Advanced Analytics in Retail

Data Tiering & *Differential Analytics* to Modernize Supply Chain

Microsoft Azure

Problems in Traditional Supply Chain Analytics

- Siloed Systems for various analytics scenarios
  - Data Warehouse: Teradata, Hadoop
  - In-memory: Hana, SQL, Oracle
  - Statistical Analytics: SAS, MATLAB
  - Business Intelligence: Business Objects
- Limits on functionality/complexity of analytics that can be done
- Temporal lag between events & analytics
- SLAs not being compliant
- Individual product expertise
- Expensive to buy, operate, maintain

Salient Points

- Brings disparate components and creates a seamless Advanced Analytics pipeline
  - Hot Data: In-memory
  - Warm Data: Data Warehouse
  - Cold Data: Hadoop/Spark
- Enables Real Time analytics
- Complex analytics unlocked with Machine Learning and multi-dimensional cubes
- Ad-hoc & cross querying capabilities
- Cost effective – pay for what you use
- High performance, handles all data

Case Study: Fortune 500 Retailer

Key Points

- **Data volume**: 20 TB, 2 years, rapid velocity
- Primarily sales and inventory data
- Dynamic: changing very frequently in real time impacting decision making
- Test launches critical for new products
- Speed and Accuracy of forecasting: big & direct impact on bottom-line
- Data analytics critical for Business teams
- Need for fast, flexible and agile analytics

- On premises infra: Hadoop & other Big Data technology for 2years+, replacing Teradata
- Analytics: SQL 2014 Enterprise, prebuilt cubes exposed via SSAS to business analysts
- Business users primary interface and tool to access data for analytics: Excel 2013
- Siloed technical teams : Warehousing, BI, In-memory processing – disparate functionality

- Business wants to **conduct lot more complex analytics** than currently possible
- Business wants much **faster SLA than 10 mins that too IT struggled to deliver**
- Business needs **real time data gathering & processing** vs. daily and weekly rollups
- Business needs **intuitive & flexible UI for custom reporting** and quick drill downs
- IT wants to **enable ad-hoc analysis** vs. creating custom cubes for new analysis

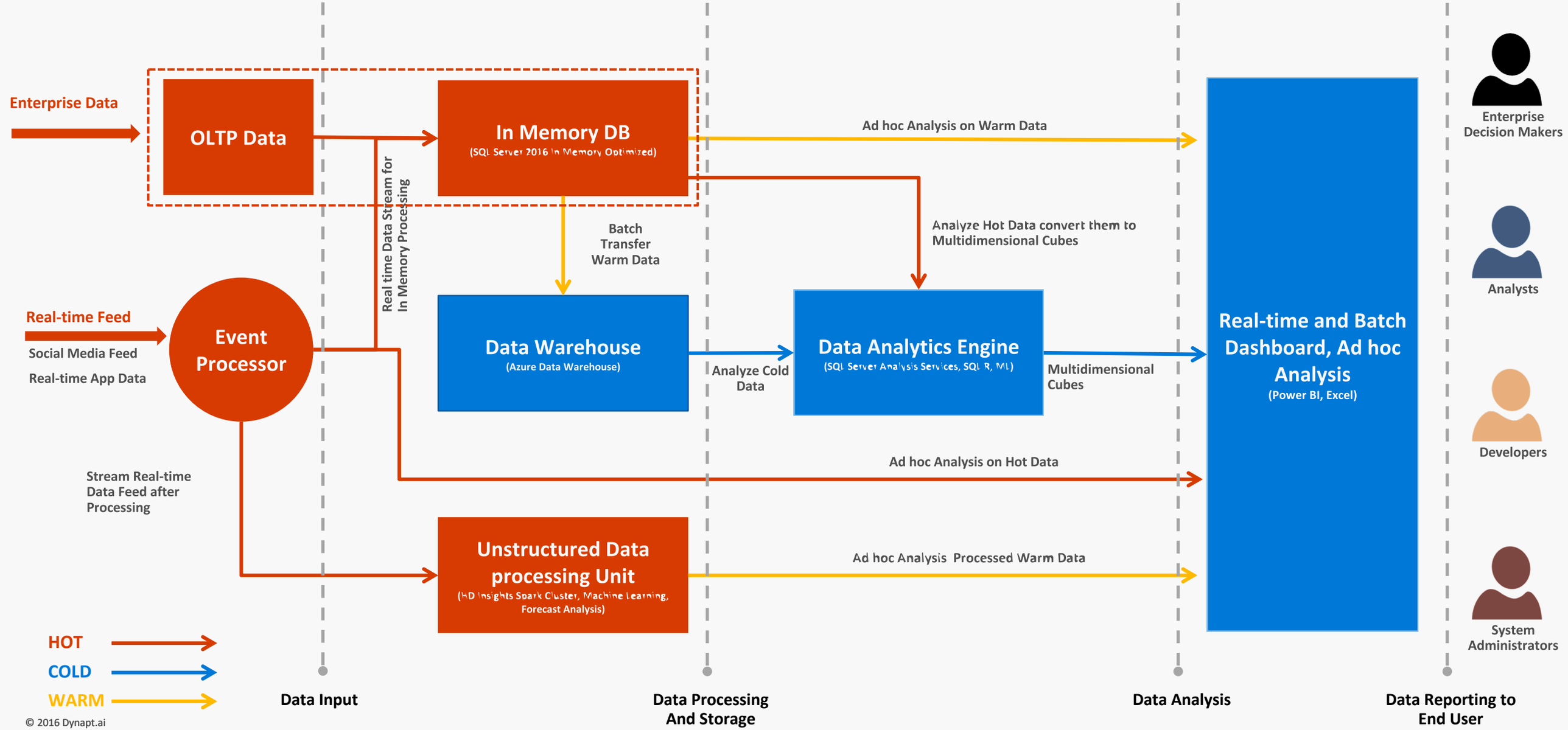
- **Data Tiers**: real time processing for hot, in-memory for warm, and cold in DW
- SLA down from **10 mins to 30 secs for warm data** & **sub 5 seconds for hot data**
- **Ad-hoc querying enabled for all data types** to enable on-demand
- **ML based, real time & offline analytics** on data, along with cross querying
- Powerful and flexible dashboard for **creating reports on the fly**, as needed

Dynapt Modernizes Traditional Supply Chain

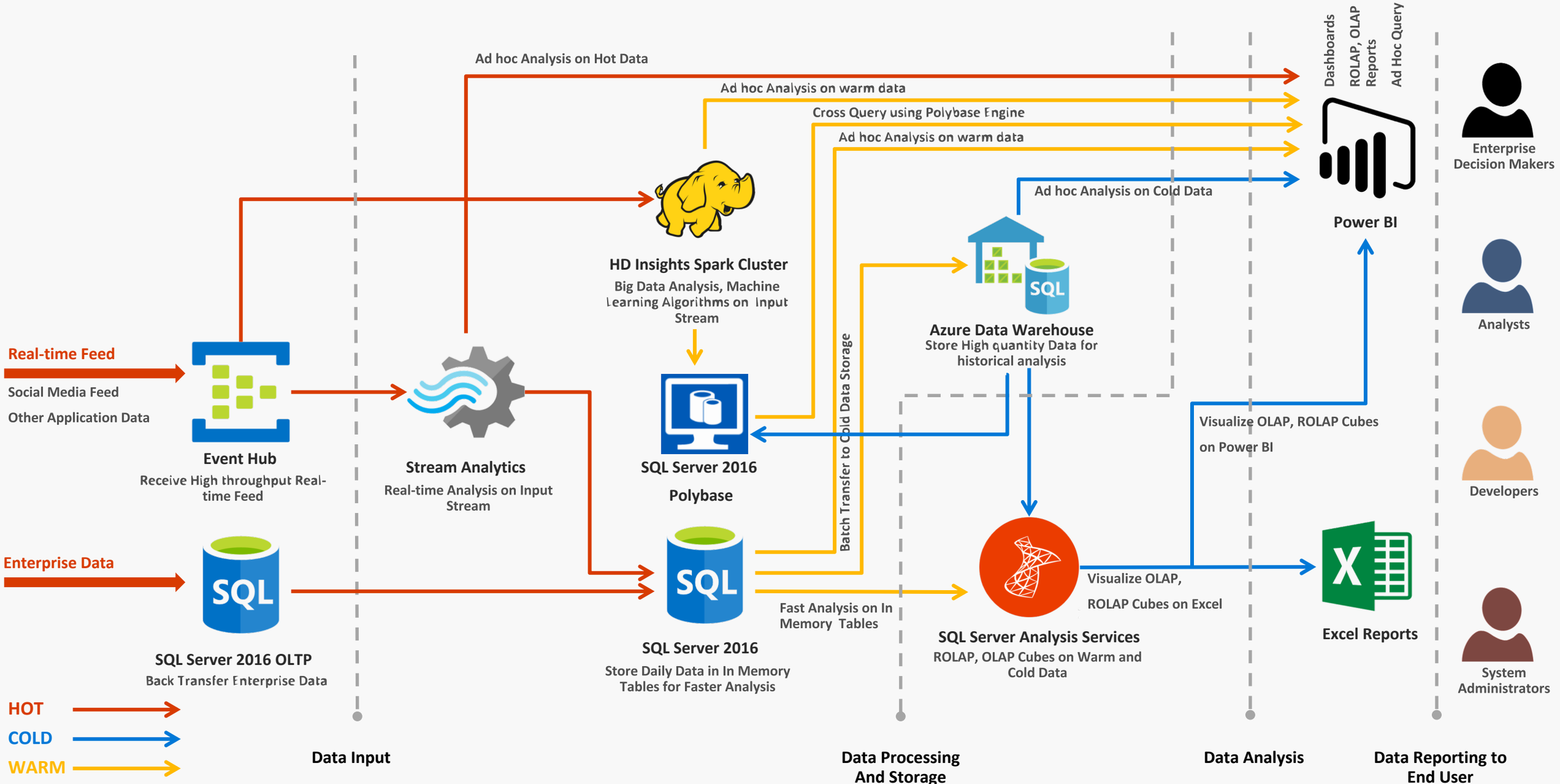
Empower business users to conduct on demand, at-will analytics, resulting in accurate forecasting, inventory & sales management with greatly improved operational & IT efficiency

- ❑ Highly scalable, low cost and delivers extremely high performance
- ❑ Handles large data volumes across variety of formats and sources from retail, financial services to manufacturing and other verticals
- ❑ Enables ad hoc querying on large datasets, in-memory processing for traditional cubes, cross querying across un/structured data and real time event processing
- ❑ **Completely Built on Microsoft Azure Platform & 1st party IP**

Functional Architecture



Technical Architecture



Key Takeaways

- **Data Tiering** – ability to categorize data as Hot, Warm and Cold to conduct cost optimized analytics with different performance across tiers
- **Complex Cubes** – build multi-dimensional, complex yet very high performing cubes with in-memory processing
- **Ad-hoc Querying** – go beyond prebuilt cubes to conduct on-demand, at-will analytics on real time and historical data
- **Multiple Data Formats** – get deep insights from variety of data formats and types (structured and unstructured) across verticals
- **Cross Querying** – ability to cross query between structured and unstructured data in real time
- **Real Time Analytics & Batch Processing** – complex event processing in real time and offline data mining with industry leading technologies for deeper insights
- **Deep Machine Learning** – leverage deep ML to build models that grow ever more accurate and smart with time and data processing