

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	\$30.274B
International	\$18.225B
60% of company's total	

Net Income

Net income – reported	\$4.833B
Percent to sales	16.0%
Earnings per share – diluted – reported	\$7.58

Taxes

Income tax expense	\$1.982B
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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	\$1.763B
Total for last five years	\$8.452B

Capital Investments

For 2015	\$1.461B
Total for last five years	\$7.482B

Employees

Worldwide	89,446
United States	35,973
International	53,473

Patents awarded

In 2015	US 565; total 3,128
In company history	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.

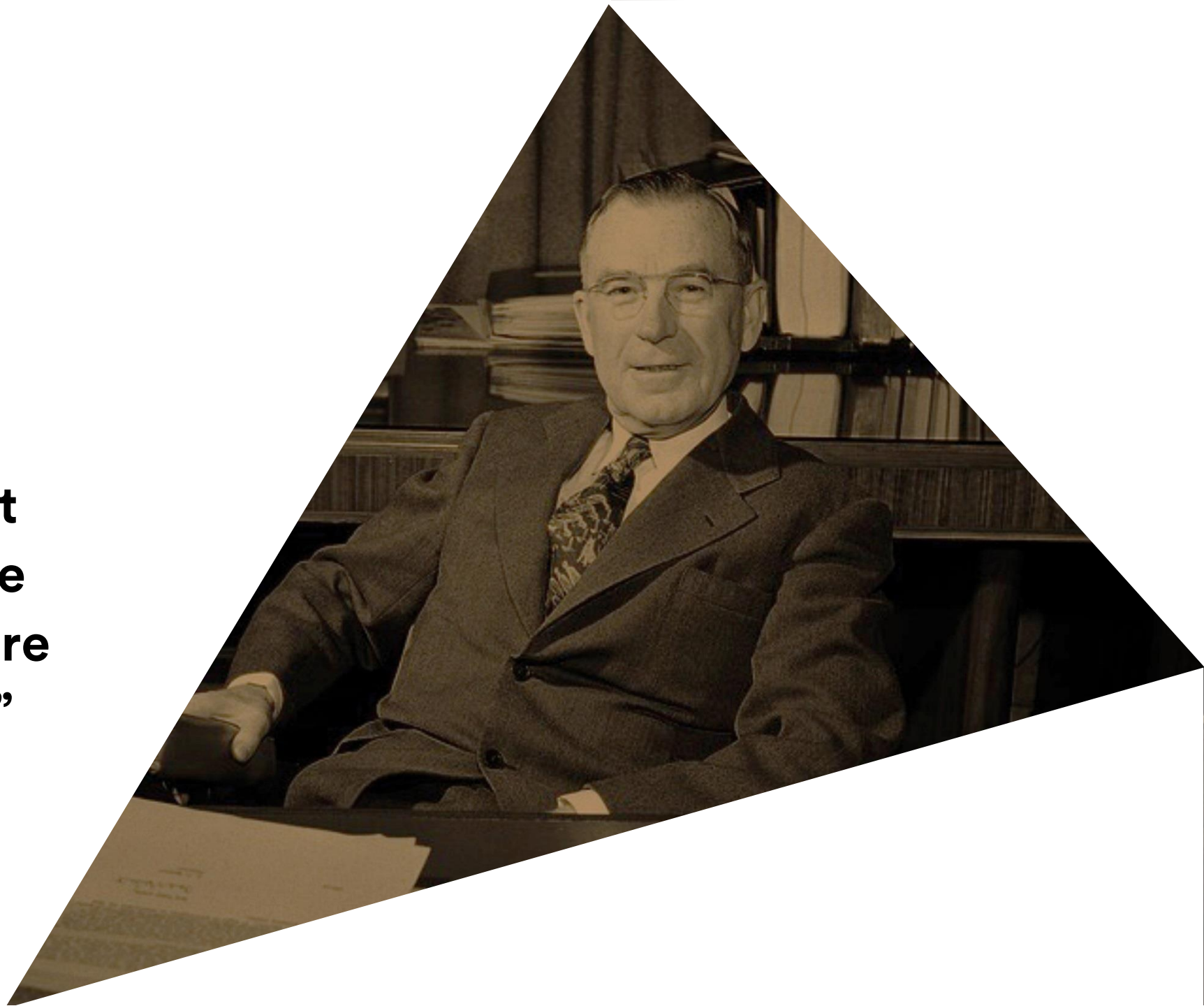
Announced sustainability-related platform and goals, reflecting increasing focus on supporting the environmental and social goals of 3M's customers and the communities in which it operates.

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

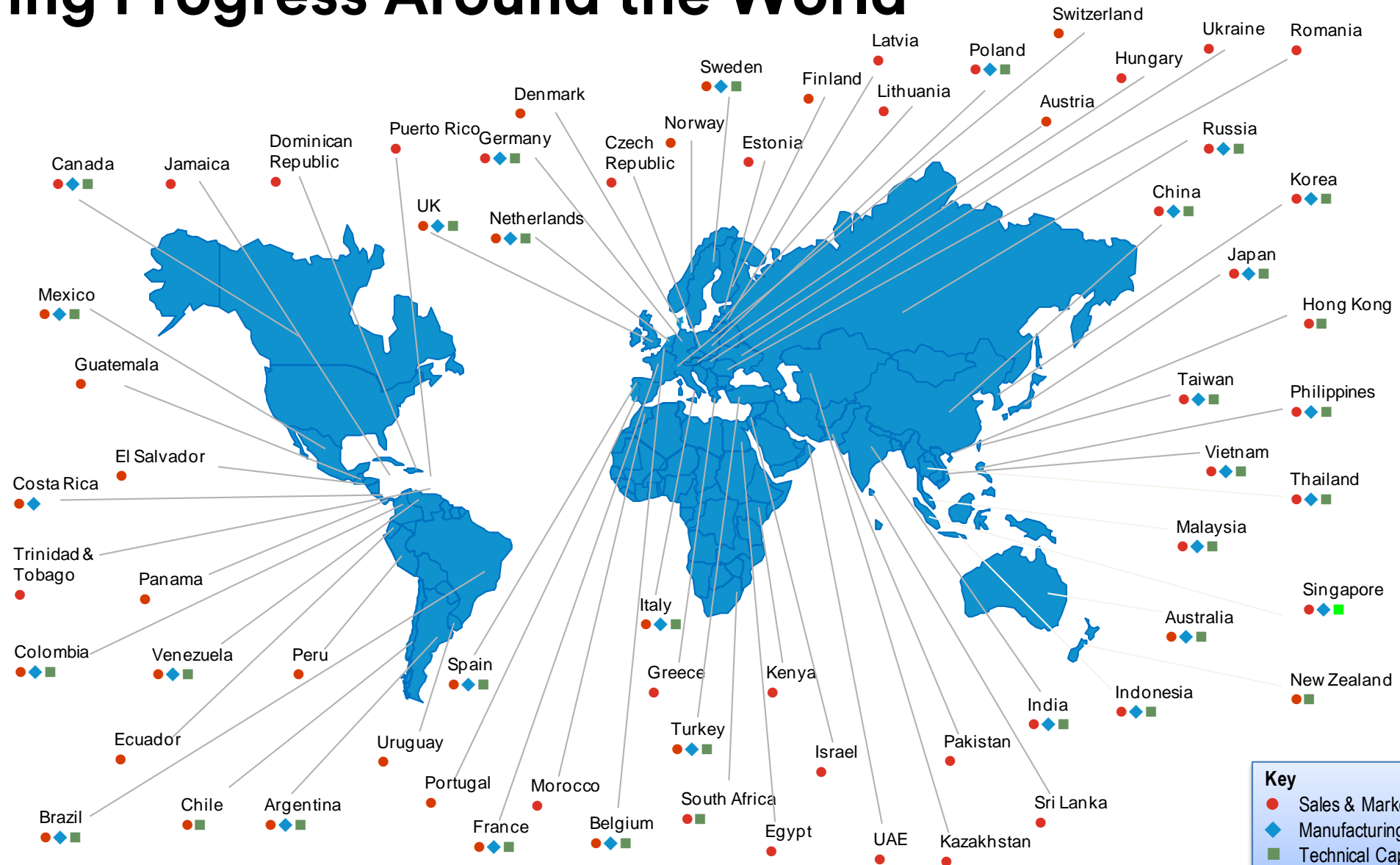
46 core technology platforms





105,000
patents

Driving Progress Around the World



Key

- Sales & Marketing
- ◆ Manufacturing/Converting
- Technical Capabilities

3M Science.
Applied to Life.™

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



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



Reduce cost by using enterprise Product Data Management Systems

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

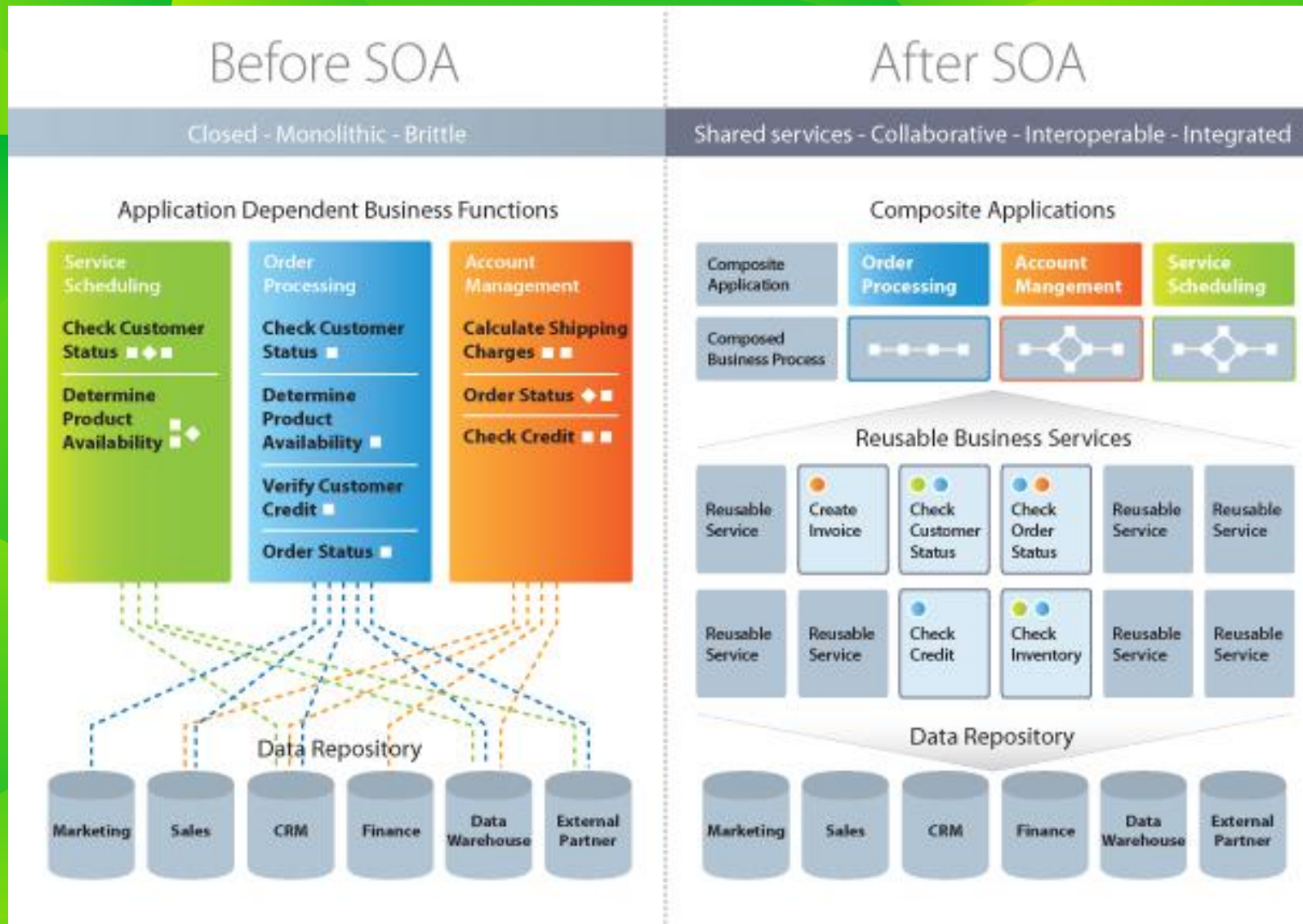


Extract Data from Snaps

The Major Challenge Faced By Enterprise Developers

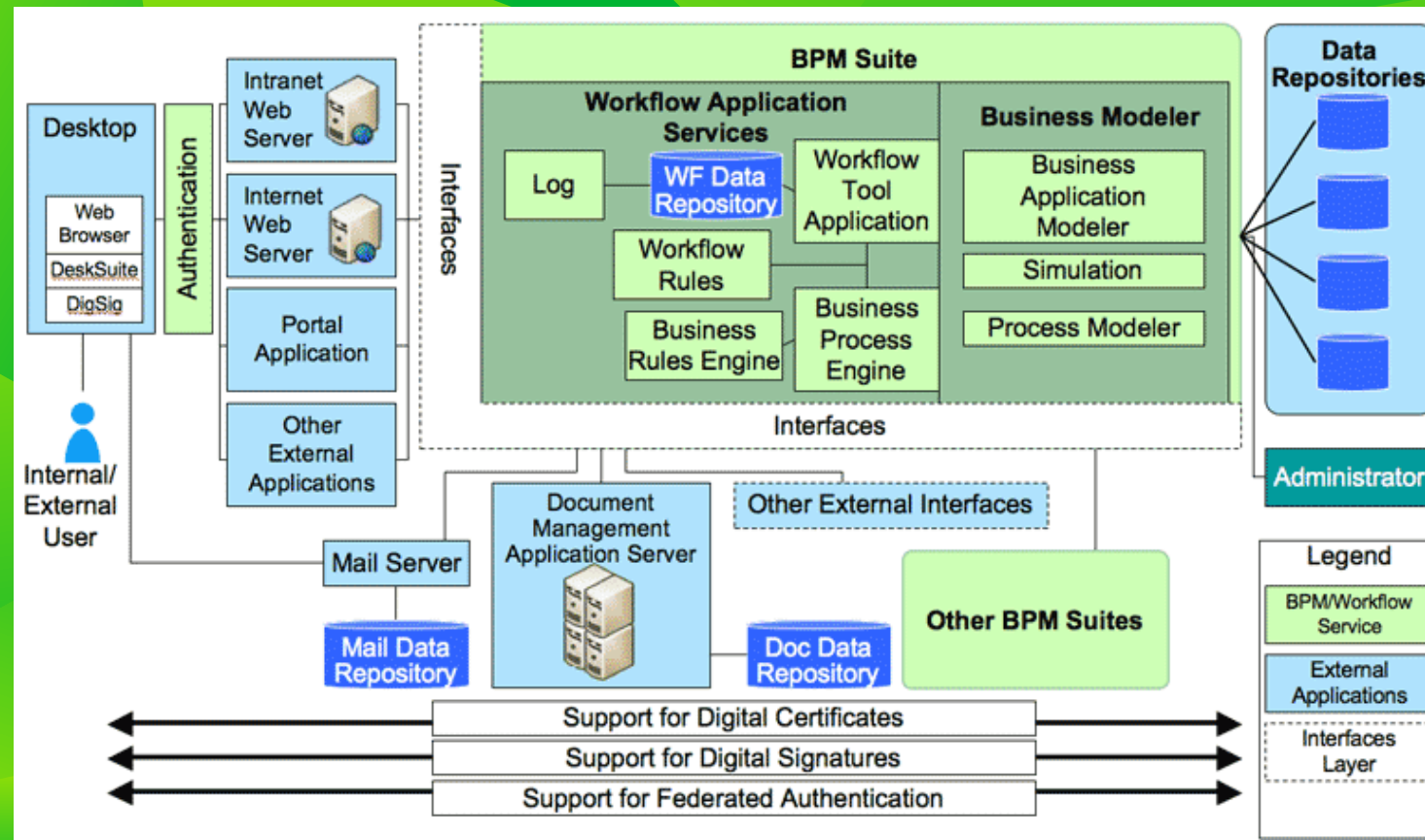


What Did I Think The Solution Was?



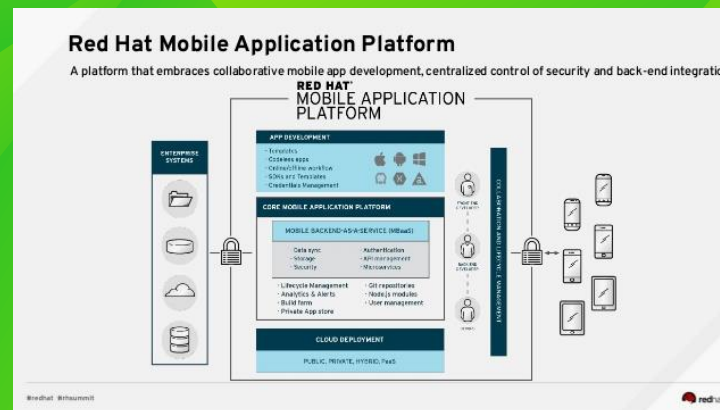
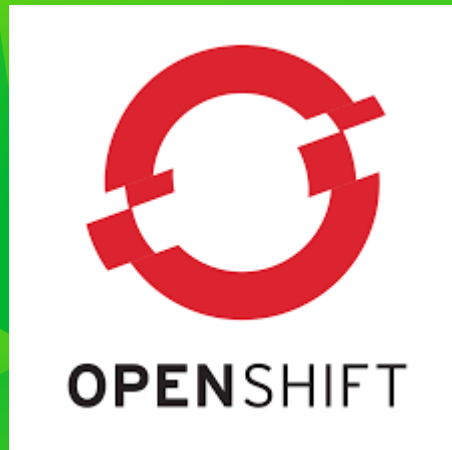
What Did My Management Think The Solution Should Be?

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



Service Layer

Aggregation Layer

Delivery Layer

Client Layer



“Mobile Needs A Four-Tier Engagement Platform”

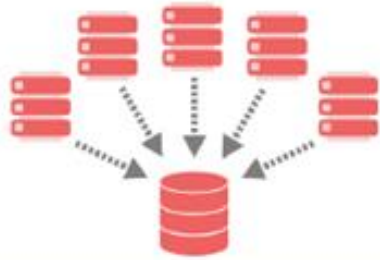
FORRESTER

- 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



Details Of The Solution We Built



Aggregate data from existing web sites and reflect into App.



Extract products data and navigation structure from existing web site without interfering actual data sources.



All the data extracted is aggregated and stored into mobile platform data store.



Each component is responsible only for a specific feature that allows decoupling (Single functionality principle)

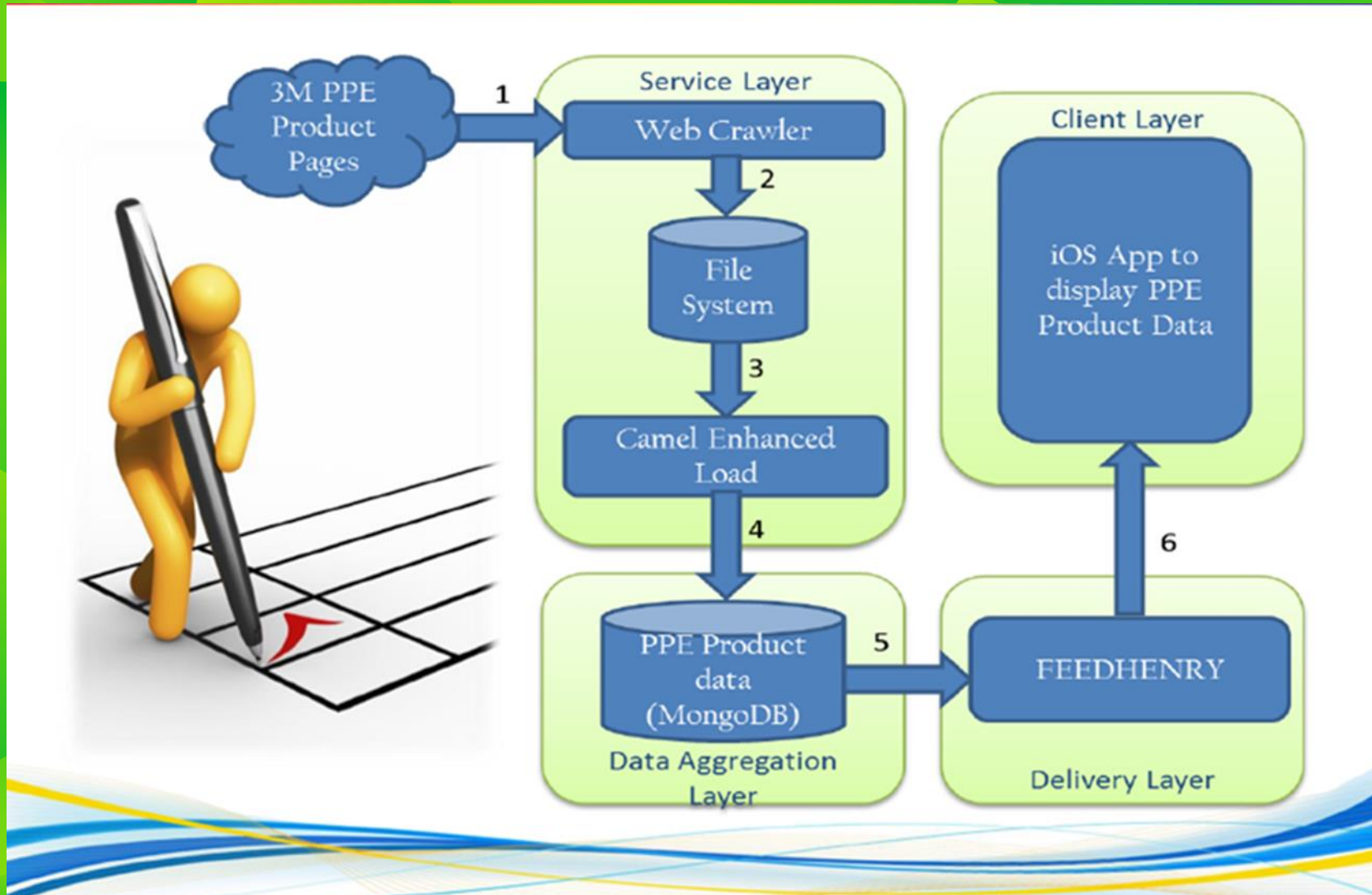


Incorporated reusability at each level with low coupling.



Data delivered using mobile platform APIs to App UI.

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.

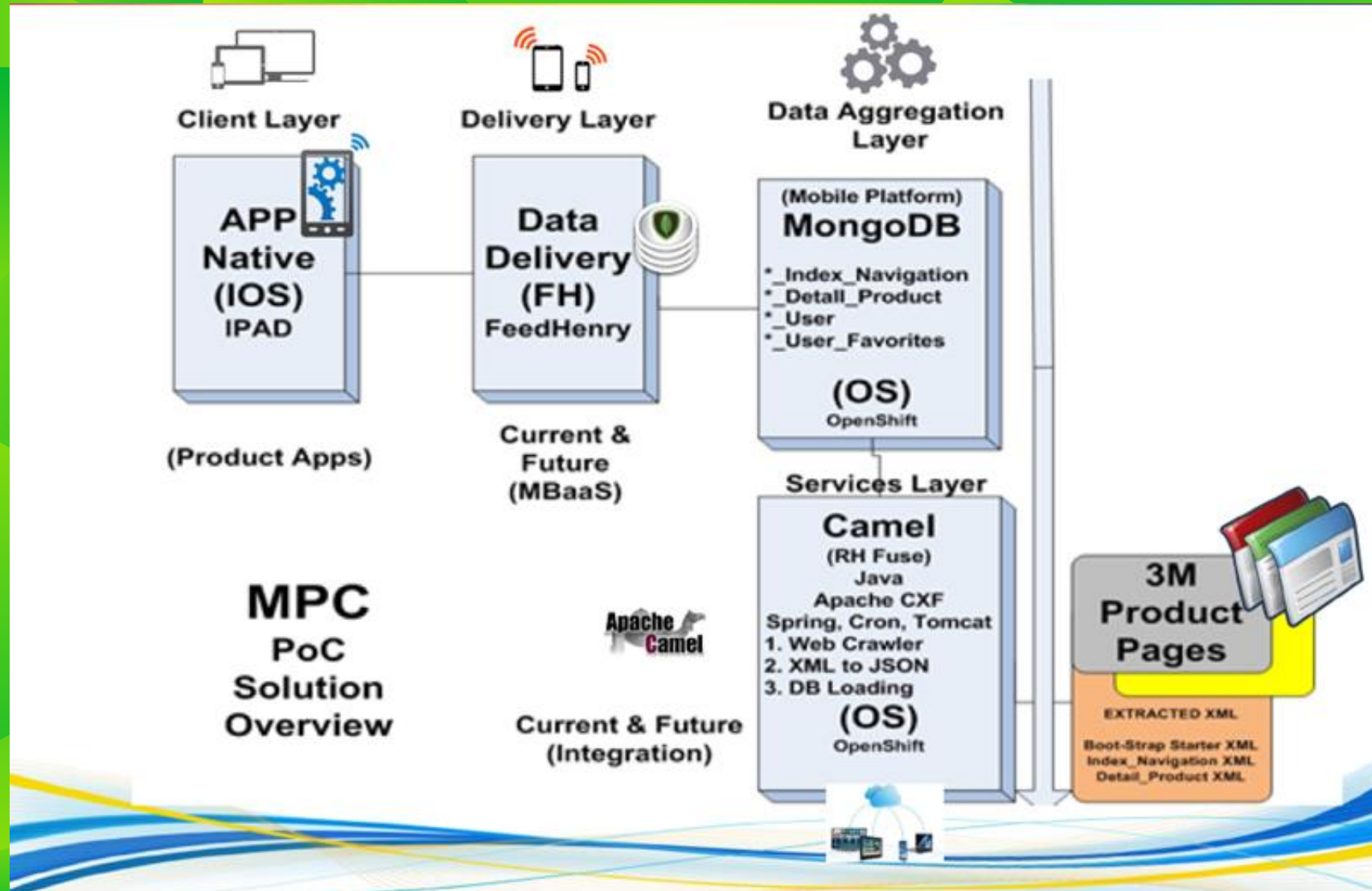


Client Tier – Native iOS Application

- 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



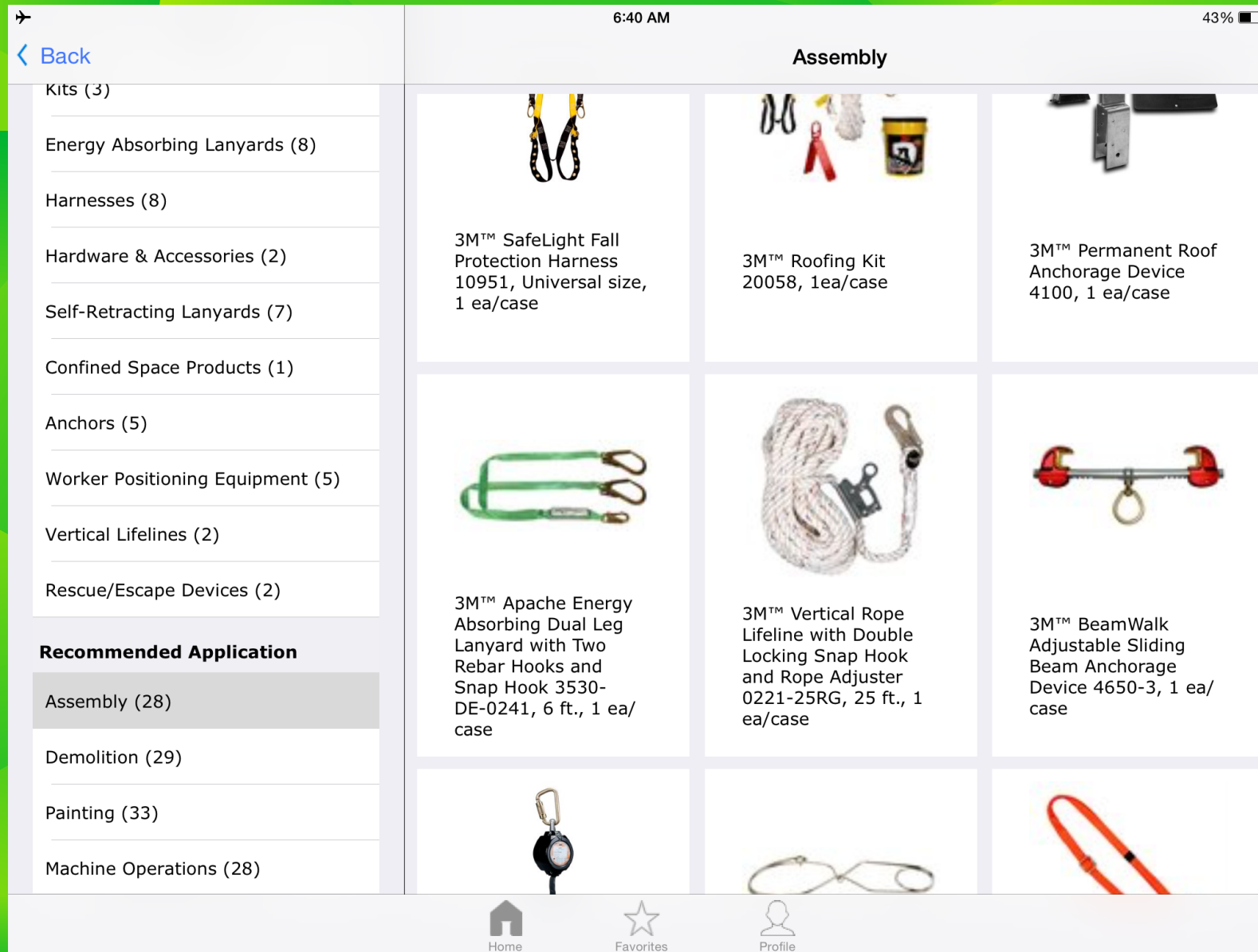
Website Compared to Mobile App



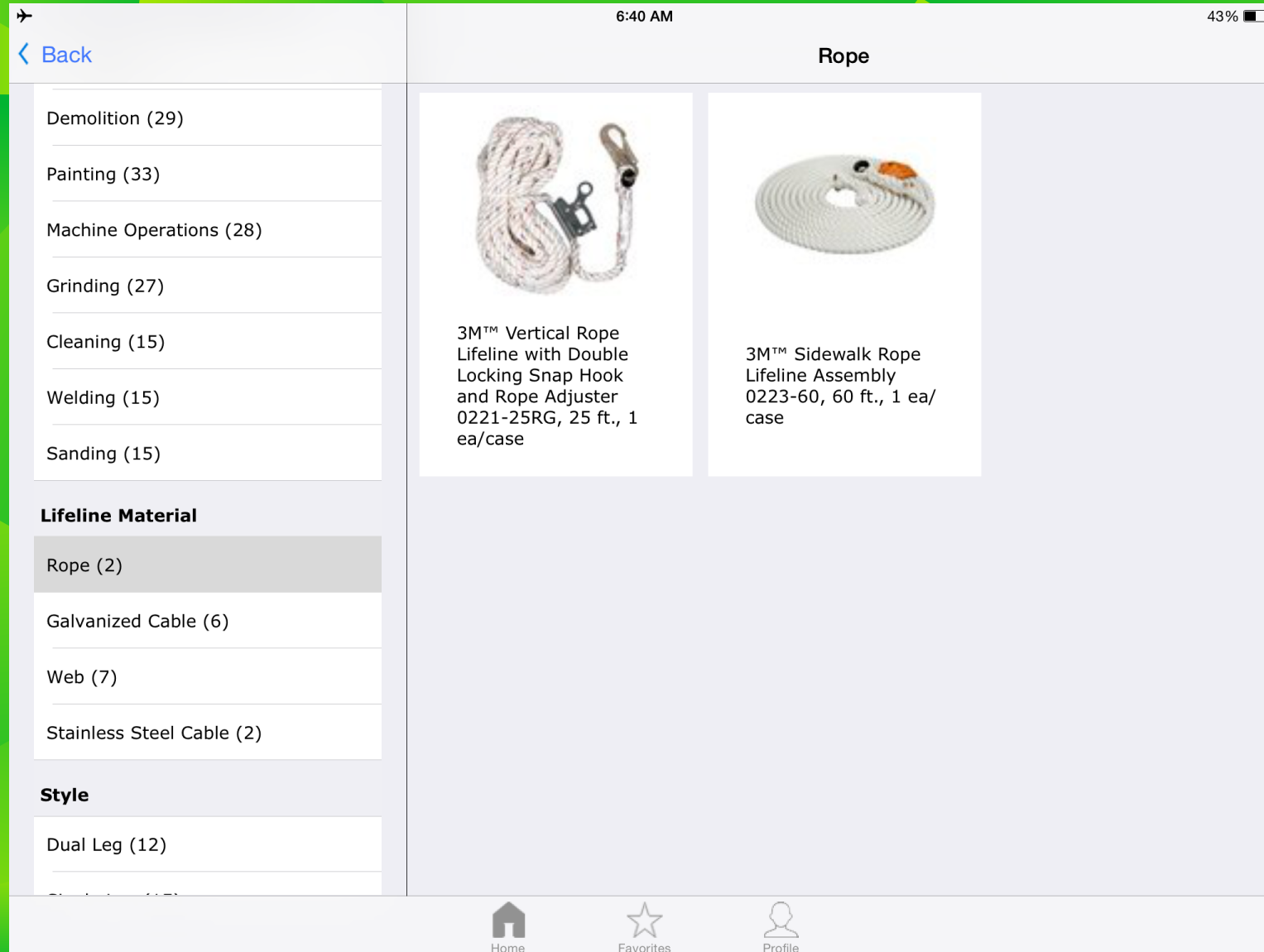
Mobile App – Home Screen



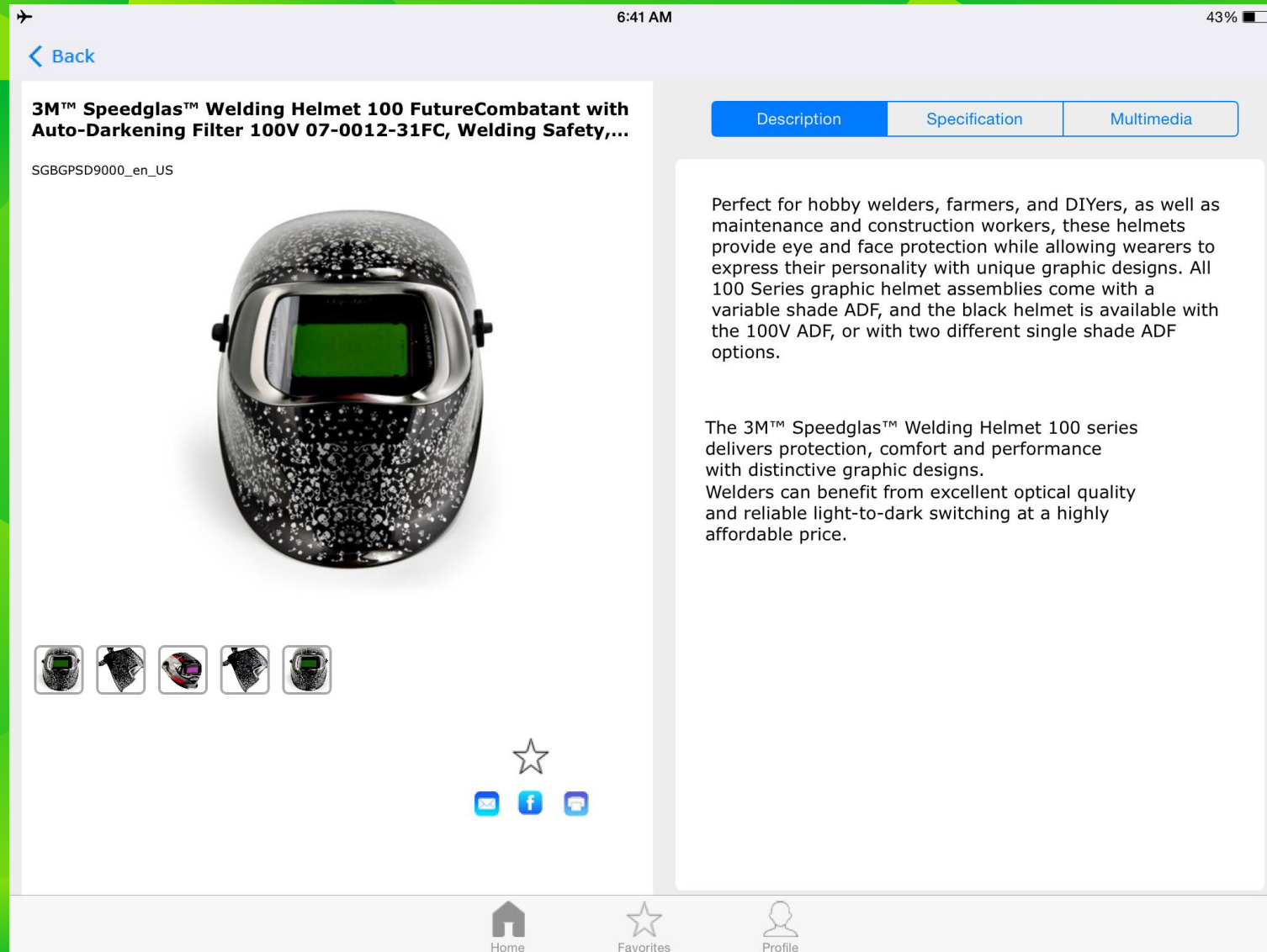
Mobile App – Product Navigation



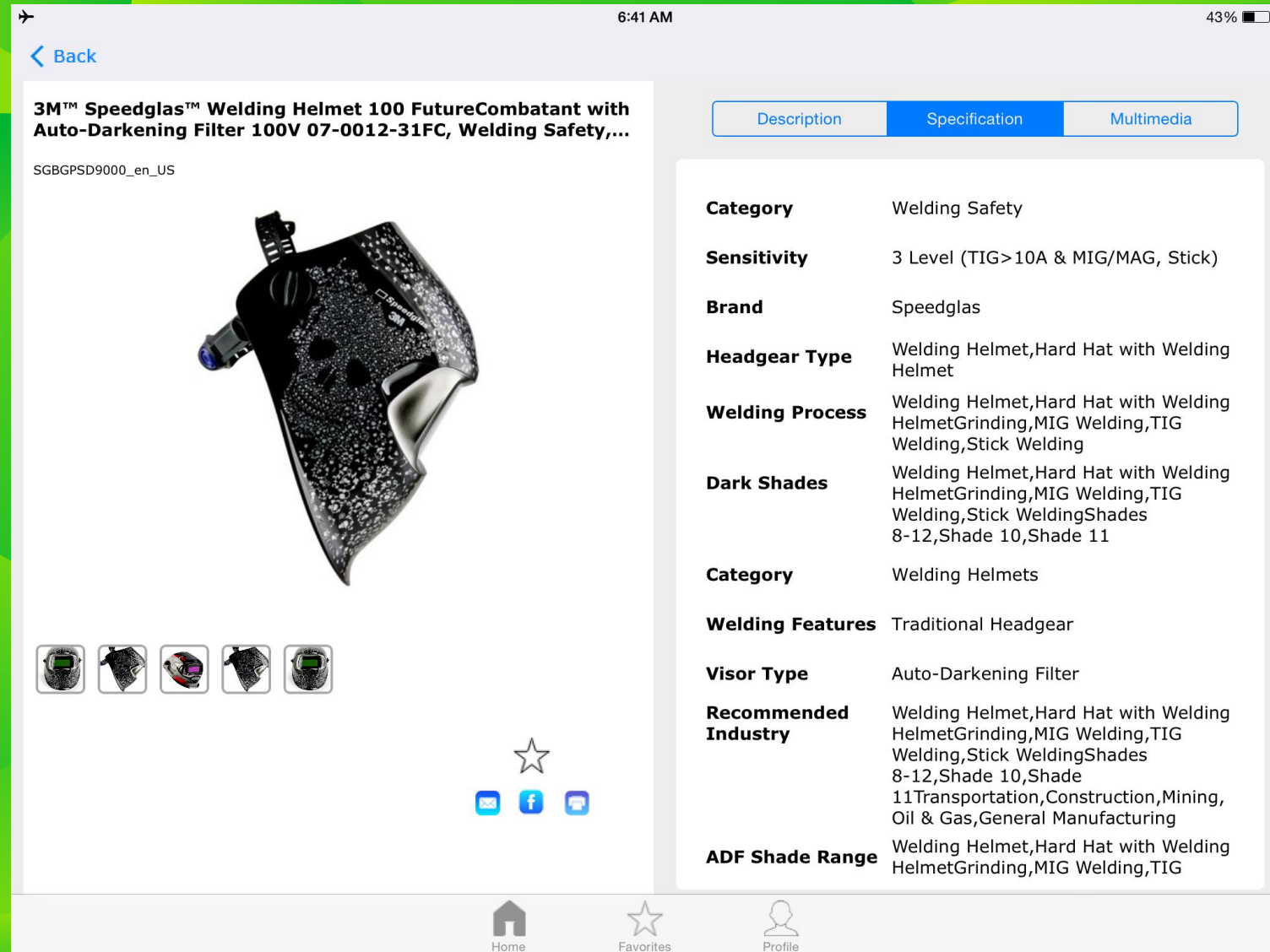
Mobile App – Navigation Refined



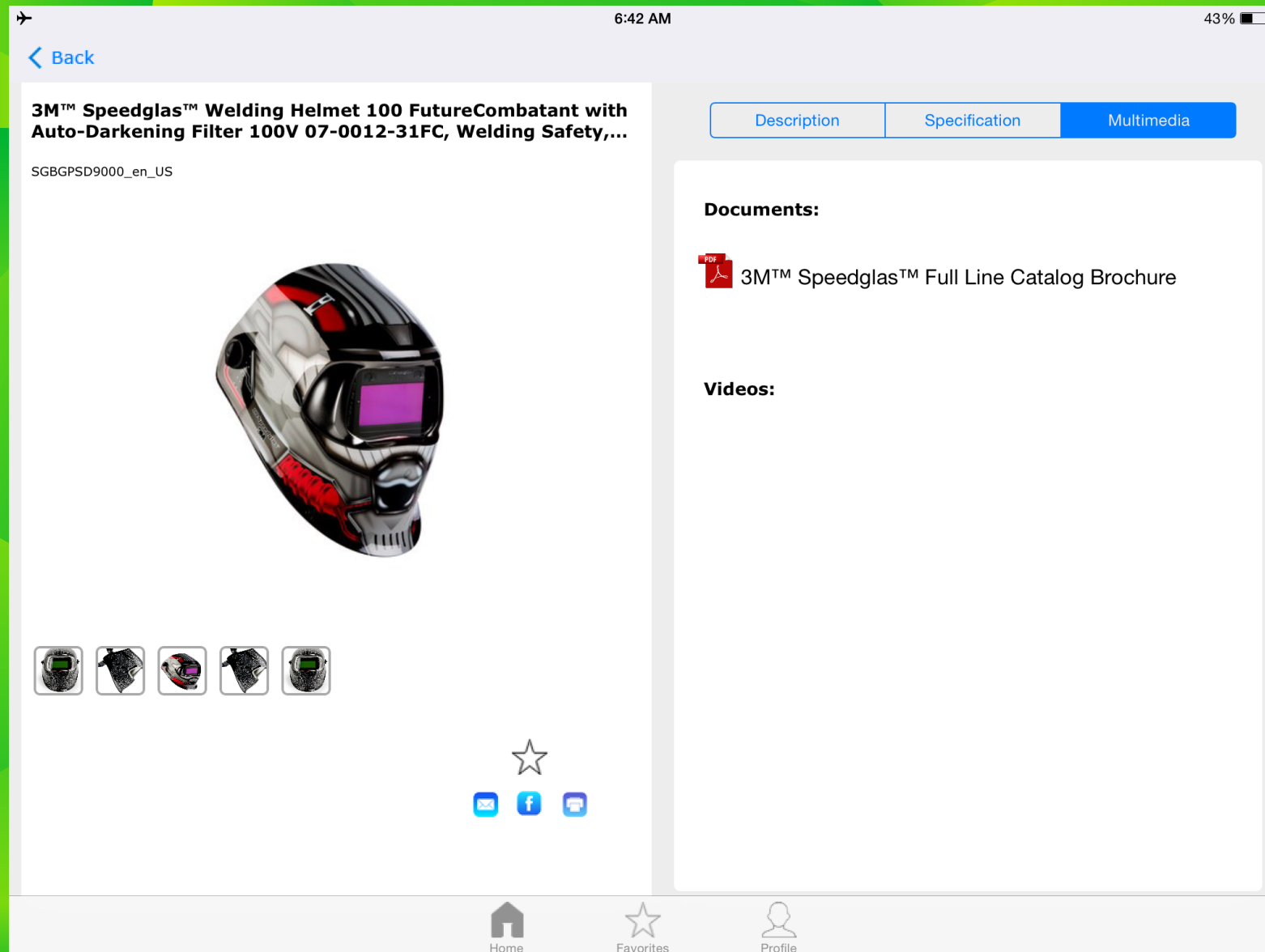
Mobile App – Product Selection Description




Mobile App – Product Selection Specs



Mobile App – Product Selection Media



MAP Designed For Future Integrations



The image shows a desktop monitor and a tablet, both displaying the 3M PPE Safety Solutions website. A green arrow points from the desktop screen to a cluster of colorful 3D cubes, symbolizing integration and future developments.

- ✓ 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!