

FARWEST STEEL
Corporation

Implementing Oracle's E-Business Suite in a Steel Service Center: An Overview

*Wolfgang Moritz, Sr. Business Analyst
Farwest Steel, Eugene, Oregon*

Who is Farwest Steel?

- Farwest Steel is headquartered in Eugene, Oregon.
- Established in 1956, Farwest Steel has steel service centers, rebar, and general fabrication branches in Washington, California, Oregon, Idaho and Utah.
- These 15 branches, plus our main offices, employ about 750 people.



Before Oracle...

- For nearly 30 years, Farwest relied on a legacy IBM mainframe running a custom “green screen” order fulfillment application.
- By 2000 it was clear that we needed to replace the legacy system.
- Driving Requirements:
 - Support future growth
 - More detailed transaction tracking
 - Increased transaction visibility

Key Business Requirements

| | Steel Service Center | Rebar | Fabrication |
|------------------------------|---|--|---|
| Primary Business | Stock ("Structural") steel distribution, plus some value added services, mainly to OEM's, other fabricators | Ready to tie rebar for private construction projects, government contracts | Complex assemblies to nearly complete products for retailers, OEM's |
| Quoting UOM | Varied: CWT (Dollars/ Hundred Pounds) CFT (Dollars/ Hundred Feet) CSFT (Dollars/ Hundred Square Feet) Each | Lump sum bid on Jobs. Otherwise per pound. | Each (completed part or assembly) |
| Shipping/ Billing UOM | Each | Pounds (to fulfill contract) | Each (completed part or assembly) |
| Primary Gap | Customer Parts: Bundling material and services into a single billable, shippable item; for hundreds of custom items each day. | Defining customer lump sum Jobs, and tracking Job fulfillment. | Complex assemblies, with many levels of sub-assemblies. |
| Secondary Gap | Industry conventions for quoting: CWT, CFT and CSFT; but billing per each. | | How to define items where the ingredients change with each order? |

Other Requirements

- Costing
 - Farwest uses Actual Cost, not Standard Cost.
 - Very detailed actual cost tracking.
- Extensibility
 - We looked into steel specific applications, but did not want to be limited in future directions.

Our E-Business Suite

- Oracle Process Manufacturing (OPM)
- OPM Financials
- Inventory
- Purchasing
- GL, AR, AP
- Order Management
- Advanced Pricing
- Delivery Based Shipping
- Discoverer
- Off site hosting (presently with Data Intensity)



Implementation Timeline

- Started in the fall of 2001
 - On release 11i.5.6
 - Originally planned as a one year implementation.
- Go Live December, 2005!
 - On 11i.5.8.
 - By 2005, 11i.5.10 was the current release, but we didn't want another delay to upgrade again.
- Second Go Live May, 2007, with upgrade to 11i.5.10 CU 2.

Foundation Decision: Inventory

- Most metals items have primary attributes, but are highly interchangeable.
 - Plate:
 - A 1" thick, A36 plate has many combinations of "Stock" lengths and widths.
 - A larger plate could be up sold, or simply cut into smaller equivalent "Stock" plates.
 - Bar:
 - A 4" angle might have a web thickness of ½" on each leg, but comes in several "Stock" lengths.
 - In some cases a 40' angle might fulfill an order for 2 each 20'.
 - Many stock plates are cut into various customer parts, leaving scrap skeletons.
- How to track Actual Cost for these and other items? Lot Costing was not an option in 11i.5.6

The Brute Force Approach

- Define a unique item for each 'stock' size, which encompasses all key attributes.

| Item | Primary UOM | Secondary UOM | Description |
|-----------------------|-------------|---------------|-------------------------------|
| PL5141/2-48-96 | EA | LBS | Plate A514 1/2" 48" x96" |
| PL1/2-REM | LBS | LBS | Plate A36 1/2" 1 LBS |
| A61/2-20 | EA | LBS | Angle 6" x 6" x 1/2", 20' |
| T84180-40 | EA | LBS | Tubing 8" x4" x0.180", 40' |
| 8615 | LBS | LBS | #8 Rebar Grade 615 |

Inventory Example

- 1 Ea **PL296-240** (a two inch thick A36 96" x 240") Master Plate:

| | | | |
|-------------------|----------|----------|---|
| PL248-96 | PL248-96 | PL248-96 | 5227.32 LB PL2-REM (Customer Parts and Scrap) |
| PL2-96-240 | | | |

- Can be cut into 3 Ea **PL248-96** (48" x 96") stock plates and 5227.32 LBS of **PL2-REM** for use in customer parts.

Order Management: Structural Sales

- How to quote in Hundred Weight (CWT), Hundred Foot (CFT) etc., but transact in Each?
- We customized the OM order form to translate input prices from the primary UOM (CWT, CFT etc.) to Each, and set the primary price in a Descriptive Flexfield.

Order Management: Processing Sales

- How to bundle various material and service ingredients into a single, shippable, billable item for each unique customer part?
- Oracle Configurator was not an option with OPM.
- We also wanted to track sell, cost, volume, history for each customer part.
- Expected about 100 – 500 customer parts to be quoted per day per branch.

Custom Solution: Keebler

- This J2EE web application had the development name of Keebler, which stuck after go-live. (Imagine a room users as elves doing the heavy, behind-the-scenes work in Oracle.)
- A two tier application, Keebler is hosted in Eugene, and synchronizes inventory items, customers etc. with our EBS database.
- Keebler remains connected to our EBS database to get dynamic queries such as inventory levels.
- Other transactions are all completed through public APIs.

Keebler Quoting

- Quickly quote stock items using industry standard UOMs.
- Tracks quotes, conversion rates, customer notes.
- Calculates processing times for various services.
- Maintains a customer parts library, bundling materials and services into a single item.

Keebler Structural Sales

Quick Search:
[Quote search \(new\)](#) [Customer search](#) [Part search](#) [Blocked search](#)

[Kart](#) [Ktx](#) [OC4J Stats](#) [SQL](#) [Vendors](#) [Reports](#) [Help](#) [Tools](#) [Logout](#)
 (FWSTST, TEST-1.0.17.8) - WMORITZ-71(Stateful)

Quote#: **K-329493** Status: **Open** [Go to bottom of page](#)

View: [Stock](#) | [Processing](#)

PRECISION MACHINE & MFG (71776) • X: PX21/2-21 = \$91.50/EACH PRICE
 GOOD UNTIL 2/1/08

Bill Thielman
 phone: 484-9841
 fax: 484-4094
[edit](#)

1290 BERTELSEN ST
 EUGENE, OR 97402
 E02 (site# 12856)
[edit](#)

Outside Salesrep: Brent Witherspoon (0106) ARO Days: Customer PO#: PriceList ID: [ORA:PriceLists](#)

Total Weight: 21279 lbs. Total Matl Sell: \$11,622.77 Grand Total: \$11,622.77

| Line# | Qty | Item | Description | |
|---|---------------------------------|------------|--|--------------------------|
| 1 | <input type="text" value="15"/> | T84180-40 | TUBING RECT ERW 8 X 4 X .180 - 40' | <input type="checkbox"/> |
| Total Gross Wt: 8400 lbs. Matl Price: \$858.40 (CFT) :F | | | Price Each: 343.36 Total Price: \$5,150.40 | |
| 2 | <input type="text" value="20"/> | C682-20 | CHANNEL 6 X 8.2 - 20' | <input type="checkbox"/> |
| Total Gross Wt: 3280 lbs. Matl Price: \$50.29 (CWT) :F | | | Price Each: 82.47 Total Price: \$1,649.40 | |
| 3 | <input type="text" value="5"/> | S10-60-120 | SHEET HR 10 GA - 60 x 120 | <input type="checkbox"/> |
| Total Gross Wt: 1406.25 lbs. Matl Price: \$46.67 (CWT) :F | | | Price Each: 131.25 Total Price: \$656.25 | |
| 4 | <input type="text" value="32"/> | A41/2-20 | ANGLE 4 X 4 X 1/2 - 20' | <input type="checkbox"/> |
| Total Gross Wt: 8192 lbs. Matl Price: \$50.86 (CWT) :F | | | Price Each: 130.21 Total Price: \$4,166.72 | |

Keebler Processing Sales

Quick Search:
[Quote search \(new\)](#) [Customer search](#) [Part search](#) [Blocked search](#) (FWSTST, TEST-1.0.17.8) - WMORITZ-71(Stateful)

Quote#: **K-329494** Status: **Open** [Go to bottom of page](#) View: [Stock](#) | [Processing](#)

PRECISION MACHINE & MFG (71776) • X: PX21/2-21 = \$91.50/EACH PRICE GOOD UNTIL 2/1/08
 Bill Thielman phone: 484-9841 1290 BERTELSEN ST
 fax: 484-4094 EUGENE, OR 97402
[edit](#) [edit](#) E02 (site# 12856)

Outside Salesrep: Brent Witherspoon (0106) ARO Days: Customer PO#: PriceList ID: [ORA:PriceLists](#)

Total Weight: 1676 lbs. Total Matl Sell: \$873.08 Grand Total: \$1,526.28

| Line# | Qty/Units | Group | Material | Shape | Act/Second | Size | Service | Drawing]]> | Rev | <input type="checkbox"/> |
|---|-----------|-------|-----------|-------|------------|-------|--|----------------|-----|--------------------------|
| 1 | 15 | | PL1/2-REM | C | 22 | x 5 | Plasma (PLC) | A6-SCREW-FLIGH | | <input type="checkbox"/> |
| | | | | | 24 | x 24 | BI: 87 P#: T#: 1 | | | <input type="checkbox"/> |
| Total Gross Wt: 1225.15 lbs. Matl Price: \$54.00 (CWT) :F | | | | | | | Price Each: 52.44 Total Price: \$786.60 | | | |
| 2 | 6 | | S10-REM | | | x | Hidef (HDP) | GRATE | | <input type="checkbox"/> |
| | 2 | | | | 48 | x 120 | BI: 5000 P#: 22 T#: 2 | | | <input type="checkbox"/> |
| Total Gross Wt: 450 lbs. Matl Price: \$47.00 (CWT) :F | | | | | | | Price Each: 123.28 Total Price: \$739.68 | | | |

Keebler Part Detail

Price Each:

- Freeze Keebler Generated Price
 User Override Price (implicitly freezes)

Total Price: \$786.60

Material

Qty: Matl Synonym: [ORA:On Hand](#), [ORA:Due Stock](#) Shape: Actual Size: x
 Units: Second Size: x Matl Price: \$0.54 LB (\$54.00 CWT) Src: **F** Override \$: CWT
 OraText: Warehouse:

Gross Piece Weight: 81.68 lbs. Total Gross Weight: 1225.15 lbs. Matl Sell: \$661.58 Adj: 0.12

Services [Add Services](#) [Refresh Services View](#)

Burn Type: Burning Inches: Pierces: Torches: Price/Min:
 OraText:

Cutting Time: Burning Sell: [delete](#) User Override Want Permutations? No NCP?

NC Programming (NCP) Time: Price/Min: Sell: \$5.00

OraText: [delete](#)

Quote Line Description:

Keebler and Order Management

When a customer PO is received, Keebler will:

- If a structural order, create and book an Order Management sales order.
- If a processing order:
 - Create a new OPM inventory item (if not already created).
 - Create an OPM Formula and Recipe to make that item.
 - Create an OM sales order for the new custom item.
 - And if outside processing services are included in the part, create an Oracle Purchase Order.

Order Processing

- Structural orders are processed through OM using scheduled Pick Release requests, which send a Pick Slip to the warehouse.
- For Processing Orders, a scheduled concurrent request looks for new parts orders not on credit hold, and then creates a batch for the ordered quantity using the custom Formula and Recipe.
 - Once the batch is closed a user or the scheduled Pick Release picks the parts order.

OPM Formula Details

- To handle quantity scalability, custom Formulas:
 - All have a single product to produce one each of the custom part.
 - All ingredients have been scaled down to produce one each.
 - All material items are listed as REM, in pounds.
 - When the batch is created, the Formula is scaled to the ordered quantity.

Rebar Jobs

- The majority of our rebar sales are project based.
- These jobs require us to supply a lump sum quote with an itemized list of materials, broken down by each construction stage, called the 'Bid Item'.
- If the contract is awarded, the job may be fulfilled over months (or years in some cases).
 - Both the customer and our rebar staff carefully monitor the actual sales against the original estimate.
- We decided not to use Projects, likely due to limitations in 11.5.6.

Custom TCA Solution

- We used the built in Trading Community Architecture to model these projects.
- **TCA Party:** Rebar customer organization.
 - **Customer Account:** Each customer project (a Job) is setup as a new customer account.
 - **Ship To Site:** Each construction phase (Bid Item) is setup as a new customer site for the job customer account. (Each customer account has a single Bill To for all Ship To Sites.)
- A Price Agreement is also setup for this Customer Account Job.

Setting Up Rebar Projects

- Each rebar branch has a **Quote** Order Type.
- With the TCA setup for a new Job, an OM order using the Quote Order Type is created for each phase (Bid Item) for that customer account, to list all materials and services.
- Because this is not meant to be an actual order, a Forms Personalization is used to prevent the accidental Booking of a Quote.
- This Quote becomes the record of the original estimate.

Tracking Rebar Projects

- With the Quote in place, new OM orders are placed and Booked for the same customer account (Job) and Site (Bid Item). Reports track the delta between the Quote and Orders:

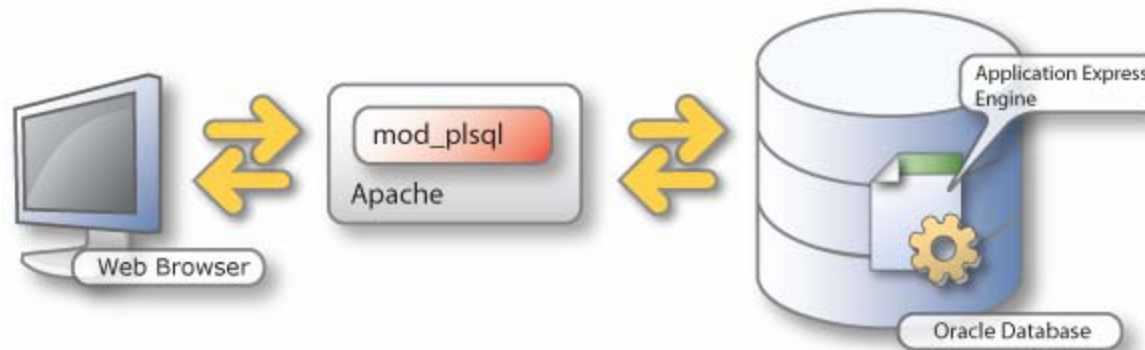
| Party: Contractor Entity | | | | | | |
|--------------------------|---------------------|--------|--------------------|---------------------|--------|--------------------|
| | Customer (Job) 1234 | | | Customer (Job) 5679 | | |
| | Quote | Orders | Remaining Q-O=R | Quote | Orders | Remaining Q-O=R |
| Bid Item (Ship To) 1 | 100 | 75 | 25 | 500 | 550 | -50 |
| Bid Item (Ship To) 2 | 200 | 210 | -10 | 500 | 450 | 50 |
| Bid Item (Ship To) 3 | 300 | 290 | 10 | 100 | 100 | 0 |
| Totals | 600 | 575 | 25 | 200 | 200 | 0 |

Application Express + K2

- For two years Keebler has worked very well.
- However, there were some short comings:
 - We wanted our Business Analysts to share in Keebler development.
 - Synchronizing production data between databases has inherent complications.
 - Implementing Keebler in newly acquired fabrication branches has presented some gaps in defining complex multi-part assemblies.
- Answer: **ORACLE** Application Express

Apex?

- Application Express is, "...is a rapid web application development tool for the Oracle database. Using only a web browser and limited programming experience, you can develop and deploy professional applications that are both fast and secure."



Apex and the EBS

- Oracle Apex and EBS appear to be almost perfectly complimentary.
 - Consolidate custom applications and EBS data into one database.
 - Use EBS authentication and functional security.
 - Easily create custom forms and reports.
- Apex is the Bondo that streamlines an EBS implementation in your unique industry.

Keebler to K2 on Apex

- We are currently developing a Keebler replacement, K2, in Apex running in our EBS database.
- The first steel users will be live at the beginning of April, 2008.
- K2 will contain the Keebler tables in a custom non-Apps schema, and invoke the same APIs to create items and orders.

K2 Batches

- Additionally, K2 will help create OPM Batches not based on a specific Formula.
- The Formula has proven to not be nimble enough for sales quoting and production management given the daily volume.
- During the quoting process, all information needed to make the custom part has been captured in K2.

K2 Batches

- To create a sales driven OPM Batch, a generic Formula will be used by a scheduled Concurrent Request.
- The Concurrent Request then inserts the actual product, ingredients and quantities into this generic batch from the K2 quote.

K2 Batches

- This allows for absolutely nimble order to order processing.
- Furthermore, it helps to more accurately associate material costs to the finished parts by bypassing the REM Inventory bucket.

Other Customizations

- Initially, customizations (other than Keebler) were all in the application forms environment.
- However, custom forms were often clumsy, and still required a user to launch a forms session to accomplish a simple transaction.
- Instead, we have focused on custom web based applications outside of Oracle.
- We now believe that any custom form is best developed as an independent web based application, perhaps in Apex.

Inventory Inspection

- Zack** is a web app linked from our Intranet Home Page.

101
 105
 106/906
 107
 108
 109
 151
 152
 157
 158
 159
 196
 199
 999
 2xx
 3xx
 4xx

PL3/4-96 c682-

 [Need Synonym Help?](#)

Check Inventory Exclude Parts?
 Check PO Due Stock Exclude Zero Rows?
 Check Xfer Due Stock

Inventory

| Synonym | Whse | On-Hand | Available |
|--------------|------|---------|-----------|
| PL3/4-96-120 | 101 | 14 | 13 |
| PL3/4-96-240 | 101 | 198 | 198 |
| PL3/4-96-360 | 101 | 8 | 8 |
| PL3/4-96-480 | 101 | 14 | 14 |
| C682-20 | 101 | 536 | 528 |
| C682-30 | 101 | 56 | 56 |
| C682-40 | 101 | 137 | 125 |
| C682-50 | 101 | 67 | 67 |
| C682-60 | 101 | 2 | 2 |
| C682-REM | 101 | 365 | 365 |

Snapshot: Sun Feb 24 17:15:07 -0800 2008, Exec Time: 1 sec, Render Time: 0 sec, Inv Rows: 10, PO Due Stock Rows: 0, Xfer Due Stock Rows: 0

Releasing Batches

- Because of the relatively high volume of sales driven OPM Batches, we needed an easier way to manage and release batches:

[Go to bottom of page](#)

WIP Branch: BOI
EUG
MED
REN Get Pending Batches

Sort #1: Due Date Sort #2: Pri Svc

Search Criteria: WIP Branch:EUG Sort: due_date_sort_pri_svc # Batches: 59 (Query: 1.8s)

| BATCH_NO | WIP_WHSE | DUE_DATE | ORDER_NO | QTY | MATL | SEC_SIZE | WEIGHT | PRI_SVC | OS_FAB | CUSTOMER |
|------------|----------|-------------|--------------|-----|-----------|-----------|--------|---------|--------|--------------------------|
| EUG-130950 | 101 | 27-FEB-2008 | 1121478-24.1 | 2 | PL5141 | 10 x 66 | 187 | FLC | | PIERCE PACIFIC MFG INC |
| EUG-130949 | 101 | 27-FEB-2008 | 1121478-23.1 | 2 | PL51411/4 | 16 x 43 | 488 | FLC | | PIERCE PACIFIC MFG INC |
| EUG-130952 | 101 | 27-FEB-2008 | 1121478-12.1 | 2 | PL57211/4 | 15 x 50 | 266 | FLC | | PIERCE PACIFIC MFG INC |
| EUG-131005 | 101 | 27-FEB-2008 | 1121481-1.1 | 1 | PL1/2 | 12 x 72 | 123 | HDP | | EMPLOYEE ACCOUNTS |
| EUG-130986 | 101 | 27-FEB-2008 | 1121480-1.1 | 282 | PL5723/4 | 96 x 240 | 78,410 | HDP | | VERSA TECH METAL FAB INC |
| EUG-130934 | 101 | 27-FEB-2008 | 1121478-1.1 | 1 | PL1/4 | 7.25 x 12 | 6 | PLC | | PIERCE PACIFIC MFG INC |

Oracle Go Live Notes

- Application users received adequate training and adapted easily.
- However non application users had a harder time, such as warehouse personnel, loaders etc.
- Insufficient training resources were invested in warehouse staff, and this did impact operations for a few months.

Inventory Management

- Inventory management was among the hardest hit areas.
- Traditionally, service center warehouse employees could substitute items without consultation to fill a customer order.
- Ultimately better training and communication with inventory control resolved this, and we now have a reasonably accurate inventory.

Future Directions

- Supply Chain Planning and Demand Forecasting
- Warehouse Execution System
- Better inventory management by use of bar codes or RFID devices
- CRM
- Business Intelligence, Dashboards, KPIs
- More Apex based custom applications, such as shop floor batch control

Conclusion

- As early adopters, implementing Oracle's EBS in a service center environment was a great challenge.
- Today, some decisions might change, but in most cases we would likely make the same choices.

Contact Information

Wolfgang Moritz

Sr. Business Analyst

Farwest Steel

wolfgang.moritz@farweststeel.com