Why right data management strategy matters

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As a warehouse manager for a large global retailer, you manage people, processes and systems; ensure goods are received and dispatched; and productivity targets are met – but none of these are possible without knowledge. Knowledge about your day-to-day tasks, knowledge on inventory management, knowledge that will aid in better decision-making and responding effectively to customer queries.

Business intelligence comes from knowledge and knowledge comes from data. In this world of global corporations and data-driven enterprises, knowledge cannot be left out as a function of experience and maturity, but must be built into the system. Enterprises no longer view data as a structured, monolithic collection or just as a 'System of Record', but as a data continuum that is multi-dimensional and connected to fuel business innovations. This is where finding relevant, actionable insights from the goldmine of data will help to create meaningful stories and create business value.

A successful data management strategy requires the ability to visualize the multi-dimensional aspects of data, such as storage, velocity, veracity, volumes and contextual awareness of the enterprise. It also needs to consider the cross-enterprise dependencies to form a cohesive view of the data.

Using data to your advantage

There are several challenges that inhibit enterprises from using data to their own advantage. Foremost is the number of data sources, which are heterogeneous and result in inconsistent views. This impacts decision-making, as it lacks correlation with no valuable real-time insights into business processes and business actions. The lack of insights coupled with the unsurmountable volume of data generated from various channels and systems amount to unpredictability in business process execution.

Open source solutions and platforms can bring value to enterprises by being cost-effective and future-proof.

Given these challenges, enterprises are forced to employ smart strategies to extract maximum value by harnessing existing heterogeneous data in the enterprises. Modern warehouses that are part of the enterprises manage and generate huge amounts of data related to products, customers, orders, labor utilization, sensors, etc. Such data can be static, transactional, structured or unstructured, which, when effectively processed, can provide valuable insights into warehouse operations. In a globalized scenario, with the advent of omnichannel fulfillment and e-commerce, enterprises need to manage a network of such warehouses, distribution centers, stores, etc.

An ideal Integrated Warehouse Platform solution

An ideal Integrated Warehouse Platform (IWP) solution provides visibility into inventory, orders, and customer information across the network of distribution centers in real time. It helps enterprises eliminate waste, carry out informed decision-making, and streamline operations by effective processing of data. Additionally, it supports information access from various mobile devices, supports analytics engines, and handles data with other host systems such as Labor Management Systems, Order Management Systems, Internet of Things (IoT) systems, etc. (Refer figure 1)
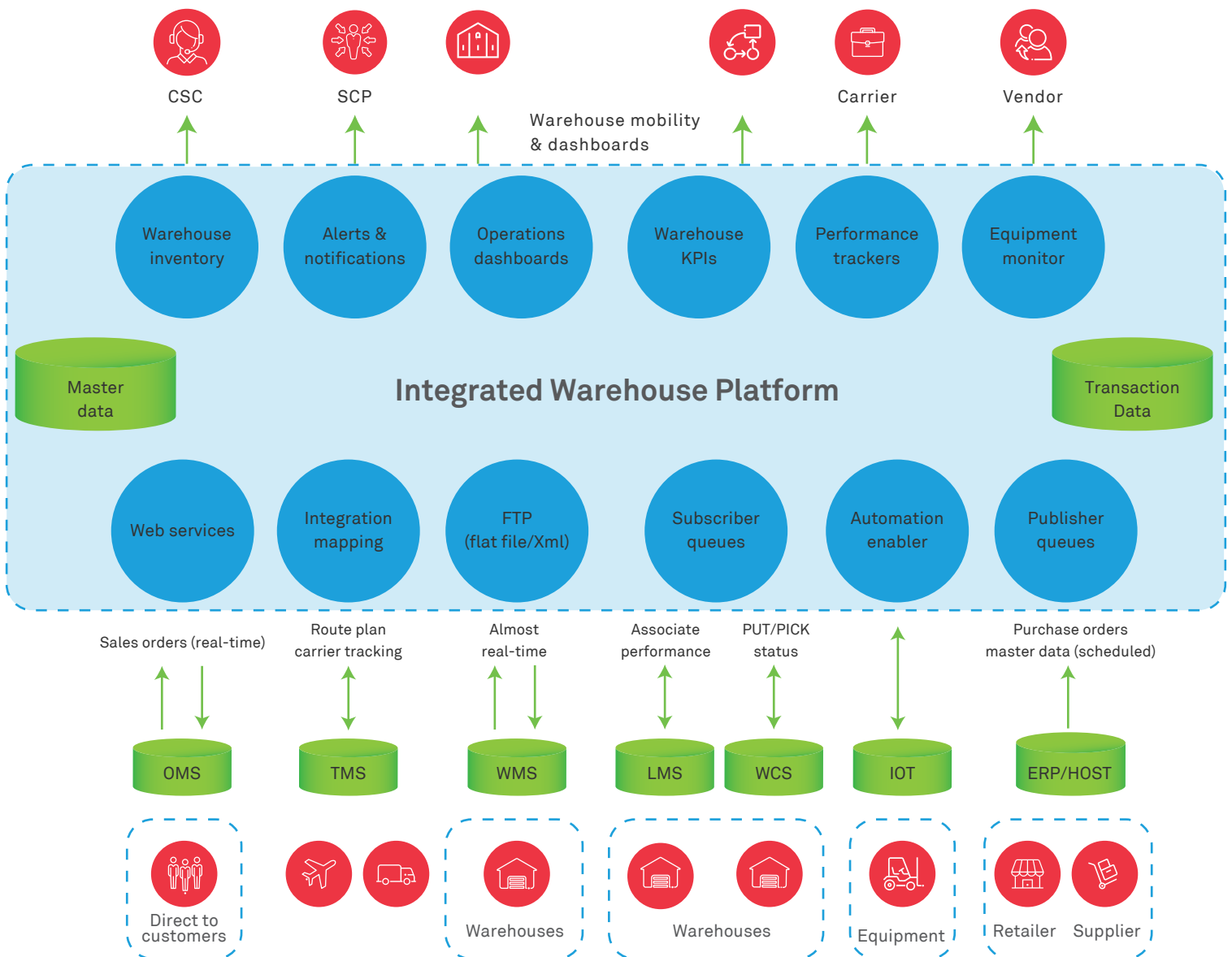

Figure 1 Integrated Warehouse Platform

A few architectural strategies should be implemented in IWP to future-proof it. IWP functionality should be split into multiple microservices, such as Inventory Service, Sales Order Service, etc. Each service should have its own database, which stores service-specific data. To ensure business continuity, provisioning IWP at the customer site must involve data migration from legacy/proprietary databases to multiple warehouse database instances. Once the migration is finished, incremental data from legacy stores and data services within IWP are synchronized, as and when the data changes. A NoSQL back end, with built -in support for time series storage and aggregation capabilities for exploratory data analysis supplements the data captured with real-time visualization and monitoring. IWP should also provide much needed mobility, wherein users can access information from different handheld devices. With data from multiple warehouses consolidated into IWP, predictive analysis provides better insights into warehouse operations, alerts, etc., across the enterprise.

Enterprises have vast amounts of valuable data buried in various systems and platforms. However, the ability to discover and harness business value from an existing data lake is the key. The right strategy at the right time can propel your business and also deliver value. Open source solutions and platforms can bring value to the enterprise by being both cost-effective and future-proof at the same time. Effectively setting up a platform and building a solution to harness the data across the enterprise is of importance, which can be easily managed with mature open source solutions that are available in the market today. Organizations can take the data bull by the horns, by aligning their data strategy to their business landscape and making the right choices. A microservices architecture may not make sense for everyone, as is the case with in-memory databases. A close alignment between business objectives and the data landscape can launch the enterprise into the insights-led future.

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With over 20 years of experience in the design and development of IT systems, Bala currently works as an architect with Wipro's Open Source Center of Excellence (CoE). He has worked with multiple technologies and frameworks, developing systems for multiple domains. He is involved in developing modern web applications using Open Source technology stacks. His other technology interest areas include real-time data processing and visualization, microservices architecture and Cloud technologies.

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