Bucket Brigade
with
Pick-to-Light & Voice Picking

Presented by:
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Blue Horseshoe (BHS) is a privately held solution services firm
- Over 300 customers across over 50+ industries
- 140+ US-based employees (all W-2 based)

Strategy Division
- Serves as an independent management and industrial engineering consulting firm with a focus on:
  - Strategic planning & operations
  - Network analysis & design
  - Facility design & layout
  - Systems evaluations, selections and implementations
  - Program & project management
- Over 220 combined years of experience
- Each team member has over 10+ years experience
  - Including multiple years outside of consulting
Agenda

1. Bucket Brigade Picking
2. Cross-Aisle Picking
3. Pick-to-Light Technology
4. Voice Directed Work
5. Challenges Merging Methodology with Technology
6. Success Stories / Results
Research

- Foremost Experts on Bucket Brigade Picking:

  John H. Bartholdi, III  
  Georgia Tech

  Donald D. Eisenstein  
  University of Chicago

  Dave Wolfe  
  TransTech Consulting
Business Pressures

Improving Productivity
- How can I improve the speed of warehouse operations?
- How do I integrate operations to reduce order processing time?
- How can I reduce manual processes?

Accuracy and Customer Service
- How can I improve overall order accuracy?
- How does it help improve Customer Satisfaction?

Mass Customization/Value-Add
- How can I manage my SKU proliferation and continuing SKU churn?
- How do I ensure regulatory and customer labeling compliance?
- How do I support more customer specific value-added services?

Lowest Total Operating Cost
- Where can I reduce inventory while maintaining high service/fill rates?
- How do I improve resource efficiency?
- How do I ensure infrastructure and staffing flexibility?
- How do I better leverage existing "IT systems investments?"
Traditional Split Case Picking

- Issues with Fixed Work Zones
  - Attempt to give each associate the same amount of work in total across a set time period (wave, shift, day)
  - Doesn’t balance work from order to order
    - Demand variability within zones throughout day creates bottlenecks
  - Differences in pick difficulty creates imbalances
    - Weight of items
    - Height of pick location
  - Workers naturally perform at different speeds
    - Zones limits the entire group to lowest associate productivity
  - Associates productivity varies throughout the day
Bucket Brigade Picking

- Coordinate associates to progressively perform operations in a defined circuit
- Each associate processes work moving toward the end
- Associates complete picks along a line until the next associate downstream assumes the work
- Associate dropping work moves upstream until assuming work from preceding associate in line, etc.
Bucket Brigade Picking

- Self Balancing Work System
  - Eliminates work zones
  - Recognize the differences in individual productivity
  - Automatically compensates for disruptions to picking activities
  - Adjusts for variability of work content
  - 25% productivity improvement over traditional zone picking “typical”
Bucket Brigade Picking

- Embraced by Strategy Division since 1991
- Virtually every client performing piece picking runs bucket brigade
- Initially implemented in pick-to-order environments using pick tickets
  - Difficult to determine individual productivity
  - Optimally would calculate team productivity
  - When individual performance required, associates would initial each pick and management summarized productivity
Bucket Brigade Picking

**Success Factors**

- Pick density
- Handoff of orders (transfer) must be quick
- Team philosophy
- Peer Pressure
- Slowest-to-Fastest in line
Cross-Aisle Picking

- Aisle widths between 36” – 42”
- Increases pick density
- Doubles the number of pick faces in same travel distance
- Locates the fastest moving items directly in front of picker
Cross-Aisle Picking

- Initial designs had carton flow rack on both sides of aisle
- Recently implementing short shelving aisles (3 – 5 bays deep) on one side of picking aisle
Cross-Aisle Picking

- Existing pick modules can be altered with shelving installed around gravity pick & takeaway conveyors
- Minimizes rework to existing material handling infrastructure
Pick-to-Light

- A warehouse order picking scheme that uses lights and LED readouts for each inventory location
- Display the locations and quantities to be picked
- Requirements based on data from the warehouse management or ERP system
- Carton Flow Rack and Carousels are good applications
- High SKU count and density of pick are required to justify
- Recently implemented with carts for mobile batch picking
Voice Picking

- WMS transmits work assignments to user worn voice terminal
- Voice terminal translates assignment data into audible commands
- User provides spoken responses to confirm actions taken
- Responses translated to data
- Host system updated
- Application is very similar to RF scans
Voice Picking

- Key Benefits
  - Accuracy
  - Productivity
  - Training / Learning Curve
  - Multi-Lingual
  - Flexibility / Expandability
  - Scalable
  - Value Add Functionality
  - WMS Support
Bucket Brigade Integration

- **Challenges**
  - Most systems include “zone balancing”
  - Have to add equipment or process to coordinate takeover with PTL
  - Passing batched orders between workers

- **Solutions**
  - “Trains”
  - Clusters
  - Ring scanners or small portable scanners allow simple take-over

- **Improved Productivity with combined process and technology**
Bucket Brigade & Voice

- Lucas Systems & Bucket Brigade
  - Celebrating a decade of Bucket Brigade Voice Picking
  - BHS worked to develop train concept with Lucas at Cengage
  - Productivity more than doubled on some projects

“Good example of how creative process engineering can drive additional, incremental productivity gains for customers”

- Jeff Slevin, COO Lucas Systems

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Bucket Brigade & Voice

- Simon & Schuster & Bucket Brigade
  - Voxware & AL Systems solution
  - BHS managed the system design and implementation
  - Increased productivity & accuracy
  - ROI Achieved in less than 1 year
  - Eliminated need for temporary staffing

“We’ve more than doubled our efficiency and productivity in the picking area.”

- Dave Schaeffer, VP, Distributions and Fulfillment
Bucket Brigade & PTL

- **Regis**
  - Initially implemented PTL & Bucket Brigade picking at Regis in 1998
  - Required each picker to use an RF device to scan the order batch to assume system control

- **PartyLite**
  - Most recent implementation of Bucket Brigade with Lightning Pick system
  - Associates use light-weight scanners
  - Used zone picking and pick-to-order at start-up
  - Only after implementing bucket brigade did they exceed productivity projections
Key Takeaways

- Bucket Brigade works with or without Technology
  - Diligence
  - Regular reporting and review with associates
  - Involve associates in the process
  - Drive team concept
  - Expect results

- Can integrate methodology with existing systems
For more information

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