

3M Introduction

Our fundamental strengths are the foundation of 3M's performance

Leveraging these assets creates value; strengthening them ensures our future



Technology

Ability to share and combine elements of 3M's broad technology portfolio to produce unique, differentiated products, translating to premium margins.



Manufacturing

Utilization of 3M manufacturing footprint and technology, including process trade secrets, leading to higher-performing products and lower unit cost.



Global capabilities

Subsidiary front- and back-office footprint that allows for the effective development, adaptation and commercialization of products.



Brand

Brand equity in the 3M brand and in strategic brands that are shared across business groups.

3M facts

3M is one of 30 companies in the Dow Jones Industrial Average and is a component of the Standard & Poor's 500 Index

Year-end 2015

Sales

Worldwide
International
60% of company's total

\$30.274B
\$18.225B

Net Income

Net income – reported
Percent to sales
Earnings per share –
diluted – reported

\$4.833B
16.0%
\$7.58

Taxes

Income tax expense

\$1.982B

Dividends

(Paid every quarter since 1916)
Cash dividends paid per share
One original share, if held, is now
shares

\$4.10
3,072

R&D and Related Investments

For 2015
Total for last five years

\$1.763B
\$8.452B

Capital Investments

For 2015
Total for last five years

\$1.461B
\$7.482B

Employees

Worldwide
United States
International

89,446
35,973
53,473

Patents awarded

In 2015
In company history

US 565; total 3,128
105,000+

Organization

26 business units, managed under these five
business groups:

- Consumer
- Health Care
- Safety & Graphics
- Electronics & Energy
- Industrial

Operations in about 29 US states and 70 countries
around the world.
Laboratories in 36 countries.

Technology

46 technology platforms, including:

- Abrasives
- Adhesives
- Electronics & Software
- Light Management
- Microreplication
- Nanotechnology
- Nonwoven Materials
- Surface Modification

8,300 researchers worldwide: 4,500 in the
United States.

Sustainability results

Prevented the generation of more than 4 billion
pounds of pollutants since 1975 through completion
of nearly 13,000 Pollution Prevention Pays (3P)
projects.

Listed on Dow Jones Sustainability Index for 16
consecutive years.

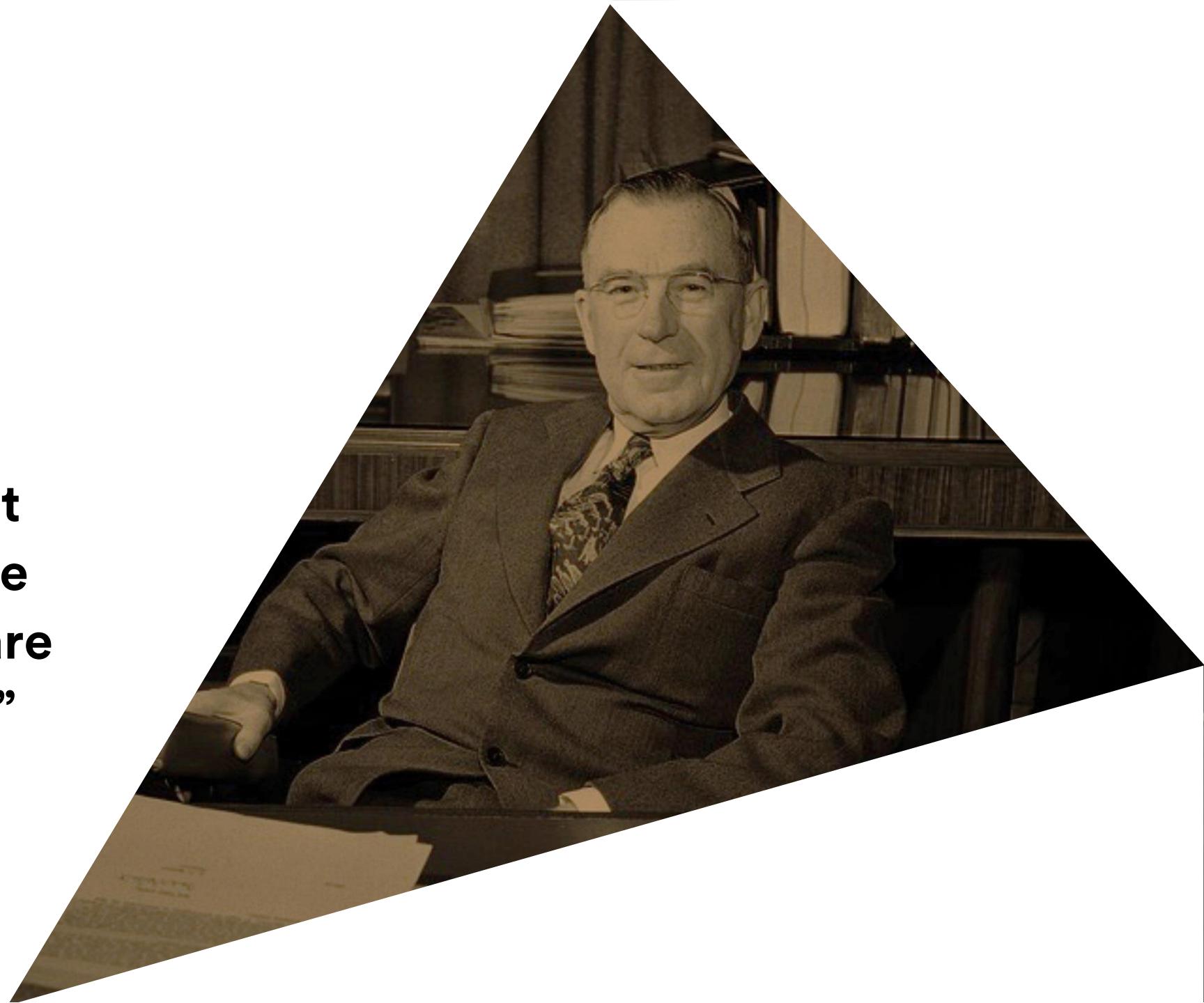
Announced sustainability-related platform and
goals, reflecting increasing focus on supporting the
environmental and social goals of 3M's customers
and the communities in which it operates.

Community citizenship/3Mgives

Cash and product donations to education,
community and environmental programs topped
\$65 million in 2015; 3Mgives has contributed \$1.45
billion since its inception.

3M employees and retirees volunteered more than
300,000 hours improving lives around the world.

“Management that is destructively critical when mistakes are made kills initiative. And it’s essential that we have many people with initiative if we are to continue to grow.”



15 percent culture



Multilayer optical film



Auto window treatment

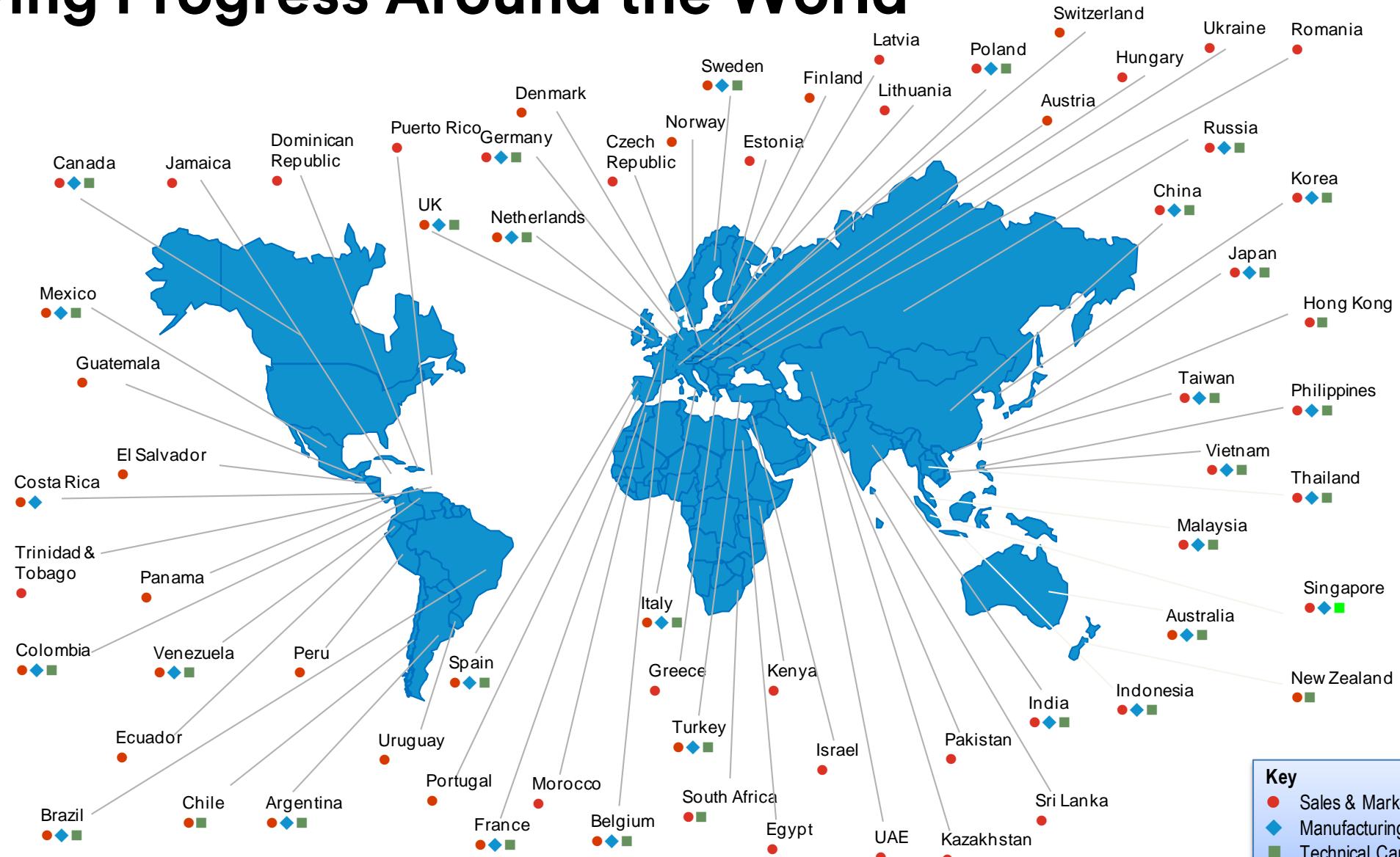
46 core technology platforms



An aerial photograph of a dense urban area. In the foreground, a multi-lane highway with a blue and white curved overpass dominates the scene. Several cars and a truck are visible on the roads. To the left, there are several high-rise buildings, some with reflective glass facades and others with more traditional brick or concrete. One building has a prominent white cylindrical structure on its roof. In the background, more buildings are visible, along with a small parking lot and some greenery.

105,000
patents

Driving Progress Around the World





ENABLING MOBILE APPS IN AN ENTERPRISE ENVIRONMENT

THERE ARE MAJOR CHALLENGES THAT REGULARLY NEED TO BE OVERCOME?

WHAT DID WE ORIGINALLY THINK THE SOLUTION TO THE PROBLEM WAS?

HOW DID WE BUILD AN EFFECTIVE SOLUTION?

Business Challenge



Offline availability of the product catalogue data



Reduce cost by using enterprise Product Data Management Systems



- Mobile benefit by having unified PIM systems.
- Encourage 3M divisions to use enterprise PIM systems



Reusable platform for mobile Apps and data extraction from existing sources.

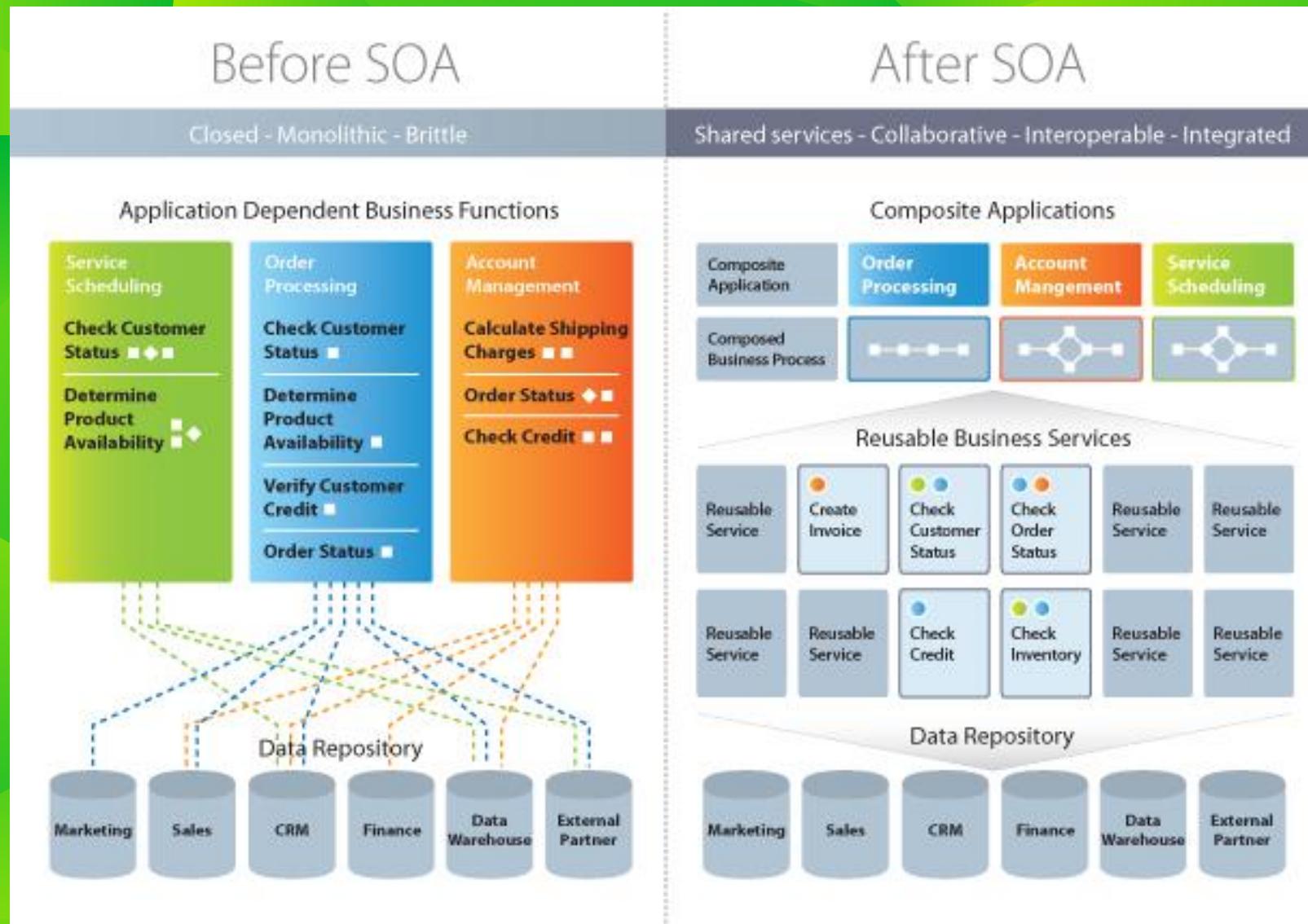


Extract Data from Snaps

The Major Challenge Faced By Enterprise Developers

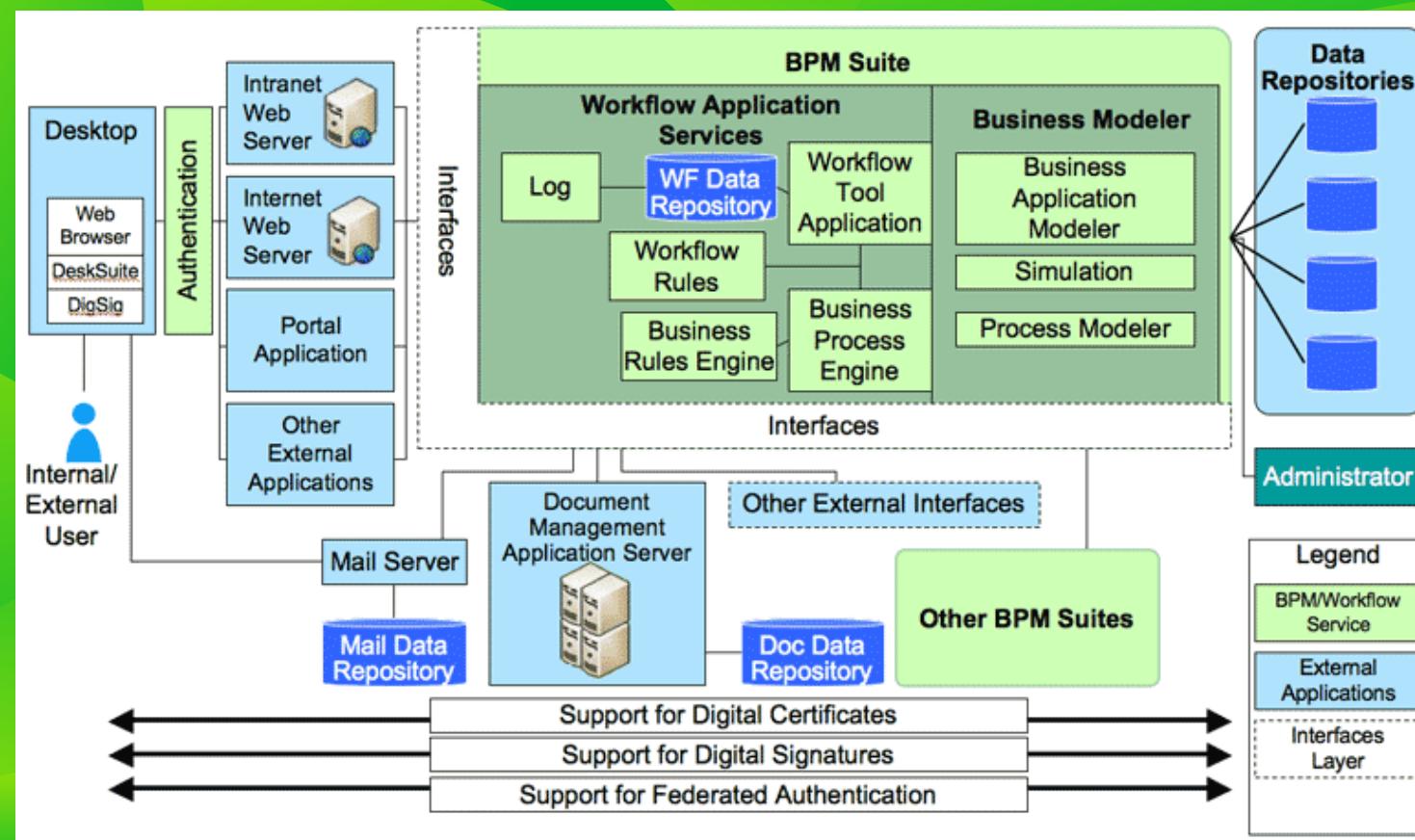


What Did I Think The Solution Was?



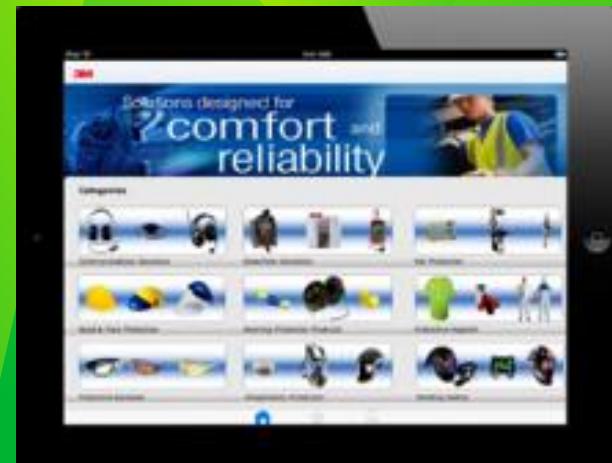
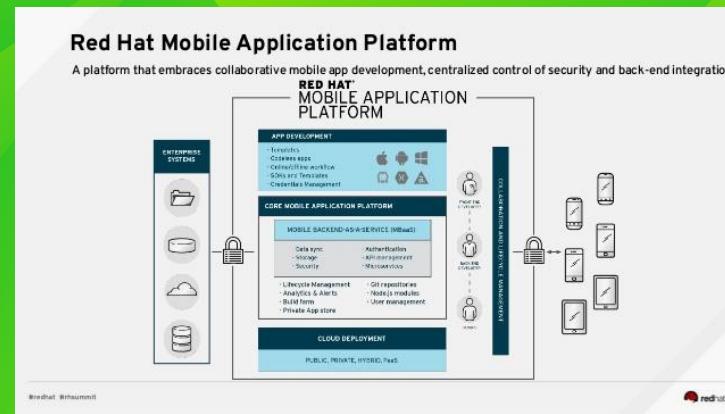
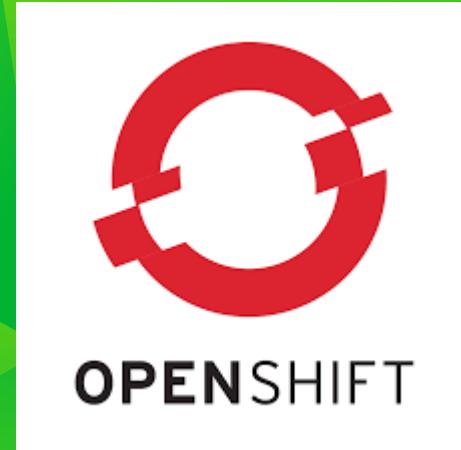
What Did My Management Think The Solution Should Be?

Find A Way To Reuses Existing Tools and Processes.



Technologies We Used For Our Solution

1. We reused existing enterprise systems and processes
2. Open Shift was used to extract data from our existing Macro Services to Create new Micro Services
3. Red Hat Mobile App Platform provided the Mobile App Specific Data Storage and Synchronization
4. Native iOS mobile Application



A Four Tier Architecture

The diagram illustrates a Four Tier Architecture with the following layers from top to bottom:

- Service Layer (Blue arrow)
- Aggregation Layer (Green arrow)
- Delivery Layer (Yellow arrow)
- Client Layer (Orange arrow)

On the left, there is an icon representing the layers, showing a cloud connected to a network of devices (TV, smartphone, tablet) which are connected to a stack of gears, which are connected to a smartphone and a tablet, which are finally connected to a laptop.

“Mobile Needs A Four-Tier Engagement Platform”

FORRESTER

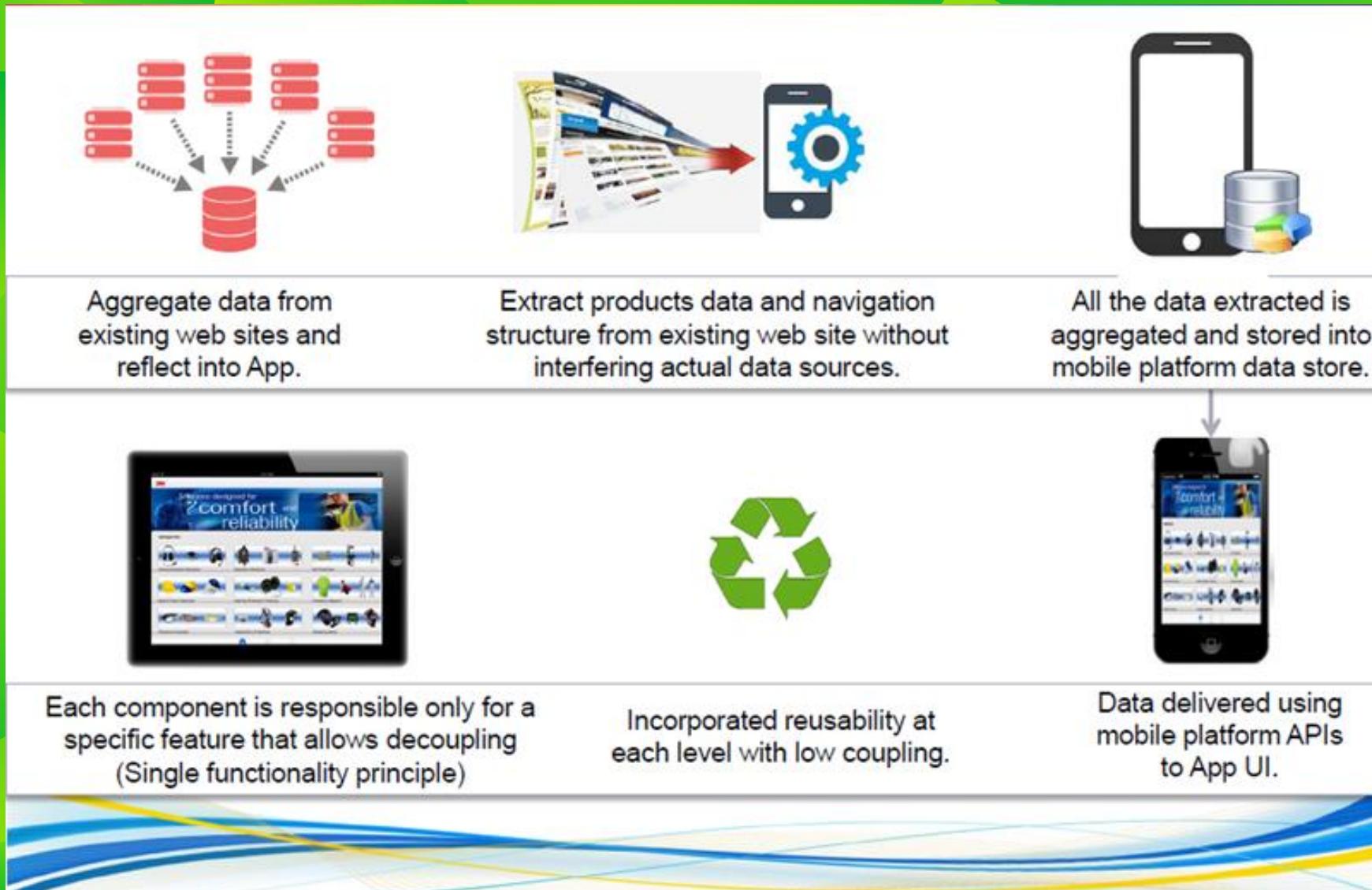
- Loosely Coupled Architecture to ensure Continuous Delivery of the application
- A robust Engagement Platform
- Addressing mobile's new requirements also requires a new mindset and new capabilities

Successful early adopters of 4 Tier Architecture

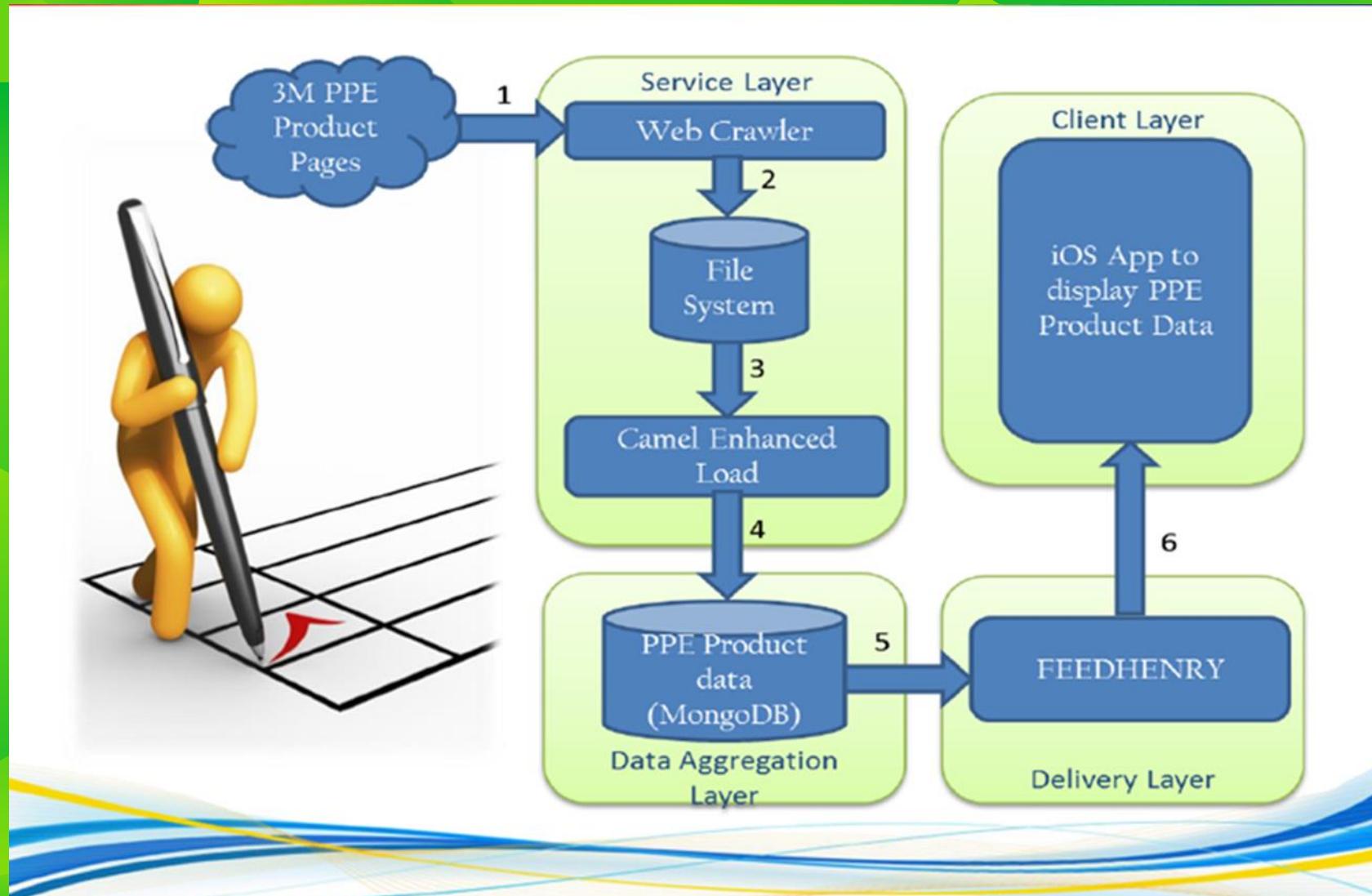
NETFLIX salesforce kinvey

A tablet screen displays a mobile application interface for 3M. The screen shows a banner: "Solutions designed for comfort and reliability". Below the banner are several categories of products: "Administrative Solutions", "Head & Face Protection", "Respiratory Protection", and "Protective Apparel". A message box on the screen says: "All Background Processing complete. You are now ready to interact with the device update area." There is a "Acknowledge" button at the bottom of the message box.

Details Of The Solution We Built



System Architecture



Service Tier – Open Shift

Custom crawler and SNAPS web site data

- Developed a customized crawler to extract data from SNAPS web site directly.
- Customized crawler extract navigation and products data in JSON and XML formats to App consume.
- Configurable and reusable component. It can be used for any other products data extracting.
- Component takes around 2.5 hours to complete process and extract data with sizes around 4 MB of navigation data and 20 MB of products data.
- It loads multi media files data of size around 180MB
- With open shift platform we can run this process on every capturing product updates.



Aggregation Tier – Open Shift and MAP

Apache Camel open source for aggregating data.

- Successfully run camel services on open shift platform
- Camel allows us data push to Feed Henry mobile platform
- Camel allows us to quick integration of data of new data source into Feed Henry as new Data Sources emerge
 - ❖ Bazaar voice
 - ❖ Pricing
 - ❖ Where to Buy
 - ❖ SAP



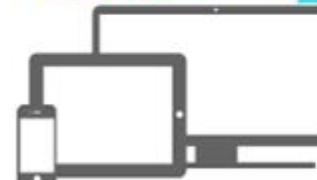
Delivery Tier – Mobile App Platform

- Data synchronization routines provide by Feed Henry mobile platform
- Feed Henry Service on AWS
 - Mongo DB
 - Developed Feed Henry services to accept data from Camel
 - Developed Feed Henry services to push data to 3M PPE
- Feed Henry client Sync SDK
 - Ability to use feed Henry to synchronize Product data and Navigation details between device app and web service
 - Ability to push new data to app without need to redeploy app
- Push data from App to Feed Henry
- User profile creation
- Add products in Favorites. Favorite products can be retrieved with profile on independent of device.

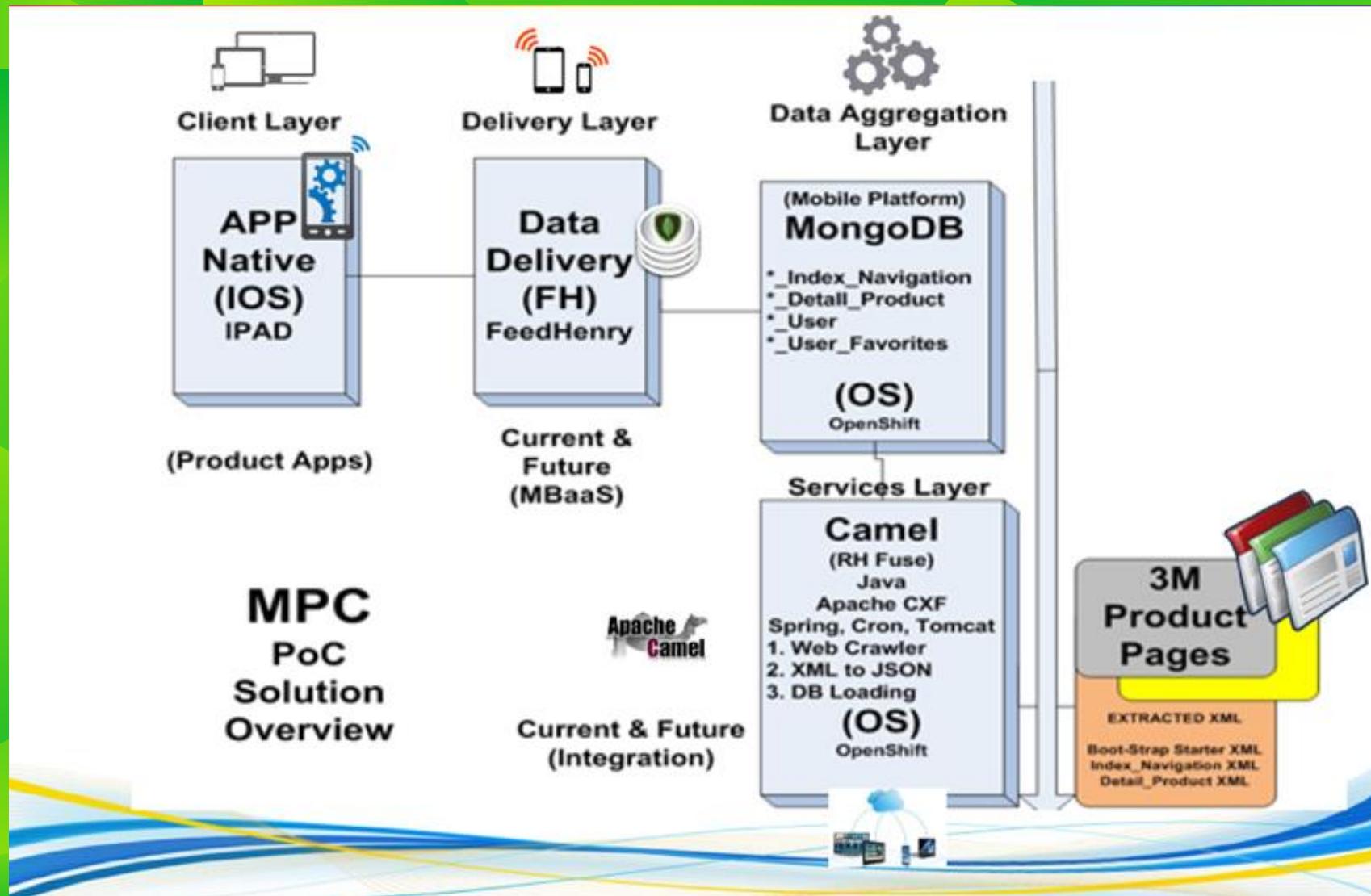


Client Tier – Native iOS Application

- Intelligent navigation
- Pre loads with data to assure high quality
- Pre loads navigation data
- Pre loads products data
- Pre loads media files data
- Allows to download media items.
- App is informed of new media items and can download them.
- App allow to maintain Favorites products.
- Local data store used for performance
- Displays Product catalogue data offline



Brining The Technology Stack Together



Website Compared to Mobile App



Mobile App – Home Screen



Mobile App – Product Navigation

6:40 AM 43% 

Assembly

 3M™ SafeLight Fall Protection Harness 10951, Universal size, 1 ea/case	 3M™ Roofing Kit 20058, 1ea/case	 3M™ Permanent Roof Anchorage Device 4100, 1 ea/case
 3M™ Apache Energy Absorbing Dual Leg Lanyard with Two Rebar Hooks and Snap Hook 3530-DE-0241, 6 ft., 1 ea/case	 3M™ Vertical Rope Lifeline with Double Locking Snap Hook and Rope Adjuster 0221-25RG, 25 ft., 1 ea/case	 3M™ BeamWalk Adjustable Sliding Beam Anchorage Device 4650-3, 1 ea/case
 3M™ Fall Arrest Lanyard 3530-DE-0241, 6 ft., 1 ea/case	 3M™ Fall Arrest Snap Hook 3530-DE-0241, 6 ft., 1 ea/case	 3M™ Fall Arrest Rebar Hook 3530-DE-0241, 6 ft., 1 ea/case

Back

Kits (3)

- Energy Absorbing Lanyards (8)
- Harnesses (8)
- Hardware & Accessories (2)
- Self-Retracting Lanyards (7)
- Confined Space Products (1)
- Anchors (5)
- Worker Positioning Equipment (5)
- Vertical Lifelines (2)
- Rescue/Escape Devices (2)

Recommended Application

- Assembly (28)**
- Demolition (29)
- Painting (33)
- Machine Operations (28)

Home Favorites Profile

Mobile App – Navigation Refined

6:40 AM 43%

Rope



3M™ Vertical Rope Lifeline with Double Locking Snap Hook and Rope Adjuster 0221-25RG, 25 ft., 1 ea/case

3M™ Sidewalk Rope Lifeline Assembly 0223-60, 60 ft., 1 ea/case

Demolition (29)

Painting (33)

Machine Operations (28)

Grinding (27)

Cleaning (15)

Welding (15)

Sanding (15)

Lifeline Material

Rope (2)

Galvanized Cable (6)

Web (7)

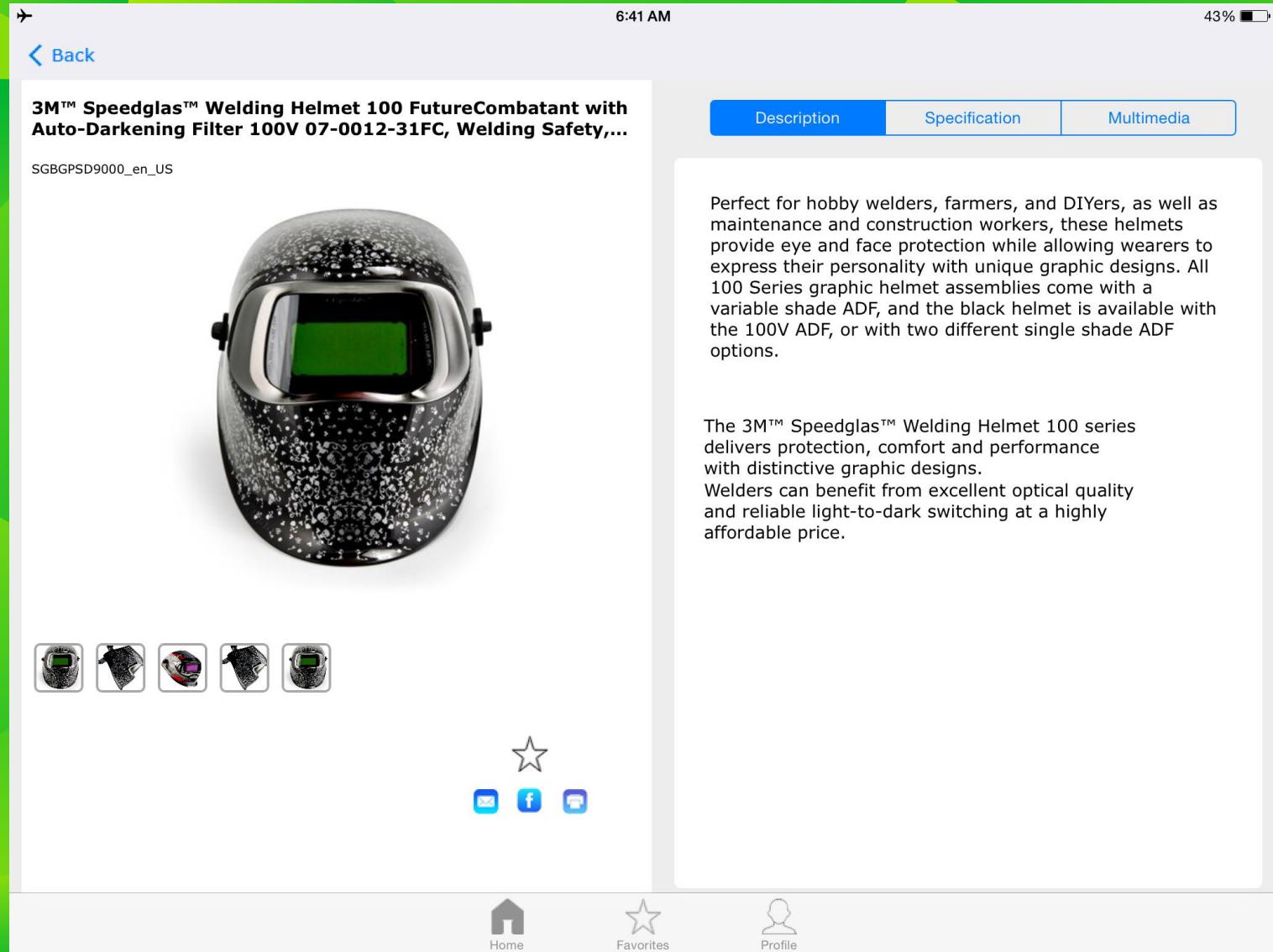
Stainless Steel Cable (2)

Style

Dual Leg (12)

Home **Favorites** **Profile**

Mobile App – Product Selection Description



The screenshot displays a mobile application interface for a product page. The top status bar shows the time as 6:41 AM and the battery level at 43%. The header includes a back arrow and the text "3M™ Speedglas™ Welding Helmet 100 FutureCombatant with Auto-Darkening Filter 100V 07-0012-31FC, Welding Safety,...". The product code "SGBGPSD9000_en_US" is also visible. The main image shows a black welding helmet with a speckled graphic design on the front. Below the main image are five smaller thumbnail images of the helmet from different angles. The right side of the screen contains a detailed product description and specification table. The description text reads: "Perfect for hobby welders, farmers, and DIYers, as well as maintenance and construction workers, these helmets provide eye and face protection while allowing wearers to express their personality with unique graphic designs. All 100 Series graphic helmet assemblies come with a variable shade ADF, and the black helmet is available with the 100V ADF, or with two different single shade ADF options." The specification table includes tabs for "Description" (selected), "Specification", and "Multimedia". At the bottom of the screen are navigation icons for Home, Favorites, and Profile.

3M™ Speedglas™ Welding Helmet 100 FutureCombatant with Auto-Darkening Filter 100V 07-0012-31FC, Welding Safety,...

SGBGPSD9000_en_US

Perfect for hobby welders, farmers, and DIYers, as well as maintenance and construction workers, these helmets provide eye and face protection while allowing wearers to express their personality with unique graphic designs. All 100 Series graphic helmet assemblies come with a variable shade ADF, and the black helmet is available with the 100V ADF, or with two different single shade ADF options.

The 3M™ Speedglas™ Welding Helmet 100 series delivers protection, comfort and performance with distinctive graphic designs. Welders can benefit from excellent optical quality and reliable light-to-dark switching at a highly affordable price.

Home Favorites Profile

Mobile App – Product Selection Specs

6:41 AM 43% 

Back

3M™ Speedglas™ Welding Helmet 100 FutureCombatant with Auto-Darkening Filter 100V 07-0012-31FC, Welding Safety,...

SGBGPSD9000_en_US



Category Welding Safety

Sensitivity 3 Level (TIG>10A & MIG/MAG, Stick)

Brand Speedglas

Headgear Type Welding Helmet,Hard Hat with Welding Helmet

Welding Process Welding Helmet,Hard Hat with Welding Helmet,Grinding,MIG Welding,TIG Welding,Stick Welding

Dark Shades Welding Helmet,Hard Hat with Welding Helmet,Grinding,MIG Welding,TIG Welding,Stick Welding,Shades 8-12,Shade 10,Shade 11

Category Welding Helmets

Welding Features Traditional Headgear

Visor Type Auto-Darkening Filter

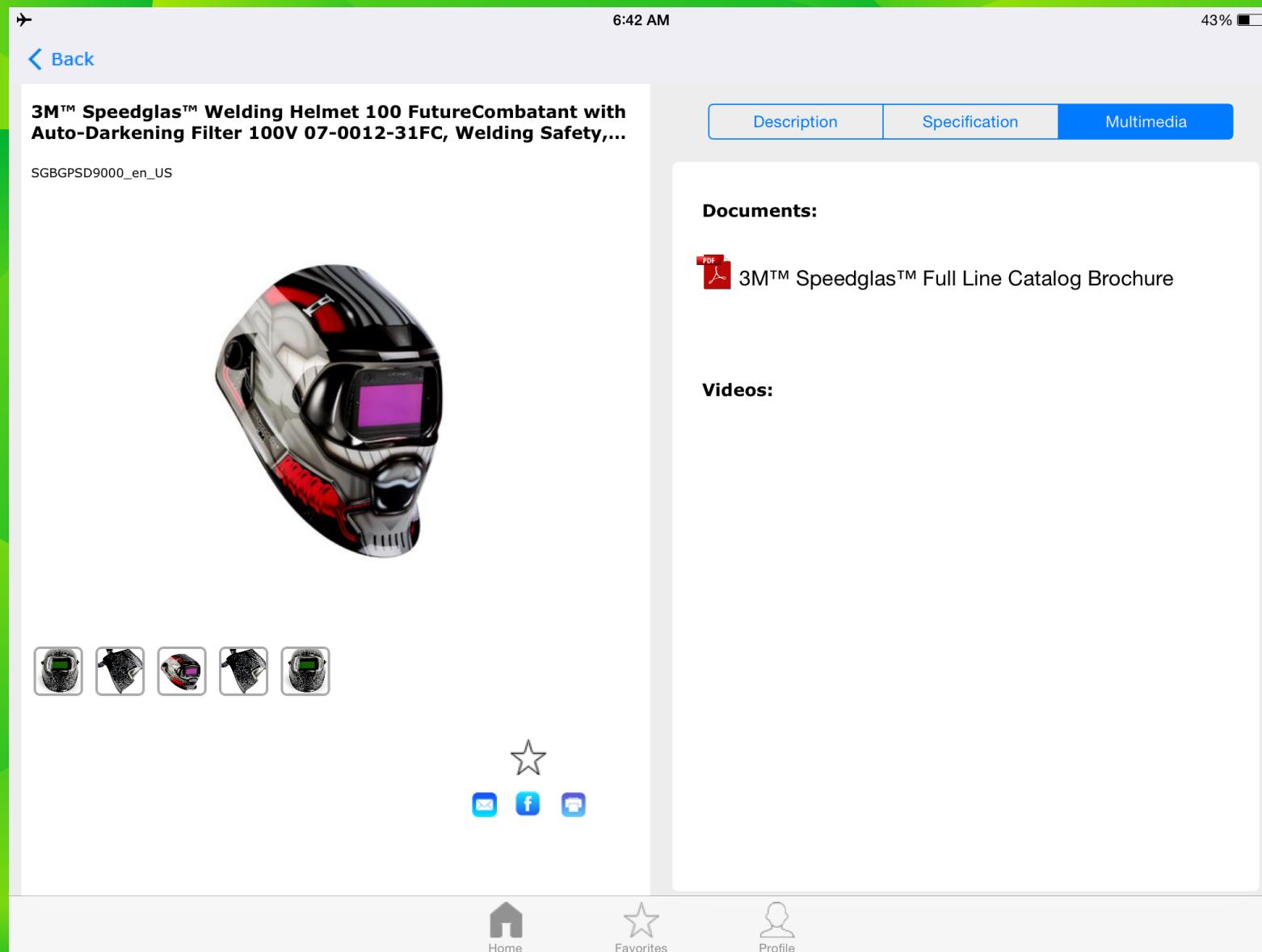
Recommended Industry Welding Helmet,Hard Hat with Welding Helmet,Grinding,MIG Welding,TIG Welding,Stick Welding,Shades 8-12,Shade 10,Shade 11,Transportation,Construction,Mining,Oil & Gas,General Manufacturing

ADF Shade Range Welding Helmet,Hard Hat with Welding Helmet,Grinding,MIG Welding,TIG

Description Specification Multimedia

Home Favorites Profile

Mobile App – Product Selection Media



6:42 AM 43% 

[Back](#)

3M™ Speedglas™ Welding Helmet 100 FutureCombatant with Auto-Darkening Filter 100V 07-0012-31FC, Welding Safety,...

SGBGPSD9000_en_US





[Description](#) [Specification](#) [Multimedia](#)

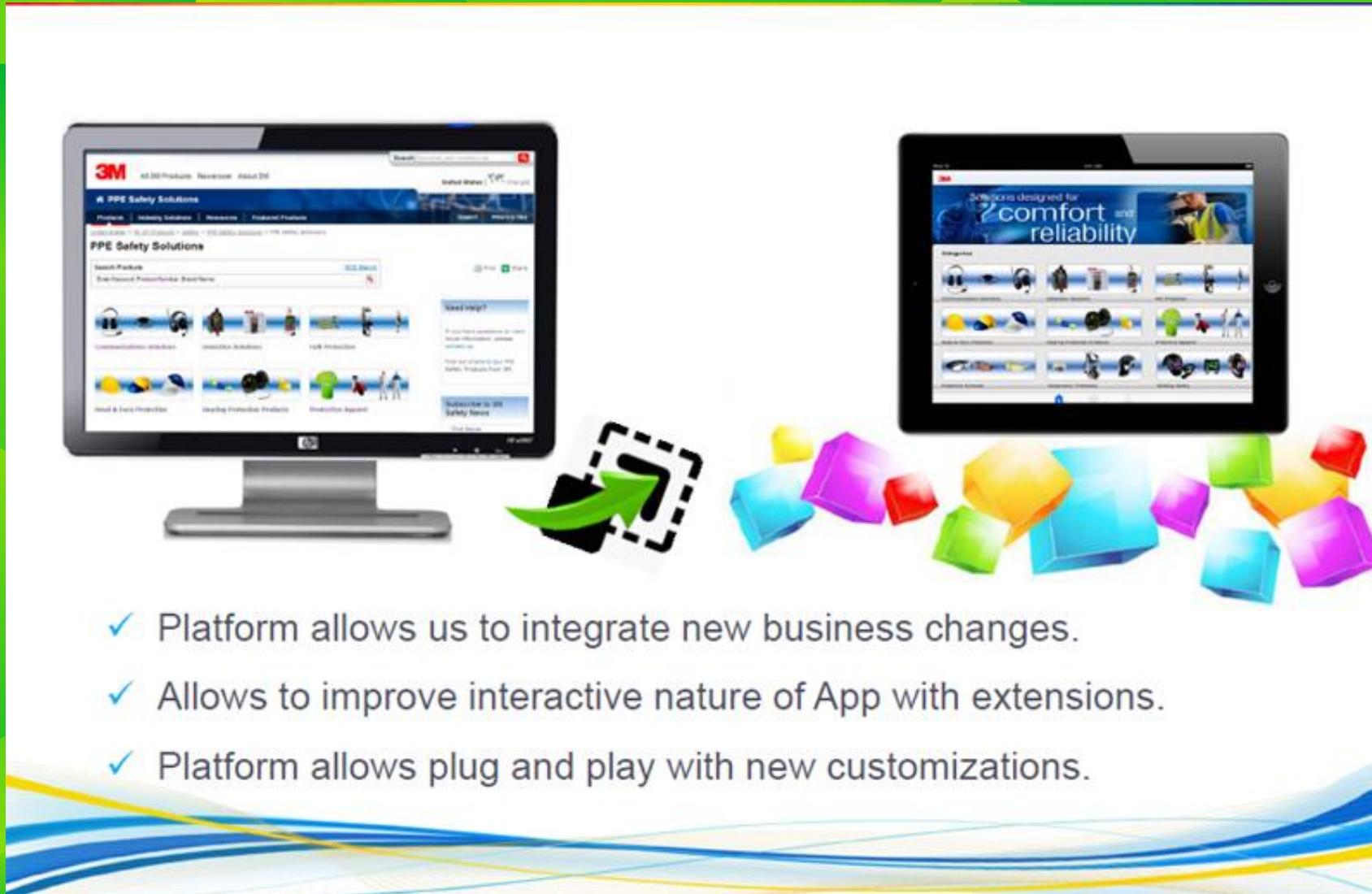
Documents:

 [3M™ Speedglas™ Full Line Catalog Brochure](#)

Videos:

[Home](#) [Favorites](#) [Profile](#)

MAP Designed For Future Integrations



✓ Platform allows us to integrate new business changes.

✓ Allows to improve interactive nature of App with extensions.

✓ Platform allows plug and play with new customizations.

Thank you!