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

Sales
Worldwide $30.274B
International $18.225B

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

Net Income
60% of company’s total

Patents awarded
In 2015 US 565; total 3,128
In company history 105,000+

Taxes
Income tax expense $1.982B

Organization
26 business units, managed under these five business groups:
- Consumer
- Health Care
- Safety & Graphics
- Electronics & Energy
- Industrial

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

Dividends
(Paid every quarter since 1916)
Cash dividends paid per share $4.10
One original share, if held, is now 3,072 shares

Capital Investments
For 2015 $1.461B
Total for last five years $7.482B

R&D and Related Investments
For 2015 $1.763B
Total for last five years $8.452B

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.

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.

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“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
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

"Mobile Needs A Four-Tier Engagement Platform"

- 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
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
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 provided 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

Categories

- Communications Solutions
- Detection Solutions
- Fall Solutions
- Head & Face Protection
- Hearing Protection Products
- Protective Apparel
- Protective Eyewear
- Respiratory Protection
- Welding Safety
Mobile App – Navigation Refined

| 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 |

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<th>Lifeline Material</th>
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<tbody>
<tr>
<td>Rope (2)</td>
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<tr>
<td>Galvanized Cable (6)</td>
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<tr>
<td>Web (7)</td>
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<td>Stainless Steel Cable (2)</td>
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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.
Mobile App – Product Selection Specs

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

- **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 HelmetGrinding, MIG Welding, TIG Welding, Stick Welding
- **Dark Shades**: Welding Helmet, Hard Hat with Welding HelmetGrinding, 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 HelmetGrinding, 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 HelmetGrinding, MIG Welding, TIG
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!