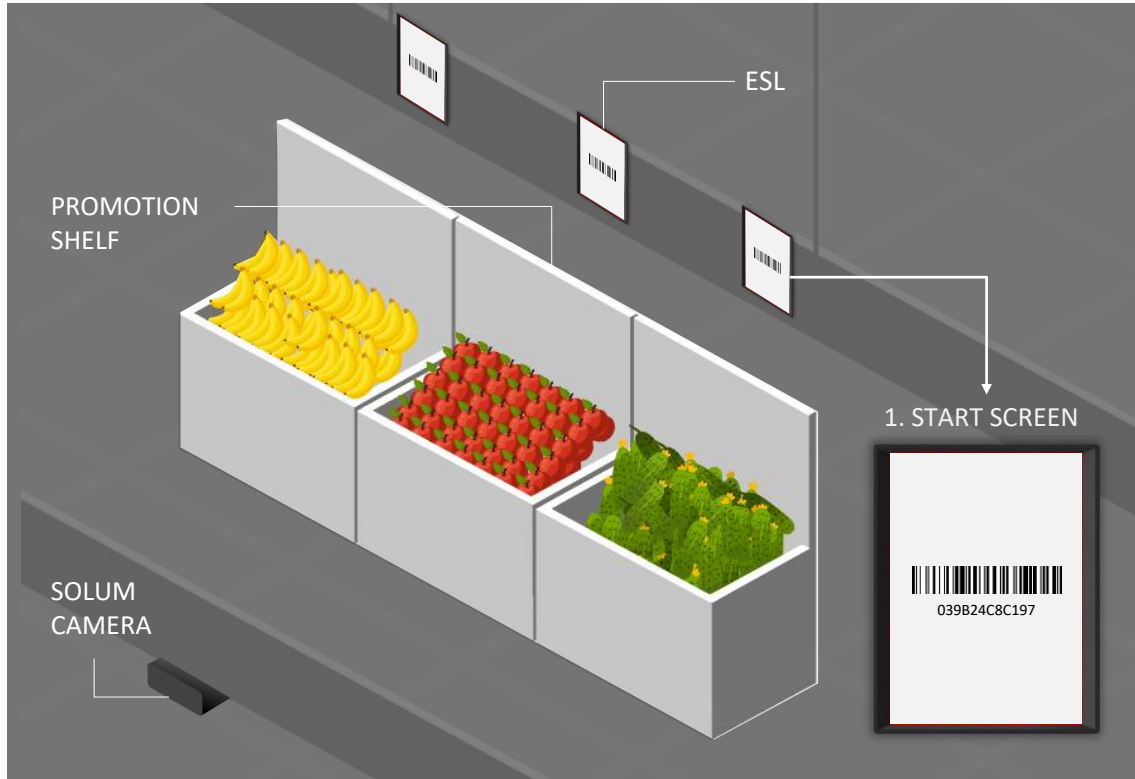
01

Auto-assign solution will help to automatically update ESL pricing information from that of real product based on POG
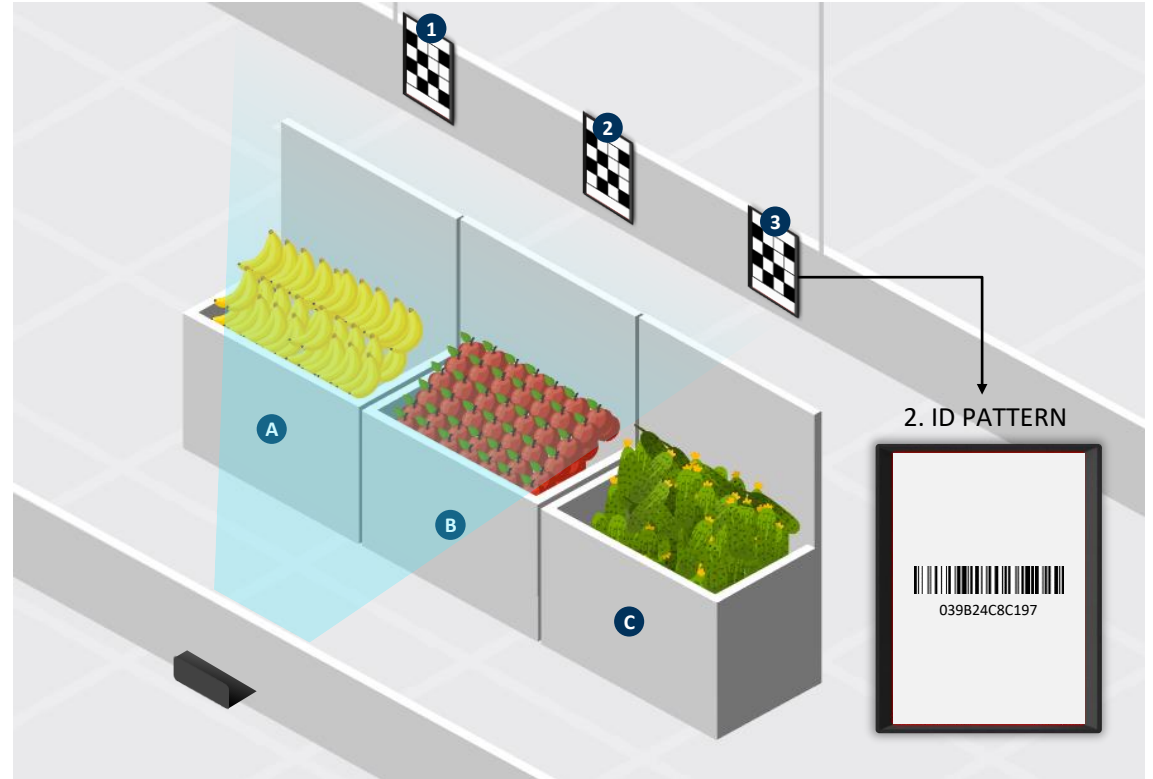
02

There is a camera under the promotion board, and large ESL on the other side displays ID pattern to help identify which ESL should be connected to the product

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AUTO-ASSIGN I REAL-O-GRAM SOLUTION (2/2)

3. PRICING SCREEN

SALE
Banana
4.39

AUTO ASSIGNMENT

A — Auto Assign → 🍌 → 1 — SALE Banana 4.39

B — Auto Assign → 🍎 → 2 — SALE Apple 4.39

C — Auto Assign → 🥒 → 3 — SALE Cucumber 4.39

03

After identifying, ESL will update price information by that of each promotion product
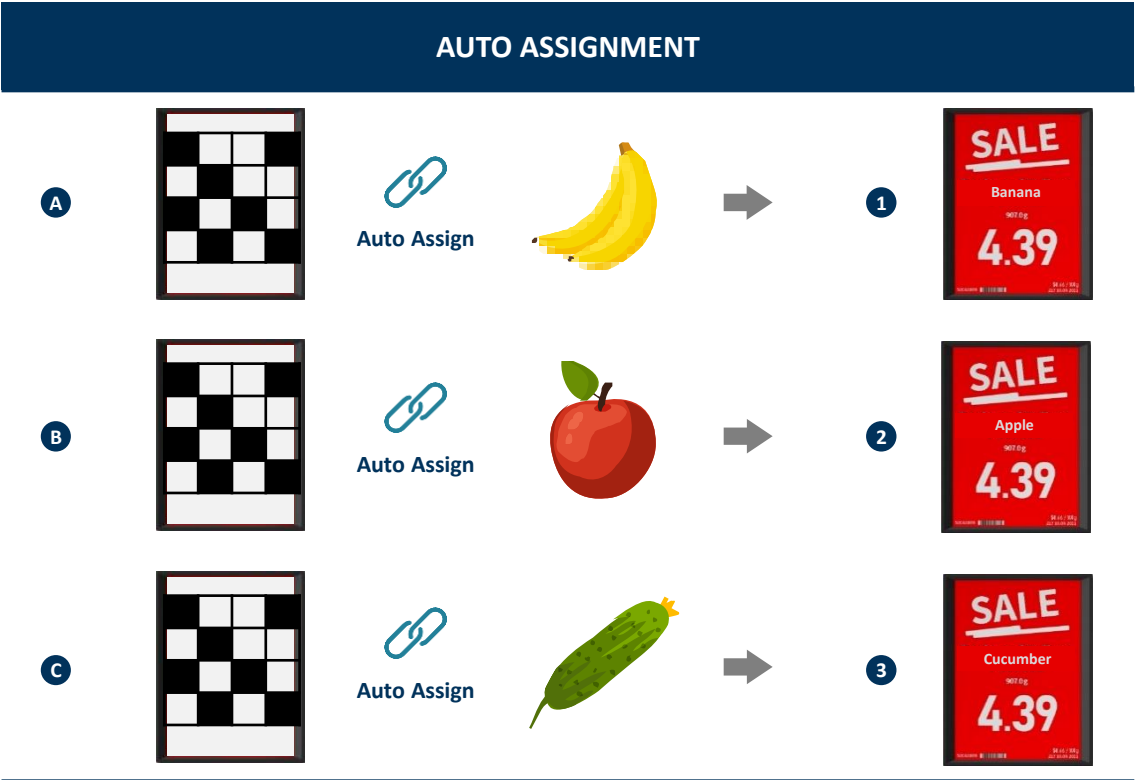
04

We expect this solution will help to increase work efficiency in each store

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POWERED-RAIL

*concept scene

Detach

Battery

Attachment

Rotation

Back side
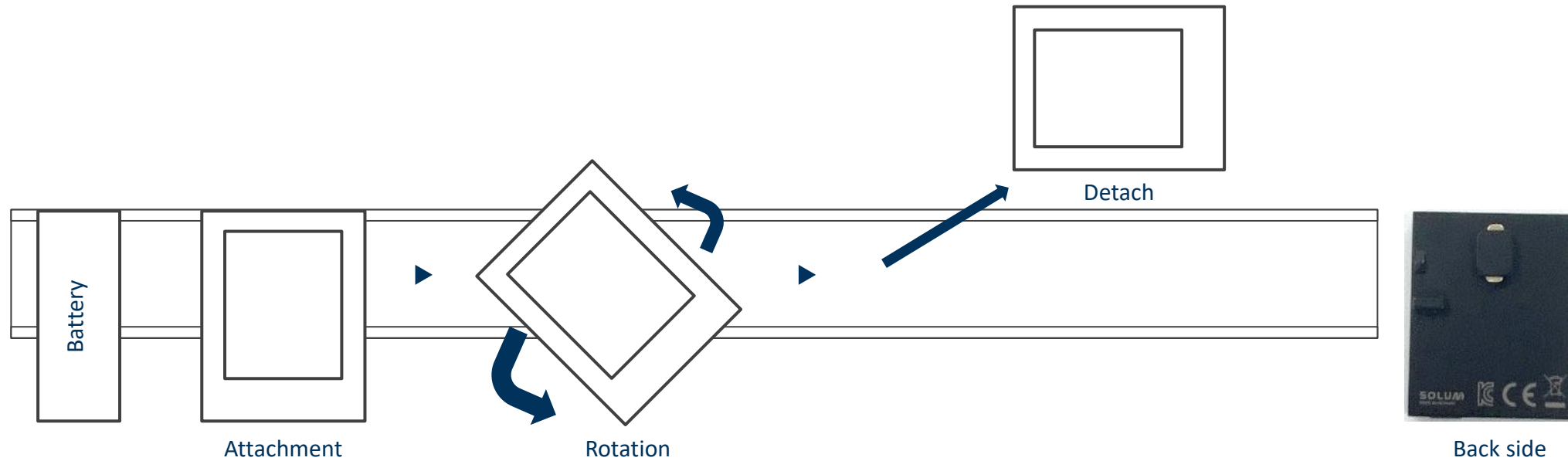
ROBOT SOLUTION I SCANNER BOT
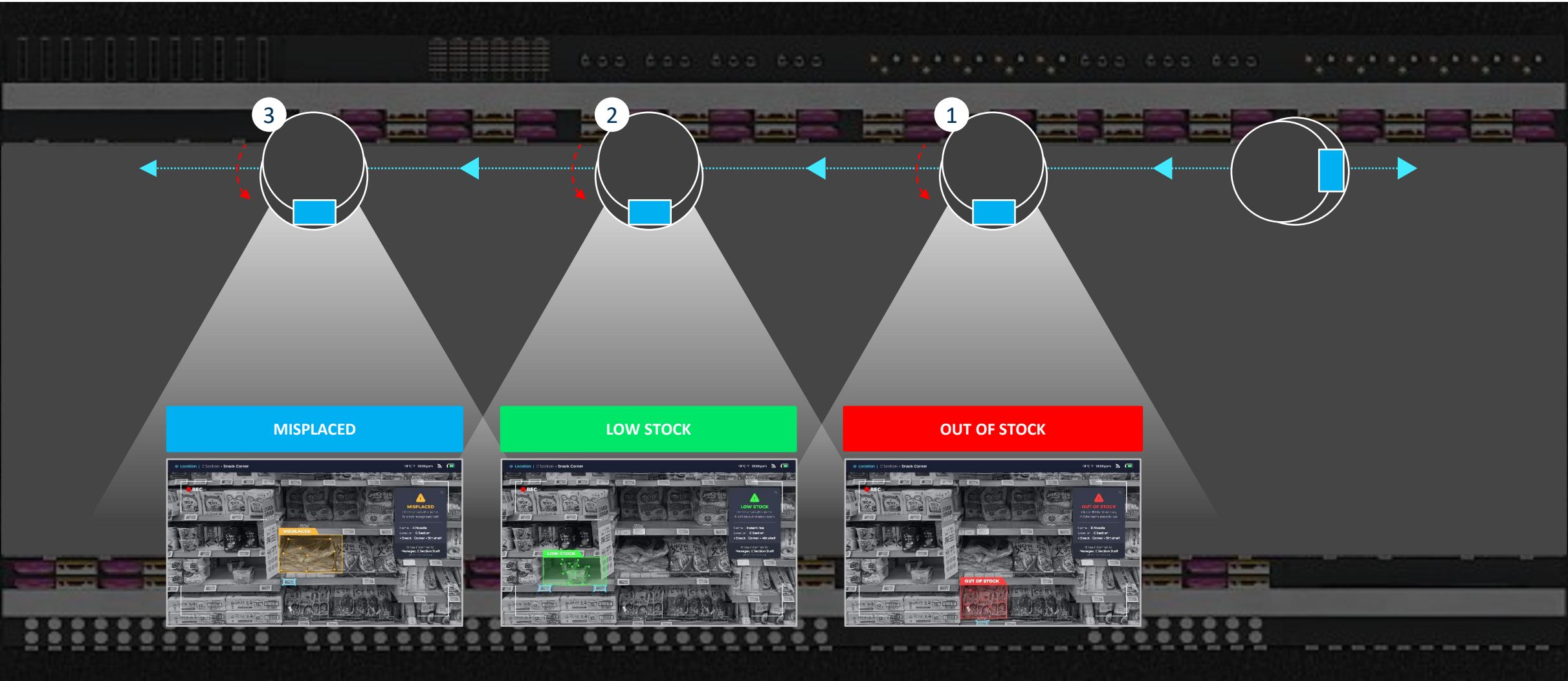
ROBOT SOLUTION I SCANNER BOT
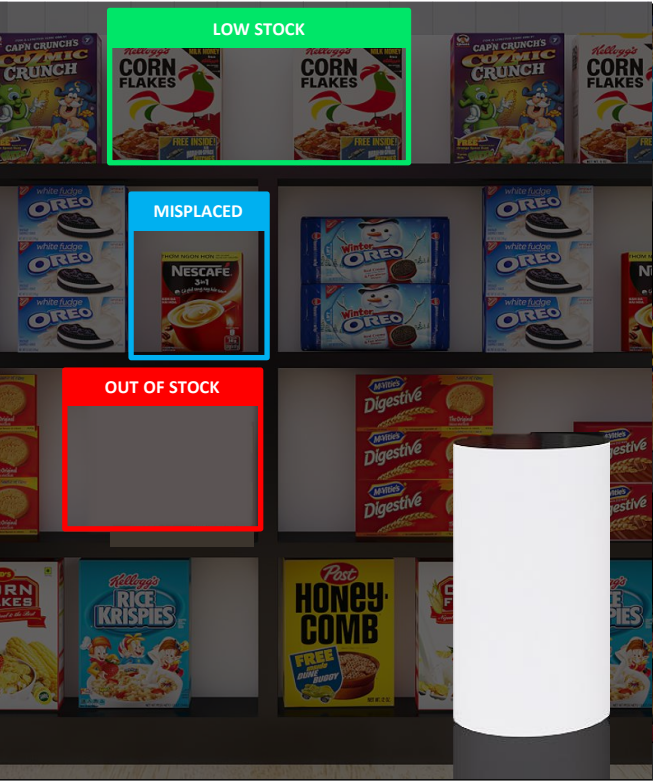
1. TAKE PICTURES OF SHELVES

The robot regularly take pictures of every shelves to check the status of it
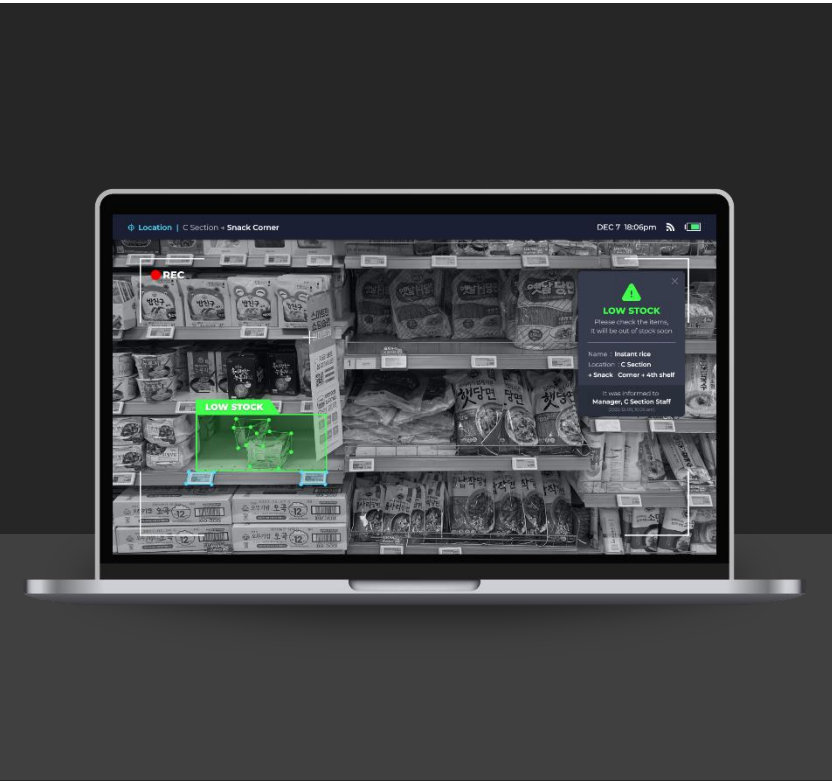
2. ANALYSIS AND CLASSIFIE ISSUES

The pictures goes to system and analysis and classified the issue of Shelves (OUT OF STOCK, LOW STOCK&MISPLACED)

3. ALERT MESSAGE TO STAFF

Push the alert to staff to notify the current issue in order to solve issue

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PICK BY LIGHT WITH 7 COLOR LED BLINKING

When a customer orders online, the list is sent to the staff via mobile

Online orders are displayed on the mobile and each staff can select which order to pick

LED on the 4products blinks at the same time The staff finds the products with LED and puts them on the tray

Press the button on the label or scan the product's barcode to remove it from the order list
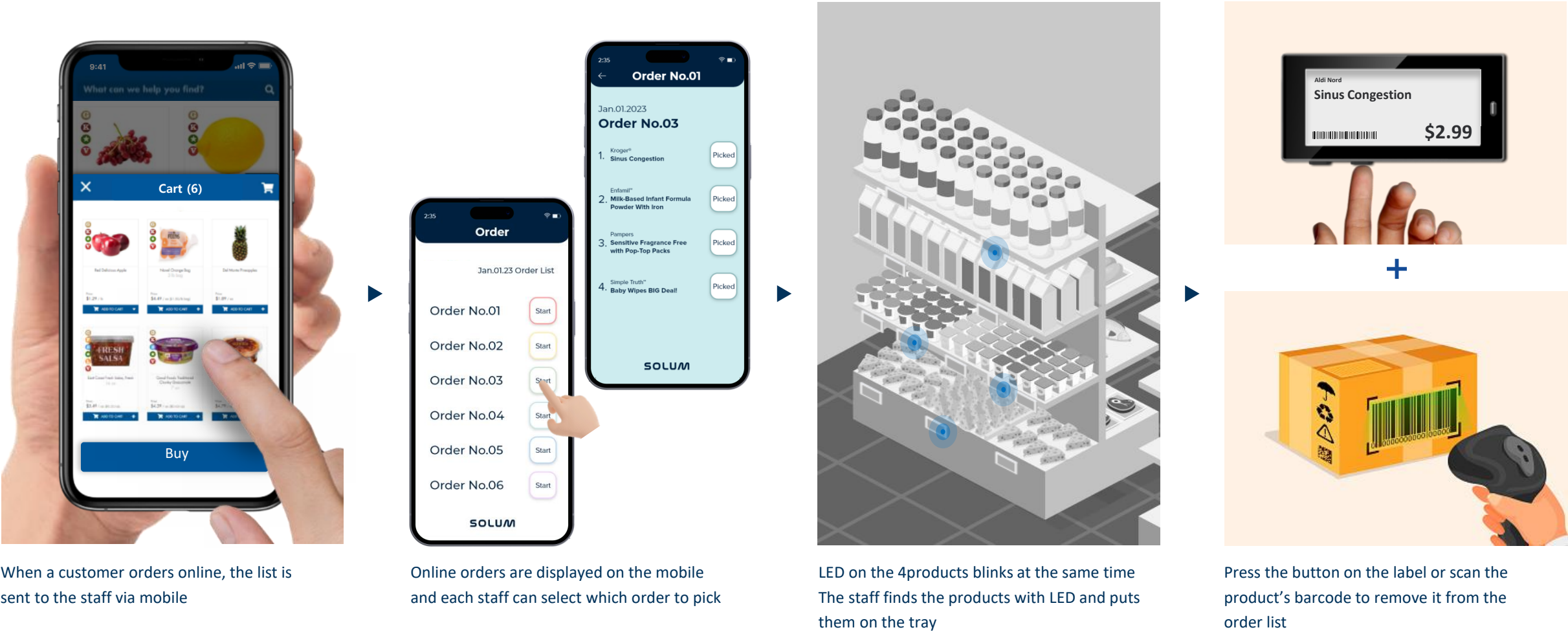
PICK BY LIGHT WITH 7 COLOR LED BLINKING

AIMS LINK SOLUTION
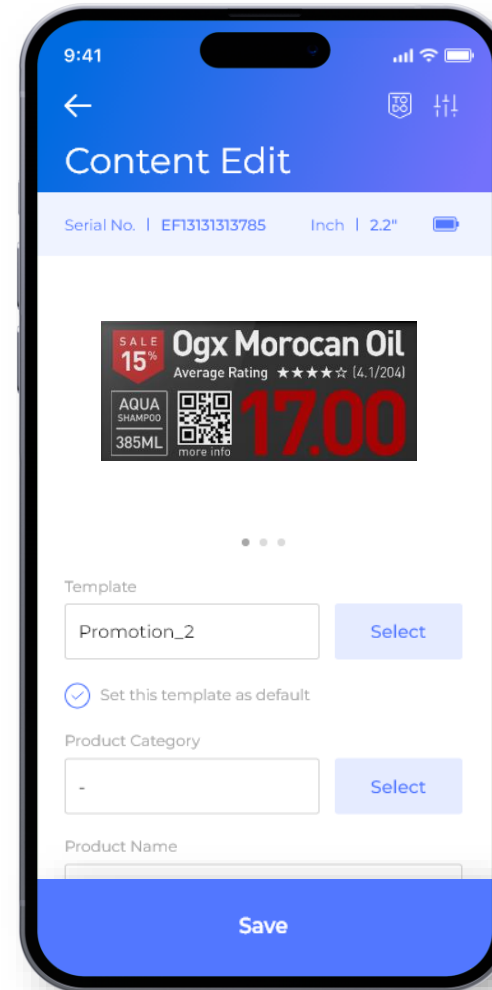
Aims Link can change the product price in real-time without installing other infrastructure in the store and can be used intuitively without special employee training

Demo video (Newton link) : Newton link video

Aims link pairing

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AIMS LINK SOLUTION I INITIAL REGISTRATION
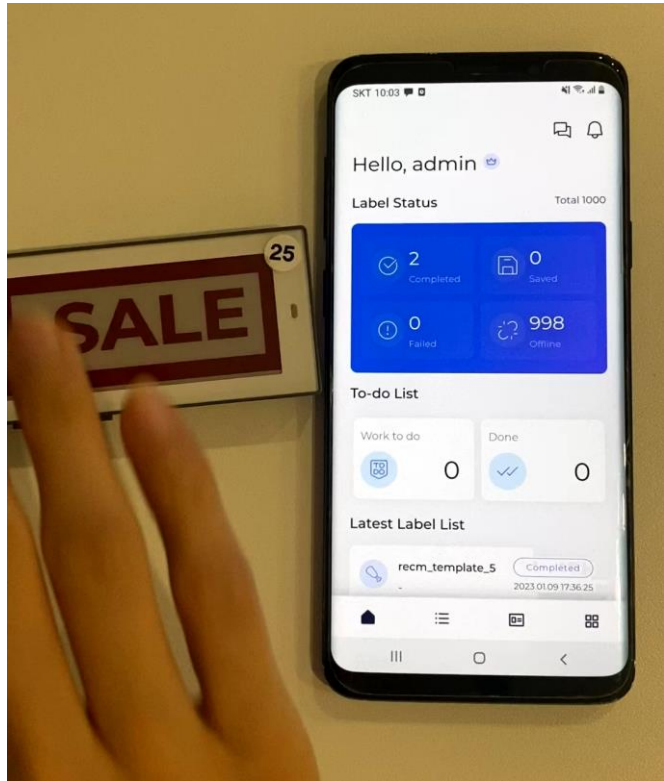
▶ [Demo video (Pairing)](#)

01
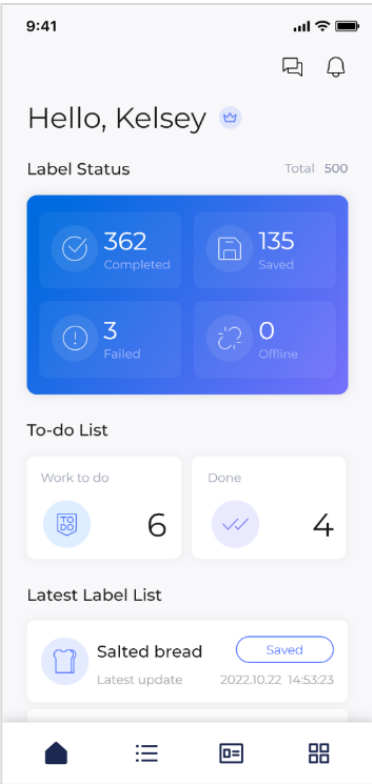
Press the button on the label on the home page
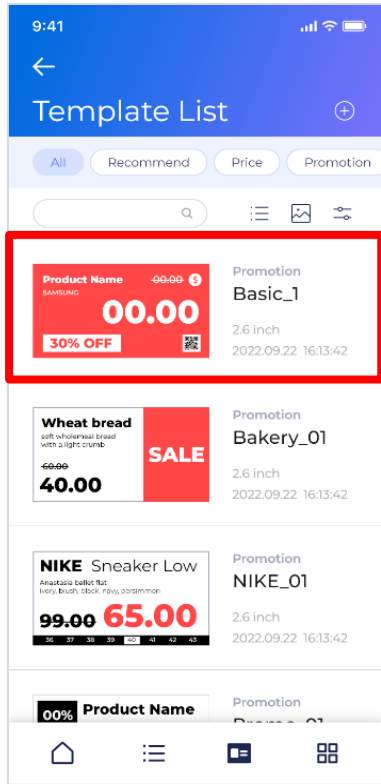
02

Select template and edit the contents
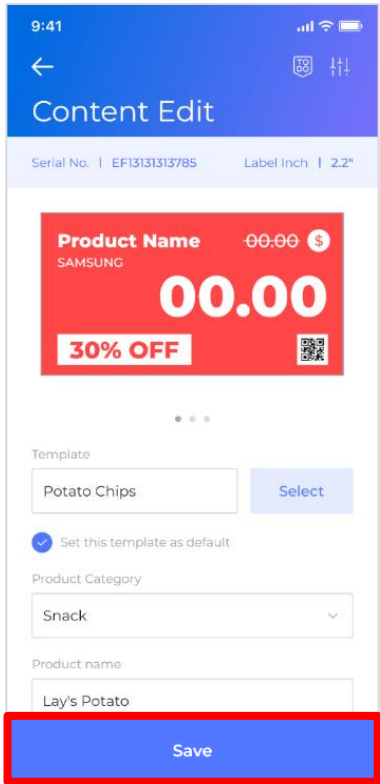
03

It is displayed on the label

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AIMS LINK SOLUTION I INITIAL REGISTRATION ON THE LIST
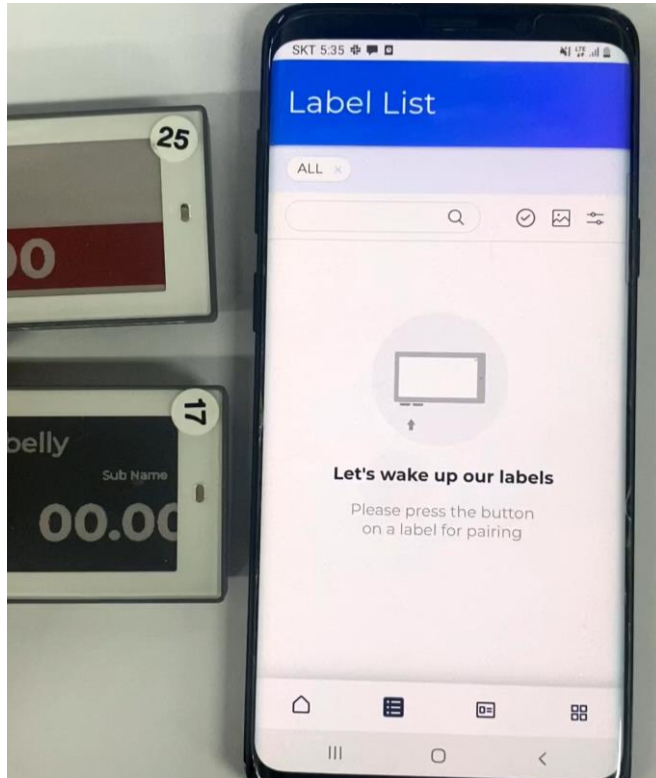
▶ [Demo video (Pairing on the list)](#)

01
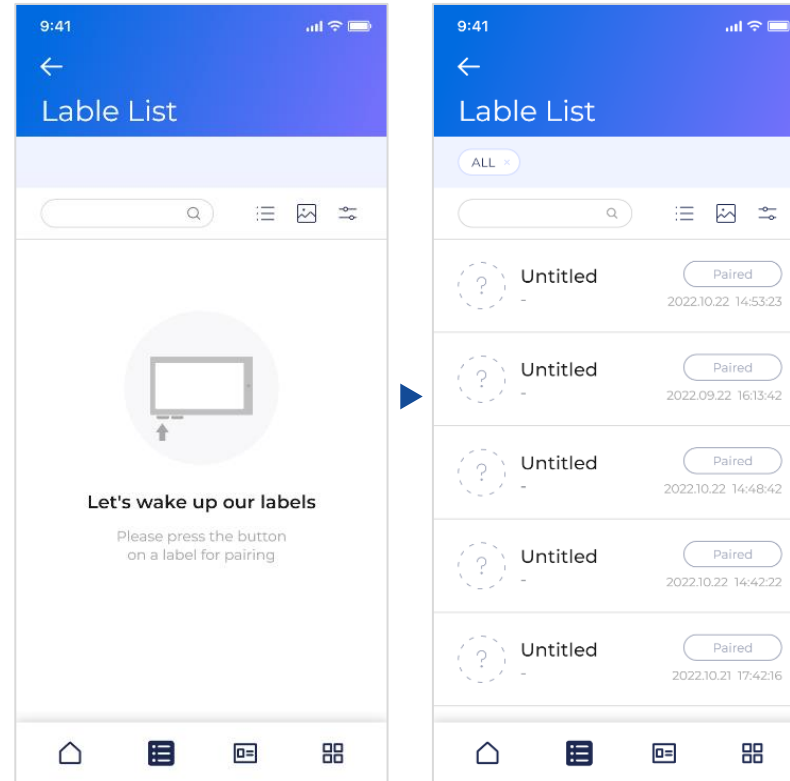
Press the button on the label on
the label list page

02

The empty label is registered on
The list

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AIMS LINK SOLUTION I INITIAL REGISTRATION ON THE LIST
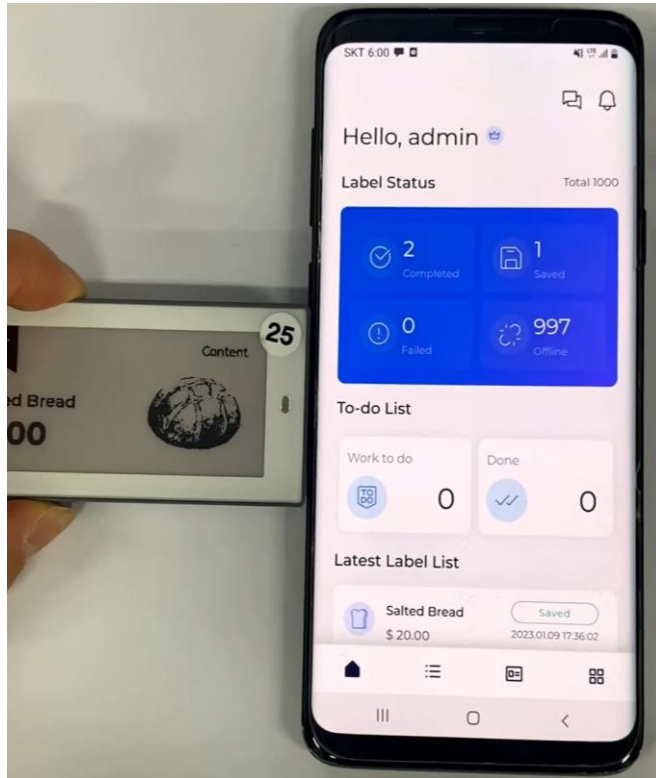
▶ Demo video (Editing)

01
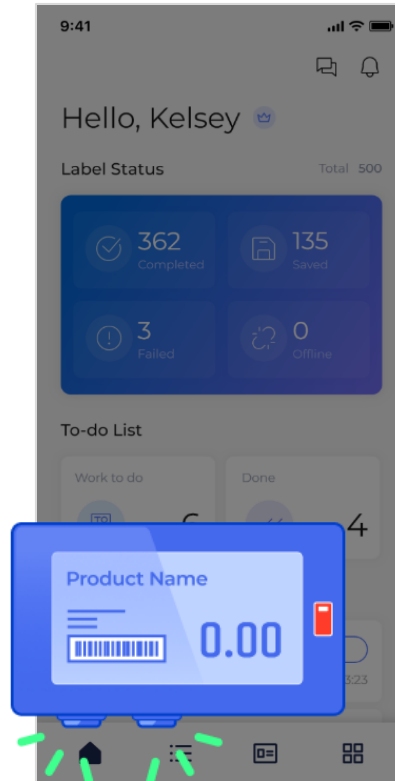
Press the button on the label on the home page
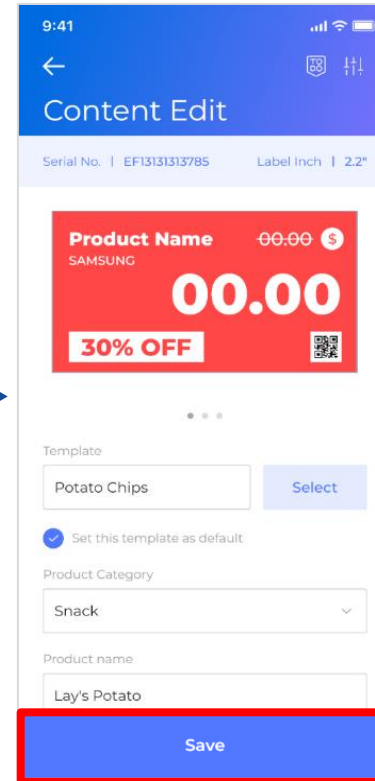
02

Edit the contents and it is Displayed on the label

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AIMS LINK SOLUTION I INITIAL REGISTRATION ON THE LIST
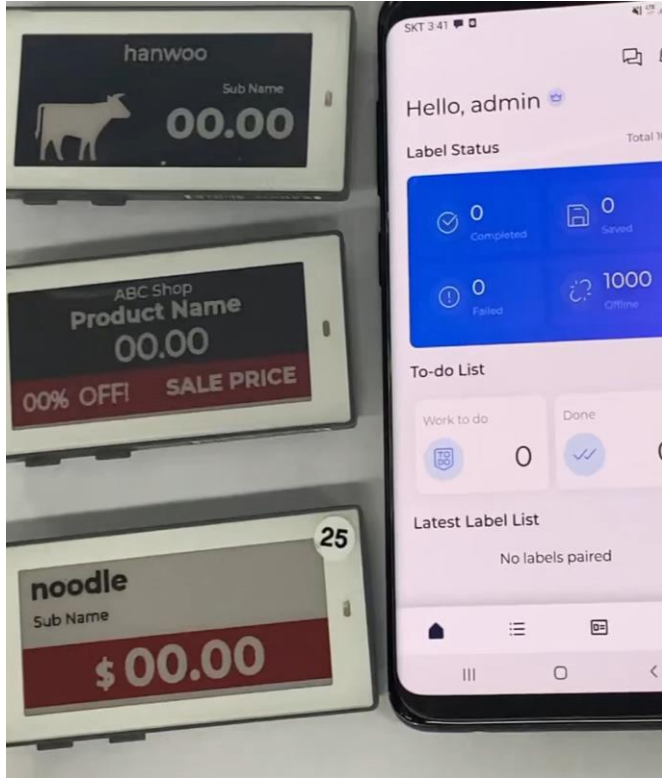
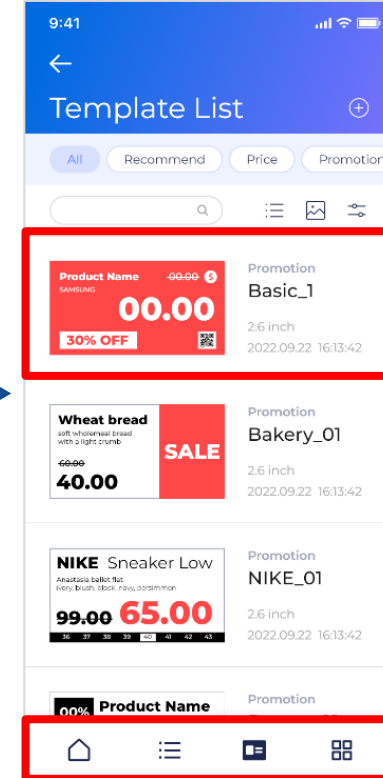[Demo video (Multi labels editing)](#)
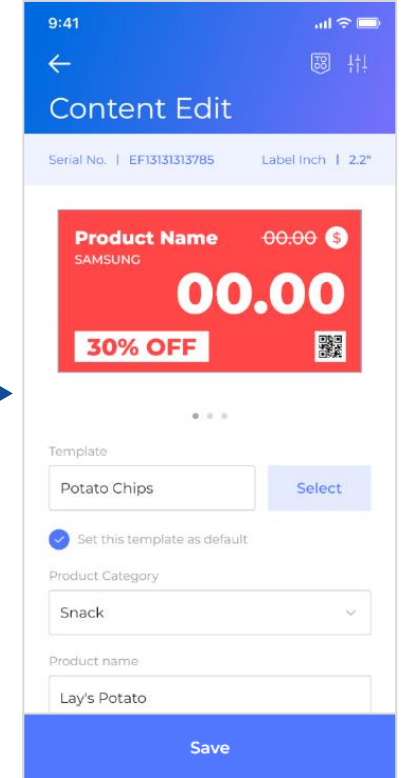
01
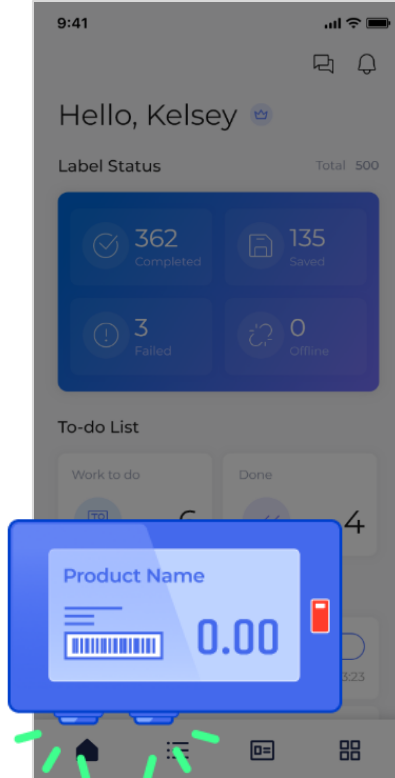
Press the button on the label on the home page

02

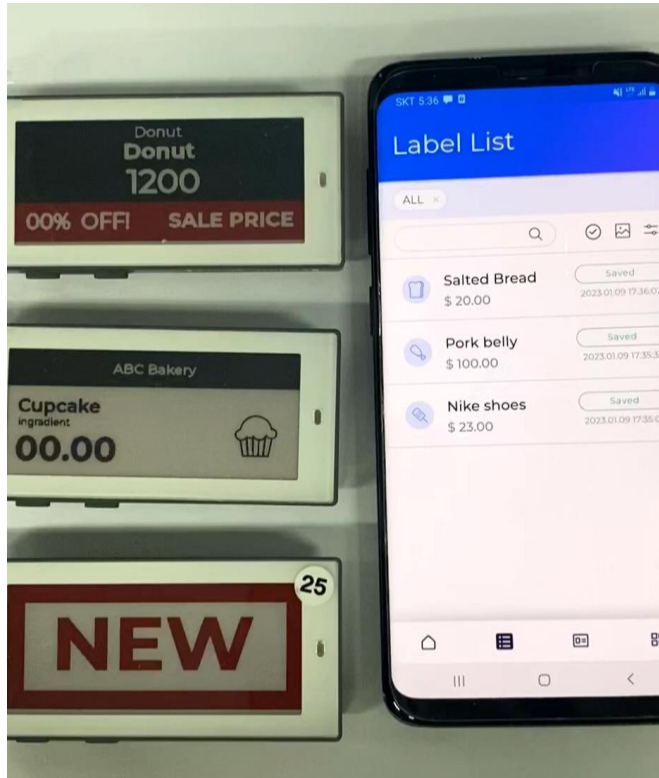Choose the labels you want to edit

03

Select the template

04

Edit the contents and it is Displayed on the label

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AIMS LINK SOLUTION I INITIAL REGISTRATION ON THE LIST

▶️ [Demo video (Label list editing)](#)
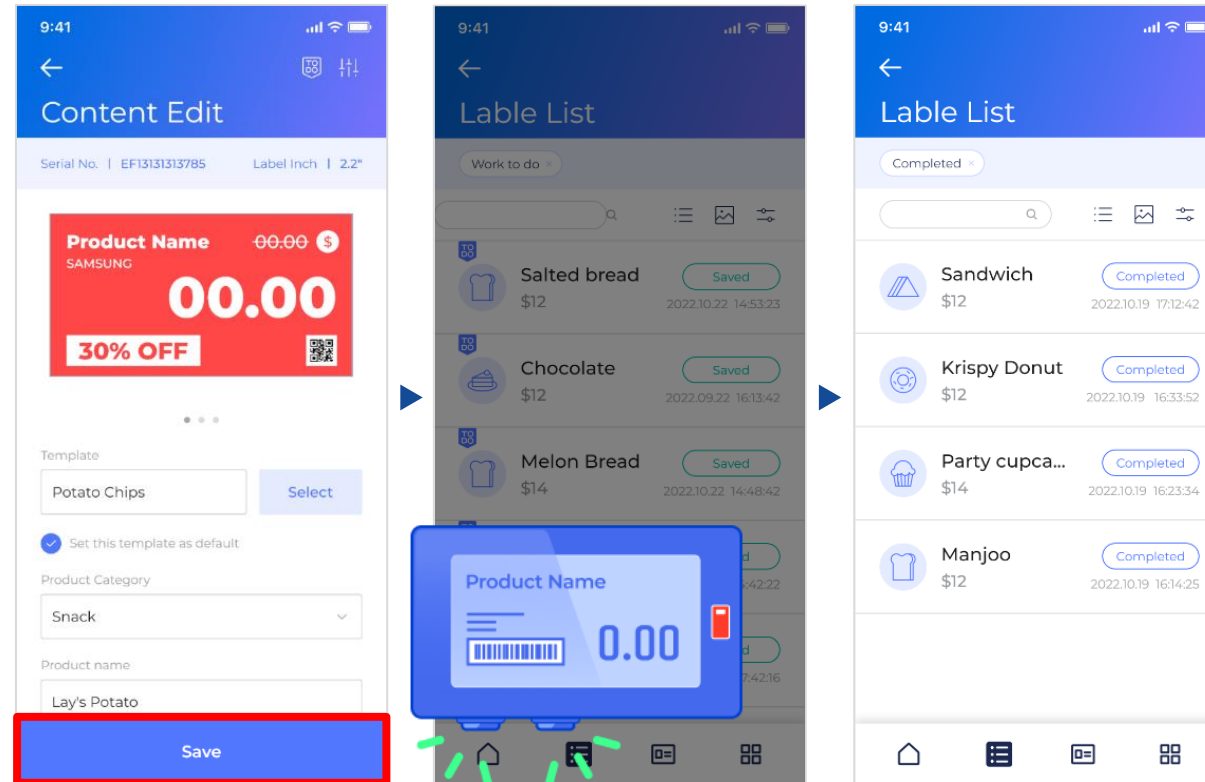
01

Edit the content on the app

02
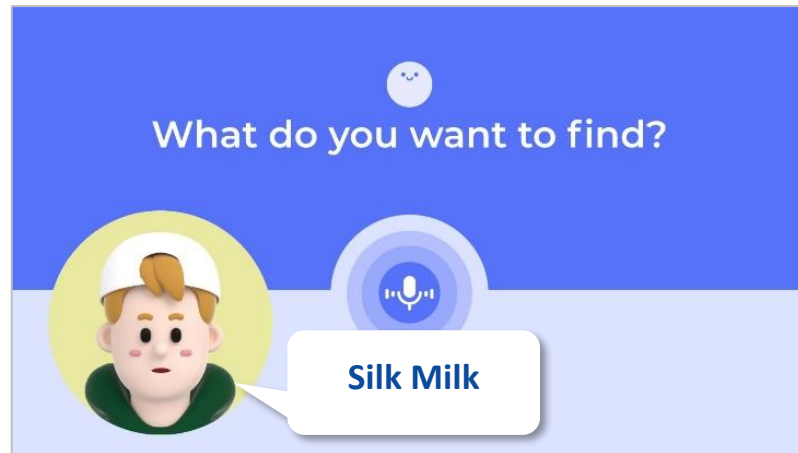
Press the button on the saved label that you want to update
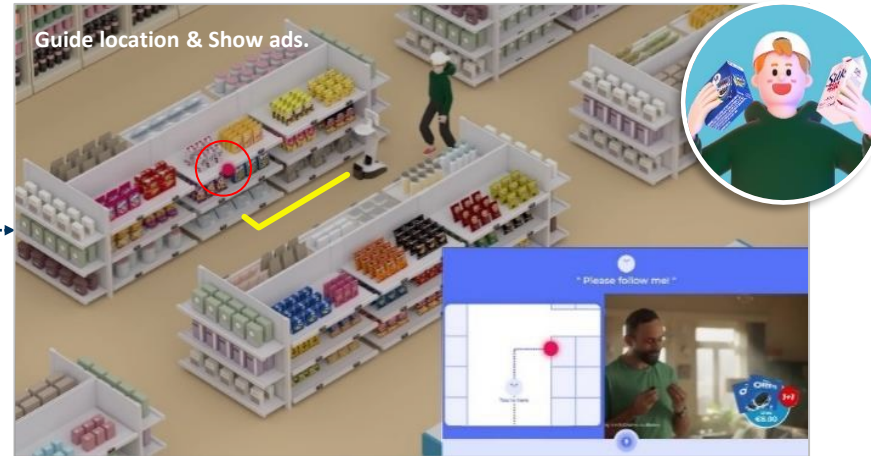
03

It is displayed on the label

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V. SMART SHOPPING EXPERIENCE

ESL+SHOPPING ASSISTANT I VOICE FINDING

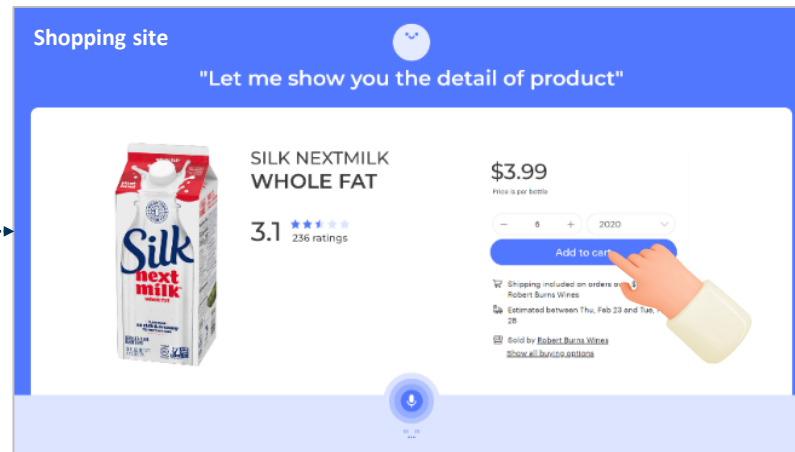**Guide location & Show ads.**

What do you want to find?

Silk Milk

1. EASY TO FIND WITH VOICE FINDING

Tell the robot what you want to find with your voice, the robot will Show you what you looking for

Shopping site

"Let me show you the detail of product"

SILK NEXTMILK
WHOLE FAT

$3.99
Price is per bottle

3.1 ★★★☆☆
236 ratings

2-1. GUIDE LOCATION & SHOW ADS.

The robot guides the shopper to the location of a product while showing advertisements of related products on the way, It can generate advertising revenue and induce additional purchases

2-2. SHOPPER CAN SHOP IN ONLINE

You can see the detail of the product that you are looking for. If there is no stock, then you can easily purchase what you want from the display

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ESL+SHOPPING ASSISTANT I STAFF CALL

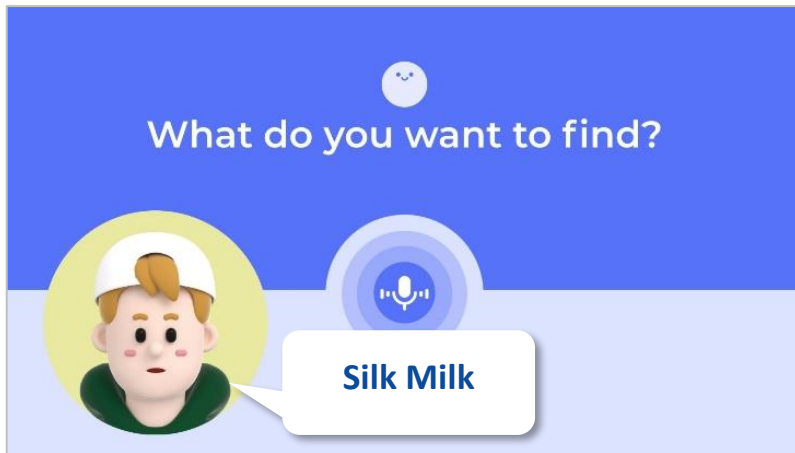Guide location & Show ads.

2-1. GUIDE LOCATION & SHOW ADS.

The robot guides the shopper to the location of a product while showing advertisements of related products on the way, It can generate advertising revenue and induce additional purchases
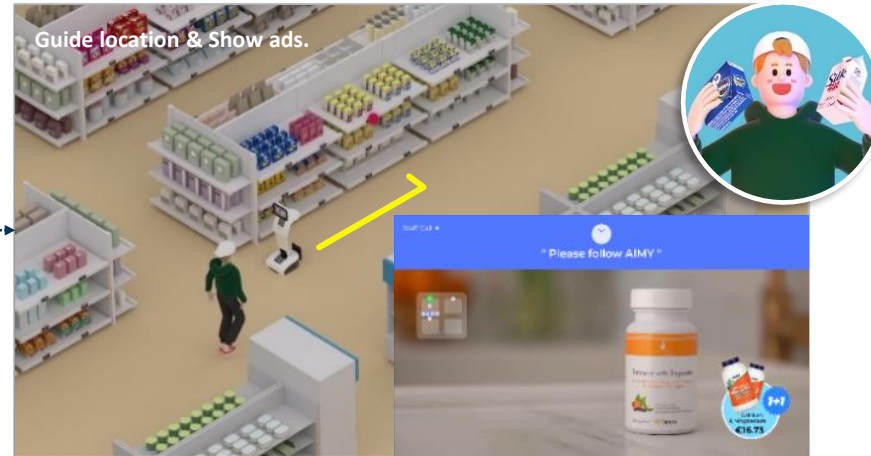

What do you want to find?

Silk Milk

1. EASY TO FIND WITH VOICE FINDING

Tell the robot what you want to find with your voice, the robot will Show you what you looking for

Shopping site

"Let me show you the detail of product"

2-2. SHOPPER CAN SHOP IN ONLINE

You can see the detail of the product that you are looking for. If there is no stock, then you can easily purchase what you want from the display
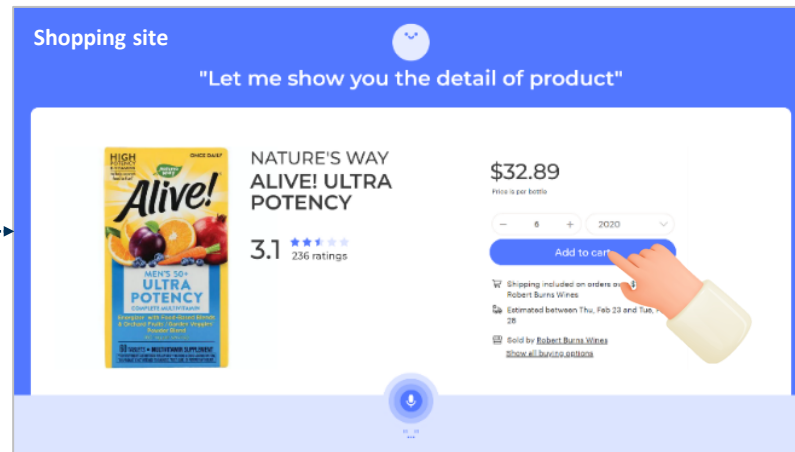
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ESL+SHOPPING ASSISTANT I VOICE & VIDEO SOLUTION VIDEO

▶ [Demo video (Voice call video)](#)

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ESL+ROBOT SOLUTION VIDEO

Demo video (Robot solution video)

ESL+SHOPPING ASSISTANT I NEWTON PLAY

Advertise

2-1. GENERATING ADVERTISING REVENUE

Shoppers can see the advertisement of the product

Shopping site
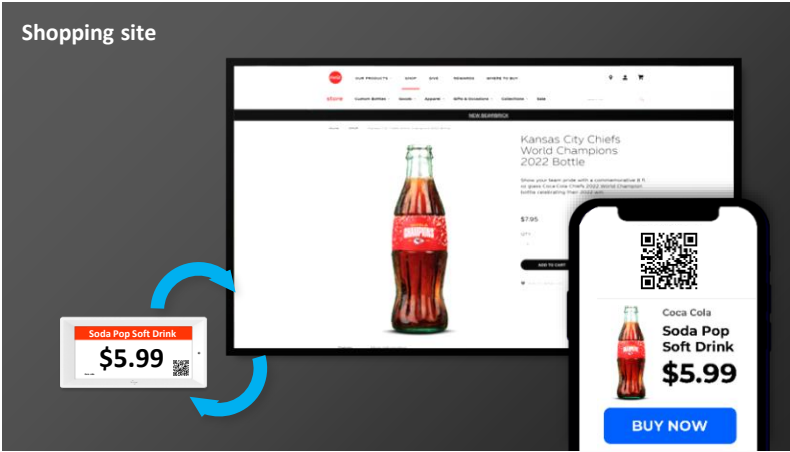
2-2. ENCOURAGING ADDITIONAL PURCHASES

Shoppers can see the detail of the product & purchase it with their smartphone at once

1. THE VIDEO PLAYS WHEN PRESS THE BUTTON

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NEWTON PLAY SOLUTION

Label #1

Label #2

Label #3

Newton ESL Gateway

Azure Kubernetes Cluster

IoT Hub

User Node Pools

Ingress Controller

Micro-Services

pod pod pod pod pod

Application Gateway WAFv2

Active Directory B2C

Database

Contents Management System

Dashboard

Mobile App

Android TV Box

Video Wall Controller (Video Splitter)

Media Wall

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NEWTON PLAY SOLUTION VIDEO

▶ [Demo video (Newton play video)](#)

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PRODUCT FINDING BY NEWTON TOUCH
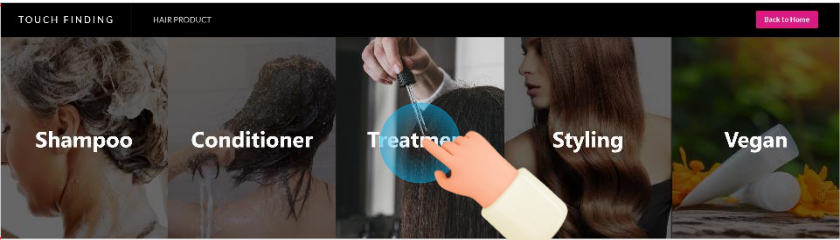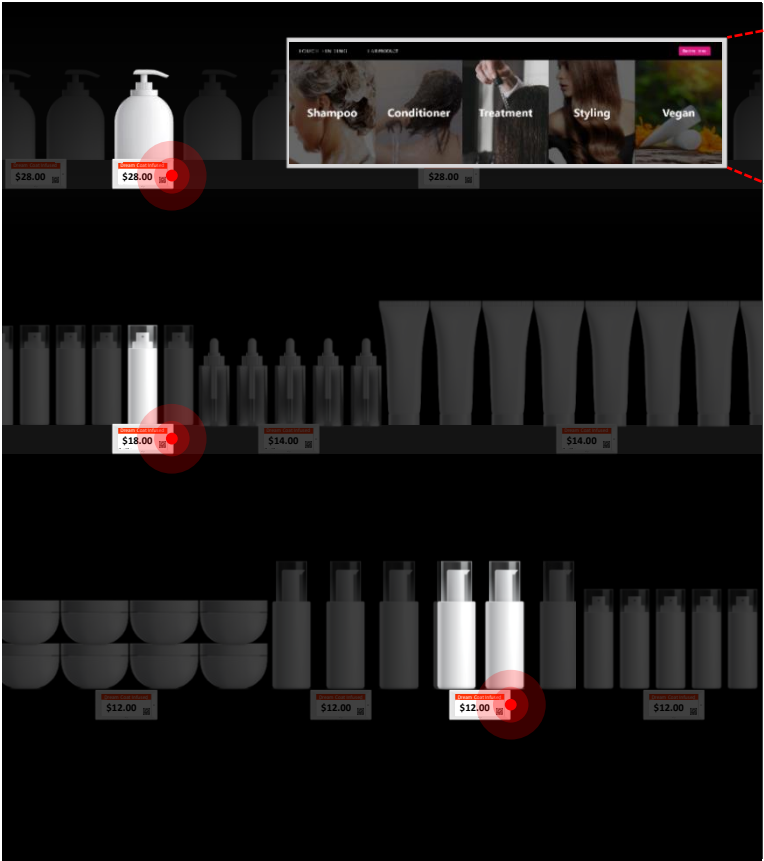
1. Selected item section
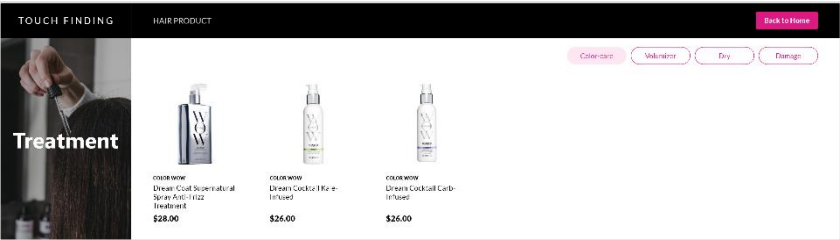
2. Selected specific item
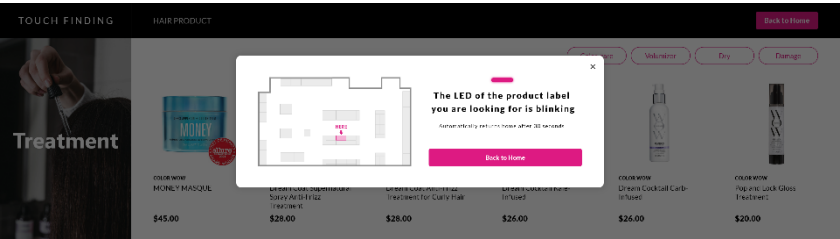
3. Check its location and details

The ESL of the product in the same category is blinking,
so shoppers can easily find what they want when shopper select the
category of products that they want to find in Newton Touch

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IN DOOR MAP SERVICE IN AIMS SAAS I MAP GENERATION

1. FILE UPLOAD AS A REFERENCE

2. ADD COMPONENT

3. MAPPING SHELVES

4. CREATE ZONE

5. ADDITIONAL OPTION

Shelves by Sales

Picking Navigator Create

Set Shelf Properties

Rights Management

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IN DOOR MAP SERVICE IN AIMS SAAS I STOCKING SYSTEM

Stocking App

Indoor Map Service

SOLUM
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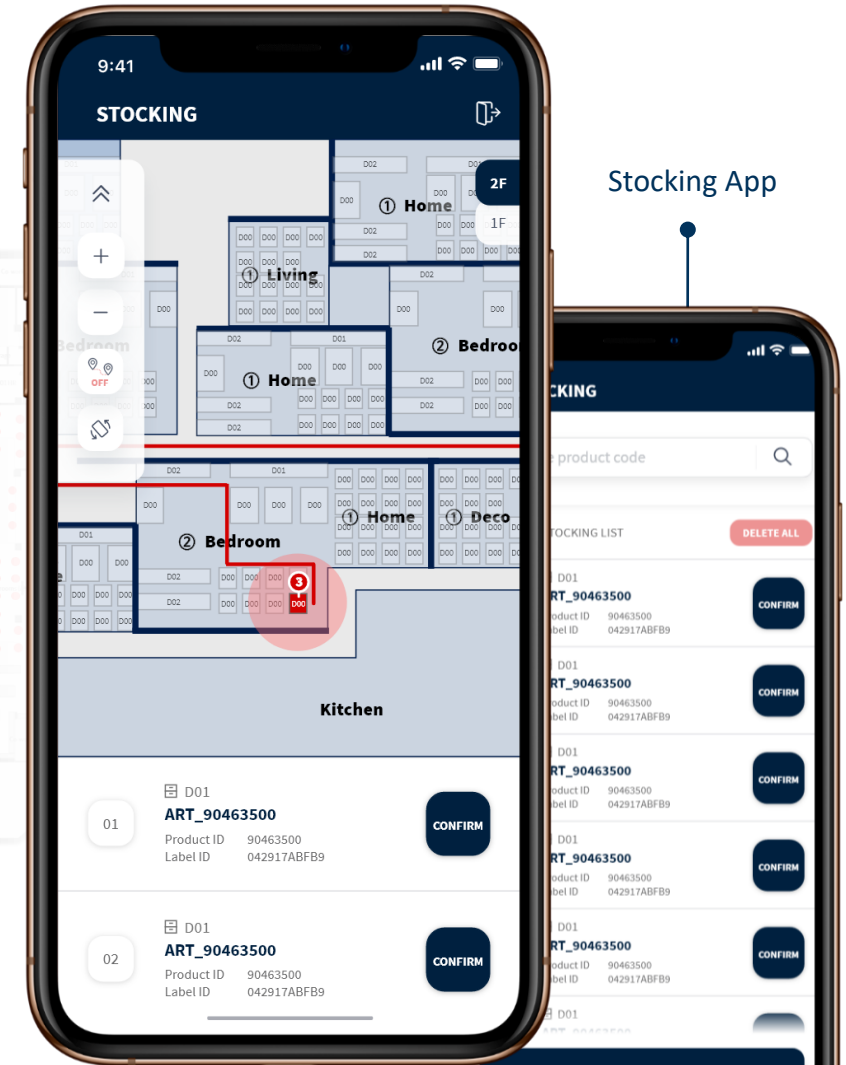
IN DOOR MAP SERVICE IN AIMS SAAS I SMART PICKING SYSTEM
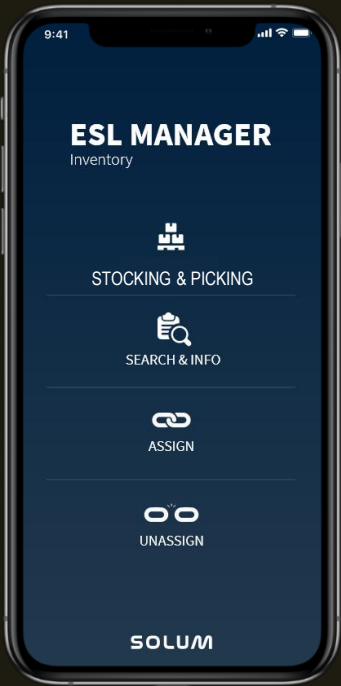
Enter the 'Stocking
&Picking' menu
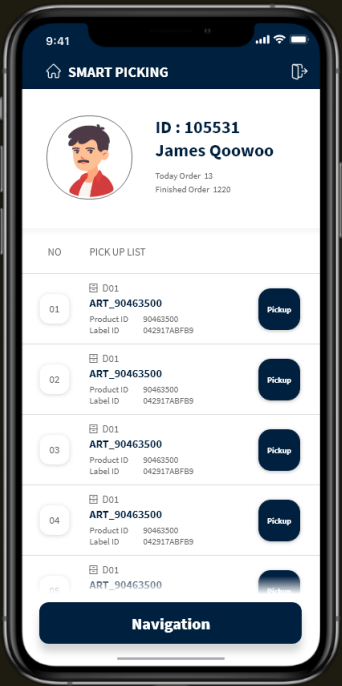
Scan Staff ID and click
the product list to pick up

Showing the short route and
blinking label created on the map

SOLUM
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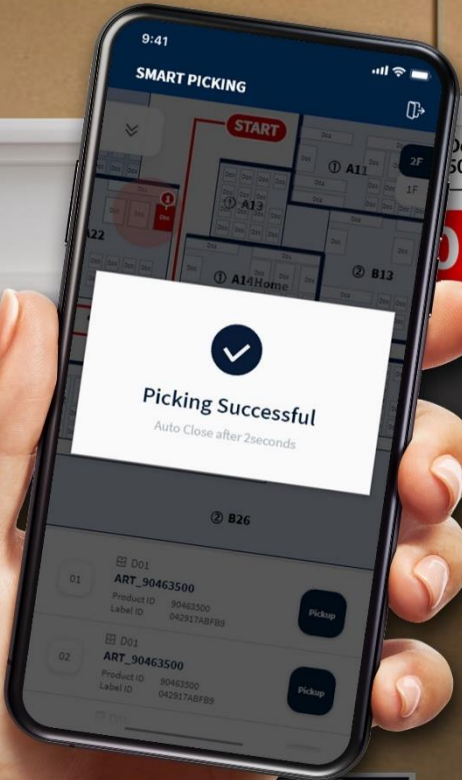
IN DOOR MAP SERVICE IN AIMS SAAS I SMART RESTOCK SYSTEM
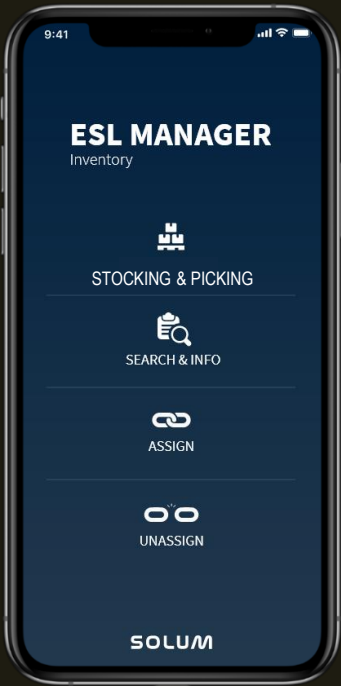
Enter the 'Stocking
&Picking' menu
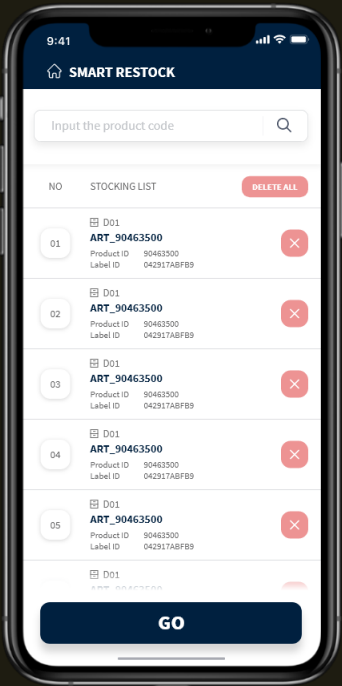
Scan the barcode
of the product to restock

Showing the short route and
blinking label created on the map

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IN DOOR MAP SERVICE IN AIMS SAAS I SMART RESTOCK SYSTEM

Enter the
"ESL Manager-
Inventory" App

Scan the barcode
of the product
to restock

Check the restock
list and tap
the "Go" button

When entering
the map, you can
zoom in/out

After restocking,
tap the "Confirm"
and you can
see the pop up

Automatically
list up the next
product to restock

Ref) You can check
label status in App
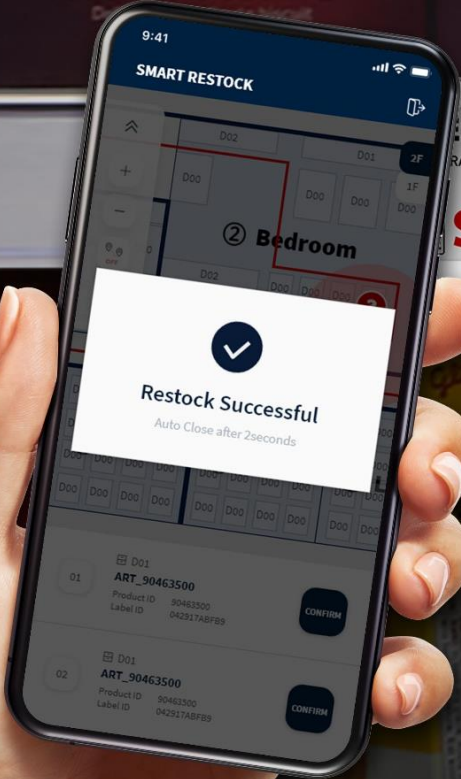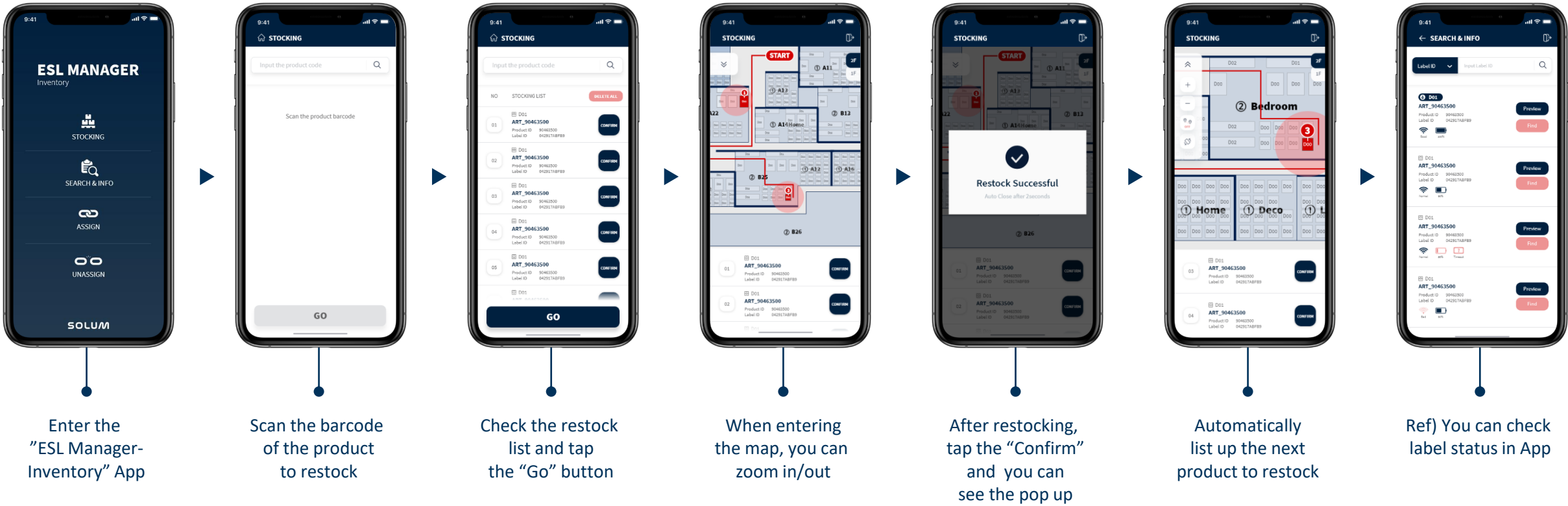
Ⅵ. ASSET MANAGEMENT SOLUTION

CUSTOMER NEEDS

AS – IS

SMALL, MOBILE EQUIPMENT IS DIFFICULT TO MANAGE

Essential asset management in the store, such as PDAs, trolleys, and carts, is not managed, leading to frequent loss, which increases operating costs for repurchasing missing assets

SPENDING TOO MUCH TIME LOOKING FOR EQUIPMENT

Loss of work concentration and efficiency due to waste f work time

DIFFICULTY TRACKING PRODUCT INVENTORY & POSSIBILITY OF THEFT OR LOSS

It is difficult to know the whereabouts of the missing inventory because inventory is identified by hand due diligence, and it is impossible to know when the theft or loss occurred

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CUSTOMER NEEDS

Trace helps store management systems improve efficiency through real-time, accurate tracking of assets across locations

ALL INVISIBLE ASSETS AT A GLANCE

Assets that are not visible or lost
With IoT Tracker, it's easy to manage

BETTER VISIBILITY ACROSS THE STORE MANAGEMENT

Digitize the management of small and mobile assets to identify the location and number of assets and easily manage & prevent loss

REDUCED EXPENDITURES

Reduces both capital and operating expenses by avoiding the loss of assets and no longer need to purchase additional assets

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TRACE TAG KEY FEATURE

A sticker type that can be easily
attached to a specific product
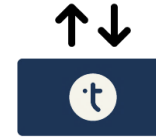
High compatibility
with Bluetooth technology

Automate business
processes with Active Label

Excellent usability
with ultra-slim, ultra-light

Overwhelming battery life
with proprietary technology

Securing visibility with location &
temperature tracking data

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SOLUM TRACE TAG
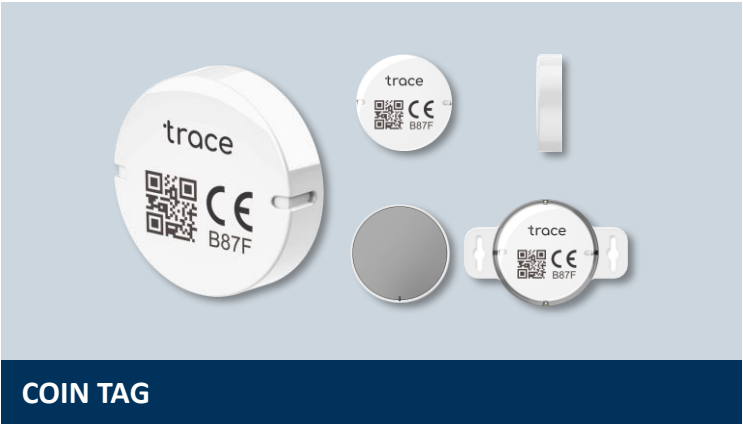
STICKER TAG

Life Expectancy • Lifespan can change due to sensing cycle schedule	Max 3.5 years (scan per 10min) Max 1.5 years (scan per 60sec)
Battery capacity	35mAh
Size	1.22 x 2.8 x 0.03 inch (ultra thin)
Sensing area	Temperature, Battery level
Certifications	KC / FCC / CE
Sensor range	Indoor 25m / Outdoor 100m
Environmental Operating Conditions	Operates from 14 to 158 °F

SLIM TAG

Life Expectancy • Lifespan can change due to sensing cycle schedule	Max 7 years (scan per 10min) Max 3.5 years (scan per 60sec)
Battery capacity	80mAh (CR-2016)
Size	1.12 x 1.96 x 0.09 inch
Sensing area	Temperature, Battery level
Certifications	KC / FCC / CE
Sensor range	Indoor 25m / Outdoor 100m
Environmental Operating Conditions	Operates from 14 to 122 °F

COIN TAG

Life Expectancy • Lifespan can change due to sensing cycle schedule	Max 10 years (scan per 60sec) Max 6.5 years (scan per 30sec)
Battery capacity	235mAh (CR-2032)
Size	Ø27, 0.27 inch
Sensing area	Temperature, Battery level
Certifications	KC / FCC / CE
Sensor range	Indoor 25m / Outdoor 100m
Environmental Operating Conditions	Operates from 14 to 122 °F

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BRIDGE & GATEWAY

VERY SIMPLE AND QUICK INSTALLATION

Plug-type bridges are all you need to plug in. Installing this bridge couldn't be easier

There is no need to install complex infrastructure, no remodeling work, there is no burden of discontinuing patient care. It's that simple

Alternatively, if a compatible Wi-Fi AP is installed, it can be used without additional infrastructure

BRIDGE

· Easy to install with a small and slim USB type
· Advantageous in power supply as it can be combined with a wall charger
· Server communication with simple settings

GATEWAY

· Can be used by connecting to an existing Wi-Fi AP

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ASSET TRACKING SOLUTION (1/3)

Dashboard

Assets

Locations

Users

Devices

Configurations

Setting

Logout

Search Product, Supplier, Order

Assets by status

Total Assets	Active Assets	Missing	Low Battery
100ea	100%	0%	2%
100ea	100/100	0/100	2/100

by Category   See all

Category Name	Active Assets	Missing Assets
PDA	30	0
Shopping Cart	40	0
Others	30	0

by Location - Zone   See all

Floor	Zone	Missing Assets
1	North East	20
1	North West	30
1	South East	0

Event Feed   See all

Asset Name	updated at	Type
PDA 001	14th Feb 23 11:33	Signal Last
PDA 002	14th Feb 23 11:33	Low Batteries
PDA 003	14th Feb 23 11:33	Low Temperature

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ASSET TRACKING SOLUTION (2/3)

Q Search Product, Supplier, Order

Assets > Map view

+ − 🗺

Q Find PDA

asset number:
L2022ST124A
asset owner: Steve Jun
last connected gateway: AP13
last connected time: 14:49 14-Feb 23

asset number:
L2022ST124A
asset owner: Steve Jun
last connected gateway: AP13
last connected time: 14:49 14-Feb 23

asset number:
L2022ST124A
asset owner: Steve Jun
last connected gateway: AP13
last connected time: 14:49 14-Feb 23

Map labels:
29 30 31 32 33 34 35 36 37 38 39 40 41 42 43 44 45 46 47 48 49 1A 1B 1C 1D 1E

Lumber & Building Materials   Plumbing & Fashion Bath   Lighting & Electrical

28A 28   51
Pro Services
27A 27   52
26A 26   53
   Bathroom Displays   54
25   8A 7A 6A 5A 4A 3A   55
24   56
23   57
22   58
   11   59
   60
Outside Garden   Green House   20 19 18 17 16 15 14   10 9 8 7 6 5 4 3 2 1   Kitchen Design Center   61
13   62
   63
Check out   Customer Service

Millworks

SOLUM Solution provider.

ASSET TRACKING SOLUTION (3/3)

Search Product, Supplier, Order

Assets > Map view

Q **Find PDA**

asset number:
L2022ST124A

asset owner: Steve Jun
last connected gateway: AP13
last connected time: 14:49 14-Feb 23

asset number:
L2022ST124A

asset owner: Steve Jun
last connected gateway: AP13
last connected time: 14:49 14-Feb 23
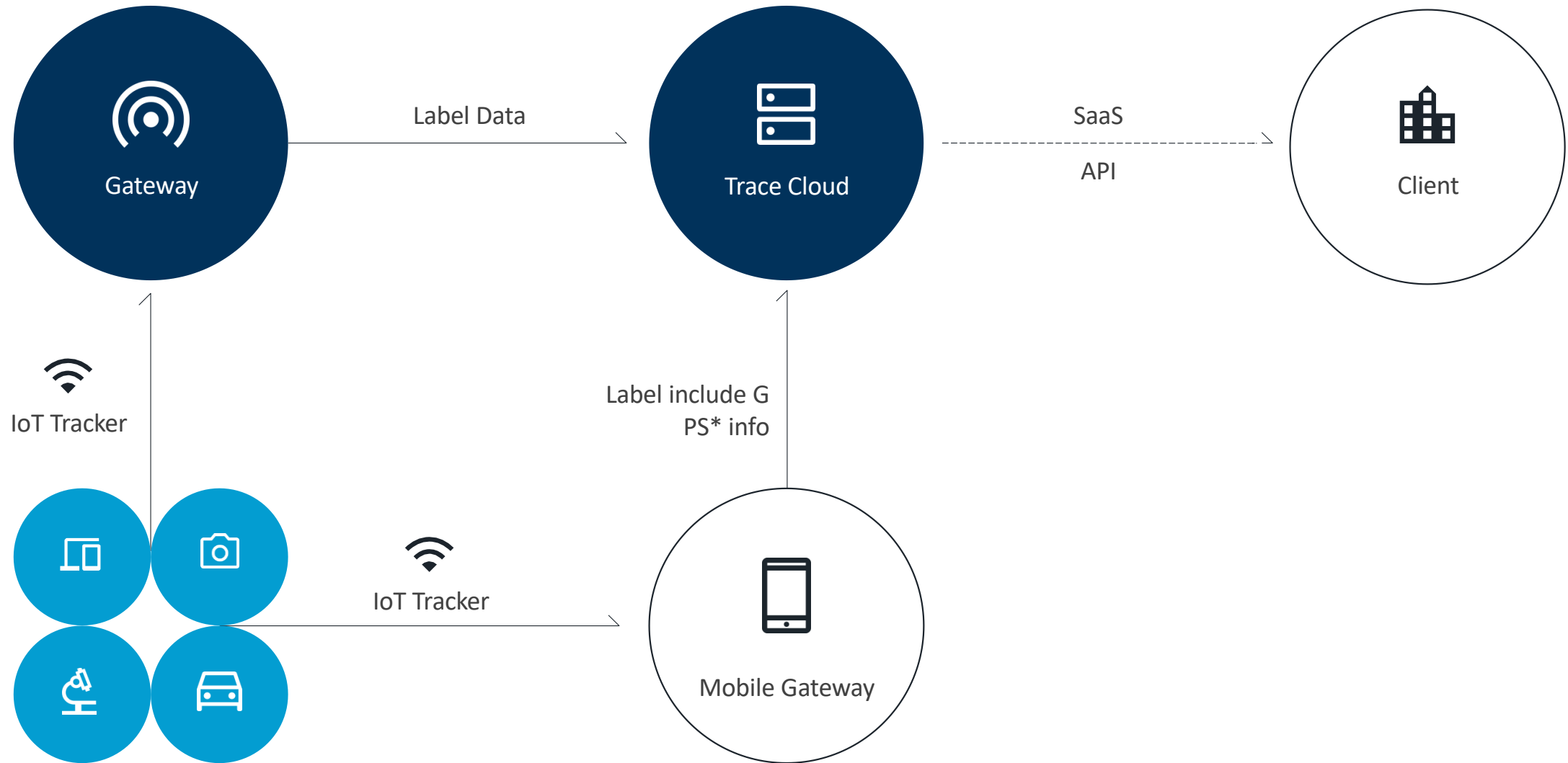
asset number:
L2022ST124A

asset owner: Steve Jun
last connected gateway: AP13
last connected time: 14:49 14-Feb 23

SOLUTION STRUCTURE

Gateway

Label Data

Trace Cloud

SaaS

API

Client

IoT Tracker

Label include G
PS* info

IoT Tracker

Mobile Gateway

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ASSET TRACKING (1/2)

ASSET TRACKING (2/2)

VII. SOLUM ROADMAP
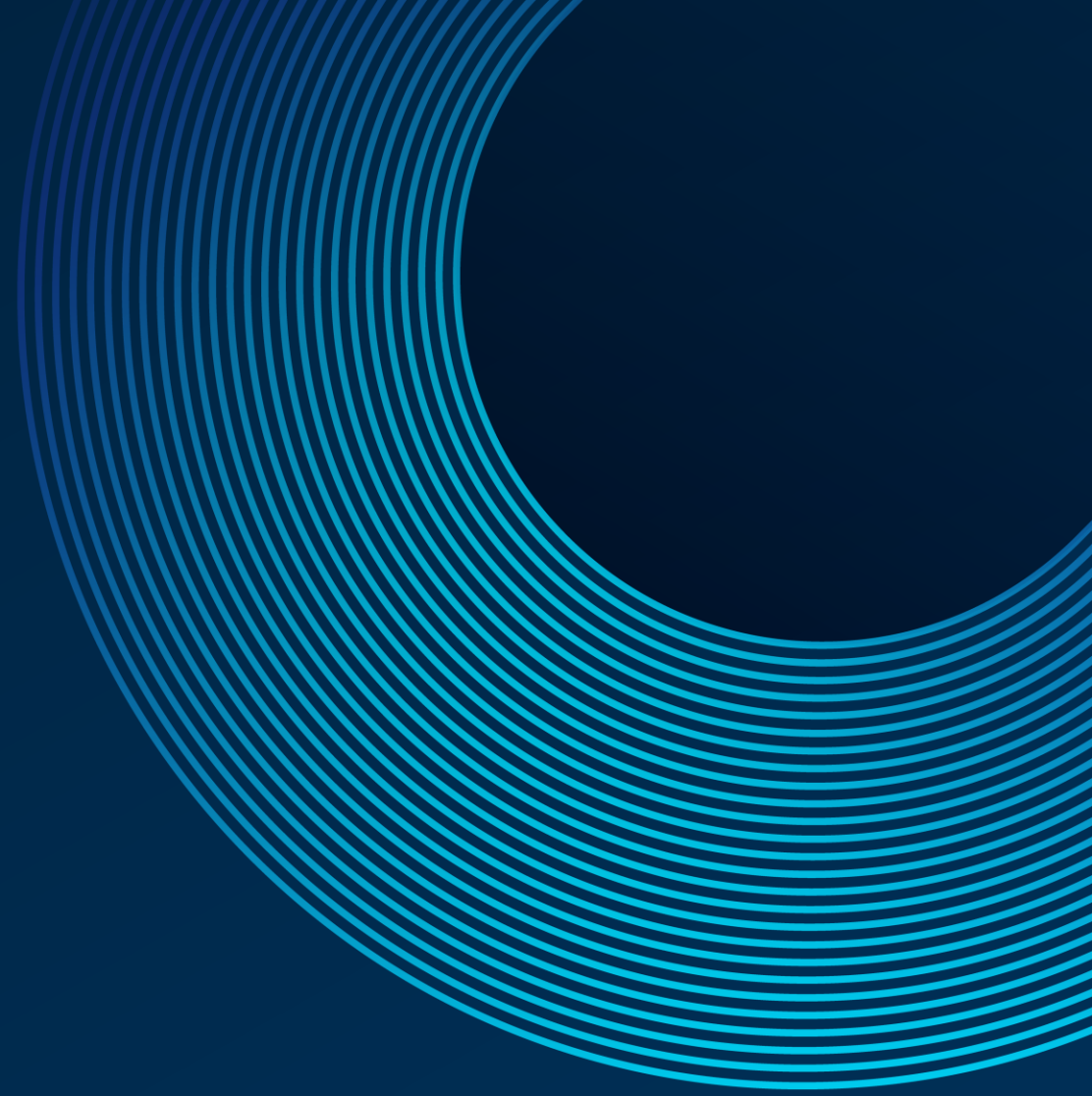
Hardware | Solution

SORT		23 Q1	23 Q2	23 Q3	23 Q4	24 Q1	24 Q2	24 Q3
Product Line-up	Multi Color			NEWTON S Slim bezel for 4-color 1.6" ~ 12.2"				
			NEWTON 5 Colors (B/W/R/Y/Orange) 1.6", 2.4", 3", 4.4", 8.2"					
			NEWTON 7 Colors (B/W/R/Y/O/G/Blue) starting with 6", 7.3"					
	Special Line-up	NEWTON X for fashion						
			NEWTON Dual Screen BWRY 8.2", BWR 11.6"					
			NEWTON Core BWR budget line-up 1.6"~12.2"					
				NEWTON Core BWRY budget line-up 1.6"~12.2"				
				Powered-Rail				
				One AP ESL BT 5.4 Standard				
Smart Shopping Experience		Pick-by-Light / Put-by-Light real-time LED blinking						
		NEWTON Play Button pop-up interaction with video						
		Product Finding with NEWTON touch						
Camera Solution		NEWTON Eye 5M Pixel						
		Geolocation with ID pattern (LBS)						
		Auto-assign with ID pattern						
		Advanced Store Services misplace, low/out-of-stock. mart KPI management / image deep learning						

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MEET OUR NEW EXPERIENCE