Package Flow Technologies
The Road to Optimization

Jack Levis
Director of Process Management
The Road to Optimization

About UPS

- Founded in Seattle, Wa - 1907
- 400,600 employees
- 200+ countries and territories
- 95,244 package cars, vans, tractors, motorcycles, etc.
- 216 owned / 296 chartered (9th largest airline)
- Drive 2.5+ billion miles / year (U.S. alone)
- Daily flight segments – 936 U.S. / 755 Int'l
- 15.1 million packages a day
- 7.9 million daily customers
- UPS / Supply Chain & UPS Freight
- Winner 2011 Gartner BI Intelligence Award
The Road to Optimization
Stated Operations Vision

- Use Historical and real time information to *predict* future patterns
- *Plan* from the forecast
- *Optimize* the plans to be as efficient as possible
- *Simplify* the operations so that the plans can be efficiently implemented
- *Analyze* actual results and feed back to forecast and planning tools
Analytics facilitates the realization of business objectives through the reporting of data to analyze trends and the creation predictive models for forecasting and optimizing business processes.

**Descriptive Analytics**
- **What happened?**
  - Prepares and analyzes *historical* data
  - Identifies patterns from samples for reporting of trends

**Predictive Analytics**
- **What could happen?**
  - Predicts *future* probabilities and trends
  - Finds relationships in data not readily apparent with traditional analysis

**Prescriptive Analytics**
- **What is best action / outcome?**
  - Evaluates and determines *new* ways to operate
  - Targets business objectives
  - Balances all constraints

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**Analytics**
- What happened?
- What could happen?
- What is best action / outcome?
The Road to Optimization
The Chain of Understanding

Organizational Maturity

Prescriptive, Situational, Real Time, Pattern Based Strategies
Optimization
Simulation
Predictive Modeling
Data Mining
Regression
Visualization
Data Modeling
Query / Drill Down
Standard & Ad hoc Reports

High

Predictions
Contextual Business Rules

Master Data Management Scorecards
Dashboards

Low

Data Warehouses
Spreadsheets and Extracts

Predicative

Ad Hoc

Foundational

Competitive

Differentiating

Breakaway

Very High

Data Needs

Medium

Prescriptive

Analytics

Predictive

Analytics

Descriptive

Analytics
The Road to Optimization
Evolution of the DIAD

The DIAD has changed from an acquisition device to an assistant for better decision making.
The DIAD has changed from an acquisition device to an assistant for better decision making.
Combined the information about each shipment to analyze service or cost deficiencies.
The Road to Optimization
How do I Affect Change??
Package Flow Technologies

- Customer
- Address (USPS)
- Geography (Map)
- UPS Proprietary
- Regulatory
- GPS
- Vehicle
- Service
## The Road to Optimization

### Knowledge Barrier

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The Road to Optimization
Knowledge Barrier

To reduce driver time, packages are loaded in a general order of delivery.
The Road to Optimization
Breaking the Knowledge Barrier
The Road to Optimization
Preload Assist Label (PAL)

INGERSOL-RAND
39001 Schoolcraft Road
Finishing Systems
Livonia MI 48150-3900

P: RED   S: BROWN   I: A14
R120-1118

Delivery Vehicle
Sortation Handling
Shelf Placement
Commit Time
The Road to Optimization
Knowledge Barrier

Training time reduced from three weeks to three hours
The Road to Optimization
Supporting one to one Business

Commit Time

Address Information

Number of Packages

Shelf Location

Additional Activity (COD, signature, etc.)
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Supporting one to one Business

Park at Dock Only
Mailroom
Check in with Security
Use freight elevator
No Indirect/Reroute/LA
The Road to Optimization
New Geographic Data
The Road to Optimization
New Geographic Data
The Road to Optimization
New Geographic Data
The Road to Optimization
Supporting one to one Business

Every delivery at the right location
Full Integration
Prediction / Analysis / Planning
Predictive decisions
Not where you are… but will be.

Current Location
Remaining Work
Completed Work

Current Location
Brown Turning Green
Telematics Data

Analyzing, designing, and implementing information systems to increase energy efficiency

- Collection and analysis of energy data sets
- Optimization of energy distribution networks
- Optimization of energy consumption systems

\[ E + I < E \]

Energy Plus Information = Less Energy
Brown Turning Green

Telematics Data

GPS Satellites
- GPS Antenna

J1708 Telematics Device
- 900 MHz Antenna

Data Stream
- ECM Engine Bus Port
- Auxiliary Port
  - Aux 1 – Reverse
  - Aux 2 – Brake (only available in accident data)
  - Aux 3 – Bulkhead door
  - Aux 4 – Seatbelt

Binary

Reverse Sensor
- Bulkhead Sensor
- Seat Belt Sensor
Telematics Analysis
Closing the loop

- Seat belt off in travel
- Speed
- Route overlap
- Delivery while idling
Telematics Analysis
Predictive Failure Analysis

Coolant Temperature

Engine Speed to Road Speed - MBENZ - Roswell


Voltage Draw
Voltage Recovery
Healthy Suspect

Percent Engine Load: Vehicle 131370

Voltage Draw
 Voltage Recovery
Healthy Suspect
The Road to Optimization
Implementing Change

1,000 buildings / 60,000 Drivers

• Trained all management
• Roles and Responsibilities
• “Vital Stats” defined and monitored
• Set up proactive alerts, support, and monitoring
  – If system fails service is impacted!!
• Updated EVERY UPS procedure
# Delivery Methods

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The Road to Optimization

Results

✓ Reduced 30 million miles annually
   • 3 million gallons of fuel
   • 30,000 metric tons of CO₂
✓ 99.8% + seat belt adherence
✓ Condition based maintenance
✓ Highest service levels in history
✓ 95% reduction in training time
   • Consistent service (Peak / Vacations)
✓ 8 billion less manual data entries
✓ Introduced personalized products
✓ Integrated with customers’ systems
➢ Poised for new breakthroughs
The Next Step – Getting to Clairvoyance

Data will need to be even smarter
The Road to Optimization

Real Time Optimization
The Road to Optimization
UPS Smart Navigation
The Road to Optimization
UPS Smart Navigation
The Road to Optimization
Breaking the Bottleneck
The Road to Optimization
Breaking the Bottleneck
The Road to Optimization
Breakaway Results
The Road to Optimization
Breakaway……

Average nearly 20 years of service

• ORION showed new ways to deliver area
• Mileage reduction
• Real time optimization – Clairvoyance
• Strong management and metrics required
The Road to Optimization
Best Practices

• Never underestimate data needs and availability
• Worry about usability
• Focus on implementation
  • Ensure training is in place
  • Update methods and processes
  • Create checklists and milestones
  • Simplify execution
• Have a goal
  • Create metrics
  • Measure progress / benefits
• Someone must own results
  – Every project needs an enforcer
a trucking company with technology

a technology company with trucks
Taking the Lead in London
Sustainable Logistics for the London 2012 Games

www.ups.com/sustainability