Case Study: Covidien Warehouse Automation

Sponsored by:

VanDerLande® INDUSTRIES

Presented by:

Andy Williams
Business Development Manager
Roy van Putten
Manager Sales Engineering

ProMat 2013
AN MHIA INTERNATIONAL EXPO
McCORMICK PLACE CHICAGO JAN 21-24
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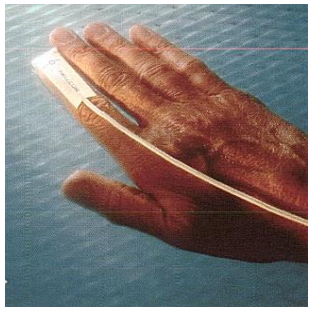
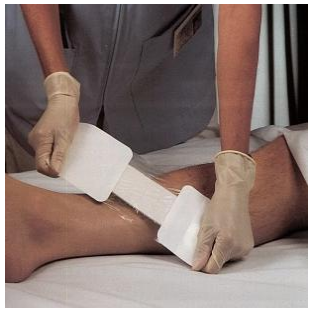




Who Is Covidien

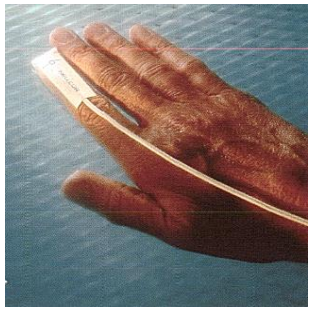
COVIDIEN
positive results for life

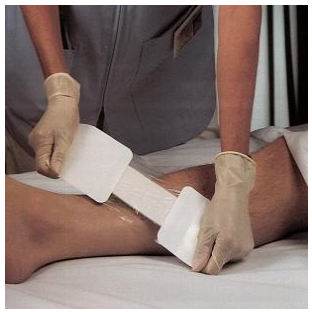
43,000 employees

50,000+ medical products

$11.9 billion company

Top 5 healthcare company





Project Objectives

Improve operational effectiveness by consolidating product flows from 4 DC's into 1 DC.

Additional objectives

- Consolidate same customer orders across multiple GBUs
- Increase operator performance levels
- Increase storage density to fit all stock in 1 DC
- Increase picking accuracy
- Decrease shipping cost

Requirements

(Re-)Design and Manage all processes in DC

- From receiving to shipping
- Manual and automated processes
- Integrate processes for GBUs from other DCs
- Full WMS and WCS

Handle Wide Range of Products

- From tiny spare parts to pallet-sized medical devices
- From very fast moving to a ‘long tail’ of non-movers
- Serial number tracking, lot controlled, instruction-for-use, kitting, labeling, etc.
- Multiple types of packaging per product

Requirements

Orders

- From direct customer orders to DC replenishments
- Customer specific allocation rules and packing instructions
- Tracking and tracing of serial numbers and lots
- Shipping size varying from single parcel to full truckloads
- High number of different carriers

Inbound

- Loose loaded and pallet loaded
- Mixed pallets and mixed cartons
- Returns

Design Process

- Conceptual design
- Selection of preferred supplier
- Detailing of conceptual design in close cooperation
  - Challenge assumptions
  - Detail system lay-out
  - Review and detail all processes from all DCs
  - Detailed analysis of performance levels
- Verify system performance through dynamic simulation
- Joint development effort to specify WMS and WCS software




Concept Overview

Parallel picking processes:
Efficient picking methods and short lead times

High volume fast movers
- picking from pallet directly to order pallet

Fast movers
- pick-by-cart from pallet to order carton, or picking of 'shippers' (full cartons)

Small slow movers
- Goods-to-person system; item picking to order carton

Other slow movers
- From pallet

Bulk stock
- Very narrow aisle storage for high storage density

Receiving

- Full pallets directly to one of
  - Narrow aisle bulk storage
  - bulk storage above pallet pick locations
  - temperature control stock
  - forward picking stock

- Mixed pallets and loose loaded cartons are put on sorter system, weighed and sorted to either
  - Chutes for palletizing to storage pallets
  - Replenishment workstations for storage totes for mini-load system

- Returns directly to forward pick faces

Fast Movers

Fast movers are picked in 1 of 3 pick-tunnels with pallet flowracks

High volume fast movers

- 3% of SKUs and lines, 32% of quantity
- On ground floor of pick-tunnel
- Full case picking
- Picking from pallet directly to order pallet

Fast movers

- 6% of items, 47% of lines
- Levels 1 and 2 of pick-tunnels
- Pick-by-cart from pallet to order carton coming from conveyor system, or
- Picking of full cases
- Both full cases and order cartons put onto conveyor system

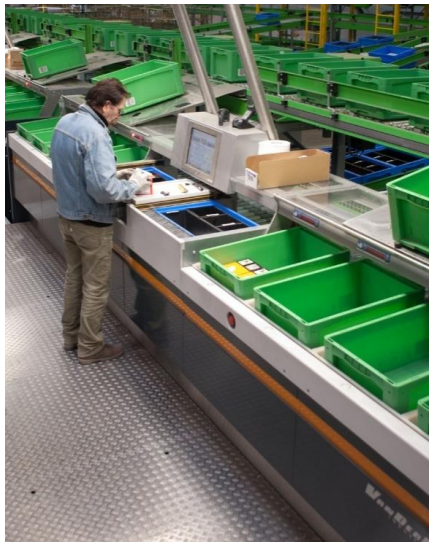
Slow Movers

Large slow movers

- 10% of SKUs, 10% of lines
- Picking from pallet in selective pallet racking
- Depending on volume:
  - Full pallet picking, picking directly to order pallet, or picking into order carton

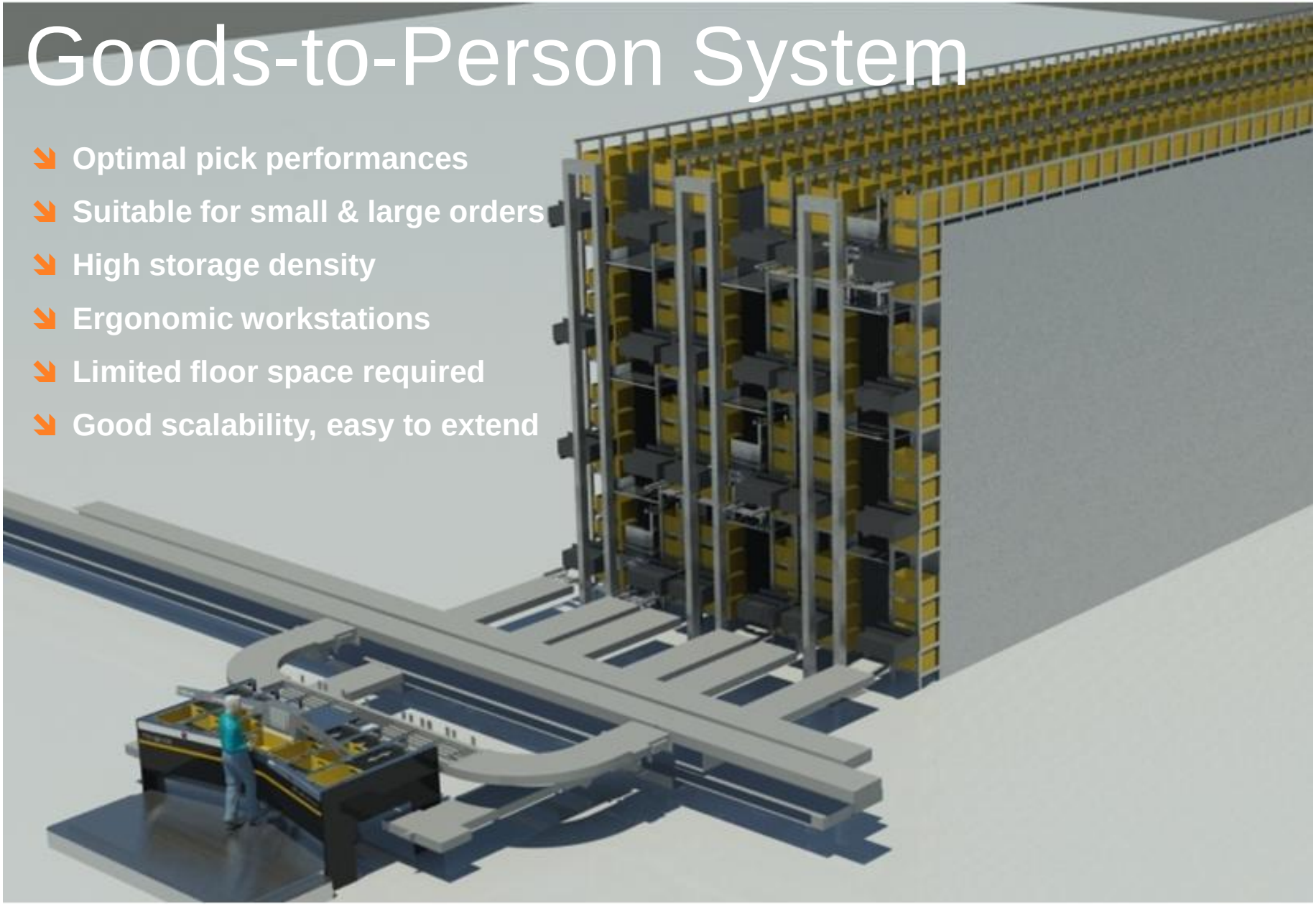
Small slow movers

- 80% of SKUs, 40% of lines
- Goods-to-Person mini-load system
- Item picking to order carton
- Multi-compartment totes
  - high storage density
  - separation of lots
- Very high picking performance
- Very high picking accuracy



Goods-to-Person System

- Optimal pick performances
- Suitable for small & large orders
- High storage density
- Ergonomic workstations
- Limited floor space required
- Good scalability, easy to extend

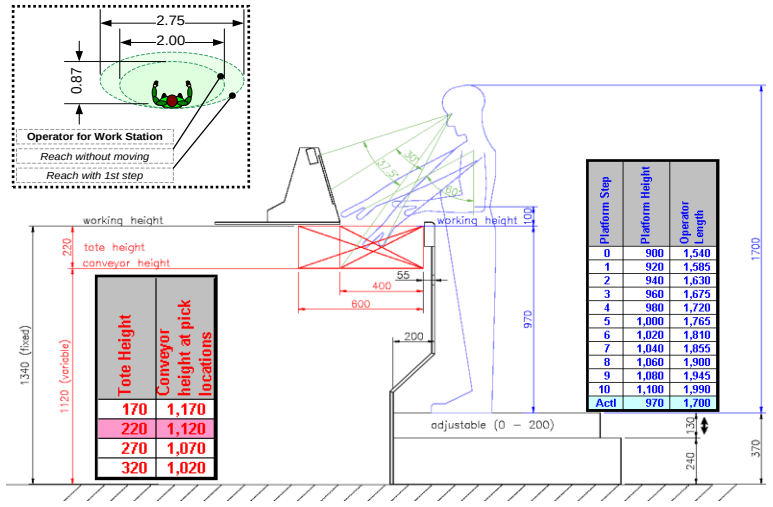


High Picking Performance

- Not just about
  - Limiting movements
  - Limiting walking distances
  - Speed

- Also sustainable performance is essential

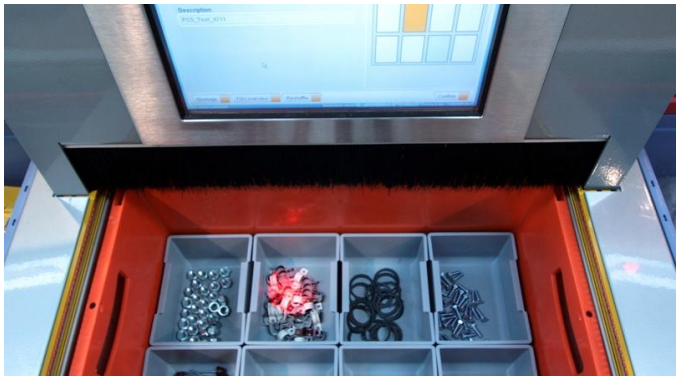
- Good ergonomics is key to sustainable performance
  - 1 Level Picking
  - Adjustable working height for operator
  - 60 degrees arm-shoulder-body angle
  - 30 – 40 degrees information-hand-product angle on eyes
  - Right lighting

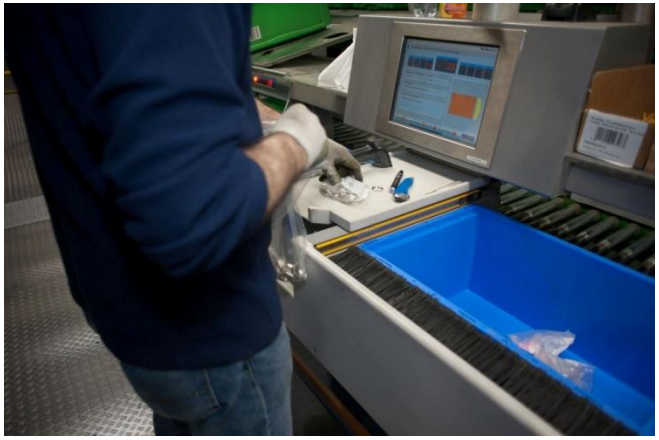


Note: If possible the TSU Top should be on the working height!

High Picking Accuracy

- **All lots separated**
  - Different tote
  - Separate compartment
- **Storage tote positions**
  - Central picking instruction screen
  - Pick pointer for compartments
  - Light screen to check correct compartment
- **Order carton positions**
  - Pick-to-light displays
  - Light screen to check placement in correct order





Packing & Shipping

Packing

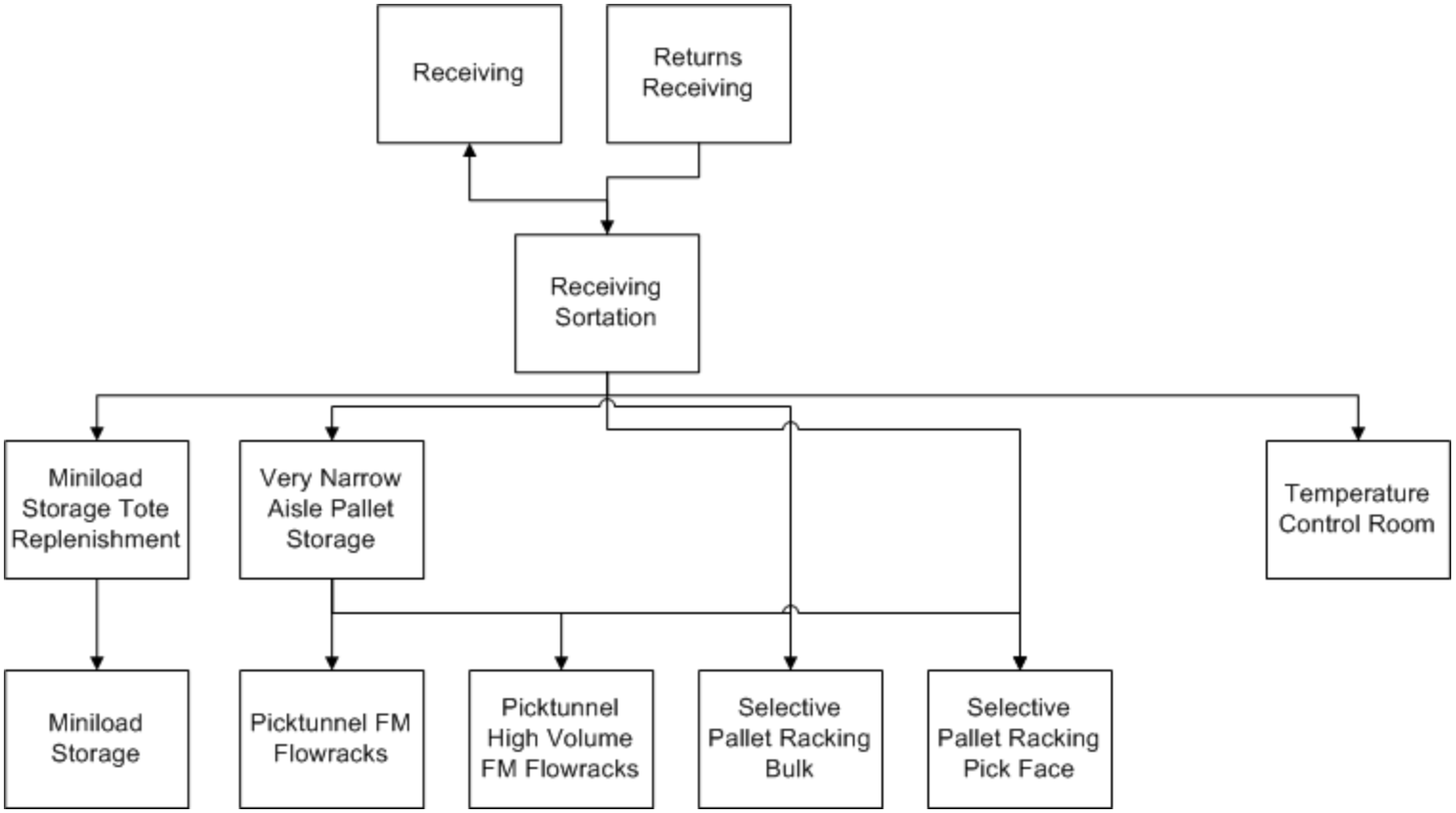
- Standard carton sizes closed automatically
  - Variable height – optimized volume
  - Automated wedging
  - No void fill materials

- Other carton sizes are packed and closed manually

Shipping

- Automated sortation to
  - Shipment
  - Order
  - Individual Order Pallet

Logistic Process Front End

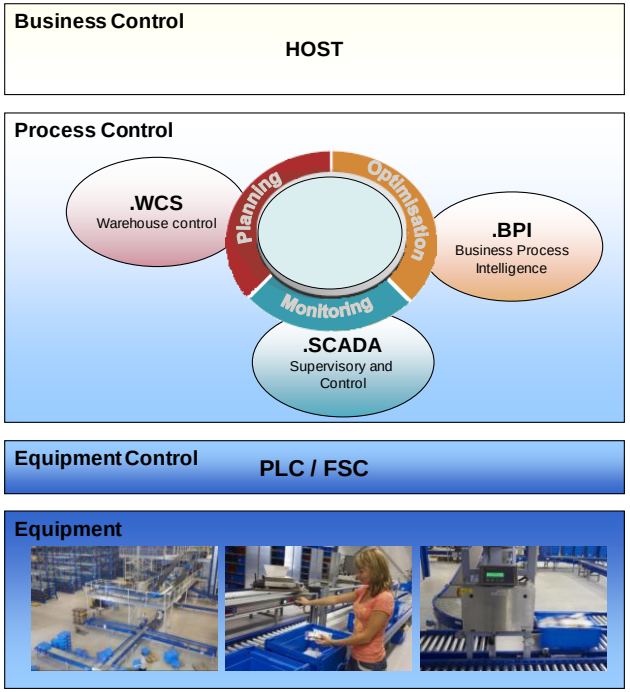


Software

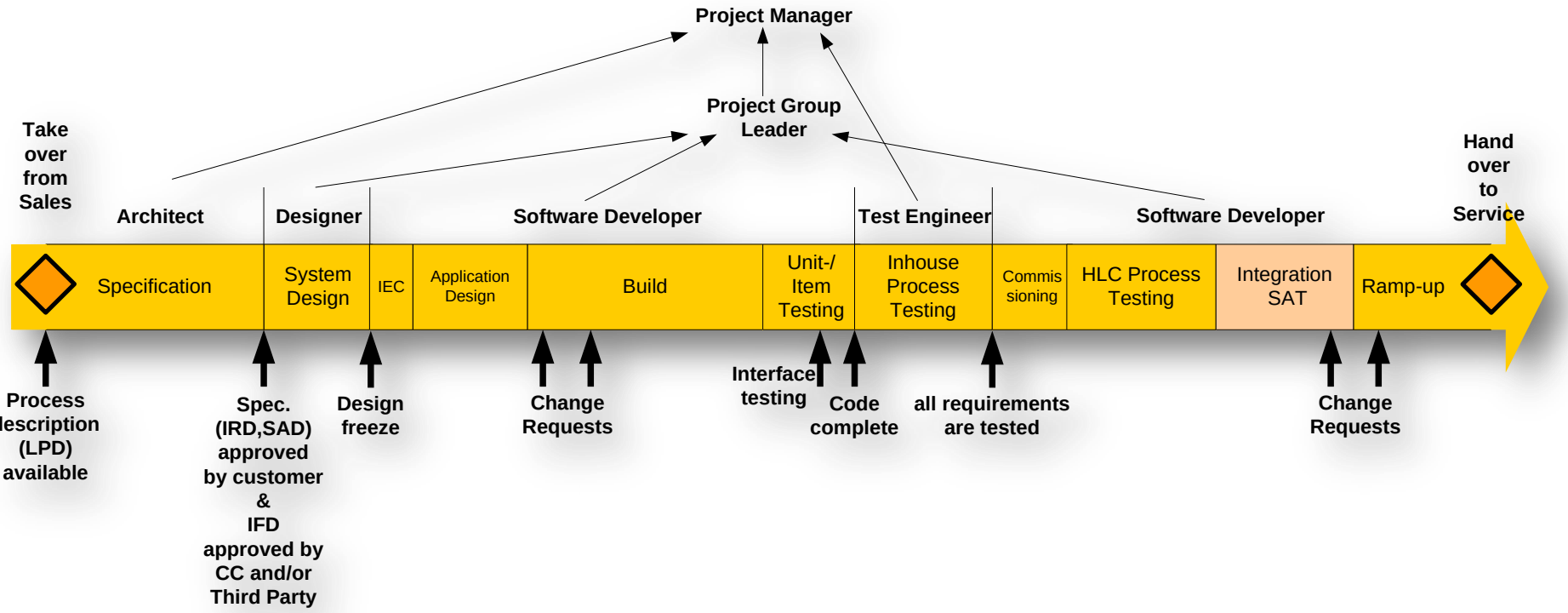
Full Warehouse Management and Warehouse Control system

- Taylored to Covidien specific requirements, e.g.
  - Lot control
  - Serial number tracking
  - Specific lot/serial number picking
  - Quality control

- Joint development effort for requirements and specifications



Software Implementation Process



Benefits

Minimize walking distance

- High performance Goods-to-person for slow movers
- Centralize fast movers in pick-tunnels

Minimize double handling

- Pick directly in shipping carton

Minimize transportation costs

- Minimize lead time, reduces last minute rush orders
- Adjust carton height instead of filling it with air

Increase storage density

- Very Narrow Aisle bulk storage
- Mini-load system for slow moving SKUs
- Multi-compartmented storage totes

Increase picking accuracy

- Real time warehouse management system
- Separated lot storage
- Voice controlled user interface

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For More Information:

Andy.Williams@vanderlande.com

Roy.van.Putten@vanderlande.com

www.vanderlande.com

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