



In-Memory
Computing
SUMMIT

NORTH
AMERICA
2018

Solving Time-to-Market and Data Flexibility problems with IMDG

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IT Architect

Agilent Technologies Inc



Agilent

Trusted Answers

About Agilent

Agilent is a leader in life sciences, diagnostics and applied chemical markets. The company provides laboratories worldwide with instruments, services, consumables, applications and expertise, enabling customers to gain the insights they seek. Agilent's expertise and trusted collaboration give them the highest confidence in our solutions.

Agilent focuses its expertise on six key markets, where we help our customers achieve their goals:

Diagnostics

- Agilent gives doctors a head start in the fight against cancer and other diseases.

Pharmaceutical

- From disease research and drug discovery, to drug development, manufacturing and quality control.

Environmental and Forensics

- We provide fast, accurate and sensitive methods for monitoring contaminants.

Research

- Instruments and S/W help Research with Scientists across Globe.

Chemical and Energy

- Help customers maximize their production of fuels and predict failures.

Food

- Helps to ensure our food supply remain free of contaminants.

Outline

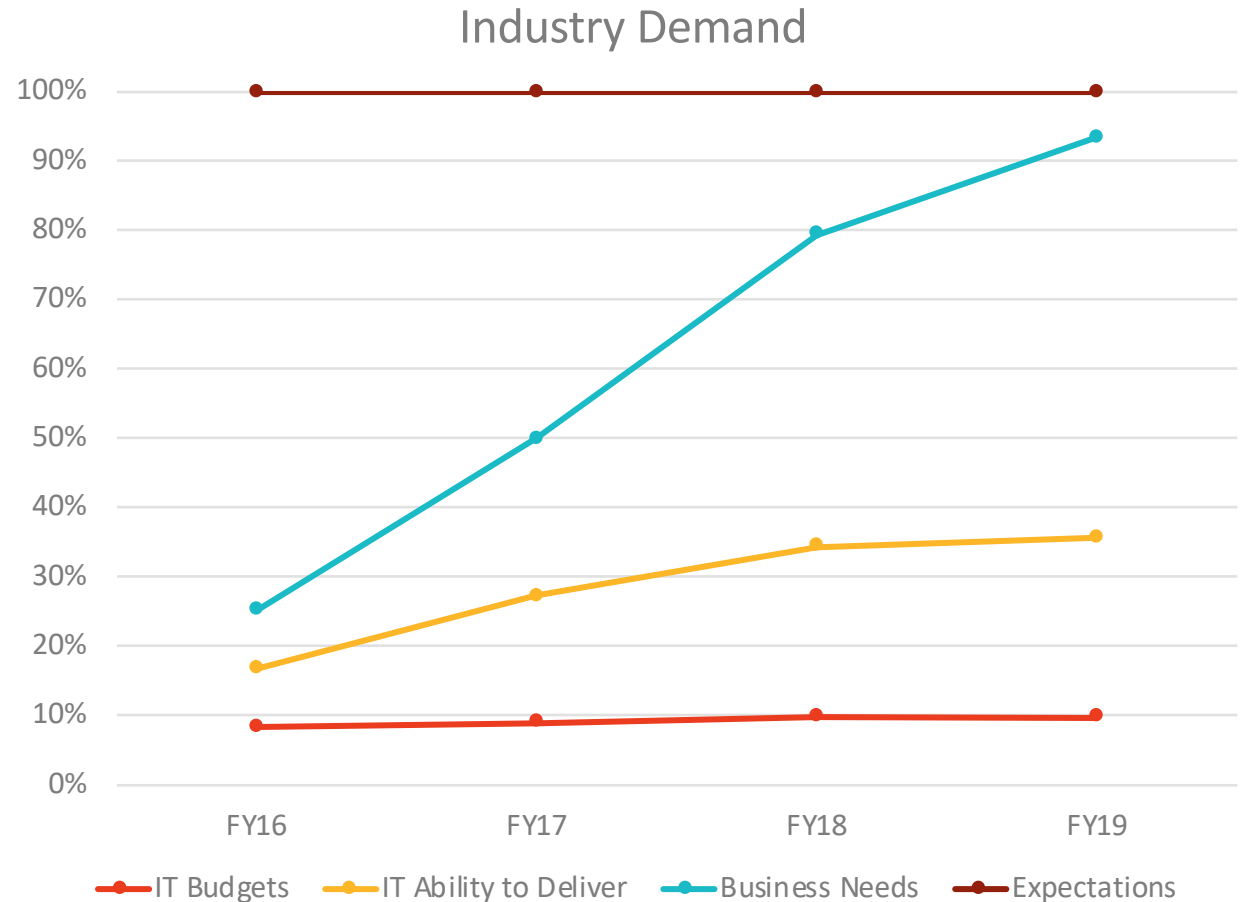
- Agility and Data Flexibility
 - Time to Market for Products
 - Data Flexibility and its complexity
- Digital Data Touchpoints
- Normalized Data Catalog
 - Product Catalog
 - Regular Data Access Patterns
- Leveraging Skinny Integrations and IMDG
 - Skinny Integrations with Web/e-Store
 - Data Flexibility using Data Grid
- De-Normalized Access
 - In-Memory Data Grid Design
 - Access from Downstream Apps
 - SLA's post IMDG
- Architecture post IMDG
- Recommendations Engine

Agility & Data Flexibility

Overview

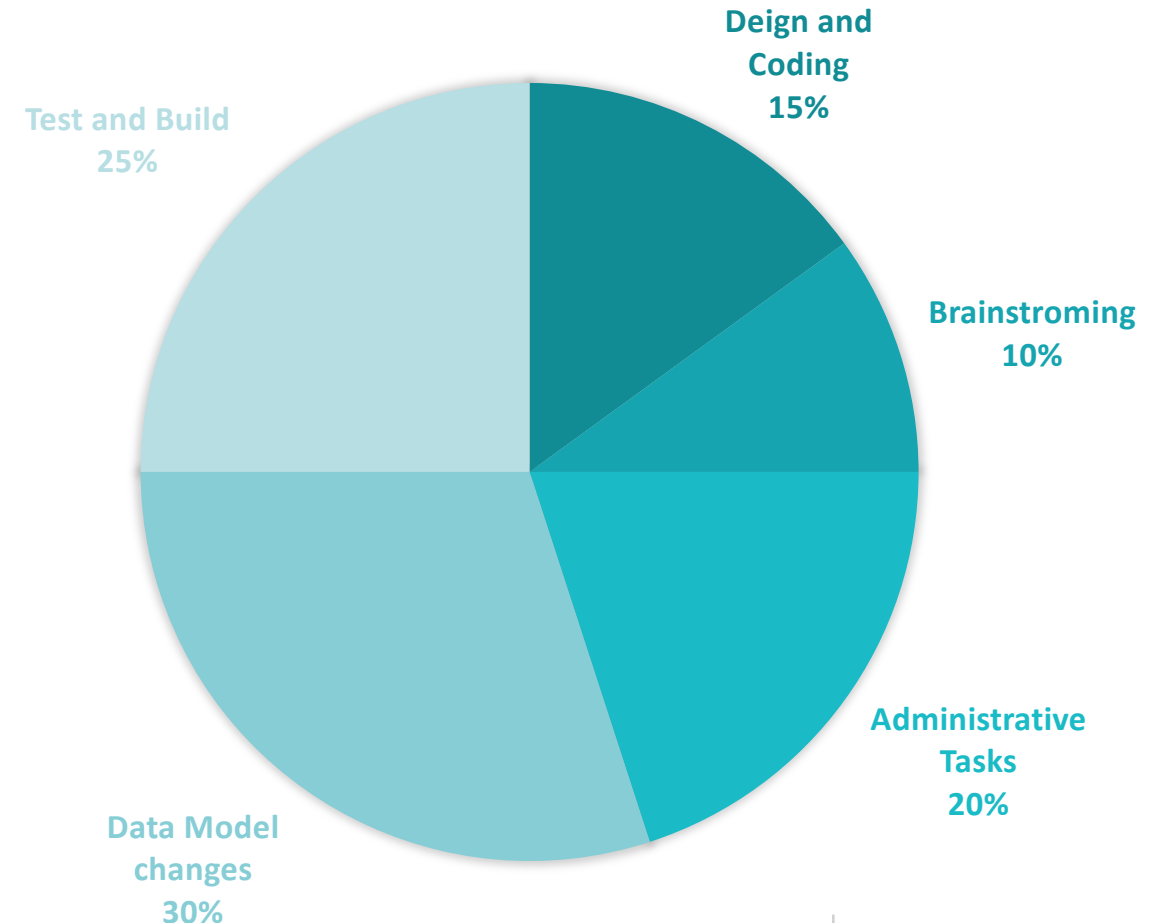
Agility Measured through Time to Market

- Increasingly, Agility of a Digital Team is being measured through time to markets for products and product related changes.
- Whether we talk about new features for customers or the **addition** of new **product portfolios** for a company.
- Digital Edge** on competition can really be achieved if we can manage and reduce time to market SLA's.



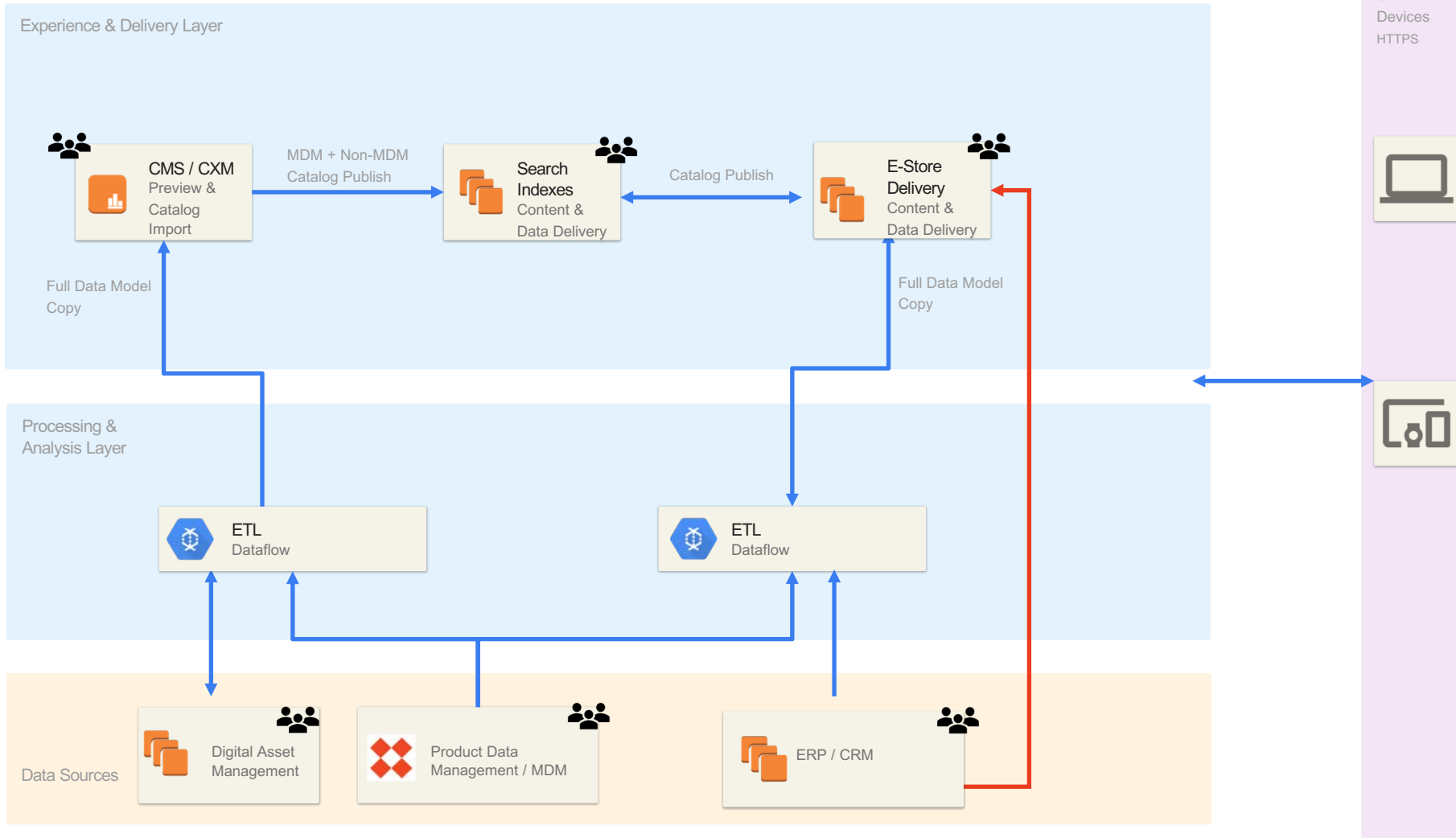
Data Flexibility and its Complexity

- Really means Relational Data Schema Flexibility.
- Schema changes to product and related content attribution from Upstream systems.
- **Integrate product data models to propagate** attribution structure changes to downstream targets.
- Agile adaptability of attribution for downstream systems.
- Complete Normalization helps to focus on core customer needs and product portfolios.



Digital Data Touchpoints

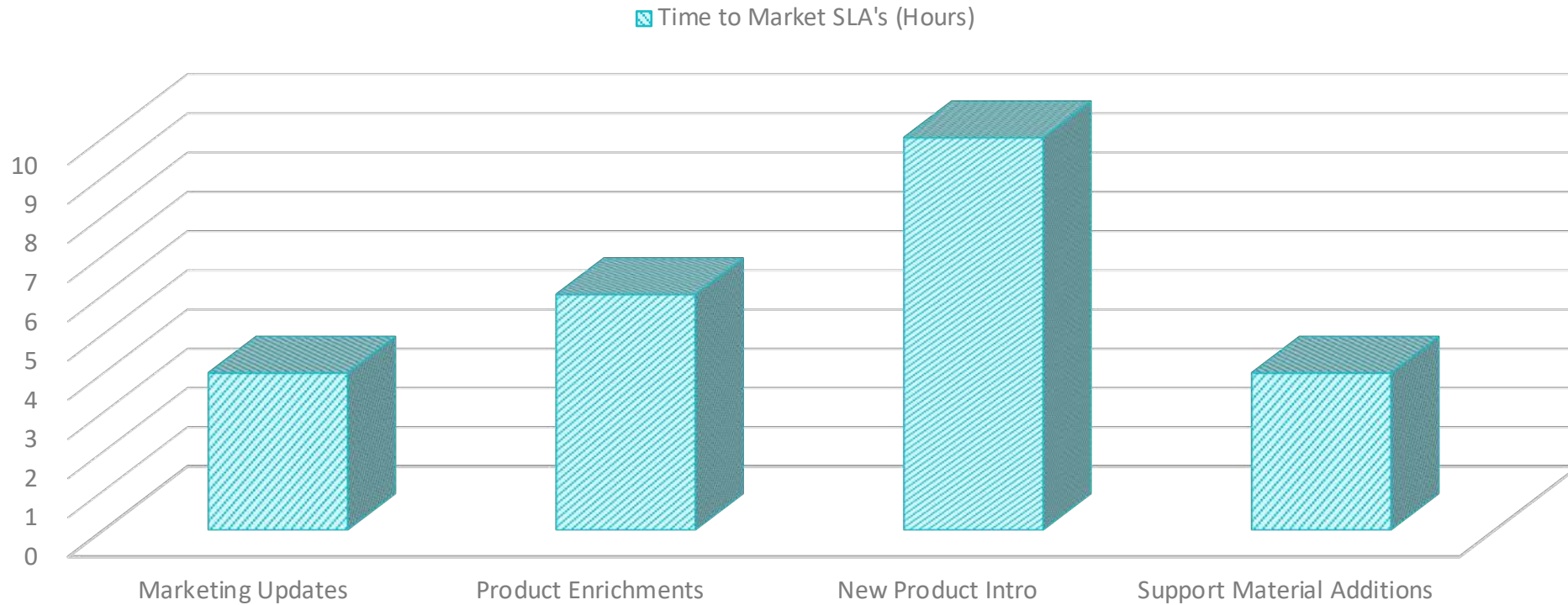
Application Stack



Asset
Associations/Tagging

MDM-to-Web SLA's

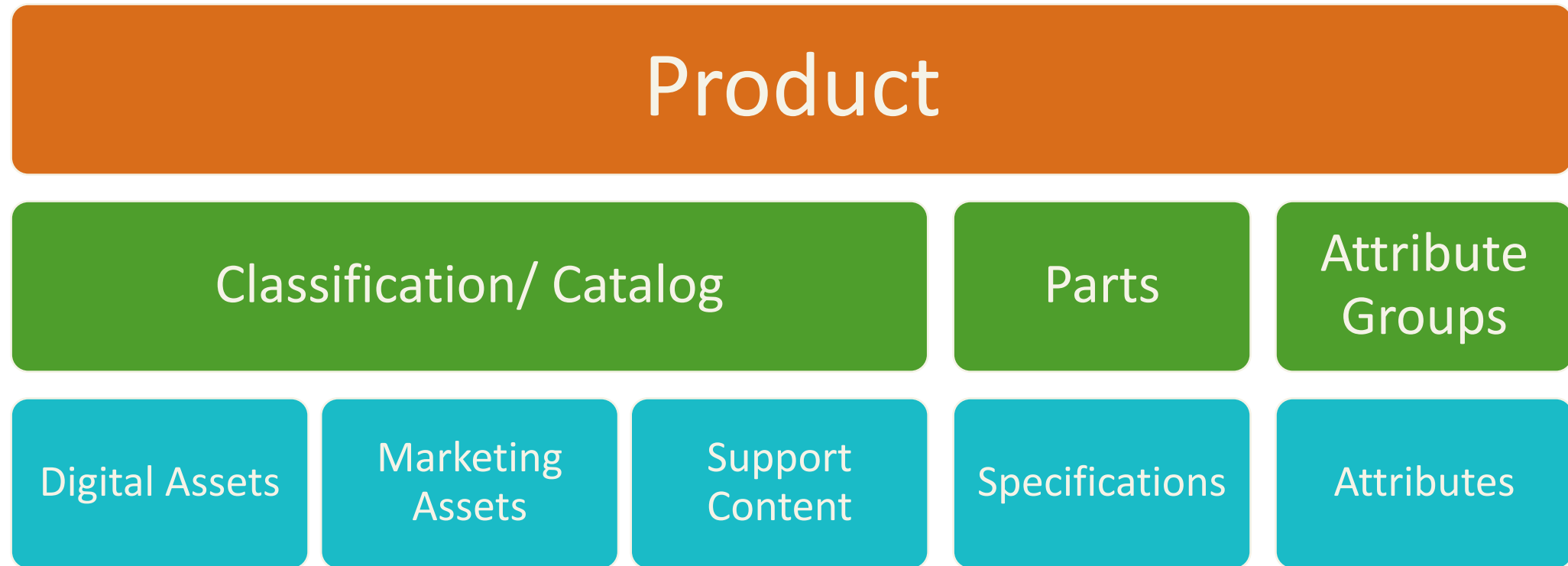
TIME TO MARKET SYSTEM SLA'S



Normalized Data

Selling Points and its Problems

Product Catalog Normalized



Data Fetch for Product Involves...

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Home > Products > Gas Chromatography > GC Columns > Capillary > DB-1ms

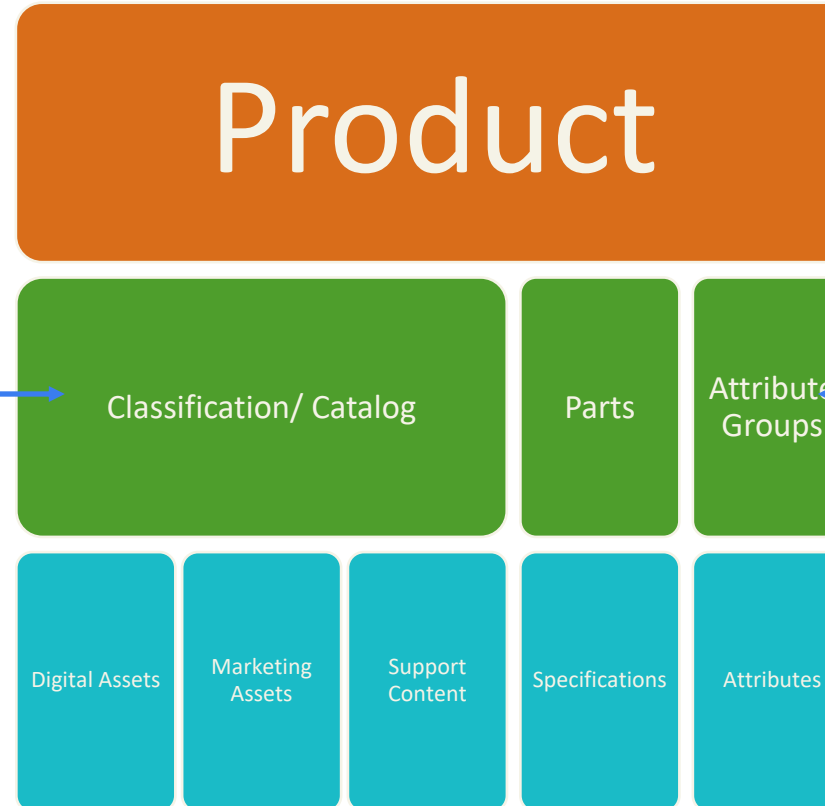
Capillary DB-1ms

Agilent J&W DB-1ms is a nonpolar, low bleed column, with excellent inertness for acids and bases and an extended upper temperature limit. Using low bleed stationary phases in DB-1ms reduces column contribution to background noise, resulting in a higher signal-to-noise ratio and better sensitivity. DB-1ms is bonded and cross-linked. In addition, reduced bleed results in improved mass-spectral purity and accurate library identification. The inertness of DB-1ms provides maximum response for active analytes commonly found in drug screening and environmental analyses.

[Product Details](#) | [Promotions](#)

| Part Number | ID (mm) | Length (m) | Film (µm) | Configuration | Your Price | QTY |
|--------------|---------|------------|-----------|----------------------|-------------|----------------------|
| +127-0112LTM | 0.1 | 10 | 0.1 | 7890/5890 LTM module | 1160.00 USD | <input type="text"/> |
| +127-0112 | 0.1 | 10 | 0.1 | 7 in. | 420.00 USD | <input type="text"/> |
| +127-0113 | 0.1 | 10 | 0.4 | 7 in. | 420.00 USD | <input type="text"/> |
| +127-0122 | 0.1 | 20 | 0.1 | 7 in. | 608.00 USD | <input type="text"/> |
| +127-0123 | 0.1 | 20 | 0.4 | 7 in. | 608.00 USD | <input type="text"/> |
| +121-0122 | 0.18 | 20 | 0.18 | 7 in. | 510.00 USD | <input type="text"/> |
| +221-0122LTM | 0.18 | 20 | 0.18 | 5975 LTM toroid | 1309.00 USD | <input type="text"/> |
| +128-0112 | 0.2 | 12 | 0.33 | 7 in. | 319.00 USD | <input type="text"/> |
| +128-0122 | 0.2 | 25 | 0.33 | 7 in. | 491.00 USD | <input type="text"/> |
| +128-0122E | 0.2 | 25 | 0.33 | 5 in. | 491.00 USD | <input type="text"/> |
| +122-0112E | 0.25 | 15 | 0.25 | 5 in. | 362.00 USD | <input type="text"/> |
| +122-0132E | 0.25 | 30 | 0.25 | 5 in. | 593.00 USD | <input type="text"/> |

1 2 3 1 - 12 of 25 results [Add To Cart](#)



Product Details

[Features](#) | [Specifications](#) | [Literature](#) | [Tools](#) | [Videos](#) | [Training & Events](#) | [Promotions](#) | [Customers Also Viewed](#)

Features

- 100% Dimethylpolysiloxane
- Identical selectivity to DB-1
- Non-polar
- Very low bleed characteristics, ideal for GC/MS
- Improved acid performance compared to standard 100% Dimethylpolysiloxane columns
- Improved signal-to-noise ratio for better sensitivity and mass spectral integrity
- Bonded and cross-linked; solvent rinsable
- Each Agilent J&W GC column is tested with the tightest industry QC specifications for column bleed, sensitivity, and efficiency to provide you utmost confidence in qualitative and quantitative results
- For details about the QC test conditions including the test probe mixture and the resulting chromatogram, please refer to the Agilent J&W GC Column Performance Summary shipped with each GC column
- Similar Phases: SPB-1, Rtx-1, BP-1, OV-1, OV-101, 007-1 (MS), SP-2100, SE-30, ZB-1, AF-1, MDN-1, ZB-1, ZB-1ms

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Specifications

Configuration choices for Agilent J&W DB-1ms

| Microbore | |
|-------------------------|------------------|
| ID (mm) | 0.10 mm |
| Length (m) | 10 – 20 m |
| Film (µm) | 0.10 – 0.40 µm |
| Temperature Limits (°C) | -60 – 340/360 °C |

| Capillary | |
|-------------------------|--|
| ID (mm) | 0.18 – 0.32 mm |
| Length (m) | 12 – 60 m |
| Film (µm) | 0.10 – 0.33 µm |
| Temperature Limits (°C) | -60 – 340/350 °C (0.33 µm) -60 – 340/360 °C |

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Literature

[Application Notes](#)

What if we could...

Accelerate
Time to
Market for
Products

Avoid
chasing
MDM data
model
changes for
Downstream

Dynamically
Upgrade
Experience
for Newer
Products

Avoid
Spending
time in
integrations
with MDM
repeatedly.

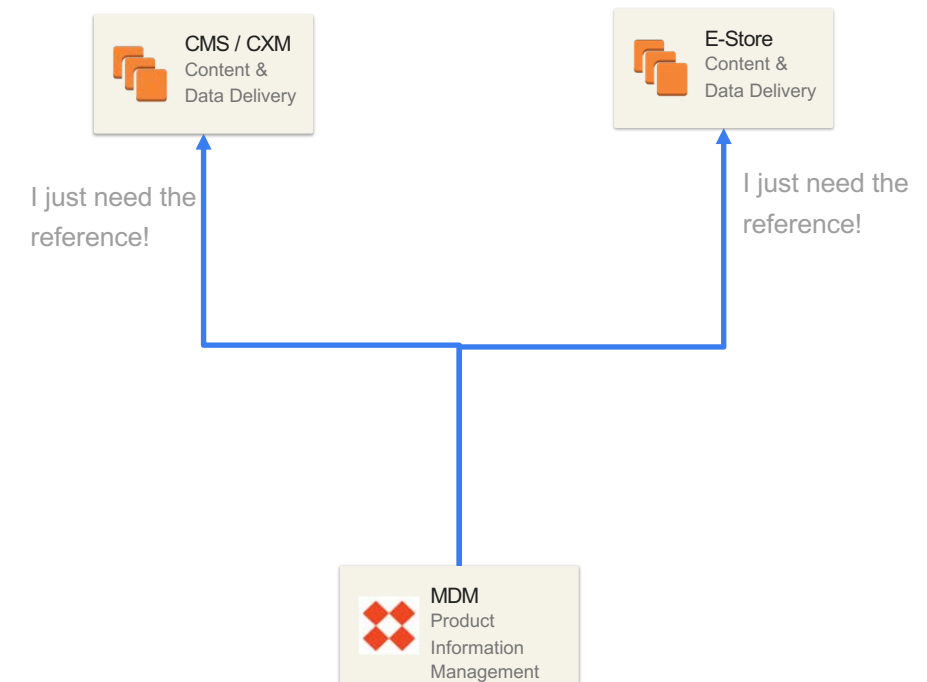
Focus on
Customer
Innovation
and data
driven
experience.

Leveraging Skinny Integrations and IMDG

TTM and Data Flexibility Solutions

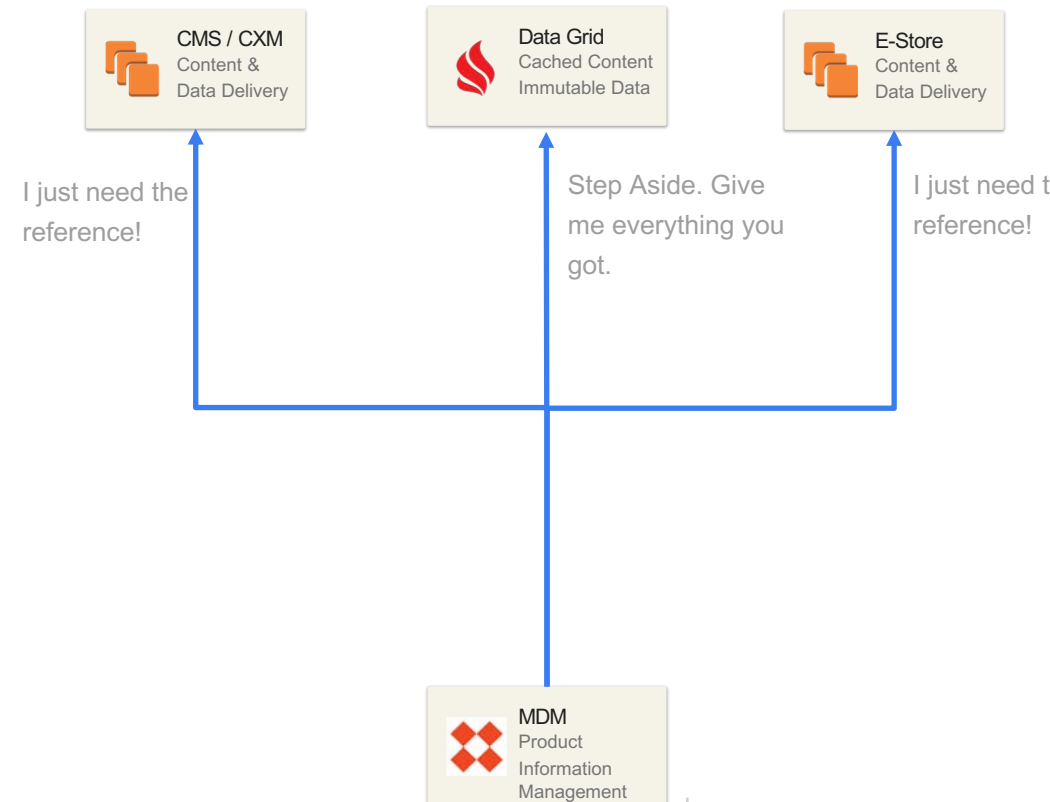
Skinny Integrations with Web/e-Store

- Import attributes in downstream systems only if needed.
 - *Core Attributes*
 - Attributes absolutely needed inside of the platform
 - Contain channel specific attributes.
 - Contain attributes used for channel specific business logic.
 - Core attributes live in delivery apps like CXM and e-Store.
 - *Improved Performance of Imports by factor of 5.*
 - *Improved Internal Publishing performance of downstream apps.*
- Don't disturb primary downstream apps for any updates.
 - *Creates Only*
 - New Product Introductions.
 - Complete new Product Portfolios.
 - Merger and Acquisitions.
 - Product Line Splits and Mergers.



Data Flexibility using Data Grid

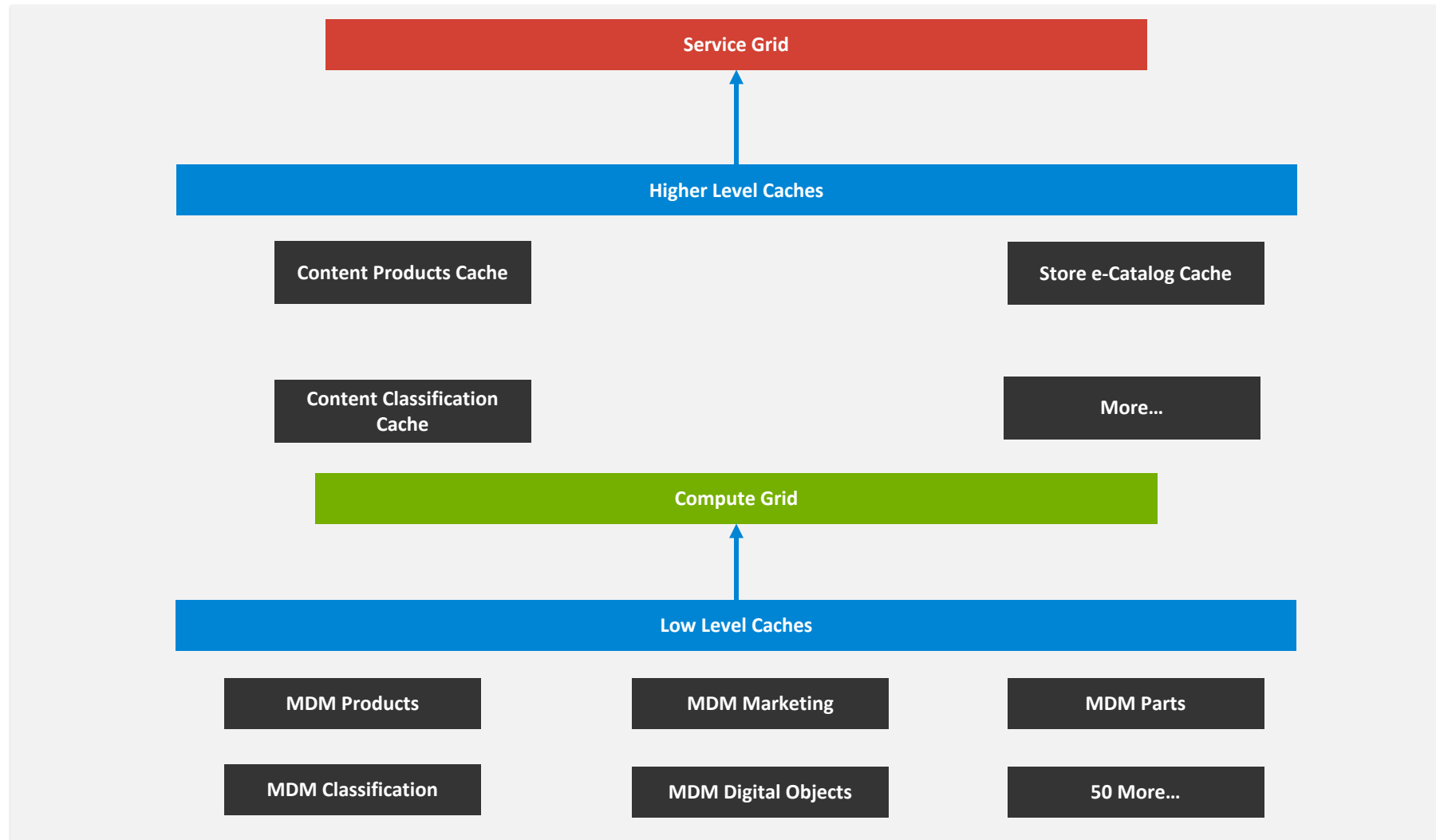
- Import all your normalized data in GridGain's Data Grid.
 - *Neighbor Attributes*
 - Attributes which are needed by the channel but can be referred in runtime.
 - Contain UI only attributes.
 - Contain omni-channel attributes which doesn't need to be channel specific.
 - Neighbors live in Data Grid
 - *Heavy attribution imports through Streaming imports.*
- Do not disturb Data Grid every time there is an update upstream.
 - *Creates and Updates*
 - Marketing Updates on products.
 - Digital Asset Associations.
 - Support Asset Additions.
 - Product Enrichments.



De-Normalized Access

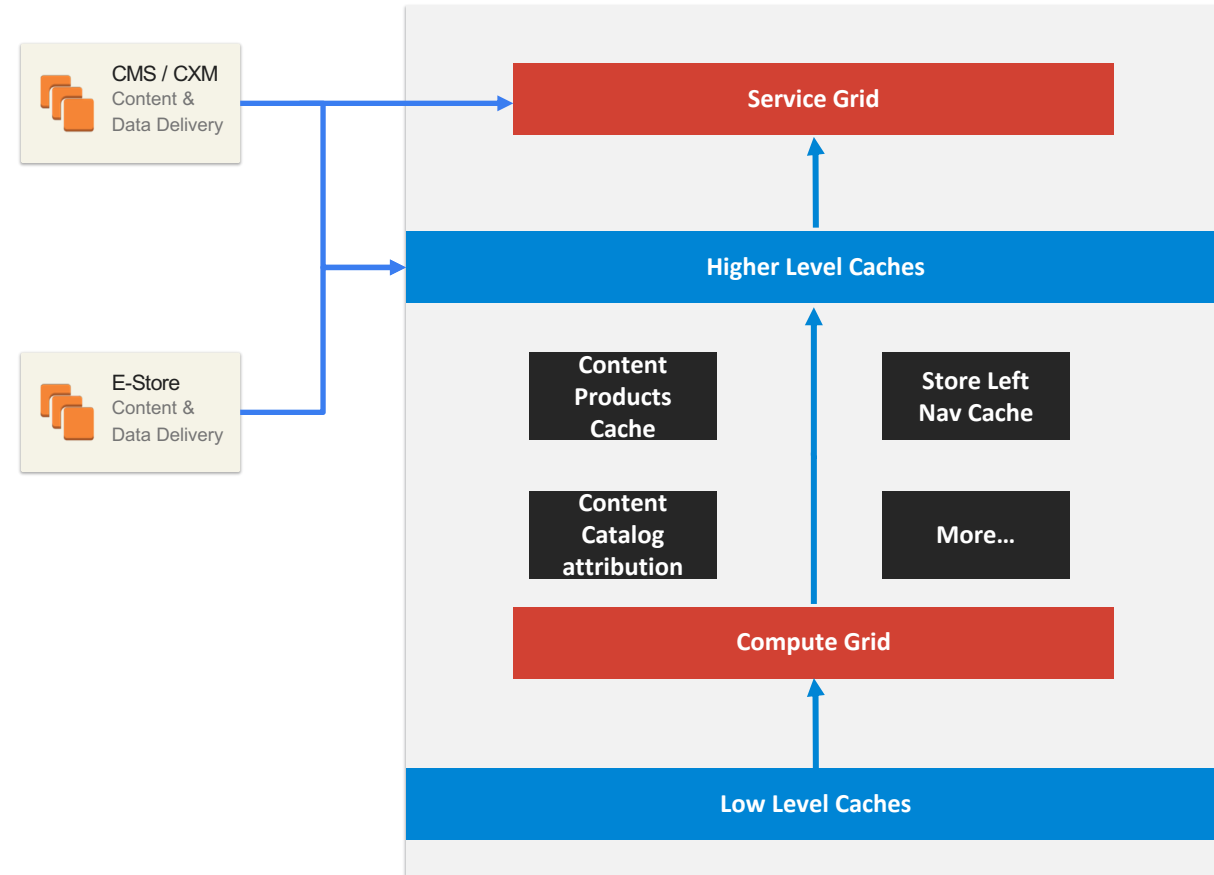
Amalgamate data for Downstream

In-Memory Data Grid Design



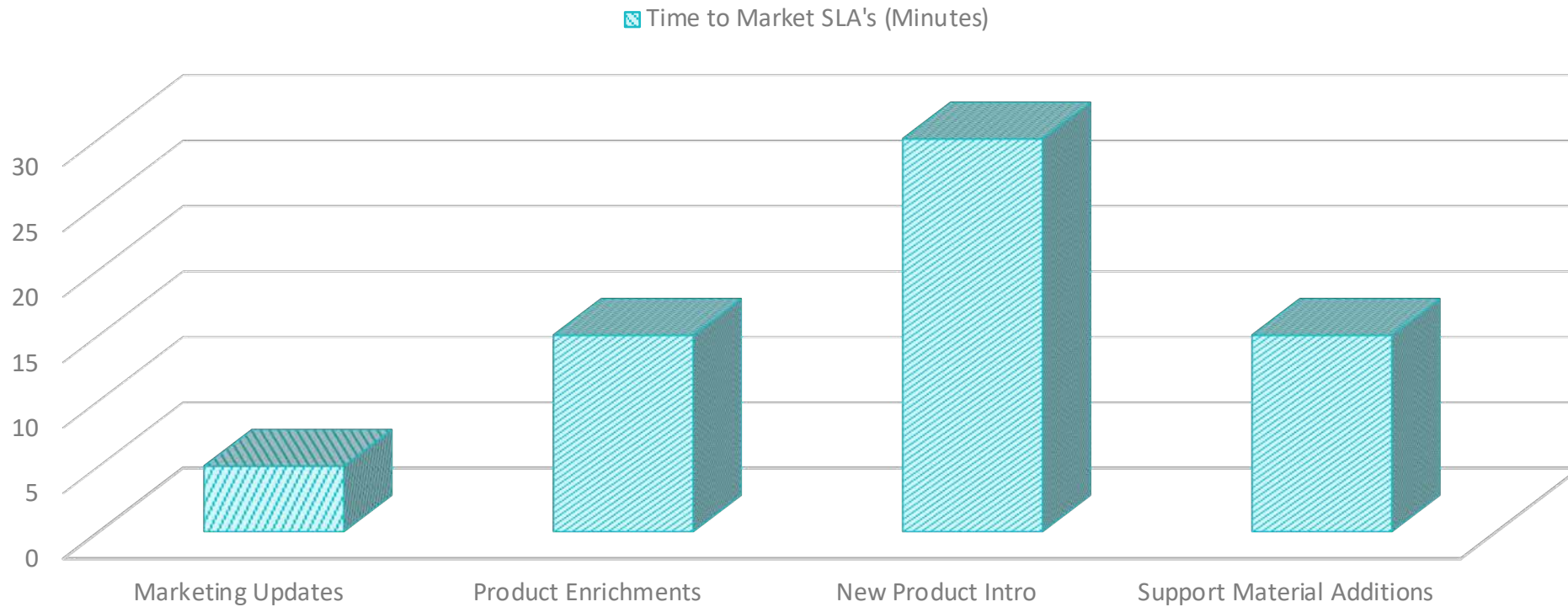
Access from Downstream Apps

- Access Patterns **bypasses any understanding of MDM Data Model Structure.**
- Downstream apps can **focus on customer experience.**
- As soon as Data changes, experience changes.
- **Improved performance** by accessing de-normalized data.



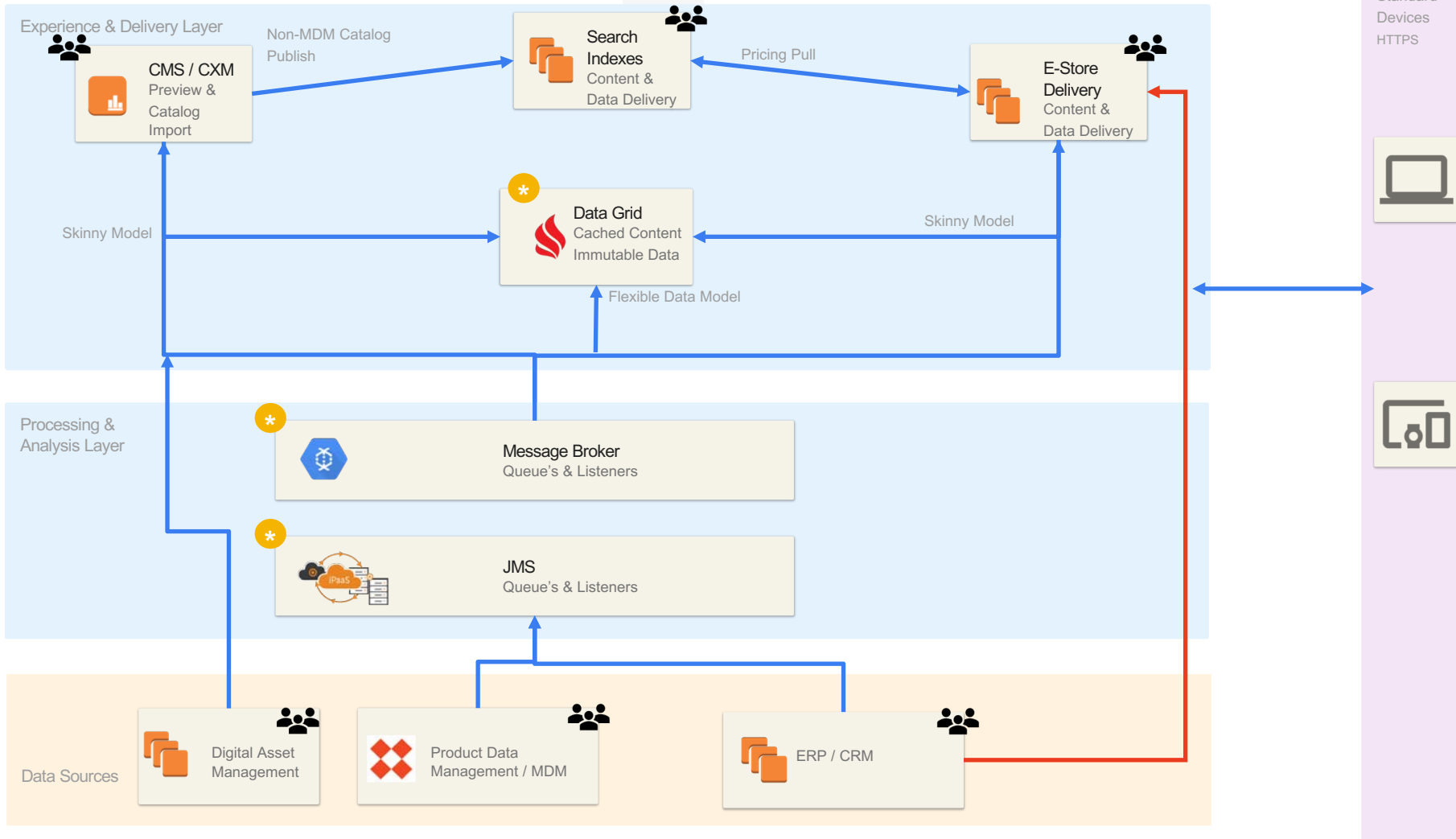
MDM-to-Web SLA's post IMDG

TIME TO MARKET SYSTEM SLA'S



Architecture and Integrations

Application Stack



Asset
Associations/Tagging

Recommendations Engine

Machine Learning and Data Delivery

Concept

- A scalable front end that records user interactions to collect data.
- Permanent storage that can be accessed by a machine learning platform. Loading the data into this storage can include several steps, such as import- export and transformation of the data.
- A machine learning platform that can analyze the existing content to create relevant recommendations.
- Storage that can be used by the front end, in real time or later, based on the timeliness requirements for recommendations.



Methodology

- Used Collaborative Filtering model, which generates recommendations based on the relationship between the visitors and products.
- No explicit information regarding the visitors or the products required in the approach.
- Implicit: Not as obvious in terms of preference, such as views, clicks, purchase.
- Solving the problem requires a matrix of user-item interactions.
- We utilized Matrix Factorization method to figure out the latent (hidden) features that relate them to each other in a much smaller matrix of user features and item features.

| | Item 1 | Item 2 | Item 3 | Item 4 | Item 5 | Item 6 |
|--------|--------|--------|--------|--------|--------|--------|
| User 1 | X | | X | | X | |
| User 2 | | X | X | | | |
| User 3 | | | | X | | X |
| User 4 | | | | | X | |
| User 5 | X | X | | X | | X |
| User 6 | | | X | X | | |
| User 7 | X | X | X | | X | X |
| User 8 | | X | | X | | |
| User 9 | | | X | | | |

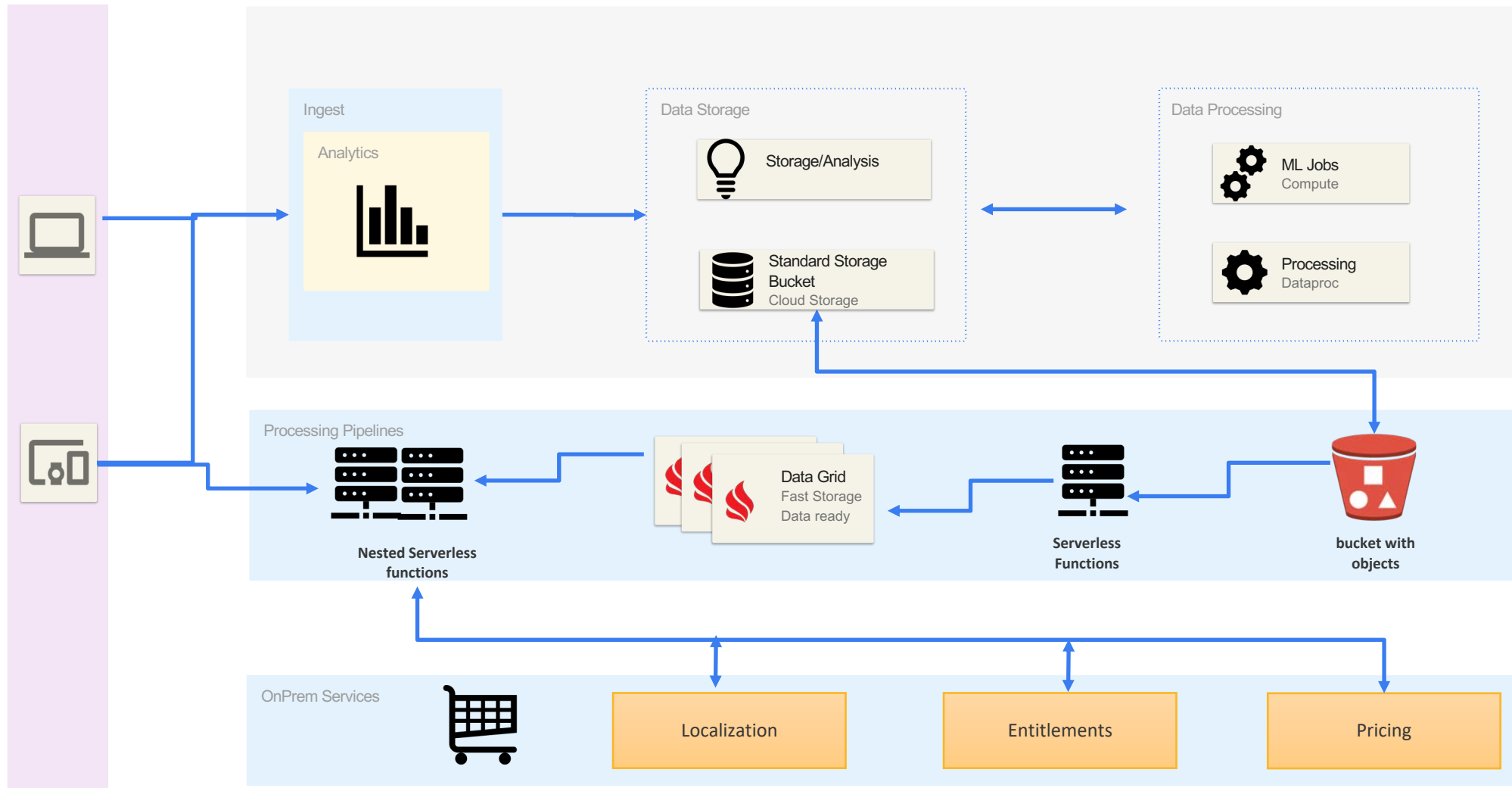
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| | UF1 | UF2 |
|--------|-----|-----|
| User 1 | | |
| User 2 | | |
| User 3 | | |
| User 4 | | |
| User 5 | | |
| User 6 | | |
| User 7 | | |
| User 8 | | |
| User 9 | | |

U

| | Item 1 | Item 2 | Item 3 | Item 4 | Item 5 | Item 6 |
|-----|--------|--------|--------|--------|--------|--------|
| IF1 | | | | | | |
| IF2 | | | | | | |

Recommendation Engine Design



Learnings

Its not for companies who:

- Have a hands off operations team.
- Want fully baked integrations through beautiful consoles like some of the Integrations Platforms provide.
- Rely on platforms to manage itself or are completely self managed.
- Want completely decoupled integrations.
- Enterprise grade security for the Grid.

Its for companies who:

- Likes to leverage utilize their internal dev and operations team to manage delivery capabilities.
- Want to be more hands on technology and integrations.
- Have better tools to monitor and diagnose problems with systems.
- Want to leverage fault tolerant clusters of compute and data.
- Data Security is taken care by the infrastructure vs the application.

Questions?

Email : appar.singh@agilent.com

Thank You!