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

Appar Singh

IT Architect
Agilent Technologies Inc

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About Agilent

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

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• Agilent gives doctors a head start in the fight against cancer and other diseases.	• From disease research and drug discovery, to drug development, manufacturing and quality control.	• We provide fast, accurate and sensitive methods for monitoring contaminants.	• Instruments and S/W help Research with Scientists across Globe.	• Help customers maximize their production of fuels and predict failures.	• 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

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Agility & Data Flexibility

Overview

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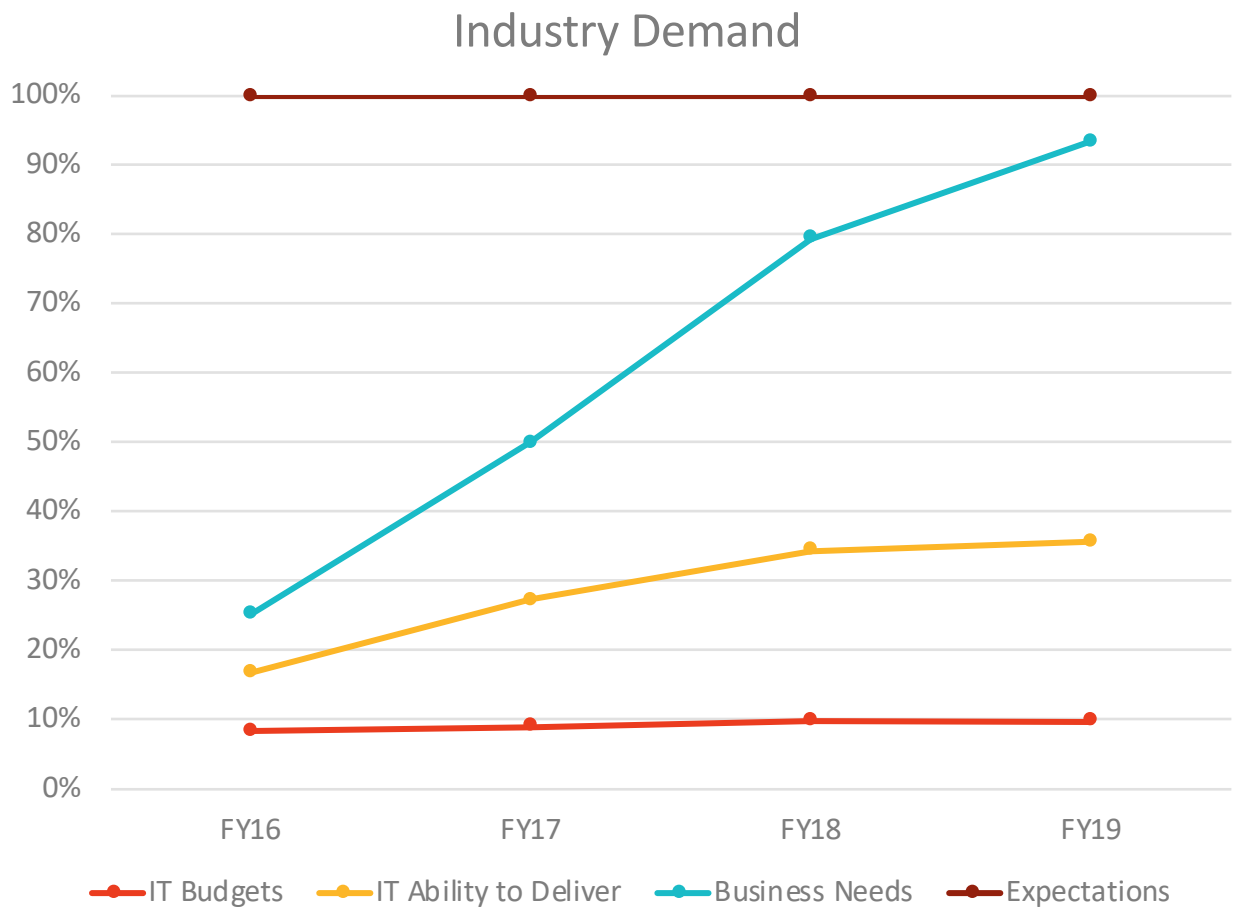
Agility Measured through Time to Market

- 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.



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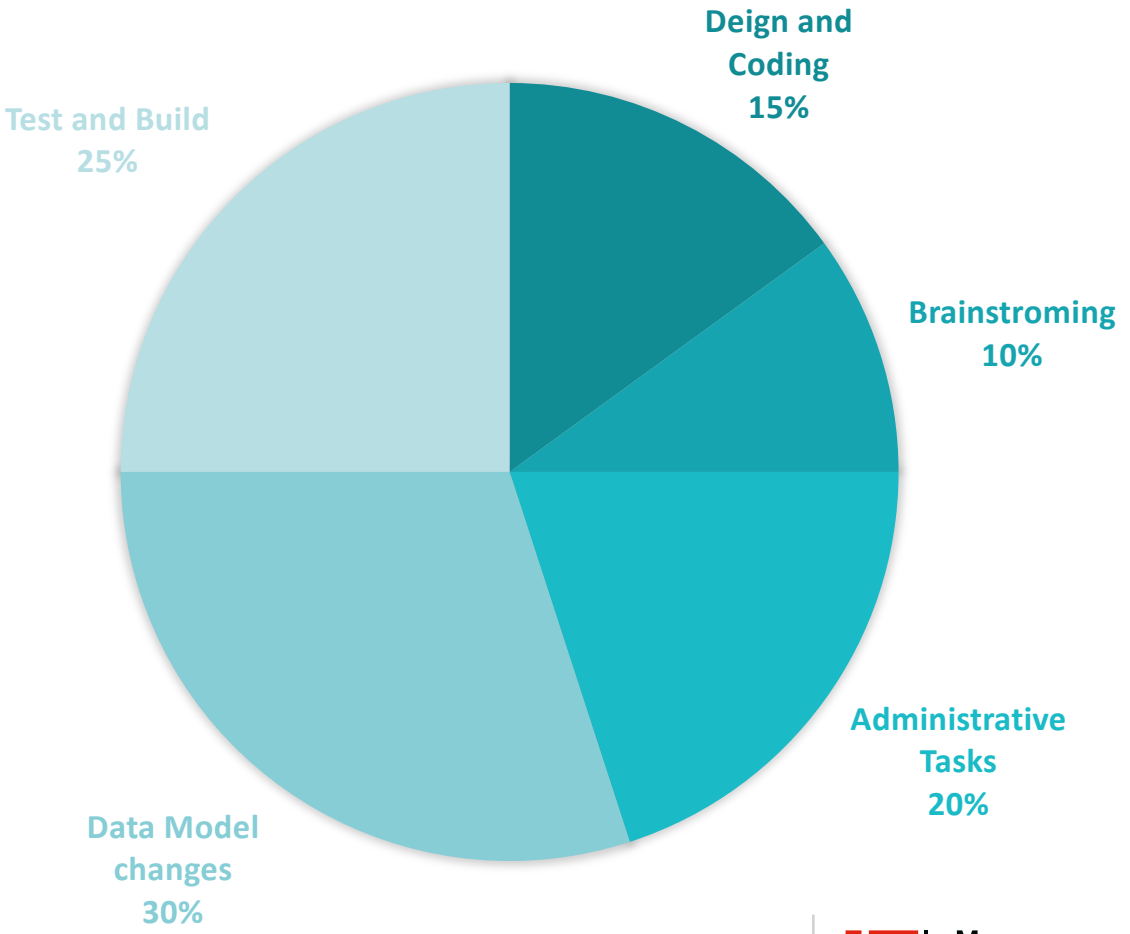
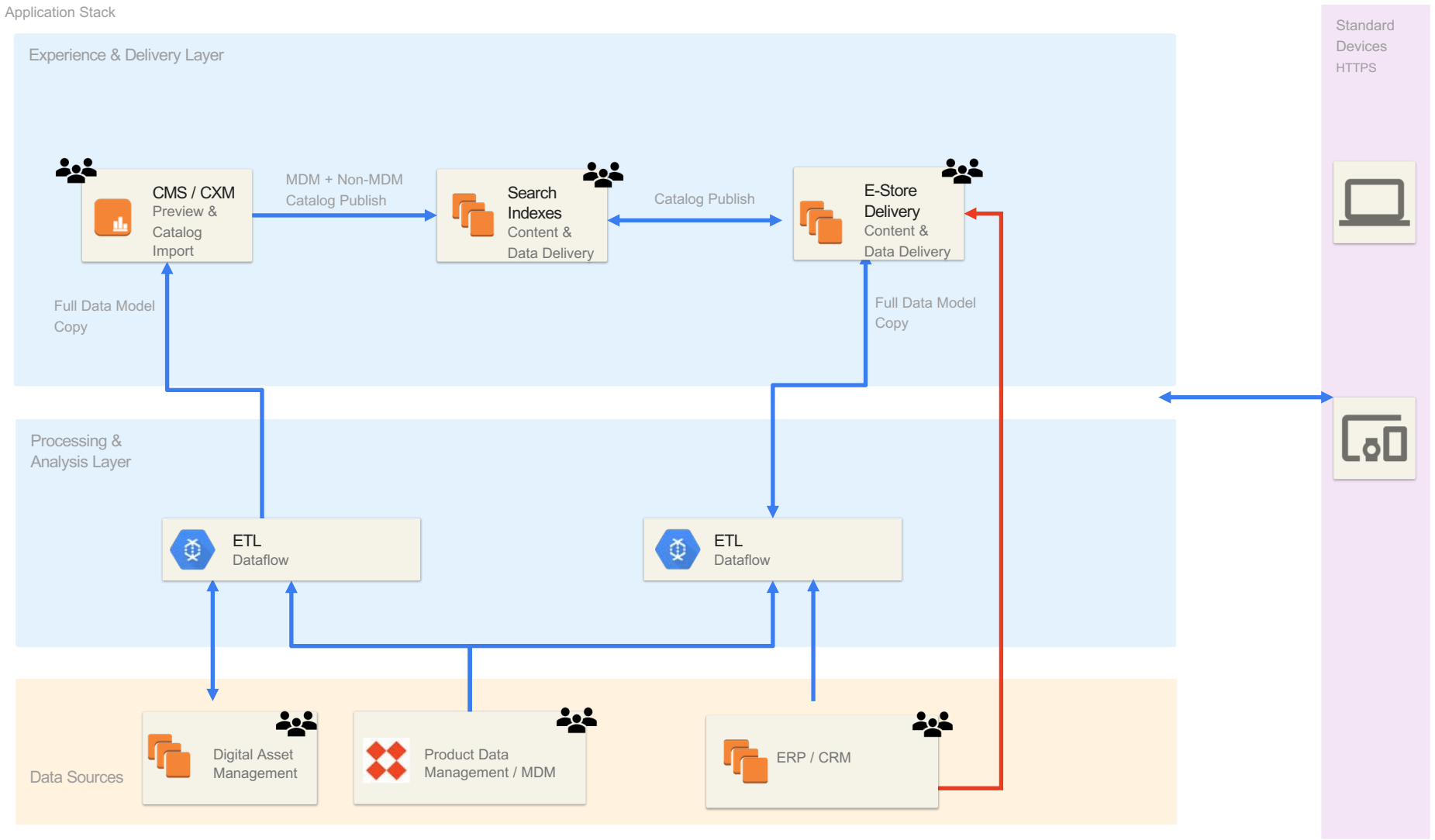
Data Flexibility and its Complexity

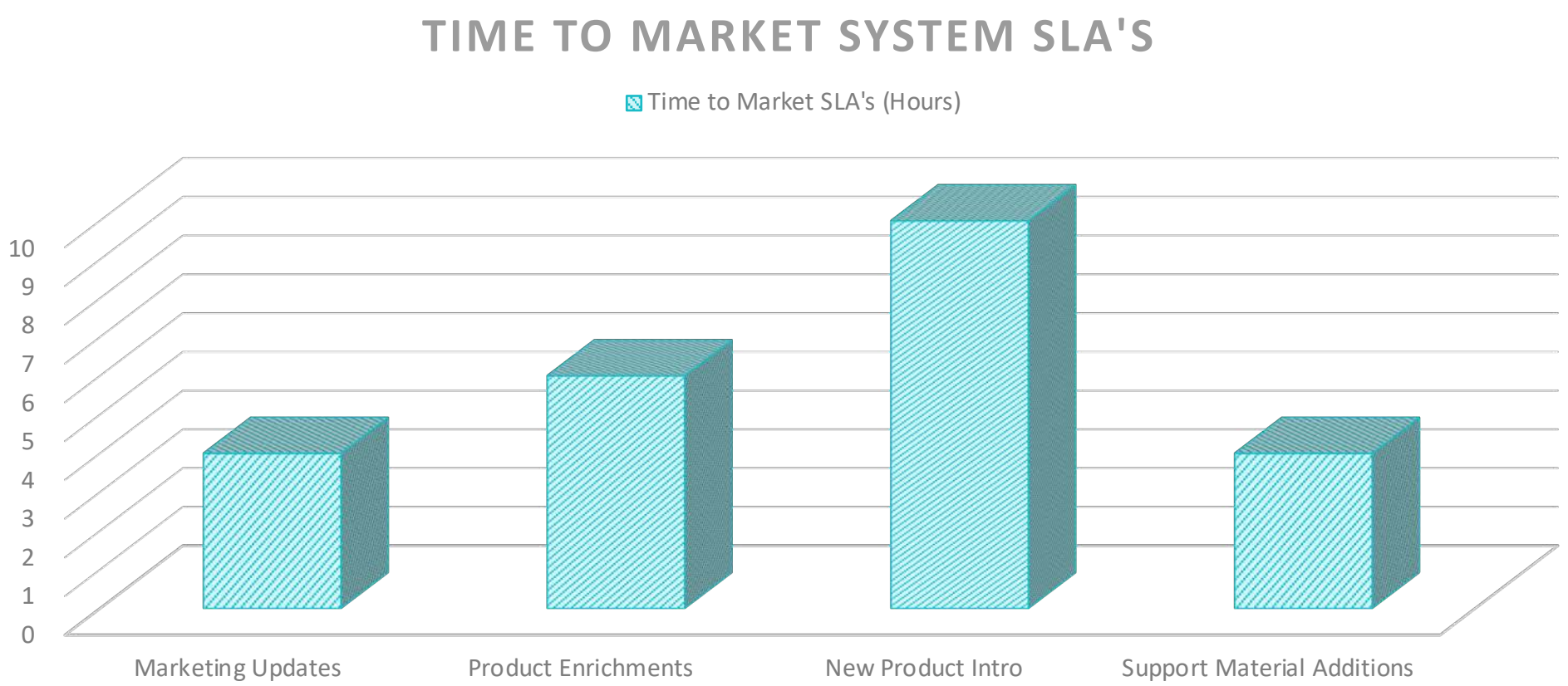
- Really means Relational Data Schema Flexibility.
- Schema changes to product and related content attribution from Upstream systems.
- **Integrate product data models to propagate** attribution structure changes to downstream targets.
- Agile adaptability of attribution for downstream systems.
- Complete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



Digital Data Touchpoints



MDM-to-Web SLA's



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Normalized Data

Selling Points and its Problems

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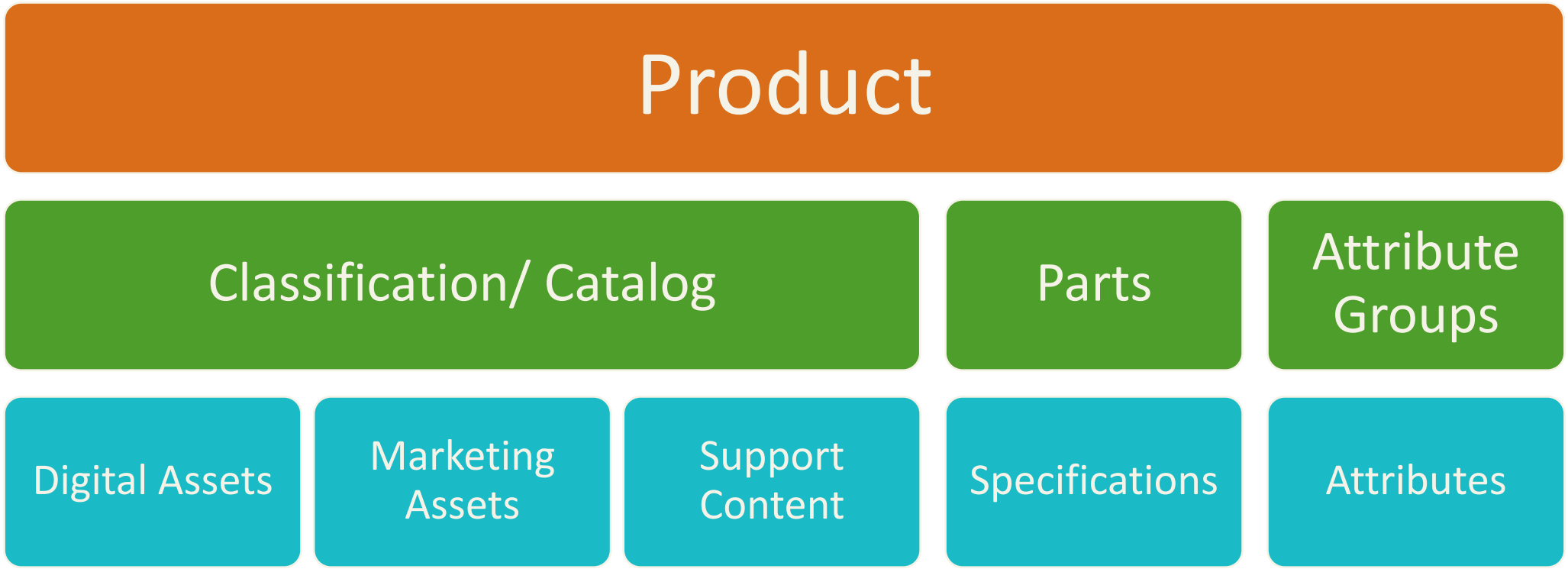
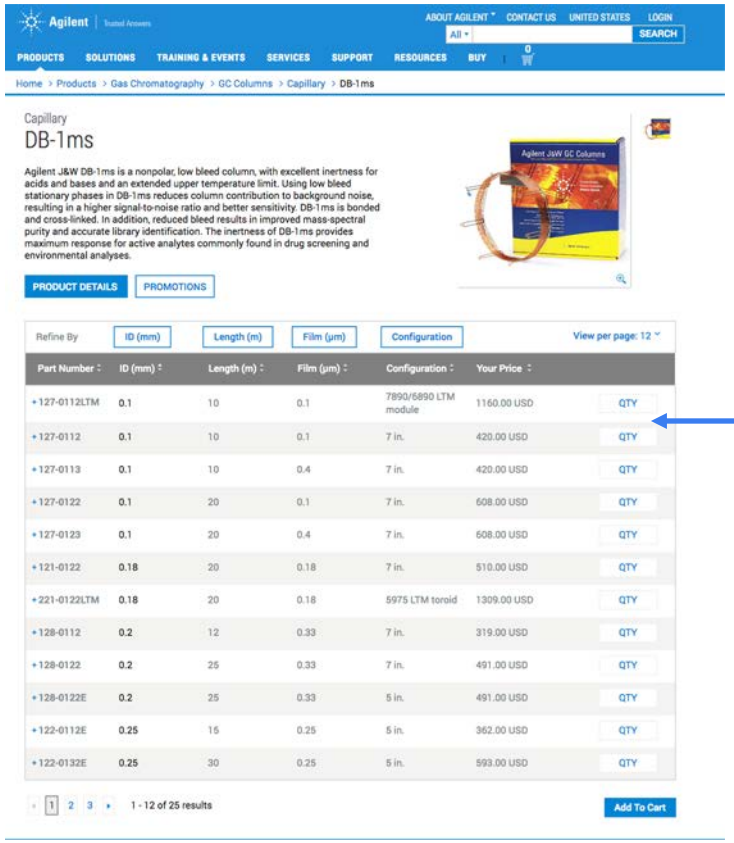
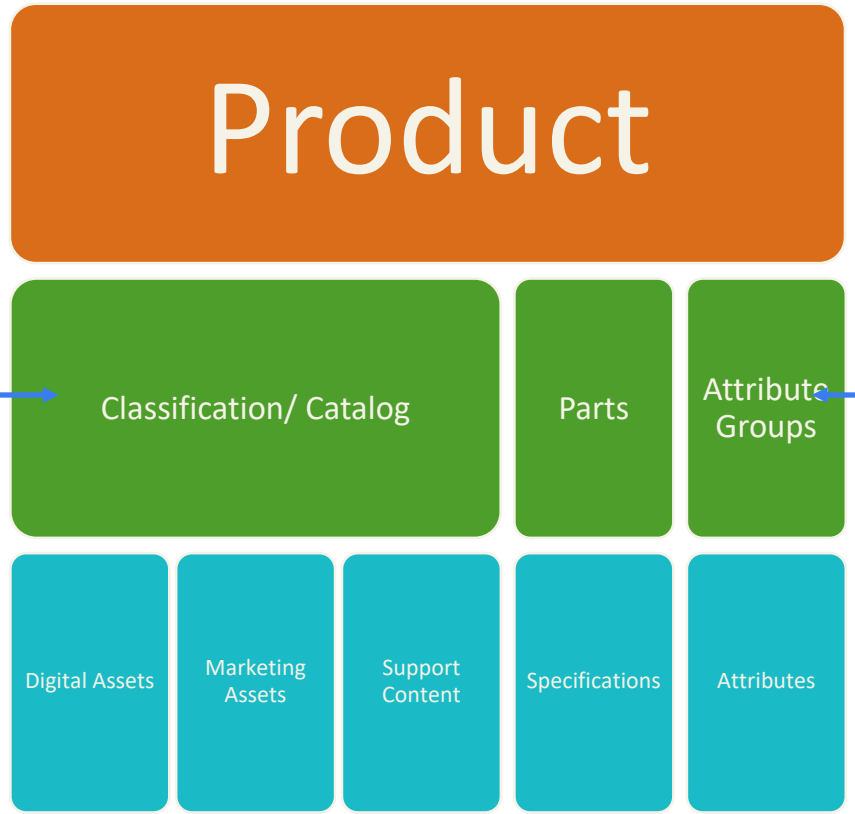
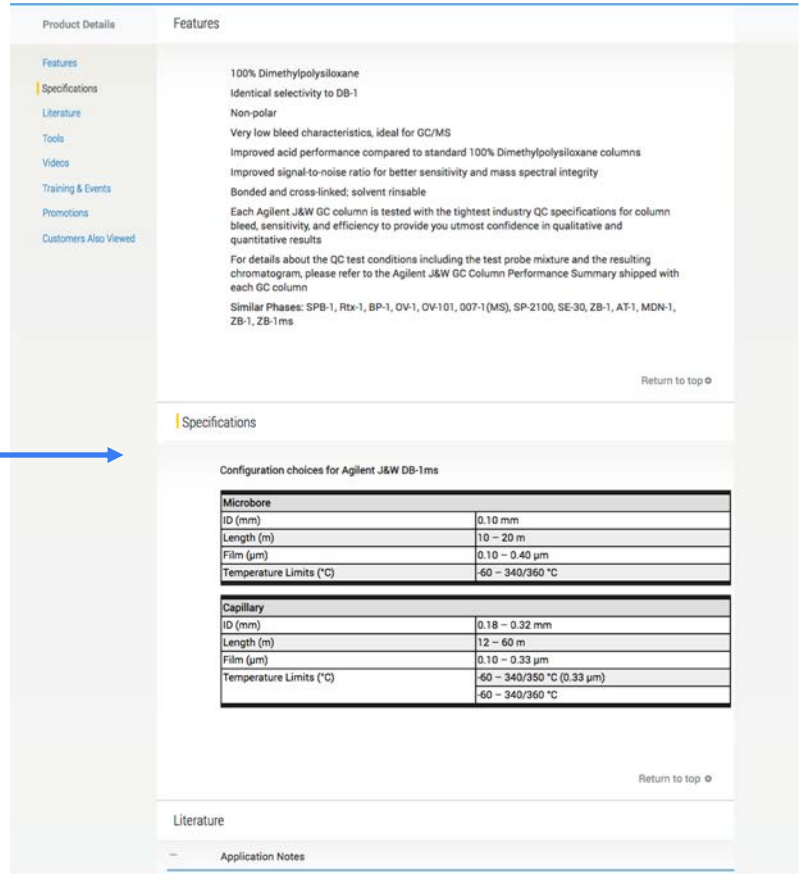
Product Catalog Normalized



Data Fetch for Product Involves…







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.

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Leveraging Skinny Integrations and IMDG

TTM and Data Flexibility Solutions

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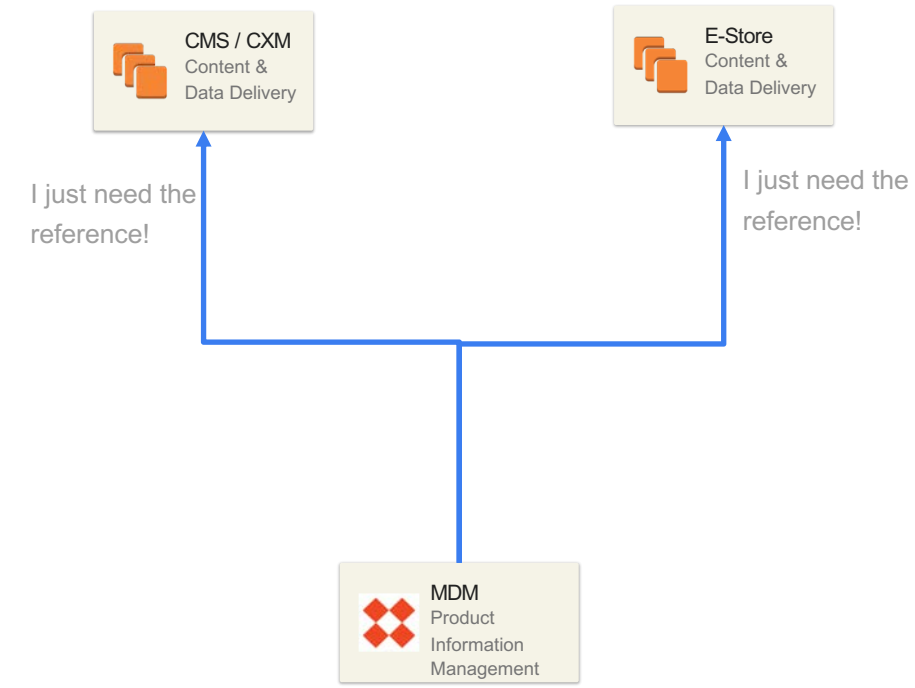
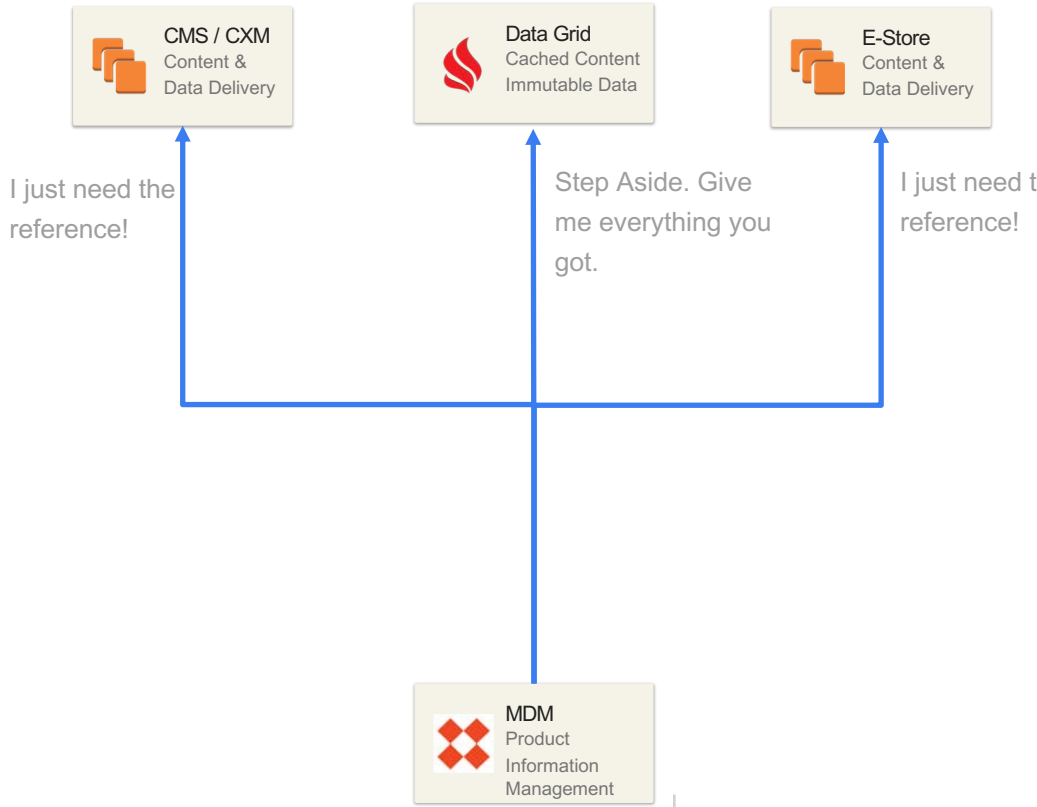
Skinny Integrations with Web/e-Store

- 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 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.



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De-Normalized Access

Amalgamate data for Downstream

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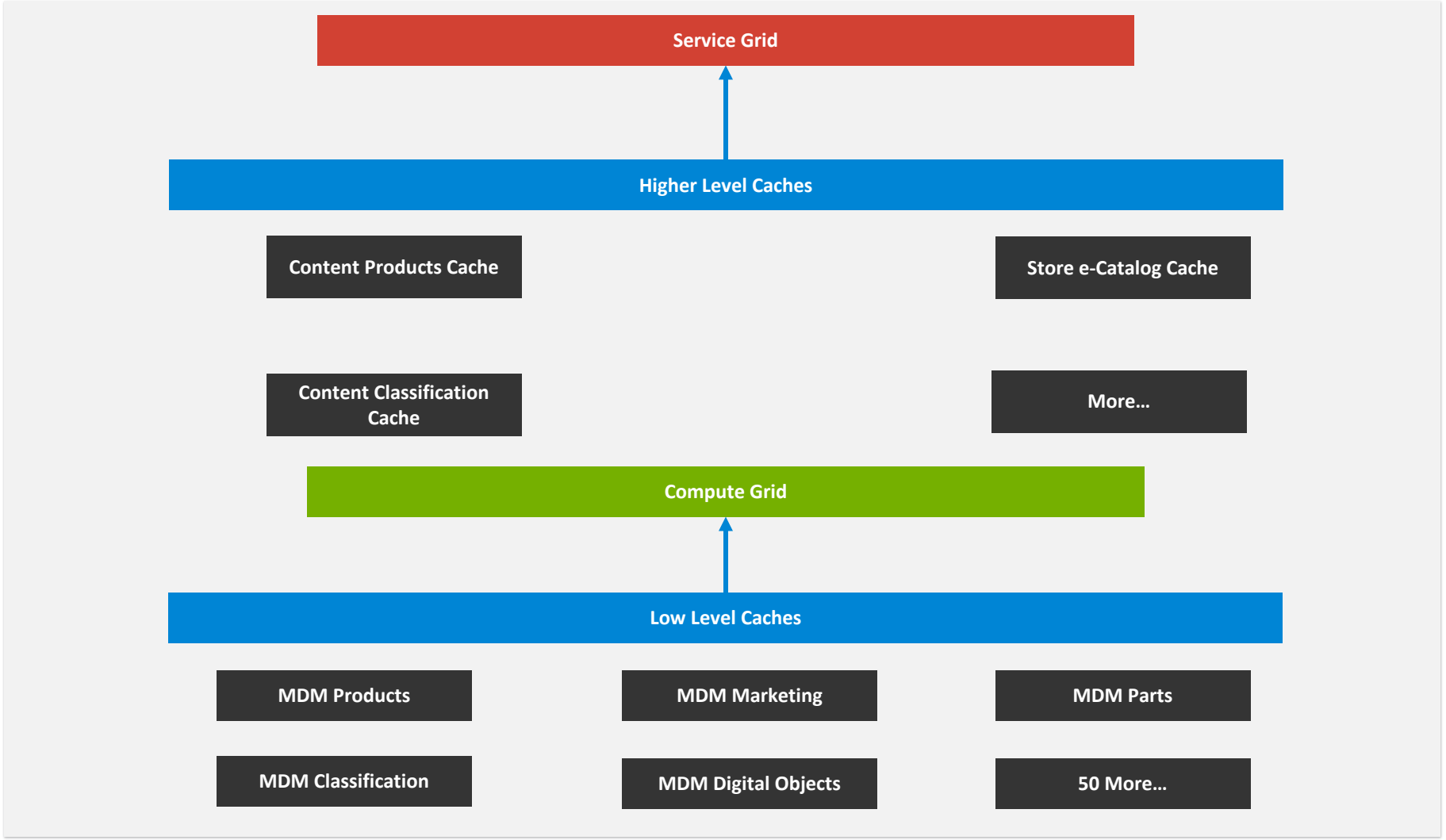
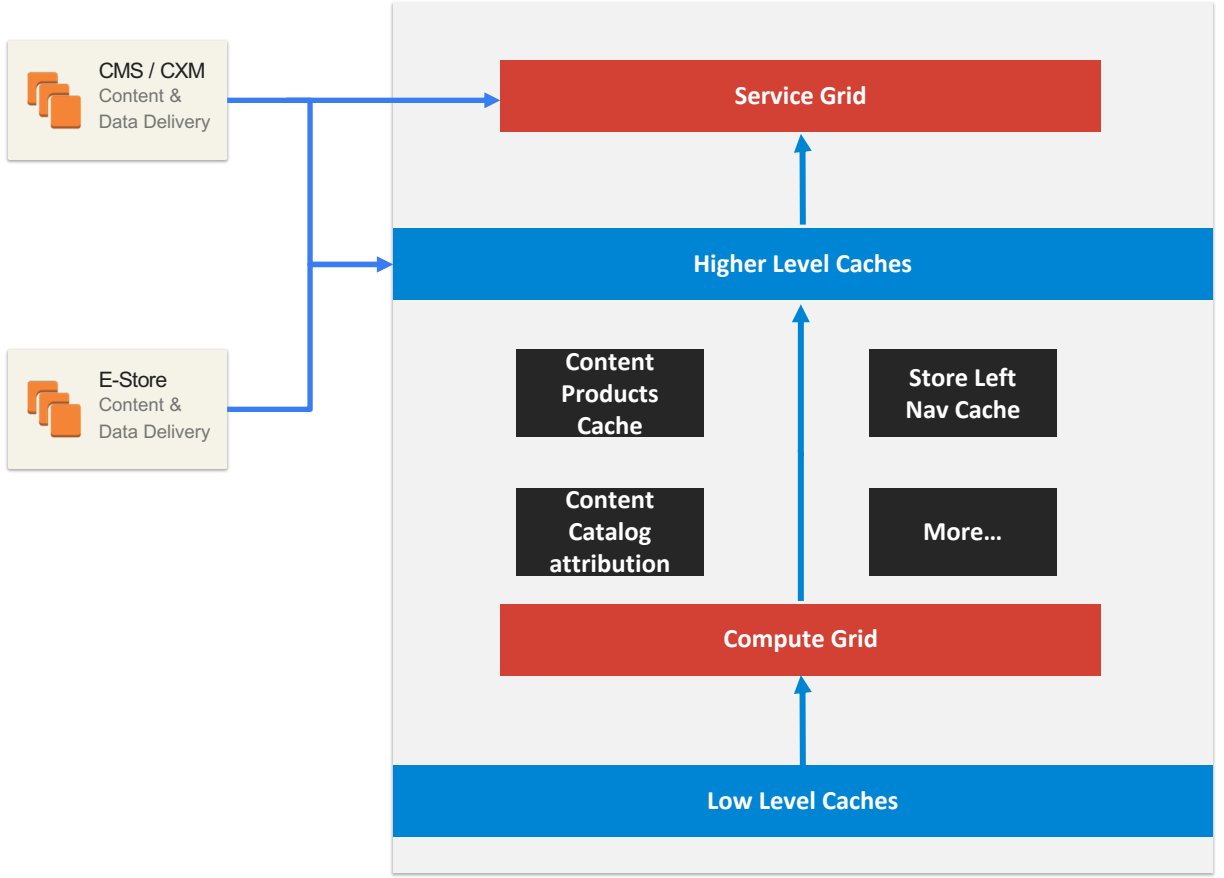
In-Memory Data Grid Design

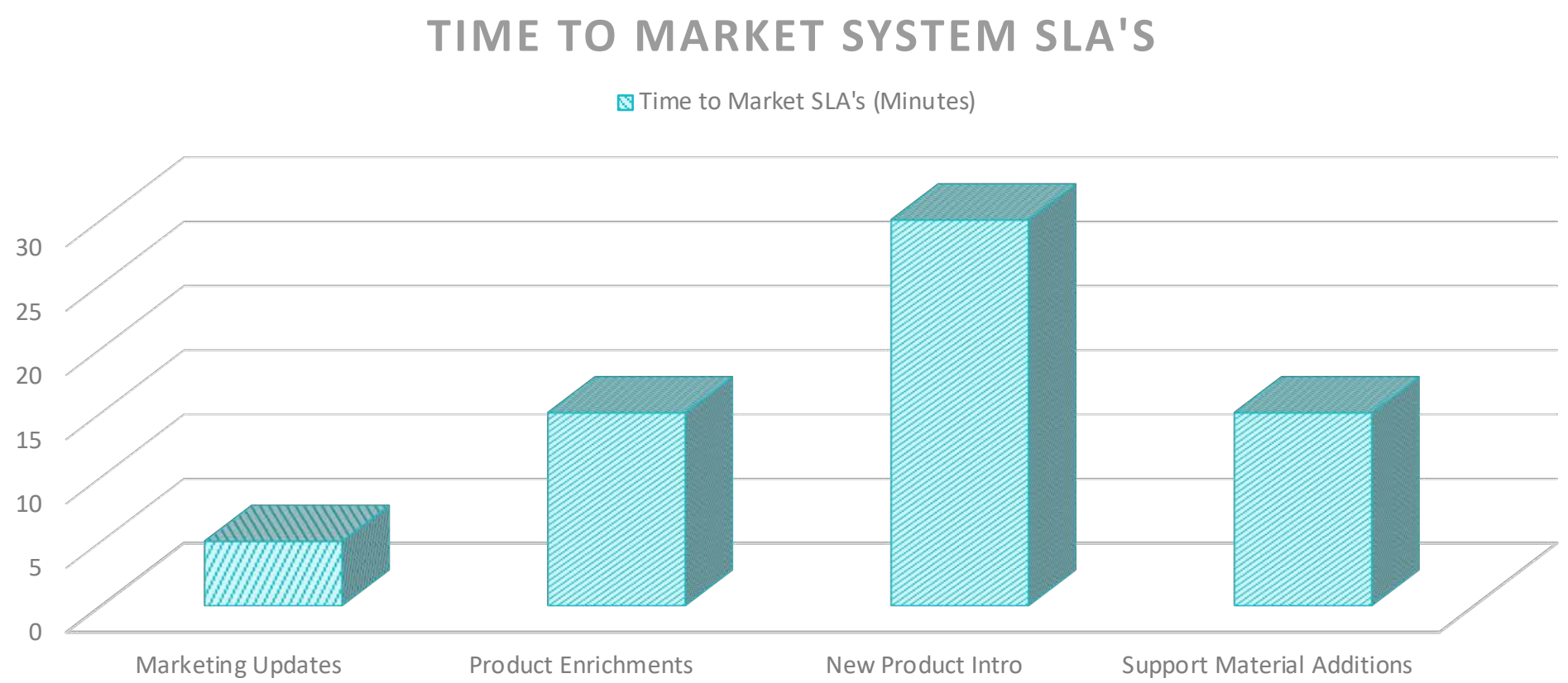


Access from Downstream Apps

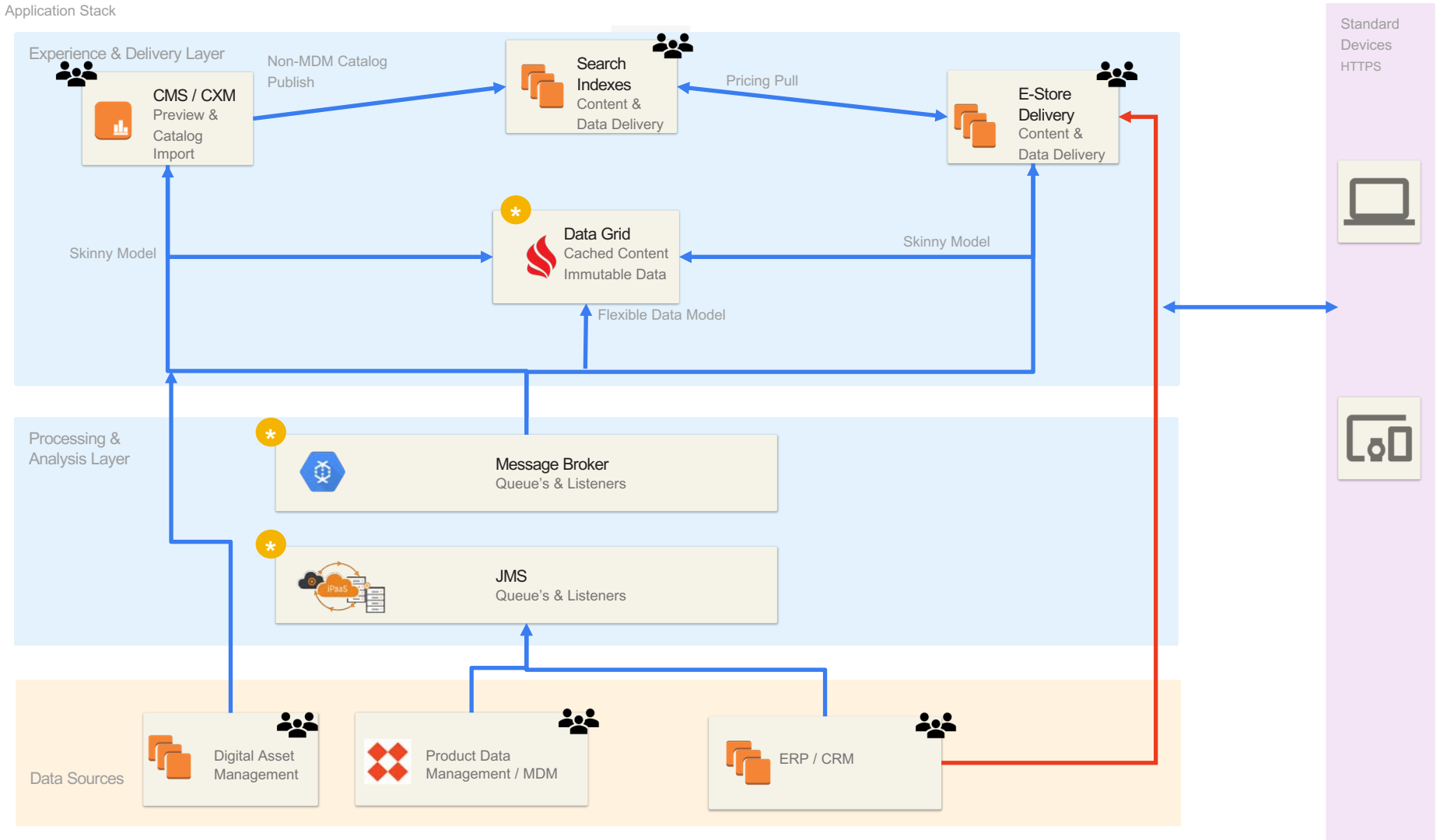
- Access Patterns **bypasses any understanding of MDM Data Model Structure**.
- Downstream apps can **focus on customer experience.**
- As soon as Data changes, experience changes.
- **Improved performance** by accessing de-normalized data.



MDM-to-Web SLA's post IMDG



Architecture and Integrations



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Recommendations Engine

Machine Learning and Data Delivery

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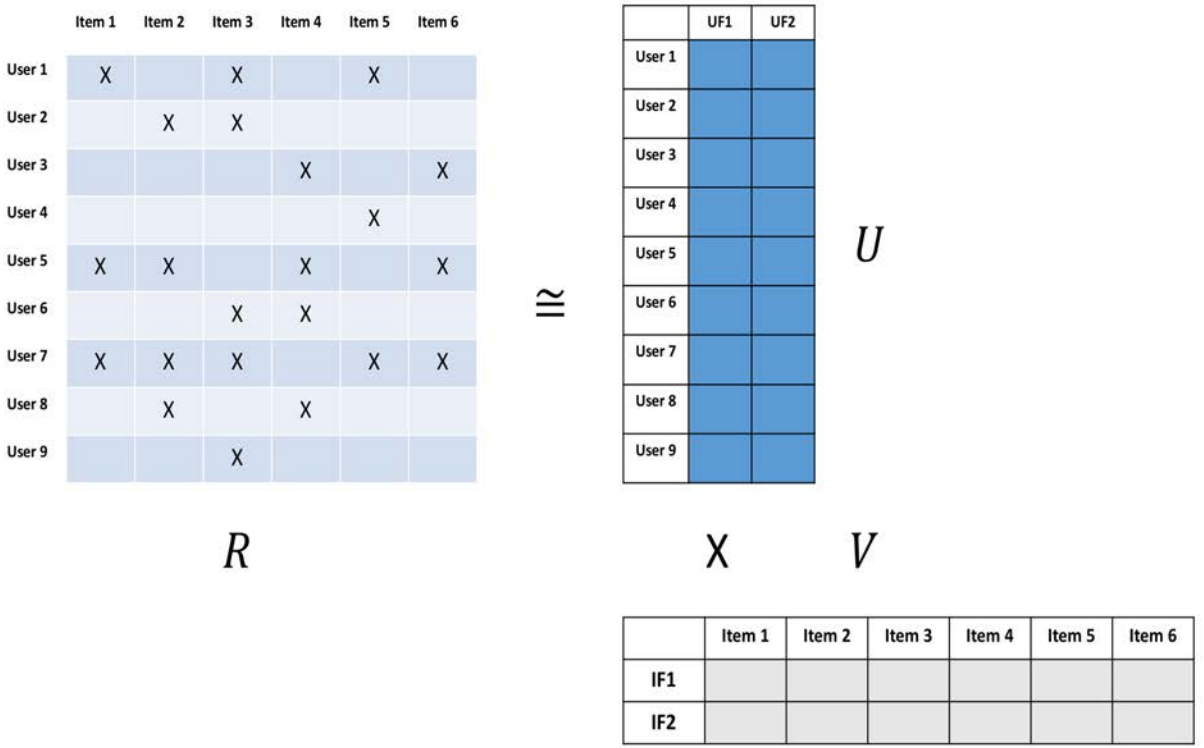
Concept

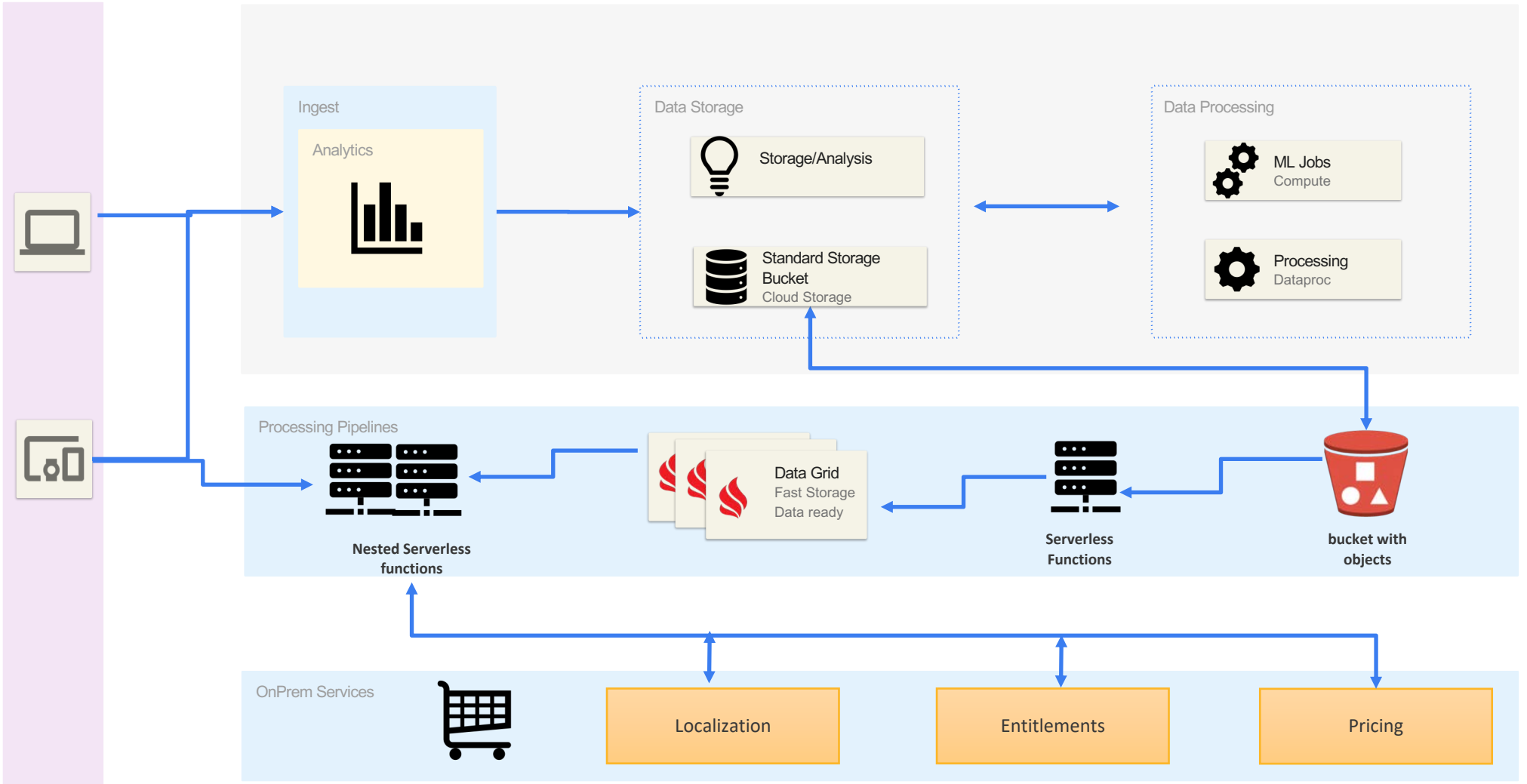
- A scalable front end that records user interactions to collect data.
- Permanent storage that can be accessed by a machine learning platform. Loading the data into this storage can include several steps, such as import- export and transformation of the data.
- A machine learning platform that can analyze 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.



Recommendation Engine Design



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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!