Godrej | INFOTECH

Unifying Your IT Ecosystem With Enterprise Application Integration (EAI)

Empowering Business through Enterprise Solutions

Contents

01. The Business Case for EAI

Dynamic market conditions require organizations to be agile and flexible and respond quickly to changing environments. In order to respond correctly, accurately and with confidence, organizations need integrated business functions that are based on a single source of truth at all times. Whether large multinational conglomerates or mid-to-small sized niche companies, all have realized the importance of using information technology to its fullest in order to keep the operational engines running smoothly and keeping data shared and synchronized with third party vendors and customers.

Your Organization Needs EAI If...

- There are multiple business units with each of them running independent software systems
- IT systems are not inter-connected

What Can EAI do for You...

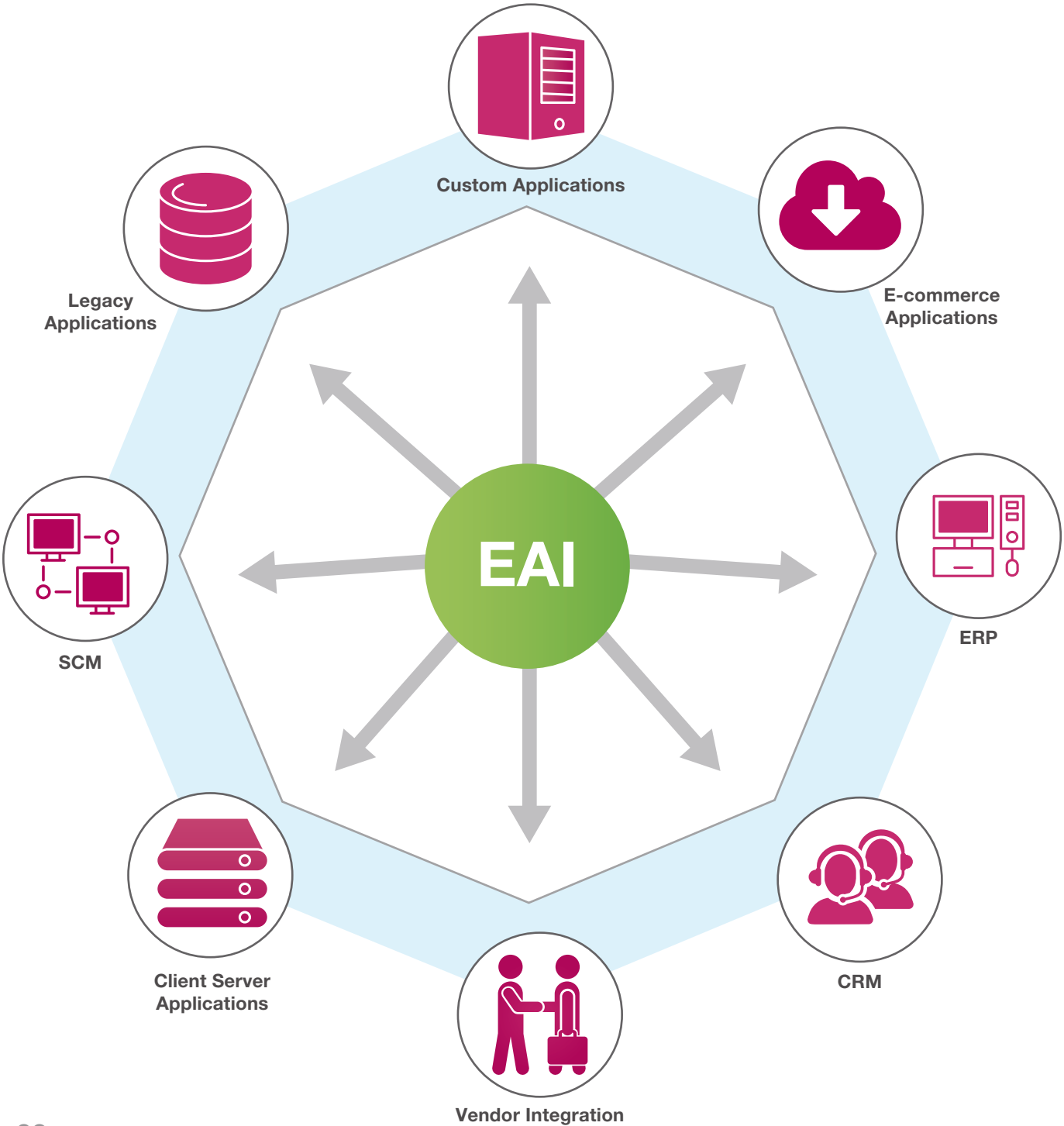
Within an Organization Boundary	Across the Organization Boundary
Enable multiple applications to exchange data and functions with each other.	Track raw materials, finished goods, spares, and machines online for their real time status.
Replace legacy interfaces - Retrofitting them with new ones to enable speedy integration techniques.	Establish B2B communication channels by web-enabling interfaces to partners, suppliers and customers. This enables e-commerce.
Reduce programmer development time and simplify system architecture.	Enable your products and services to be featured on industry market places/ portals.
Eliminate waiting for inputs from other departments.	Create your own B2B self service portal that acts as a primary access point for external partners and customers.

What Will You Gain...

- Enterprise systems that are more closely related to real world business processes
- Improved quality and accuracy of data
- Transparency in product price, availability and delivery
- Reduced costs and improved service

75% of all the companies which provide IT-related services simultaneously use at least 6 (!) different applications.

- Gartner



02. ERP/ EAI / Both?

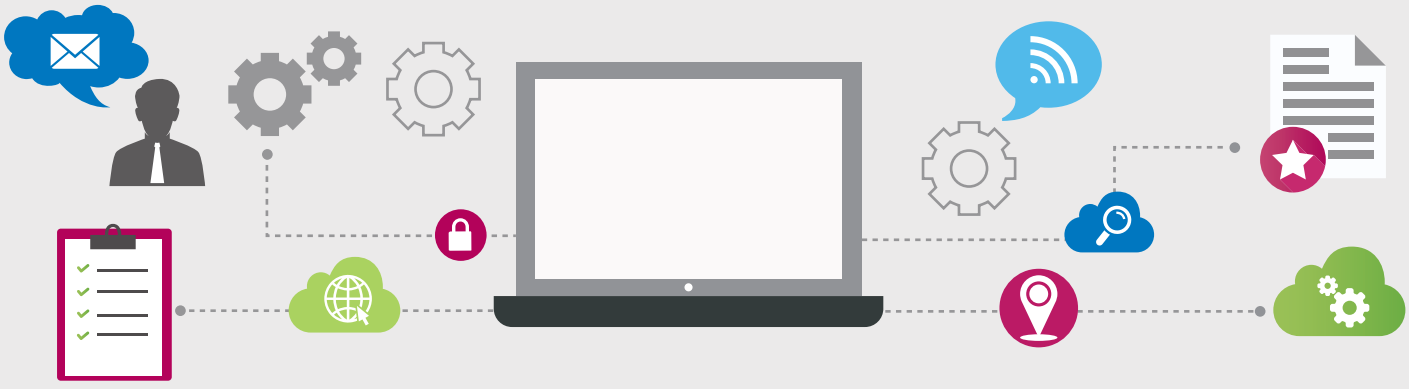
ERP - Used to automate business processes in an organization
EAI - Automates the inter-operability between different application software

ERP - Push oriented - First standardizes business processes, and then uses information technology to implement them.
EAI - Pull oriented - Existing applications and business processes are mapped and merged into integrated forms.

Generally organizations use ERP applications for automating finance, accounting, sales, marketing, inventory, and shipment processes. They also use EAI to then integrate the ERP with other packaged and custom built software like CRM, HCM, WMS, HR and other line of business specific applications.

03. Benefits of EAI

- Lower total cost of ownership due to lesser development and support costs
- Interoperability of software applications with a standardized interface across components with different operating systems, languages and data formats
- Real time access to a single source of accurate data, leading to less time spent on search activities
- Unified user-friendly interfaces for effective collaboration between individuals, departments, functions and processes
- Secure and scalable architecture to meet the needs of growing organizations
- Users can respond quickly to business critical events leading to increased agility
- Reduces IT complexity by avoiding the steep learning curve associated with installing new systems



04. Building an EAI Strategy

Typically CIOs have as much as 30% of their IT budgets allocated towards EAI initiatives

Determine Primary Objectives

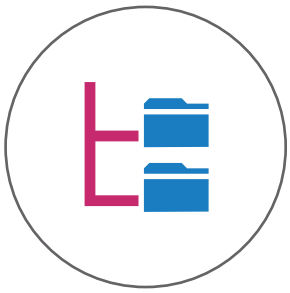
It becomes easier for EAI architects to take implementation related decisions once the fundamental objectives of the EAI efforts are clear. Main drivers that lead to the initiations of EAI activities are -

- Data Integration
- Vendor Independence
- Common Facade across Applications

Choose an Approach

Some of the most common questions to be answered when framing an overall strategy are -

- Measuring value addition through both qualitative and quantitative ROI methods
- Security, scalability, reliability and availability factors expected
- Use of on-premise, cloud or hybrid deployment options
- Intelligent reporting needs that then determine data aggregation and collection options



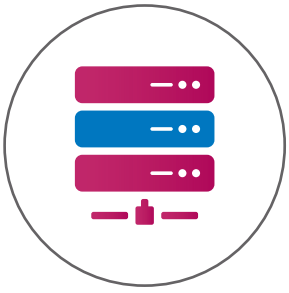
Identify Appropriate EAI Types and Topologies

Once a high level picture is framed, depending on the organization's size, industry, budget and complexity, different degrees of integration can be done.

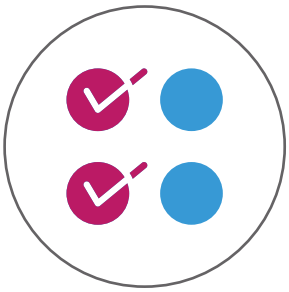
EAI Types

Data Integration

This is one of the simplest ways to achieve integration amongst disparate systems. In this approach, ETL (Extract, Transform, Load) tools are used to extract data from one or more source databases, clean and transform it as per business rules, and finally load it into a common enterprise data repository (a data warehouse) or specific repositories tuned to serve different business needs (data marts). This is a low cost, low risk approach that is well suited for organizations that require integrated data and can do without integrated business processes and user-interfaces. This is also known as Enterprise Information Integration (EII).



Application Interface

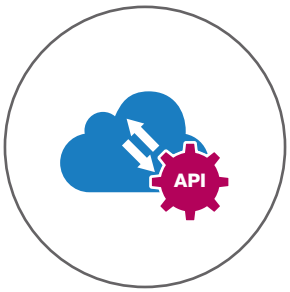


Most suitable for integration of business processes that cross multiple application and system-human boundaries. In this case, source and target applications expose their frequently used business functions and interact with each other with the help of Service Oriented Architecture (SOA) or Message Broker platforms. Traditionally, tightly coupled systems required application integrators to have internal knowledge of both the source and target systems. However, with the advent of standardized message transfer mechanisms such as XML, applications can be integrated in a loosely coupled manner, thus allowing individual applications to make internal changes as and when needed.

User Interface

Also known as re-facing, this approach replaces existing legacy and desktop based interfaces of multiple applications with standardized browser based interfaces. Building enterprise business portals are a common approach to this kind of integration wherein multiple applications are presented in a federated customizable web interface.

Middleware Approach



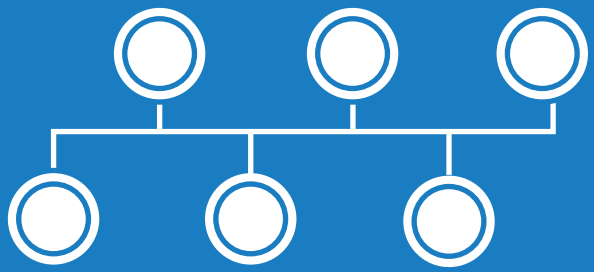
EAI through the use of middleware technology is also commonly used for moving information and sharing business processes amongst applications. The middleware system encapsulates the communication mechanism amongst systems so that developers can concentrate on dealing with the APIs (Application Programming Interfaces) of the source and target systems. Once an organization invests in a middleware platform, the same middleware API can be used for integration between multiple applications deployed on different platforms.

Being an underlying technology of EAI, middleware can be used at any level of integration. The most common applications of middleware though are at the application interface level through the use of a message broker and at the user interface level through the use of a business portal.

EAI Topologies

1. HUB-SPOKE

2. BUS



1. HUB-SPOKE

- Also known as Message Broker Model.
- Has a Centralized Server.
- Message from the Sender is Sent first to the HUB via the SPOKE.
- The HUB routes the message to the appropriate Sender via the SPOKE.
- The HUB -> An integration engine that has additional capabilities for message transformation, enhancement and intelligent routing.
- The SPOKE -> Queues/ Topics created on the HUB.
- PROS - Removes complexity by avoiding cross connections amongst clients.
- CONS - Hub becomes the Single Point of Failure.
- Limited scalability - Performance gets impacted as number of clients get added.

2. BUS

- Also known as the Message Bus Model.
- BUS - Network based messaging backbone.
- Message translation is done at the publishing and subscribing clients by the use of adapter components.
- PROS - Scalability - Clients can be added without impacting the performance of the bus.
- CONS - Higher Maintenance Needs.

05. Application Integration with Dynamics AX ERP

Common integration methodologies -

- Web Services
- Staging Database
- File based (csv, xls, xml etc.)

06. Our EAI Expertise

"Enterprise Application Integration Market to Reach USD 13.79 billion with 10.11% CAGR Forecast by 2020. The key end-users identified for this market are BFSI, Business Services, Manufacturing, Healthcare, IT, Telecom, Consumer and Retail.

- Mordor Intelligence

a. Manufacturing

EAI is being used considerably by businesses that specialize in the Manufacturing, Trading, Distribution and Logistics sectors. One of the most popular mechanisms for facilitating EAI in these scenarios is through the use of the EDI (Electronic Data Interchange) format. EDI is a computer-to-computer standard for transferring business documents between the various organizations in a supply chain. For Manufacturing organizations, the purchase, production, shipment and quality business processes are integrated using the real-time transfer of EDI documents such as purchase order, advance shipment notice, warehouse stock transfer advice, price/ sales catalogue, planning schedule and material release.

Challenges

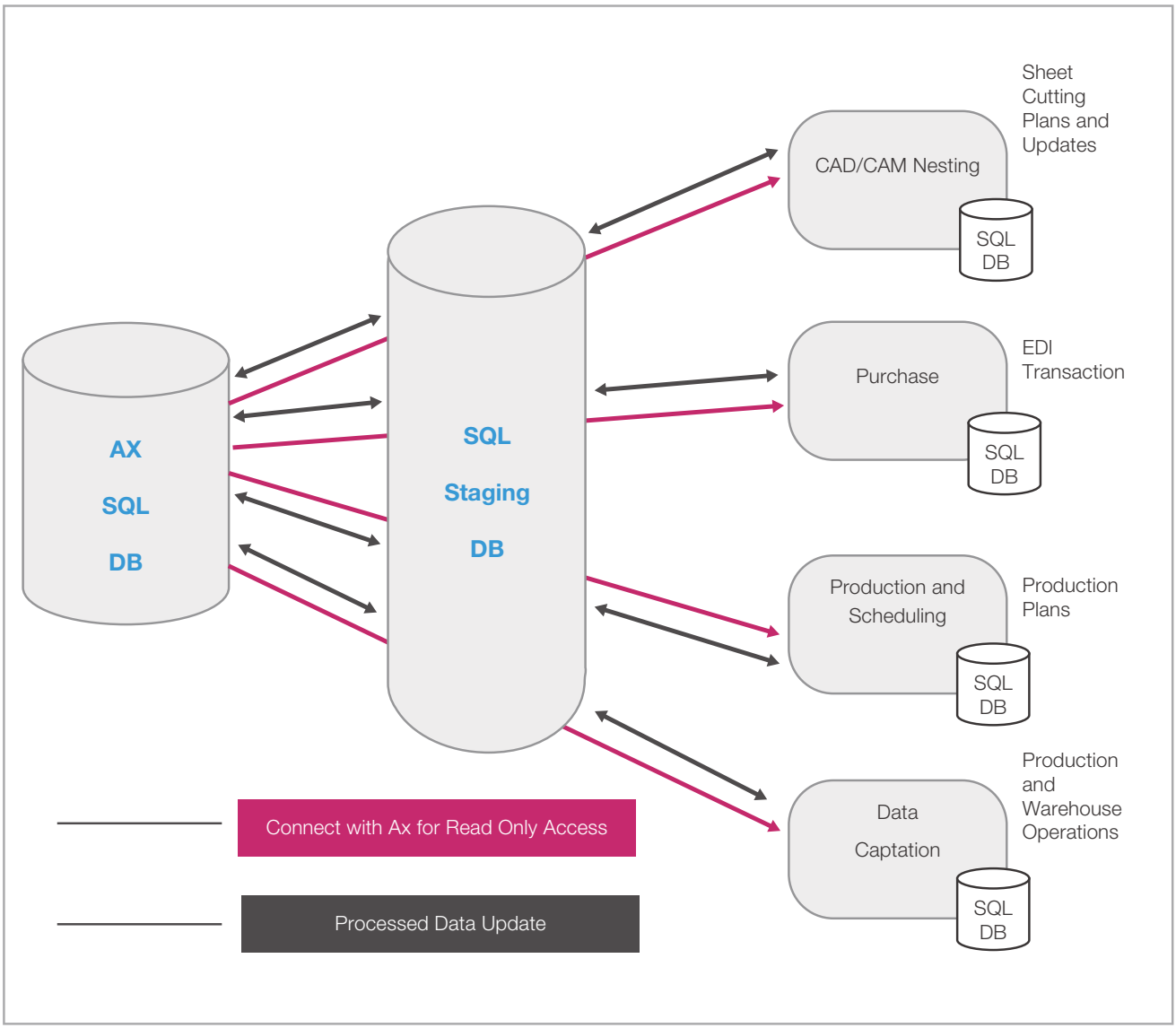
- Dealing with delayed orders due to dynamic demand and supply conditions
- Large fixed asset maintenance costs due to lack of real time information on machines
- Handling large number of sensitive design and production documents

Solution

One of the world's largest steel production organizations has cleverly used EAI techniques to streamline its supply-chain. The client's avenues for working with leading global trading partners has grown exponentially by opening up its channels for Business-to-Business transactions. Microsoft Dynamics AX ERP, robust data replication techniques and the use of EDI for message communication are some of the essential components that are used in creating a secure, scalable and standardized application integration architecture for this client.

Benefits

- Transparency in status of production orders leading to efficiency in meeting customer's requirements and timelines
- Use of well-organized production and planning techniques such as load balancing and dynamic routing
- Scalability and security in transfer and storage of high volume business documents



b. Retail

The Retail Industry has today transformed itself from a completely store based environment to an Omni-channel based experience that engages with customers across online, mobile, home and store fronts. EAI plays a vital role in the retail IT ecosystem, primarily to combine POS and online processes into a single unified view for ease of decision making.

Challenges

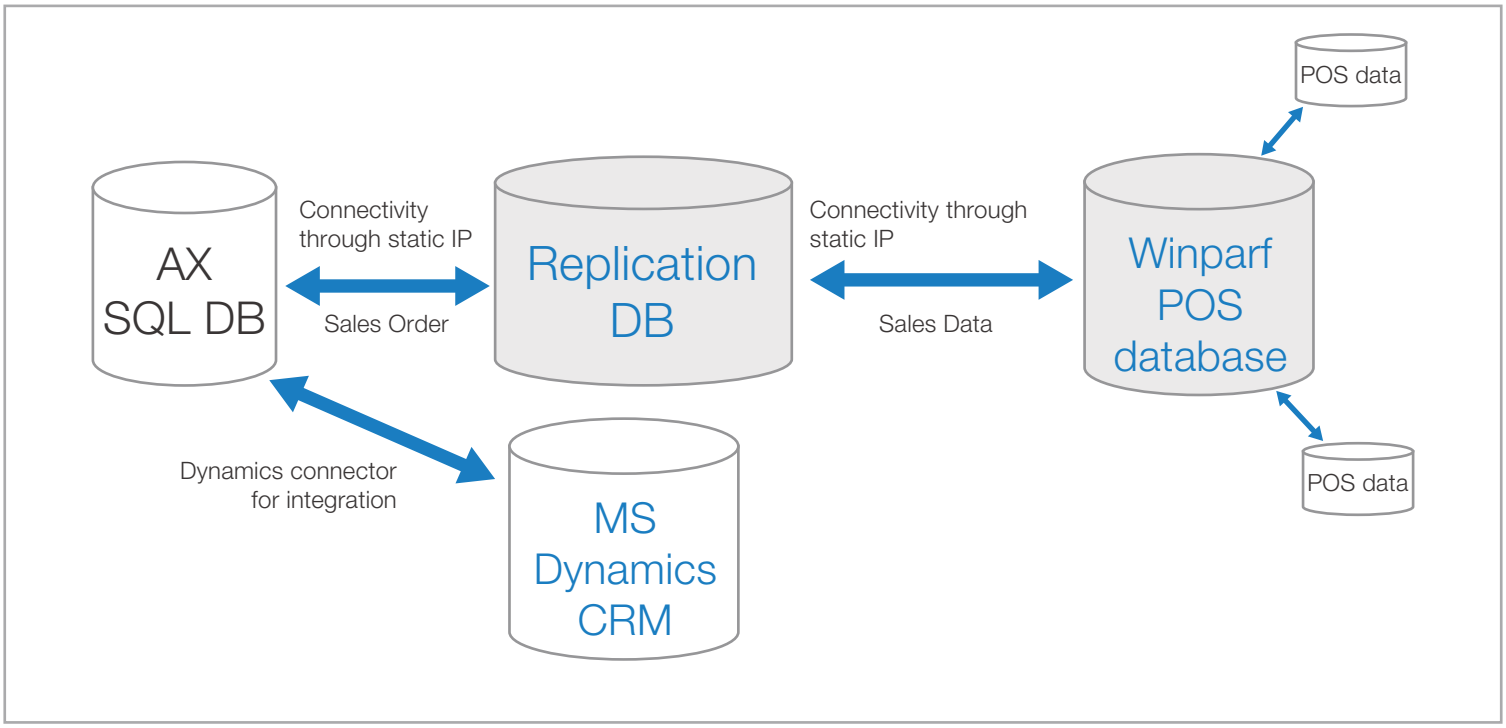
- Integrating inventory, warehousing, logistics and financials across online and offline channels
- Managing customer loyalty program across online and physical store customers
- Creating and scheduling successful marketing campaigns

Solution

A large multi-national retailer, when faced with some of the typical application integration challenges, has successfully used EAI to integrate multiple systems with Microsoft Dynamic CRM. The different systems in use by the organization are:

- **MS Dynamics AX** – This is ERP system which stores all master & back office transactions & transfers data to CRM & POS system.
- **Winparf** – Retail POS system pulls sales and customer data from the various stores.
- **MS Dynamics CRM** - All sales data is made available in CRM for BI reporting.

POS, MS CRM and AX Integration Approach



Benefits

- Data from multiple sources is now available in the Microsoft Dynamics CRM system.
- Goal Management Feature in CRM is used for setting product goals and identifying highest and lowest selling products.
- Various Dashboards and Loyalty Programs provide a well-developed insight for the Organization.

c. 3PL

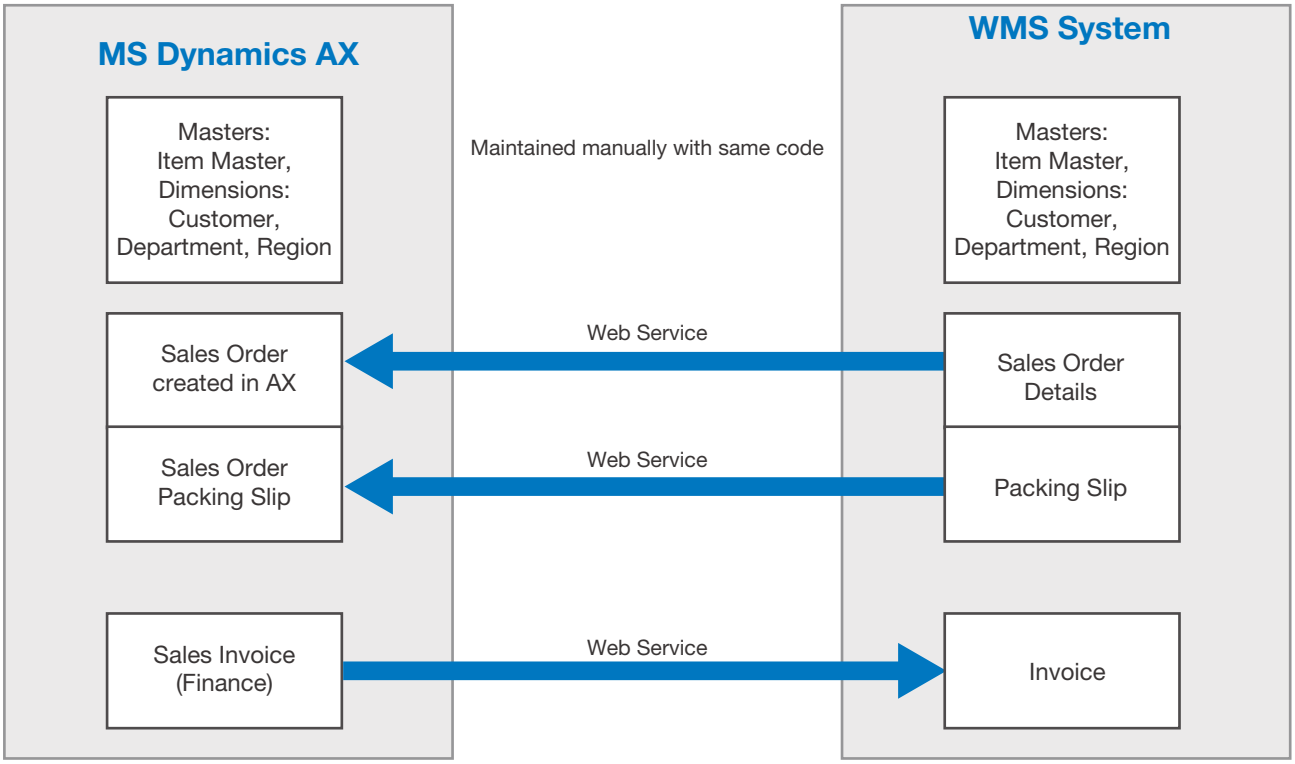
Today's insanely demanding customers have led to an exponential increase in the need for 'Last Mile Delivery'. With the rise of e-Commerce, the burden on logistics becomes more due to the need for organizations to spread their operations internationally. The global parcel delivery market is estimated to be at more than €70 billion, with United States, Germany and China accounting for over 40% of the market. What is interesting to note though, is that developing markets have experienced more than 100% growth in this segment over the past couple of years. For organizations that are facing rapid growth in this kind of scenario, EAI has proved to be extremely useful by enabling organizations to customize products just-in-time and also provide same day deliveries.

Challenges

- Synchronizing master data amongst multiple systems
- Lack of integrated system to ensure traceability of orders, right from purchase to delivery
- Lack of real-time, consolidated data for reporting and business-critical financial decision making

Solution

One of GITL's clients, a global 3PL organization successfully integrated its Warehouse Management System (WMS) with its Microsoft Dynamics AX system. The master data is now maintained uniformly, and a web-service based architecture has been used to integrate important business information such as sales order data (Order no, item lines, quantity, price, UOM, currency), dimensions (Branch, customer department, division, region) and packing slip data (Sales order number, WMS invoice number and date).



Benefits

- Greater visibility of shipment details across the organization
- Synchronized Master data
- Integrated transaction data leading to accurate financial reporting

d. Not-for-Profit

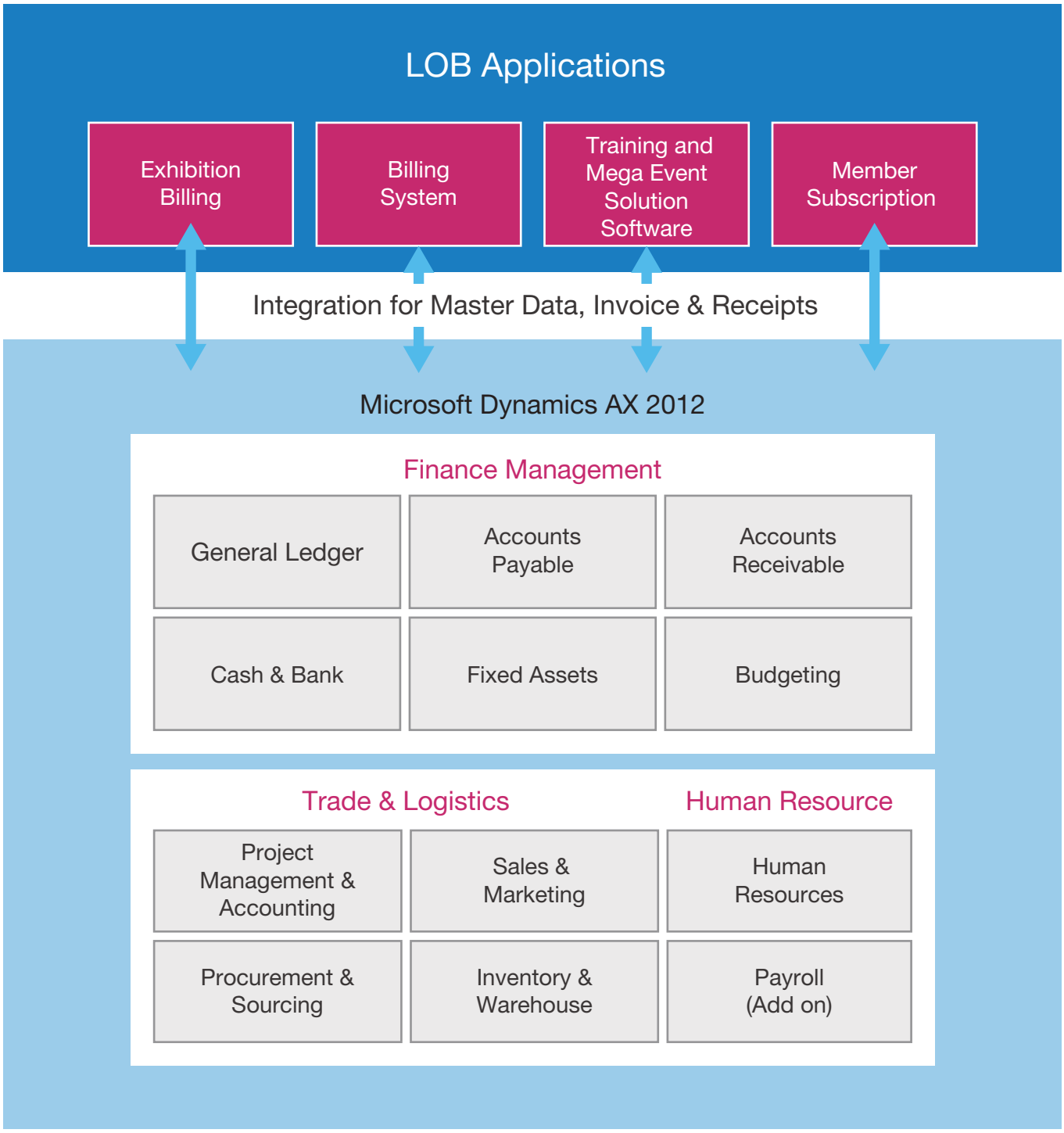
Not-for-Profit organizations have unique business needs when it comes to EAI. Firstly, the possibility of having many separate systems for various Lines of Business (LOB) is larger. In addition to this, the need for production efficiency and cost-effectiveness is also one of the primary motivations that drive these organizations towards initiating an EAI exercise.

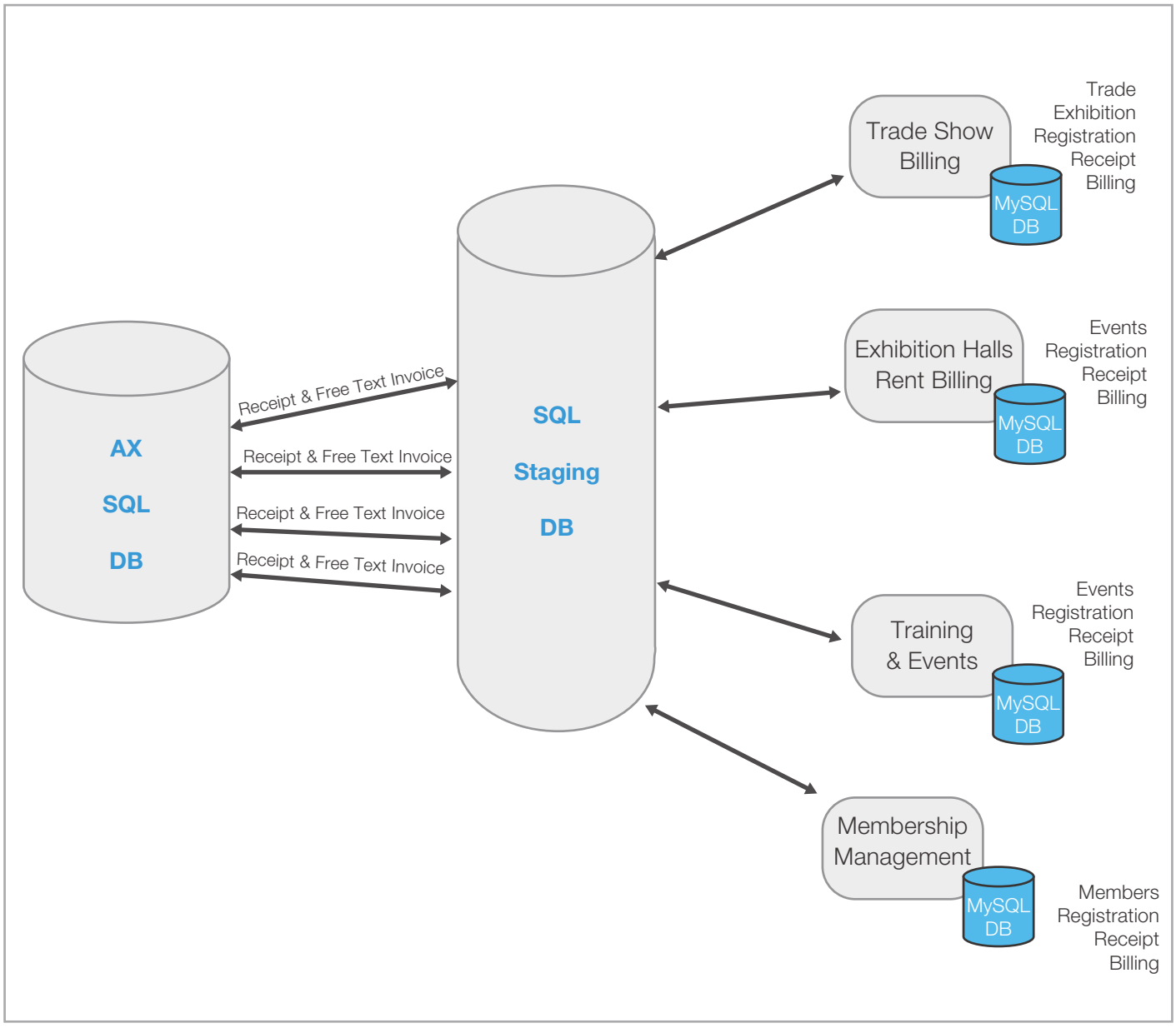
Challenges

- Multiple LOB applications
- Efficient resource management

Solution

India's largest association of machine tool manufacturers was facing similar issues when it came to achieving their goal of having a single integrated, efficient and optimal system. The solution provided by GITL covered integration of the different surround systems with the Microsoft Dynamics AX software through the use of a staging database.





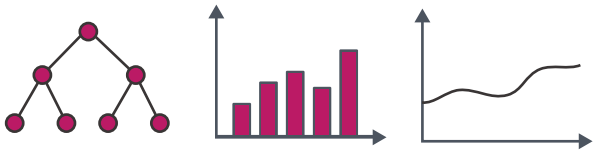
Benefits

- Integration of multiple LOB applications with the central ERP system
- Efficient resource utilization

07. Business Intelligence with EAI

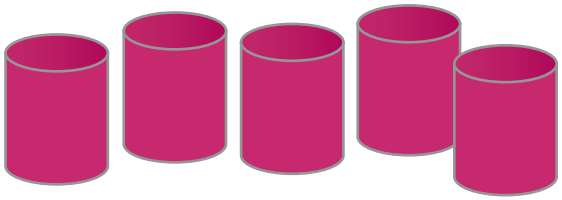
OLTP, Data Warehouse and OLAP are the components that make up a BI reporting system.

OLTP



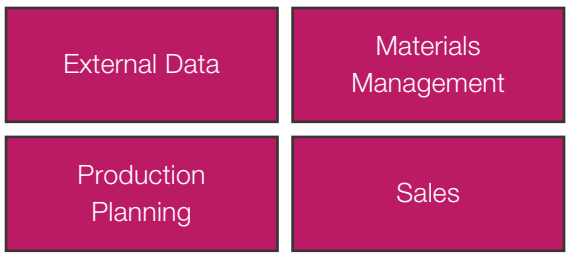
Analyzing Tools

Data Warehouse



Aggregated Information

OLAP



Online Transaction Processing (OLTP)

System which will have data from finance, sales, materials management, production planning and external systems or sources. Generally, data in transaction system can be accessed with proprietary tools & programming e.g. SAP or Oracle programming tools. However, with Extract-Transform-Load i.e. ETL tools, required data is extracted from OLTP to Data Warehouse.

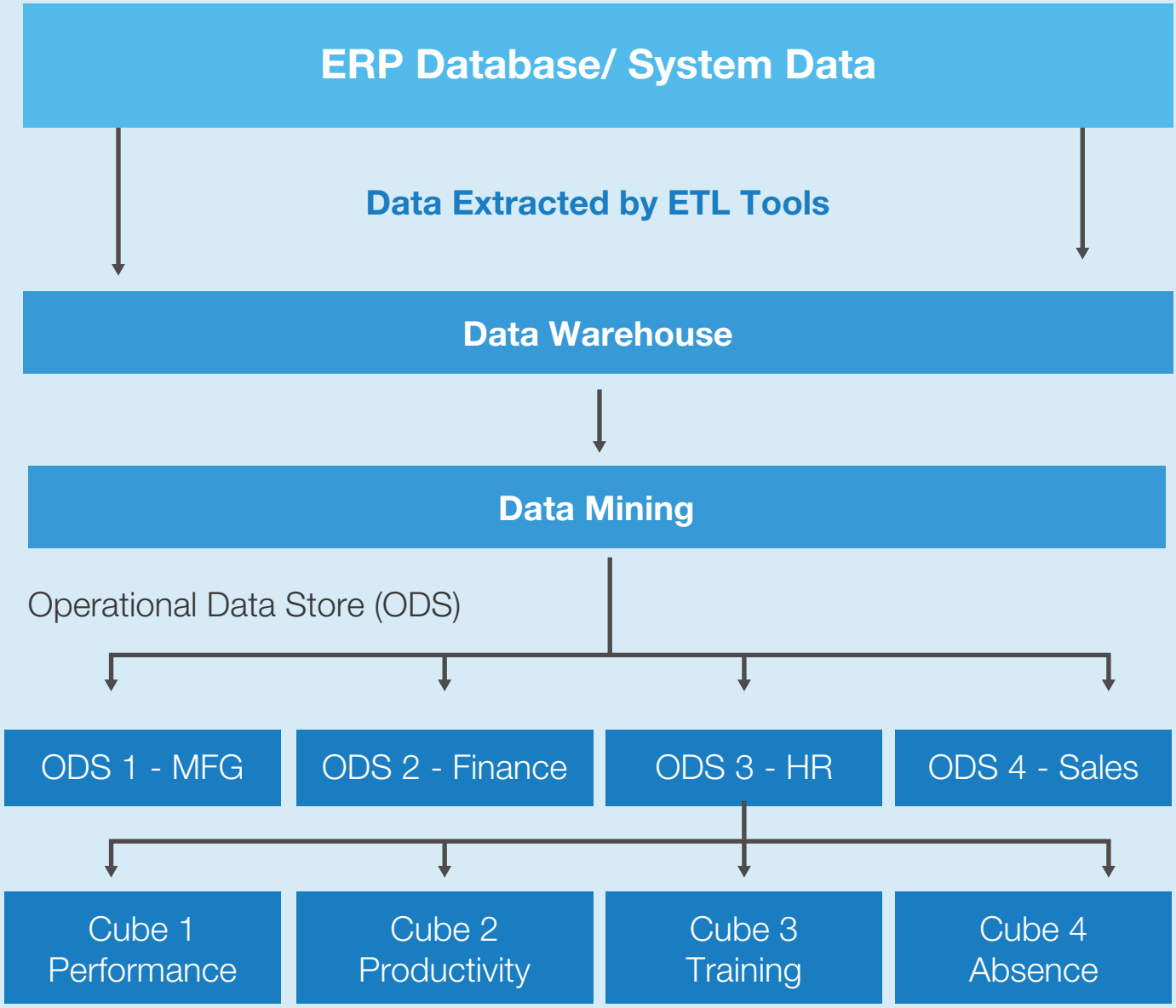
Data Warehouse

Databases which will have aggregated data from OLTP. Only required data is moved from OLTP to Data Warehouse which delinks data from OLTP.

Online Analytic Processing (OLAP)

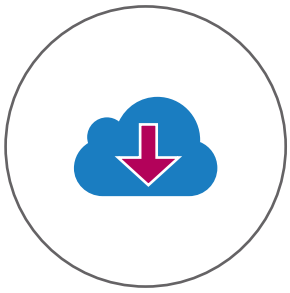
Tools like Microsoft Excel are used with the Data Warehouse for analysing data in graphical or trend formats in batch mode or online real-time mode.

Data processing is required before the business intelligence report is generated and it involves the following steps - Data warehouse > Data Mining > Operational Data Store > Cubes



- Data in data warehouse is free floating data which needs to be made available in specific formats whenever required for analysis. Data mining helps in giving discipline, structure and meaning to free floating data.
- In Data Mining, data is placed in a structure called Operational Data Store (ODS) which holds only related data separately. E.g., if a database has a total of 100000 data elements, out of which only 25000 are related to Sales, then ODS-Sales will have all required sales data (25000 data elements) stored separately for analysis. Thus, an ODS makes it easier to retrieve related data much faster & without complexity.
- To further analyse and view sales data, it will be difficult to view 25000 data elements. Hence CUBES (data views) are created with specific performance data elements (e.g. 10 data elements). Multiple cubes are created from a ODS with different criteria, e.g. for HR we can have Cube-1 related to Performance, Cube-2 related to Productivity, Cube-3 related to trainings and cube-4 for absence.
- It is possible to drag and drop data elements from the Cubes to Microsoft (MS) Excel to generate reports which can be refreshed on a real-time basis. With cubes, users can create multiple views of the same data. Business rules can also be defined for the cubes so as to derive computed values based on the source data.

08. Future Trends



Cloud Computing

Features

- Automated, programmable layer of abstraction
- Multiple hosting options

Integration Implications

- Best suited for creating self-service applications
- Provides global connectivity and access

IoT

Features

- Connection of physical objects to the internet
- Bi-directional communication

Integration Implications

- Capable of handling massive data volumes
- Can have countless end-points

Mobility

Features

- New breed of applications developed specifically for mobile
- Supports the concept of a mobile workforce

Integration Implications

- 24*7 transactions
- Light weight data transfer

Wearable Technology

Features

- Body borne computers
- Factors in surroundings

Integration Implications

- Needs to be tuned for enterprise scenarios
- Takes data aggregation to the next level

Big Data

Features

- Volume, Variety, Velocity (3V's)
- New ways to manage new insight

Integration Implications

- Best fit for newer data architectures
- Not fit for traditional tools

Why Godrej Infotech Limited?

Godrej Infotech Limited, till date, has successfully worked with numerous large and mid-scale businesses for implementing enterprise integration projects with Microsoft Dynamics AX. The AX product is a best fit product for these industries, with multiple out-of-the-box features that bring the much needed efficiency and ease into strategic and day-to-day operations. The product now easily integrates with other Microsoft Office professional tools such as Office 365 and Power BI to bring the best of all Microsoft technologies under a single unified platform. Microsoft Dynamics AX also interfaces with mobile applications, enabling users on the field to access and record key information in real time.

At Godrej Infotech Limited, we have a large pool of AX certified technical and functional consultants that have in-depth knowledge and experience in working with global, multi-business industries. Our relationship with Microsoft Dynamics was initiated in 2003, which has since then resulted in one of the most successful business lines for us, as we collaborate on building profitable and innovative solutions for our clients. We have executed several full life cycle implementation, migration, global rollout and support engagements for organizations across India, Europe, APAC, USA and Middle East using Microsoft's proven Sure-Step methodology. More recently, we have also started an Enterprise Mobility practice for providing integrated mobile applications to our customers, who benefit significantly from such anytime, anyplace flexibility features.

Microsoft Dynamics

We feel honored to have received numerous awards and acknowledgements from our partners - Microsoft, Infor and LS Retail.

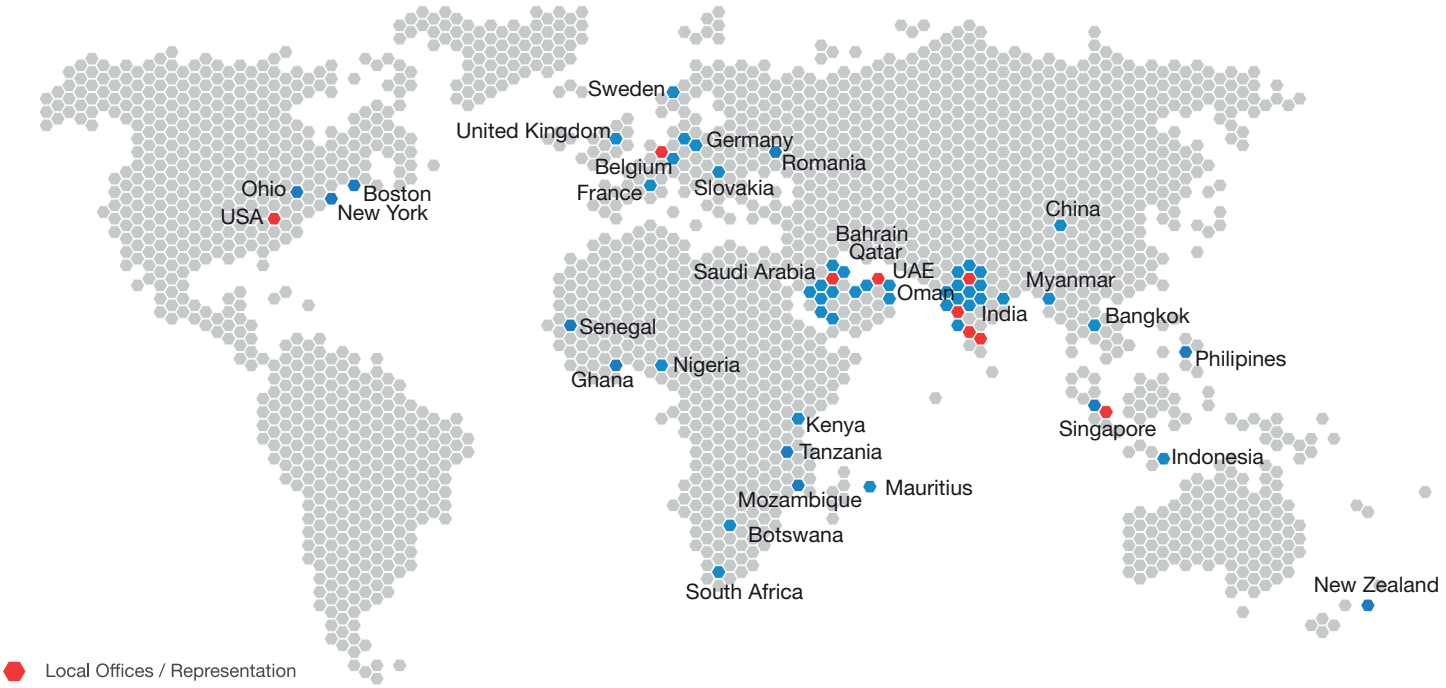
- Member of Inner Circle and President's Club for Microsoft Dynamics
- Gold Partner, Microsoft Dynamics, ERP and CRM
- INFOR Associate Channel Partner, 'Best Performing Partner' for Asia - Pacific region
- Diamond Partner for LS Retail

LS Retail Diamond Certified Partner 2016

A quality conscious organization, we are certified for ISO 9001:2015 and SEI CMM Level 4. We also follow the EFQM 2020 Business Excellence Framework for achieving sustainable, flexible and progressive growth in all of our business lines.

Our customer help desk and state-of-the-art, in-house data center are operational 24*7 to ensure smooth running systems and workflows for all of our global user community.

Global Presence



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