LET THE TRANSFORMATION BEGIN
Dell EMC IT Big Data Analytics Journey

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Agenda

1. Dell EMC IT Big Data Journey
2. Building the Data Lake
3. Marketing Science Lab Use Case
4. Technical Benefits
5. Lessons Learned
6. Q&A
Dell EMC IT Big Data Journey
A Journey Of Maturity

1. AGGREGATE
   - Consolidation
   - Master Data
   - Common BI Tools
   - BI Governance
   - FOUNDATION

2. LIBERATE
   - BA-as-a-Service
   - Data Scientist Services
   - Collaborative Analytic Tools
   - Unified Analytical Platform
   - ANALYTICS ENABLEMENT

3. INNOVATE/ITERATE
   - Flexible / Scalable
   - Mission Critical
   - Real Time Capable
   - Collaborative Delivery
   - DATA LAKE

4. HARNESS
   - Analytics -based decision making
   - Leveraging data to predict future models
   - Transforming operations by applying analytics
   - ANALYTICS ENTERPRISE

Building The Data Lake

- **PROCESS EXECUTION**
- **MONITOR THE BUSINESS**
- **MEASURE BUSINESS PERFORMANCE**
- **IMPROVE THE BUSINESS**

DATA LAKE

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EMBED INTO BUSINESS APPS “MAKE THEM SMARTER”

INNOVATE
ITERATE
REFINE

GOVERNANCE

ERP
CRM
Master Data
Machine Data

WORKSPACE
BU App
Analytics
# Dell EMC IT Data Lake Architecture

## Analytics Toolbox Applications

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<th>Applications</th>
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<td>SAS</td>
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<td>Tableau</td>
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<td>Hadoop MapReduce</td>
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<td>SAP BusinessObjects</td>
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<td>Spark</td>
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<td>CF</td>
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<td>Docker</td>
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## Data Platform

### Execution
- Cassandra
- PostgreSQL
- Memory DB
- GemFire

### Process
- Spring XD
- Pivotal HD
- Greenplum DB

## Data Governance

- Attivio
- Collibra

### Ingestion

- Social Media
- Sensor
- Network
- Web
- Supplier
- Market
- ERP
- CRM
- PLM

## Structured vs. Unstructured

- HDFS on Isilon
- Hadoop on ScaleIO
- Big Data Foundations | Big Data Systems

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Dell - Internal Use - Confidential
Big Data Analytics

**Security**
- Predict failure
- User behavior analysis

**IT**
- Predict failure of exchange servers

**Manufacturing**
- Proactively identify disk drives
- Better yield rates

**Services**
- Proactive and predictive services

**Sales**
- Service contracts renewals ~100M

**Marketing**
- Cross sell products ~10M
- Blending data target marketing & Segmentation to drive incremental revenue

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Security & Compliance  
Grow Revenue  
Increase Efficiency
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Leadership’s Big Data marketing vision.

"The marketing science lab had the goal to build a lean team of data analytics guys that could deliver insight en masse to the marketing team to make it more productive. Less communications, but more targeted, in a way that we think will be more attractive to that target audience." (2013)

"...the best data may reside outside the organization’s database. Combining this data with your CRM and making sense of it requires robust algorithms. However, the benefits are tremendous—you’ll get better understanding of your customer profiles to create more targeted solutions and messaging." (2013)

"To get a 360 degree view of your customer, you must find a way to pull all of this information into your grid and merge it with the data you do own" (2015)

The EMC Marketing Science Lab funnels CRM data into EMC’s data lake solution for predictive modeling ... by marrying our internal data with external unstructured data ... we are able to find individuals" (2015)
## Marketing Science Lab

### Waterfall of Capabilities

### SKILLS
- Applied Statistics
- Programming

### TOP METHODOLOGIES
- Clustering/Classification
- Next Likely Purchase Association Rules
- Propensity-To-Buy
- Text Analytics

### BIG DATA ANALYTICS
- Response
- Purchase Rules
- Segmentation
- Journeys
- Full ROI
- Marketing Mix
- Lead Score

**BIG DATA ANALYTICS**

- **Clustering/Classification**
- **Next Likely Purchase Association Rules**
- **Propensity-To-Buy**
- **Text Analytics**

**SKILLS**

- **Applied Statistics**
- **Programming**

**TOP METHODOLOGIES**

- **Response**
- **Purchase Rules**
- **Segmentation**
- **Journeys**
- **Full ROI**
- **Marketing Mix**
- **Lead Score**
Marketing Science Lab Portfolio

Big Data use cases = the power of EMC Federation technology.

- Parker Antarctica Expedition and EMC Data Lab
- Human Face of Big Data
- Greenplum Las Vegas Workbench + Open Source Tools (2012)
- Information Generation Website
- Partnering with Sales and IT for Greenplum Master Analytics Record (2013)
- Dell EMC Business Data Lake (present)
- Business Data Lake Campaign Marketing Science Lab Powered By Intel
- Math Behind the Morcambe Missile
- F1 Truck Jump & Viral Marketing

Marketing Science Lab Portfolio
Dell EMC’S Business Data Lake

Blending more data than ever before for targeting and segmentation!

**Media Sources**
- TechTarget
- Bombora

**Competitive**
- Aberdeen (Harte Hanks)
- CITDB
- Fairfax
- Fortune 500
- SFDC
- HG Data

**Social Data**
- Sysomos
- Sprinklr
- WordPress
- Disqus
- Twitter

**Marketing Response**
- 3rd Party Events
- Aprimo Marketing Contacts
- Adobe Analytics (Omniture)
- EBC Attendance
- Product Training Data

**Enterprise**
- Installed Base
- Opportunities
- Telemetric Data (SYR)
- Contracts
- Professional Services
Analytical Process

Customer segmentation

A wide range of attributes (giving the rich customer profile shown below) were used to categorize ABM accounts into three distinct segments based on purchase readiness — Undecided, Motivated and Ready — using a statistical technique called cluster analysis.

1. Dell EMC Business Data Lake
   Wide range of data for blending using EMC business data lake:
   - Enterprise Mfg. & Bookings
   - Sales & Marketing History
   - Social Media
   - Competitive
   - External Media Usage

2. Develop Target
   Work with IMC lead to develop target using product, competitive, social and marketing history dimensions selected in partnership with marketing leads for defining targets.

3. Statistical Analysis for Segmentation
   Statistics were combined with business rules to group accounts. Accounts and prospects targeted using machine learning techniques (k-means clustering) to group (or classify) contacts and companies based on similar characteristics.

4. Tableau and Aprimo Integration
   Develop and deploy Tableau Workbooks to give 360-degree view into accounts, prospects and marketing contacts.

5. Deploy
   Roll-Out to Field Marketing through Playbooks, etc.
   Marketing-empowered sales-led engagements.
   Marketing-led digital engagements.
Use Case: Marketing Science Lab

Blending data target marketing & segmentation to drive incremental revenue

The Dell EMC Marketing Science Lab was created to deliver incredibly deep, 360 degree views of customer behaviors, needs, sentiments, and drive unprecedented marketing effectiveness for Dell EMC.
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Technical Benefits

**FASTER ANALYTICS**
Data Lake enables faster data analytics & modelling

**SIMPLIFIED PROVISIONING**
Reduced number of tables/report required

**TOOL AGNOSTIC**
Business logic in the DB not the tool provides increased flexibility

**FASTER DATA INTEGRATION**
Marketing Automation Data into BDL reduced from 7-10 days to <24 hours

**DATA GOVERNANCE**
Provides one version of the truth

**SHARE WORKSPACE**
Ability to share data analysis with others
Lessons Learned

The right people, aligned in the right way, working with the right technology

DEDICATED TEAM

ESTABLISH INDIVIDUAL / TEAM TO LEAD THE EFFORT

PARTNERSHIP

DETERMINE WHICH FUNCTIONS & TECHNOLOGIES TO INVOLVE

GAIN EXECUTIVE SPONSORSHIP

COMMUNICATE, EDUCATE, DRIVE ADOPTION

IT'S A JOURNEY
Key Takeaways

IT’s A DARWINIAN EVOLUTION

TREAT DATA LIKE YOUR PRODUCT

USER EXPERIENCE IS KING

IT’s A TEAM SPORT

COLLECT EVERYTHING

YOUR DATA DIFFERENTIATES YOU

INTEGRATION MATTERS

DEMOCRATIZE YOUR DATA

PERFECTION IS NOT REQUIRED

IT’s A DARWINIAN EVOLUTION

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**Dell EMC Global Services Big Data Approach**

Accelerate a strategic business initiative with big data analytics

<table>
<thead>
<tr>
<th>BUSINESS</th>
<th>TECHNOLOGY</th>
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<td><strong>ASSESS</strong></td>
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<td>Identify and prioritize an analytics use case that offers an optimal combination of business benefits and implementation feasibility.</td>
<td>Assess the current state against the goals for adding new capabilities. Assess technology gaps, and develop a future state architecture with implementation roadmap.</td>
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| | **PROVE** |
| | Demonstrate how the analytics use case would deliver analytic lift if put into production and prove the potential ROI. |
| | Prove that the technology delivers the required technical capabilities within the customer environment. |

| | **DEPLOY** |
| | Implement the analytics use case into production to create an operational Big Data solution to a business problem. |
| | Implement the technologies and processes into production to enable the required Big Data capabilities. |

**Big Data Module (BDM)**
- Software Installation
- BDL (analytics) Implementation

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**Big Data Proof of Value**

**Big Data Proof of Technology**

**Big Data Applied Analytics Implementation**

**Big Data Vision Workshop**
Repeat process for qualified business cases...
Identify where and how to start / leverage Big Data Analytics

1. Align business and IT goals around big data
2. Identify strategic opportunities for big data analytics
3. Review current environment and identify data sources
4. Prioritize key use cases by assessing feasibility and ROI
5. Recommend the appropriate analytics engagement and big data deployment roadmap
Key Steps

- Research and select strategic business initiative (objectives, success metrics, timeframe)
- Leverage group dynamics with Business and IT stakeholders to extract big data use cases
- Identify and secure key data sets (typically 5-6GB)
- Perform data science work to determine which data sources provide the most value
- Envisioning exercise to help convey the “realm of the possible” with big data analytics
- Prioritize big data use cases, feasibility and ROI
- Review, recommend, and plan a course of action for implementation

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**Engagement:** Identify the optimal times, places and offerings with which to engage Creators in order to influence their product and project buying decisions

**Communication:** Leverage marketing and social media to influence and measure Creators and their “spheres of influence”, advocacy and net promoter scores

**Product/Project:** Identify, influence and predict buying and project planning decisions, and understand the effectiveness of marketing and merchandizing in reaching them at decision time

**Financial:** Identify the drivers of decisions and measuring the effectiveness of influencing those drivers

**Identify/Targeting:** Provide a predictive environment for identifying the Creator’s lifecycle

**Loyalty:** Create and monitor a customer loyalty index that can guide customer acquisition, growth and retention marketing campaigns