Implementing OTM with Oracle ERP and Kewill

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Agenda

Business and Project Overview
- Garmin Corporate Overview
- Garmin Transportation Overview
- OTM Global Implementation Goals
- OTM Implementation Strategy

Technical Setup Overview
- Architecture / Software Components
- OTM with ERP and Kewill – Process flow
- Setup – ERP
- Setup – OTM
- Setup – OTM to KEWILL integration

Summary
- Error Handling
- Lesson Learned
- Challenges
- Q&A
Global Supplier of Navigation, Communication and Information Products

History of Successful Growth:

- Profitable every year since the Company’s inception in 1989
- Worldwide presence and distribution
- Strategic emphasis on market segmentation and vertical integration
- Worldwide employment of over 9,900 associates
The Global Leader in Personal Navigation Devices

- Expected 2013 revenue of $2.5 - $2.6B
- Cash of over $2.7B with no debt
- A global leader in each market we serve
- Over 15 million units sold worldwide in 2012
- Over 115 million GPS enabled units sold worldwide since inception
Markets We Serve

Automotive / Mobile
- Personal Navigation Devices
- On and off board applications for mobile phones
- Automotive OEM solutions

Outdoor
- FRS, GMRS, PMR communication devices
- Wireless tracking
- Geocaching
- Touch screen golf GPS
- Handheld devices for hunting and hiking
- Dog training and tracking

Fitness
- Wearable GPS based fitness devices
- Speed and distance watches
- Heart rate monitoring
- GPS based cycle computers

Marine
- Broad product line from handhelds to chartplotters
- Core technology includes radar, sounders, autopilots, networks
- Solutions for aftermarket and OEM

Aviation
- General aviation products targeting small to mid size aircraft
- Core technology includes communication, radar, flight control, mapping and navigation
- Revolutionary glass cockpits
Market Diversification

- Auto / Mobile
- Outdoor
- Fitness
- Marine
- Aviation

Product Depth

Market Breadth
Global Presence

- Salem, OR
  - Aviation R&D
  - Aviation manufacturing

- Stuttgart, Germany
  - Yokohama, Japan
  - Novi, MI
  - Auto OEM Programs

- Olathe, KS (Headquarters)
  - Primary R&D center
  - Aviation manufacturing and certification
  - Sales, distribution, and support for the Americas

- Chicago, IL
  - Retail store

- Research & Development
  - Calgary, Alberta
  - Chandler, AZ
  - Chengdu, China
  - Cluj, Romania
  - Los Angeles, CA
  - Minneapolis, MN
  - Newport, OR
  - Raleigh, NC
  - Santa Clara, CA
  - Soquel, CA
  - Tucson, AZ
  - Würzburg, Germany

- Beijing, China
  - Shanghai, China
  - Sales and support

- Xizhi, Zhongli, & LinKou, Taiwan
  - Consumer manufacturing R&D
  - Sales, distribution, and support for the Pacific Rim

- Schaffhausen, Switzerland
  - Parent Company
  - European MarComm

- UK Headquarters
  - Sales and support
  - Central European distribution center

- EMEA sales and distribution
  - Graz, Austria
  - Brussels, Belgium
  - Copenhagen, Denmark
  - Lohja, Finland
  - Paris, France
  - Munich, Germany
  - Milan, Italy
  - Amsterdam, Netherlands
  - Dilling, Norway
  - Warsaw, Poland
  - Barcarena, Portugal
  - Johannesburg, South Africa
  - Barcelona, Spain
  - Billdal, Sweden

- South American sales and distribution
  - Sao Paulo, Brazil
  - Santiago, Chile

- Sydney, Australia
  - Distribution

9,192 associates
What Do We Do?
Manage efficient and cost effective movement of domestic and international shipments in the Garmin global supply chain.

- Small Package ▼
- Expedited ▼
- Heavy Weight Air ▼
- Mail
- Less-than-Truckload ▼
- Full Truckload ▼
- Ocean ▼
Garmin OTM Global Implementation Goals

• The guiding principle behind Garmin’s Oracle Transportation Management (OTM) global implementation is to **reduce logistics costs while respecting customer delivery expectations**.

• The OTM global implementation shall establish a platform for evolution via subsequent business initiatives, including:
  
  • a) **quoting** – communicating / engaging customer in delivery options to proactively manage expectations
  
  • b) **planning** – transportation selection per business-defined criteria and to match customer expectations
  
  • c) **execution** – internal process improvement initiative to streamline distribution center activities
  
  • d) **visibility** – track & trace visibility and performance analytics
  
  • e) **payment** – freight invoice matching, automatic payment, and claims tracking

• Implementation of a comprehensive OTM platform is an enabler for new and empowered business processes to serve customer satisfaction and cost savings in order fulfillment and logistics.
Implementation & Evolution Philosophy

**Establish and manage realistic expectations**
- Recognize OTM is a vast, multi-faceted tool that can support multiple opportunities – business needs must be prioritized
- Recognize improvements are an evolution and not without challenges and process changes

**Build flexible & scalable platform for future needs**
- Supply chains evolve. Systems evolve. Not all of the answers - or even all of the questions – are known upfront. Fitting the system to the business needs is an ongoing discovery and evolution.
- A platform that is flexible and scalable to support an array of dynamic business rules is the best manner to serve the business.
- Start broad & simple, then slowly hone and enhance to meet specific needs.
- Deliverables may become more defined as OTM evolution progresses.

**Recognize OTM as a system**
- As a system, OTM has inputs and outputs.
- The quality of inputs (i.e. weights, dimensions, etc.) determines how the system can be leveraged to provide valuable output.
- The more refined the inputs, the more granular decisions OTM can make.
- All rules-based planning is subject to the quality of both the inputs and rules. It is important to define successes and failures associated with data or algorithms, respectively.

**Leverage seeded functionality wherever possible**
- In attempt to remain scalable and minimize support requirements, careful consideration should be given to any requests for customized development.
- OTM is a multi-faceted tool and exhaustive effort should be given to rule out seeded functionality options before determining to create custom developments or integrations.
- When customization is required, the seeded OTM Automation Agent toolkit should be reviewed as an opportunity to develop customizations within the boundaries of the designed OTM product.
## Garmin OTM Evolution Plan

<table>
<thead>
<tr>
<th>Initiative / Phase</th>
<th>Deliverable(s)</th>
</tr>
</thead>
</table>
| 1. OTM Installation & Discovery | a) Stable application standup in development, test, QA, and production environments and documented SDLC / cloning flow.  
b) Issuance of appropriate credentials to implementation team  
c) Define OTM domain structure (how data is partitioned, since application is global)  
d) Define OTM user roles  
e) Define process for managing OTM access credentials  
f) Identify key features, functions, integration points, and configuration options  
g) Identify functional changes to existing eBS applications and evaluate / communicate impacts to stakeholders  
h) Continue to define & scope subsequent initiatives  
i) Continue to design future state solutions  
j) Maintain opportunities log |
| 2. OTM Integration with Oracle Order Mgmt / Shipping Execution | a) OM-OTM integration (Olathe, Southampton, Sydney origins)  
b) Configuration for mapping orders/lines to ship units for OTM planning (must document design and setups) |
| 3. OTM Integration with Kewill Flagship | a) OTM-Flagship integration including mapping rate offerings between Flagship and OTM for quoting and planning (Olathe, Southampton origins) |
| 4. Routings & Simple Rules | a) Garmin-preferred routings  
b) Customer routings  
c) Other rules not reliant on introduction of new data not yet in existence (i.e. rates, transit networks, etc.)  
d) Determine responsibilities and develop/train business roles for maintaining routings and rules in OTM moving forward  
e) Provide training for managing business rules (Olathe, Southampton, Sydney origins) |
| 5. Planning Optimization | a) Least-cost carrier selection for parcel & LTL/TL shipments (allocation commitments, etc.)  
b) Service level optimization to eliminate unnecessary expediting (transit networks)  
c) Determine responsibilities and develop/train business roles for managing / loading non-supported carrier/service rates to OTM (or Flagship as generic/universal carrier) |
| 6. Track & Trace Visibility | a) Central repository for all shipment tracking information  
b) End-to-end performance analytics for delivery performance |
| 7. Multi-Mode Shipping | a) Advanced optimization such as parcel break-bulk |

*Phases subject to further definition and segmentation by site and process as evolution progresses.*
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Architecture/ Software Components

**Oracle E-Business Suite – 11.5.10.2**

1) Order Management  
2) WMS (Warehouse Management System)  
3) Shipping Execution  
4) Accounts Payable  
5) Others- EDI and OBIEE

**Kewill- Kpack 4.1 and Flagship 5.2.0**

**OTM 6.2.8 Software Components**

1) RHEL 5.7 (Apps, Web and Integration servers)  
2) Oracle RDBMS Server 11.2.0.3  
   a) OTMQA currently 750GB  
3) Oracle Client 11.2.0.3 (Apps and Web servers)  
4) WebLogic Server 10.3.3 (Apps servers)  
5) Jrockit 1.6.0_20 (Apps servers)  
6) Apache 2.2.16 (Web servers)  
7) Tomcat 6.0 (Web servers)  
8) OAS SOA Suite 10.1.3.5 (Integration(BPEL) servers)  
   a) Schemas stored in OTM database
Architecture/ Software Components

Scalability Topology

High Availability / Redundancy

- OTM Scalability (clustering) enabled for redundancy and increased throughput to promote performance.
- “Scalability” is the proprietary horizontal scalability solution for OTM.
- Weighted routing to load balance requests between application servers
- OAS SOA Suite (BPEL) used for processing between EBS and OTM.
Process Flow: OTM – ERP – Kewill

Pick Release Prior to Transportation Planning

Oracle EBS (OM/Shipping)
1.1 Create Sales Orders
1.2 Book Orders
2.1 Create Deliveries
2.2 Reserve Inventory
2.3 Allocation/Detailing
2.4 Create Pick Tasks
2.5 Send Deliveries to OTM?

Oracle Transportation Management
3.1 Create Order Releases
3.2 Generate Ship Units
3.3 Run Bulk Plan
3.4 Send Planned Shipments to EBS

Kewill Flagship
3.3.1 Provide Parcel Rates

Process Step Type
- Seed: Configuration Changes
- Custom Code
ERP Custom Development

1. Ignore for planning at Delivery

![ERP Custom Development Image]

2. Adjust dates on delivery to drive correct Earliest_Pickup_Date and Latest_Delivery_Date in OTM.

![ERP Custom Development Image]
## Setup – ERP

1. **Create user and assign Order Management Super User Responsibility.**
2. **Set Profile Options at site level**

   System Administrator responsibility > Profile System Values

<table>
<thead>
<tr>
<th>Profile</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>OTM: Corporation Country Code</td>
<td>United States</td>
</tr>
<tr>
<td>OTM: Domain Name</td>
<td>GARMIN</td>
</tr>
<tr>
<td>OTM: Domain Password</td>
<td>CHANGEME</td>
</tr>
<tr>
<td>OTM: Domain User</td>
<td>GARMIN.ADMIN</td>
</tr>
<tr>
<td>OTM: Integration Enabled</td>
<td>Order Management Only</td>
</tr>
<tr>
<td>OTM: Proxy Port</td>
<td></td>
</tr>
<tr>
<td>OTM: Proxy Server</td>
<td></td>
</tr>
<tr>
<td>OTM: Servlet URI</td>
<td></td>
</tr>
<tr>
<td>OM: Source for TP Early Ship/Deliver Date</td>
<td>Same Date as Ship / Deliver Deadline</td>
</tr>
<tr>
<td>WSH: BPEL Webservice URI for OTM</td>
<td></td>
</tr>
<tr>
<td>WSH: Currency Conversion Type for OTM</td>
<td>Corporate</td>
</tr>
<tr>
<td>WSH: Default Shipping Responsibility for OTM</td>
<td>Order Management Super User</td>
</tr>
<tr>
<td>WSH: Default Shipping User For OTM</td>
<td>GARMINOTM</td>
</tr>
<tr>
<td>WSH: Default Shipping Responsibility for OTM</td>
<td>Order Management Super User</td>
</tr>
<tr>
<td>WSH: BPEL Domain Name</td>
<td>default</td>
</tr>
</tbody>
</table>
3. **Order Management Setup**

**OM System Parameter**

Order Management Responsibility > Setup > parameters

![OM System Parameters](image)

- Operating Unit: GARMIN INTERNATIONAL OPERATING UNIT
- Category: Generic Parameters
- Parameters:
  - Enable Freight Rating: Yes
  - Enable Ship Method: Yes

4. **Inventory Setup**

**UOM conversion loads to UOMMAP in OTM**

Inventory Responsibility > Setup > Unit of Measure Conversions

![Unit of Measure Conversions](image)
Setup – ERP (Cont.)

Corresponding OTM UOM need to be populated in flexfield at UOM.

Inventory Responsibility > Setup > Unit of Measure
5. **Shipping Setup**

Shipping Parameters

Order management responsibility > Shipping > Setup > Shipping Parameters

---

**Global Parameters**

Order management responsibility > Shipping > Setup > Global Parameters
Carrier setup
Order Management responsibility > Shipping > Setup > Freight Carrier, Cost Type > Freight Carrier

Shipping Execution Role Definition
Order Management responsibility > Shipping > Setup > Grant and role
6. WSHOTMUP.SQL Script
   • wshhotmup.sql per Metalink note 370742.1

7. Assign Concurrent programs to specific request group:
   • Shipping-Transportation Carriers Synchronization
   • Shipping-Transportation Outbound Interface
   • Shipping-Transportation outbound interface – Child
   • Planned Shipment Interface

8. Synchronize the Carrier data
Setup – BPEL

BPEL
Save WSDL for web services in your local drive and save the Endpoint Location.

When deployed, BPEL Processes are automatically published as Web Services so that they can be easily initiated by other BPEL processes or also by Visual Basic applications, Excel spreadsheets or J2EE applications.

WSDL location:

Endpoint Location:
http://kyirenky-us:9/y/u/orabpel/default/OtmVoucherToOracleApInvoice/1.0
Setup – OTM

1. Create Domain
2. Assign Domain Grant
3. Define VPD profiles, users, user roles, and menu
4. External Systems- Help > Show me
5. Copy and activate Automation agents in your domain

<table>
<thead>
<tr>
<th>Action</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>GARMIN.ORDER RELEASE - DELETE</td>
<td>ORDER RELEASE - DELETE</td>
</tr>
<tr>
<td>GARMIN.SEND FIRST LEG SHIPMENT TO EBS</td>
<td>SEND FIRST LEG SHIPMENT TO EBS</td>
</tr>
<tr>
<td>GARMIN.EBS ALLOCATE ORDER RELEASE WHEN PLANNED</td>
<td>EBS ALLOCATE ORDER RELEASE</td>
</tr>
<tr>
<td>GARMIN.SHIPMENT MOD - RESEND TO EBS</td>
<td>SHIPMENT MOD - RESEND TO EBS</td>
</tr>
<tr>
<td>GARMIN.ORDER RELEASE - INSERT</td>
<td>ORDER RELEASE - INSERT</td>
</tr>
<tr>
<td>GARMIN.SHIPMENT DELETE - SEND TO EBS</td>
<td>SHIPMENT DELETE - SEND TO EBS</td>
</tr>
<tr>
<td>GARMIN.ORDER RELEASE - MODIFY</td>
<td>ORDER RELEASE - MODIFY</td>
</tr>
</tbody>
</table>

6. Bulk Plan Parameter
   - Shipment Management> Power Data> General>Parameter Set
7. Assign the parameter set to Domain
8. Create itinerary
9. Sync up following data in OTM:

<table>
<thead>
<tr>
<th>ERP</th>
<th>OTM</th>
</tr>
</thead>
<tbody>
<tr>
<td>Freight Terms Code</td>
<td>Payment Method</td>
</tr>
<tr>
<td>Freight Carrier</td>
<td>Service provider</td>
</tr>
<tr>
<td>FOB</td>
<td>INCO Terms</td>
</tr>
<tr>
<td>Mode Of Transport</td>
<td>Transport Modes</td>
</tr>
</tbody>
</table>

10. Use CSV upload to load data in OTM
11. Upload OTM Tables in the following order:

- CALENDAR
- ACTIVITY_CALENDAR
- ACTIVITY_CALENDAR_OVERRIDES
- REGION
- REGION_DETAIL
  Once Region is uploaded, navigate in OTM to “Configuration and Administration”
  >> “Process Management” >> “Formulate Regions”
- X_LANE
- RATE_SERVICE
- SERVICE_TIME
- RATE_OFFERING
- RATE_GEO
- RATE_GEO_COST_GROUP
- RATE_GEO_COST
12. Schedule bulk plan and outbound transmission in OTM

Bulk Plan - Operation planning > process management > To Buy Side Shipments
Outbound Transmission - Business process Automation > Staging Transmission Processing
Setup – OTM to Kewill Integration

1. Install the Kewill FlagShip server as described in your FlagShip user’s manual.

2. Update glog.properties file (normally reside in <otm_install_path>/glog/config) in OTM application server.

3. Following properties need to change:

```java
# external Kewill FlagShip - optional
glog.RatingEngine.Kewill.URL=Flagship-test
  glog.RatingEngine.Kewill.port=1200
```

   
   Shipment Management ➔ Power Data ➔ Qualifiers ➔ Location Reference Number Qualifiers
5. Associate OTM Locations (for warehouse) with applicable Kewill shipping locations using KEWILL_CUST_NUM
6. Confirm following Service Provider Alias Qualifier IDs exist in PUBLIC domain

Contract and Rate Management > Power Data > Qualifiers > Service Provider Alias Qualifiers.

**KEWILL CARRIER CODE**  
**KEWILL CARRIER GLOBAL_ID**

7. Associate OTM service providers with Kewill Flagship carriers using KEWILL CARRIER CODE and KEWILL CARRIER GLOBAL ID

![Diagram showing association of OTM service providers with Kewill Flagship carriers](image)

8. Ensure that rate service ID matches the service level selector code in Kewill, in rate service setup

![Diagram showing rate service setup](image)
9. Invoke Kewill from Rate Offering or Rate Cost (both methods are listed in OTM’s Kewill integration document),
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Error Handling

Types of errors:
- Hardware/network failure
  - F5 load balancer
  - Data base issue
  - BPEL
- Process flow issues
- Transmission Errors
  - Data Synchronization Issues
- Automation Agent
- Exception messages

Error Handling:
- Manually reprocess failed transmission
- Transmission error logs
- Redo Transmission
- Notification Alerts
- DBA- monitoring
- Use of log files to identify root cause
- Error Log- Errors, possible cause, resolution, and owner.
- User Training
Lessons Learned

Lesson Learned

- Seeded integration only supports One domain, use VPD profile, user roles, access control list, menu etc to provide specific data access.
- Business Number Rule may need to be changed - as these can get exhausted.
- Carrier name (length) limit 15 character.
- Carrier address is needed for carrier synchronization.
- Use References and Remarks for additional fields.
- Utilize saved query, object status and Automation Agents to address business needs.
- Modes must be created in your domain, since the domain name is passed from the EBS profile. OTM provide more modes but integration support modes defined in EBS.
- ERP service level should match with OTM rate Service and OTM rate service ID should match with the service level selector code in Kewill.

- Create Index for improved performance.
- Some Shipping exceptions in ERP need to be changed to Information Only to prevent message.

- Big LOB files – Database size grows very fast, need to be managed.
- You can limit size of XML files by defining output profile.
- Purge and Archiving is key to manage LOB segments (maintenance) sooner rather than later to keep database growth under control.

- EBS tracks reference data (location, item) in ERP-WSH_OTM_SYNC_REF_DATA table, it affected integration when new OTM instance was pointed to previously connected ERP instance.
- Use multiple OTM instances for research and discovery.
Challenges:

- Other warehouse initiative that could be affected by OTM.
- Change Management.
- Synchronize pick release and Bulk Plan timing
- Resources-Limited OTM Knowledge
- Training
- Lack of OTM Documentation
- Data integrity and mapping ERP>OTM>KEWILL
- Rate Management-data source, contract vs. negotiated, Accesorials etc.
- Frequent out of memory errors on the Apps servers – working with Support to determine root cause
- Constant management of LOB segment growth.

Key Success Factors:

- Acquiring OTM knowledge internally
- Close partnership with business users.
- Efforts to layout current and future processes etc.
- Load testing helped to identify several issues.
- OTM Upgrade
- Benchmarking with current OTM customers
- Consultant Engagement – As needed
Questions?