Roadmap Overview
1/29/2019
3-5 year Roadmap Objectives

• Core: Maintain Best in class solution for mastering and managing complex multi-domain data solutions and technologies (Services Architecture, Complex Models, Scalability, etc.)

• Community: Build a vibrant community of technology partners who exploit their domain expertise to deliver a marketplace value added services

• Leadership: Provide market leadership in defining and delivering ability to build and master the B2B2C value chains (MDM Experience Management)
Agile Data Fabric™ (ADF) Connectivity Overview

Aspects of EnterWorks ADF:
• Services Oriented Architecture (SOA) for Agile Development/Integration
• Diverse interfaces (REST API, Hadoop DFS, OBDC, FTP, etc.)
• Legacy interactions with ERP, CRM, PLM, WCM, POS, etc.
• Secure, fast, highly available, and scalable within the ADF
• Hybrid Data Cloud across on-Prem & Cloud (AWS, Azure, Google Cloud, Rackspace, etc.)
• Private multi-tenancy for communities and portfolio/ divisional companies

Connected Content Differentiation
• Plug N Play Modules / Future-Proof
• Supports B2B2C Network strategy
• Extends PIM into PIM 2.0
• Data Pool Integration and Syndication
• EnterWorks ADF Marketplace – Partner and Customer Enabled Development
Partner Value Marketplace

Value Add Applications and Services

• Vendor score carding and data onboarding (e.g., Vendor Portal/Mapping)
• Content Enrichment: Categorization, Product Relations (Upsell, Cross sell), Normalization, etc.)
• Market Intelligence: (e.g., Review Analysis, Comparative Searches, Facets of interests, etc.)
• Syndication Services Implemented in Enable Agile Data Fabric
Enable 2019 Product Roadmap

**MxM**
- Advance Reporting and Data Analysis
- Next Gen Merchandising Desktop
- Next Gen PLM
- Partner Service Extensions (AI/ML Content, Vendor Score Carding, Market Analytics, etc.)
- Marketplace Extensions (ETL Data Pipes, etc)
- 3rd Party Syndication Services
- Collibra Services (Policy Mgmt.)

**Enable 2020**
- Next Gen UI Phase 2
- Next Gen Data Model Visualization
- AI/ML (Adaptive Model Extensions)
- Enhanced DQ (Merge, Location)
- Enhanced Search and DQ Reporting Svc
- Next Gen Workflow
- Publication Extensions (InDesign/Jasper)
- Next Gen Empower Datamart
- Next Gen Sales & Public Portal Phase 1&2
- Next Gen Vendor Portal
- Menu Application

**Cloud**
- Support for POSTgreSQL
- Public SaaS Offering
- Support for Linux in Cloud
- PaaS Containerization (Kubernetes/KOPS)
- Serverless computing (FaaS)
- SOC 2 Security Certification
- ISO 27001 Certification

EnterWorks Acquisition, Inc. Proprietary and Confidential
Advanced Reporting and Data Analysis

- Integrated reporting engine for complex reporting and outputs
- Intuitive web-based report design
  - Drag and drop interface
  - Tables and crosstabs
  - Charts: pie, bar, line, area, etc.
  - Point and click aggregation
- Multiple output formats including PDF, Word and Excel
**Example: New Product Introduction Velocity Use Case**

- **Goals**
  - Improve New Product Introduction (NPI) lead time.
  - AI/Machine learning models can learn from historical patterns and forecast NPI velocity and identify slow moving products early on, thus allowing for remedial action.

- **Predictors** – Vendor profile (name, products supplied, revenue, vendor growth etc.); Product profile (type, style, price etc.); Business processes; Data quality

- **What we predict** – estimated time to introduce the product to market

- **When we predict** – when product is received by merchant

- **End result** – products with high probability of causing introduction delays will be identified and can be acted upon

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**Schematic Predictive Model**

- **Product Id**: 1001, 1002, 1010
- **Delay Score**: 0.8, 0.75, 0.01
- **Risk Level**: High, High, Low

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**Sample Product Risk Score**

<table>
<thead>
<tr>
<th>Product Id</th>
<th>Delay Score</th>
<th>Risk Level</th>
</tr>
</thead>
<tbody>
<tr>
<td>1001</td>
<td>0.8</td>
<td>High</td>
</tr>
<tr>
<td>1002</td>
<td>0.75</td>
<td>High</td>
</tr>
<tr>
<td>1010</td>
<td>0.01</td>
<td>Low</td>
</tr>
</tbody>
</table>
Analytics – Elasticity Modeling & Optimal Pricing Use Case

- **Objectives**: Use MDM data to understand the effectiveness of discount & promotions and design optimal pricing strategies
- **Elasticity** \( (E) = \frac{\% \text{ Change in Quantity Sold}}{\% \text{ Change in Price}} \) (products elasticities vary, thus discovering elasticities and cross elasticities enable the determination of optimal price that maximizes overall revenue)
- **Methodology**: years of sales, promotions & discount data used to create week level sales volume vs. price & promotions dataset:

<table>
<thead>
<tr>
<th>Product Category</th>
<th>Elasticity</th>
<th>p-value</th>
<th>Elastic/Inelastic</th>
<th>Discount Recommendation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Shoes (overall)</td>
<td>-1.110</td>
<td>0.0</td>
<td>Elastic</td>
<td></td>
</tr>
<tr>
<td>Marked down shoes</td>
<td>-1.142</td>
<td>0.0</td>
<td>Elastic</td>
<td></td>
</tr>
<tr>
<td>&lt;50 markdowns</td>
<td>-3.08</td>
<td>0.516</td>
<td>Inelastic</td>
<td>Do not discount</td>
</tr>
<tr>
<td>50-150 markdowns</td>
<td>-0.964</td>
<td>0.0</td>
<td>Inelastic</td>
<td>Do not discount</td>
</tr>
<tr>
<td>150+ markdowns</td>
<td>-1.115</td>
<td>0.0</td>
<td>Elastic</td>
<td>Do not discount (Optimal markup &gt;&gt; current markup)</td>
</tr>
<tr>
<td>Regular priced shoes</td>
<td>0.334</td>
<td>0.579</td>
<td>Inelastic</td>
<td>Do not discount</td>
</tr>
<tr>
<td>Designer</td>
<td>-1.385</td>
<td>0.073</td>
<td>Inelastic</td>
<td>Do not discount</td>
</tr>
<tr>
<td>200+ non-designer</td>
<td>-2.512</td>
<td>0.0</td>
<td>Elastic</td>
<td>Discount is recommended. Optimal markup &lt; current markup</td>
</tr>
<tr>
<td>50-200 non-designer</td>
<td>-4.371</td>
<td>0.0</td>
<td>Elastic</td>
<td>Discount is recommended. Optimal markup &lt; current markup</td>
</tr>
<tr>
<td>&lt;50 non-designer</td>
<td>0.169</td>
<td>0.889</td>
<td>Inelastic</td>
<td>Do not discount</td>
</tr>
</tbody>
</table>
Analytics – MDM “in-the-box” Use Cases

Please note these use cases employ descriptive analytics

SKU Analysis – real-time view of millions of SKU’s in MDM
  • Snapshot of product/SKU counts and their state
  • Product/SKU distribution within repository, taxonomy, hierarchy and channel
  • Data quality stats – SKU’s with missing required attributes etc.
  • Relationships cardinality overview like number of products supplied by vendor

Business Process Flow Analysis
  • View of New Product Introduction processes and state
  • Product/SKU distribution across all workflows
  • Product/SKU distribution per workflow and per stage of workflow
  • Aging of product/SKU in workflow
  • User activity time lapse within each workflow
AI/Machine Learning Uses Cases

Customer-Driven Marketing – 360 View of Channel Engagement
• Use of customer data to segment, target, and personalize offerings

Store Localization
• Including assortments, pricing, store formats, promotions, online influence on store

Marketing Mix and Promotions Modeling
• Determining which marketing investments and promotions work, and which are less effective

Product and Content Recommendation – single channel, omnichannel, and endless aisle
• Recommend products, identify cross-sell/upsell and messaging for particular customers

Trend Forecasting
• Identify drivers: products, change in shopper behavior/preferences, seasonal impacts, geo differences, cross-channel and promotional influences

Competitive Profiling
• Obtain web-based competitive intelligence to incorporate in responding / tuning offer strategies
Lifecycle Management Approach to AI/ML

- Driving Differentiated Experiences through Closed Loop Feedback
- Control System for Trend Shaping and Prediction
Partner Extensions

Apply Domain Expertise to Provide Value Added Services

- Vendor score carding and data onboarding (e.g., Vendor Portal/Mapping)
- Content Enrichment: Categorization, Product Relations (Upsell, Cross sell), Normalization, etc.
- Market Intelligence: (e.g., Review Analysis, Comparative Searches, Facets of interests, etc.)
- Syndication Services Implemented in Enable Agile Data Fabric

Reporting – Vendor Scorecard Use Case

Vendor Performance Scorecard
Measuring of vendor performance is an important requirement in the MDM industry. Vendor Performance scorecards utilize data from the Vendor and Product domains.

Goals
- Detect vendors with the highest volume of product returns
- Reward vendors with the fastest completion of onboarding process
- Measure fulfillment rate by vendor
- Plot vendor deliveries by month

Features
- The dashboard in the top right corner was BI tool
- The dashboard in the bottom right corner was ETL tools
- Both reports were embedded within Tenzing Snapshots

DIVE
Machine Learning Platform
- Auto-Classification
- Auto-Normalization
- Product Recommendation
- Mapping of Unstructured Data

LEVERAGE MACHINE LEARNING TO ENHANCE YOUR MDM
**Vendor Performance Scorecard**

Measuring of vendor performance is an popular requirement in the MDM industry. Vendor Performance scorecards utilize data from the Vendor and Product domains.

**Goals**
- Detect vendors with the highest volume of product returns
- Reward vendors with the fastest completion of onboarding process
- Measure fulfillment rate by vendor
- Plot vendor deliveries by month

**Features**
- The dashboard in the top right corner was created in Microsoft Power BI tool
- The dashboard in the bottom right corner was created in Tableau
- Both reports were embedded within Enable and acquire data via Snapshots
AI/ML for MDM Use Cases

Data Sources
- Vendor
- Excel Spreadsheet
- Data Pool
- MDM User
- Other Application

DIVE - Machine Learning Platform
1. Raw data
2. Unmapped, uncategorized and unstandardized data
3. Mapped, categorized and standardized data
4. Clean data
5. User behavior and purchasing patterns
6. Product recommendations

MDM Platform
- Continuous Product Attribute Learning
- Continuous Product Behaviour Learning

eCommerce/Website

Automated Product Classification
DIVE automatically classifies your raw data and sends back classification suggestions with 80-90% accuracy.

Automated Data Normalization
DIVE uses historical data and current trends to automatically generate business rules and standardize data.

Automated Product Recommendation
DIVE analyzes your MDM and Commerce data to generate recommendations and product references.
Enable Agile Data Fabric Integrations

- **Infrastructure (Services)**
  - AWS Elastic Search (in SR2)
  - AWS Simple Queue Service - SQS
  - Azure Service Bus

- **ETL (Data pipes)**
  - AWS Glue (In development)
  - Azure Data Factory

- **AI/ML (Translation and Language Context)**
  - AWS/Google/Azure Translate
  - AWS Komprehend
**ETL Use Case**

**Easy to manage:** ETL as a Service.

**Scalable:** If you need to add more resources, you can do it per tier, without affecting the other tiers.

**Flexible:** integrating with Enable Queue or via ETL Service
Next Generation Portals

- **Sales, Public, Vendor, and Third Party**
- **ADF Framework**
  - Enable SDK
  - Shared Microservices
PaaS to FaaS Strategy

• Dramatically improve ROI thru lower cost for Hosted and Managed Services environments

• Incremental Approach addressing key component in architecture

• Drive Innovation
  – Container based management framework (e.g., PaaS)
  – Emerging Serverless Architecture (e.g., FaaS)
Enable™ will meet or exceed industry standards for IT Security best practices.

Attestation by an independent auditor that EnterWorks’ IT Security policies, procedures, and practices are operational, monitored, and being improved continuously.

Assurance to our customers that our software product is produced in a managed and secure environment.
# Release Plan

<table>
<thead>
<tr>
<th>Enable 10 - Q1 2019</th>
<th>SR1 - Q3 2019</th>
<th>SR2 - Q4 2019</th>
<th>Major, SE1, &amp; SR2 - 2020</th>
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<tbody>
<tr>
<td>Next Gen UI Phase 2</td>
<td>Enhanced Search and DQ Reporting Svc</td>
<td>Next Gen Vendor Portal</td>
<td>Refactored Empower DataMart</td>
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<tr>
<td>Public Portal Phase 1&amp;2</td>
<td>Enhanced Scheduling and Monitoring</td>
<td>Next Gen Data Model Visualization</td>
<td>Next Gen Workflow Engine (Design console)</td>
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<tr>
<td>Next Gen Sales Portal Phase 1&amp;2</td>
<td>Kubernetes Phase 1</td>
<td>Benchmark Performance Improvements</td>
<td>Enhanced Merchandising Desktop</td>
</tr>
<tr>
<td>Support for PostgreSQL</td>
<td>3rd Party Syndication Services</td>
<td>(ADF) ETL Data Pipes</td>
<td>Menu Application (Menu/Recipe)</td>
</tr>
<tr>
<td>Container Installation</td>
<td>Security Certifications - SOC2</td>
<td>(ADF) AI/ML Services for Content Enhancement</td>
<td>Integration with Collibra (Policy)</td>
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<tr>
<td>Sales and Customer Driven Enhancements</td>
<td>Partner Community Services (Marketplace)</td>
<td>Kubernetes KOPS Phase 2</td>
<td>Security Certifications ISO27001</td>
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<td>Sales and Customer Driven Enhancements</td>
<td>Hosted Environment Support</td>
<td>Partner Community Services (Marketplace)</td>
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Questions?