The Science of EDGE

E-commerce Logistics – The Customer is Now in Control!

Track 4 Session 7
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Abstract

Online is all grown up and the retail sector is entering the next phase: highly efficient e-commerce fulfillment logistics. Find out why “next day is so yesteryear” and what companies are doing to raise the bar for service levels. This presentation provides a detailed look at the e-commerce fulfillment strategies of major retailers including Amazon, Walmart, Home Depot and others. Hear what the All-Stars are doing and planning in e-commerce logistics.
Agenda

• E-Commerce Market Update

• E-Commerce Fulfillment Networks
  - Amazon
  - Google
  - Walmart
  - Target
  - Home Depot
  - Macy’s
  - Instacart

• Key Takeaways

• Conference Cloud

• Questions
Qualifying Statements

• **MW**PVL is strictly unbiased in its views and opinions towards the companies discussed in this presentation

• Any errors or omissions are unintended and we have made every effort to report accurate information

• We have not received payment of any kind to prepare these materials
Pendulum of Power Causing Market Disruption

Manufacturer  Distributor  Retailer  Consumer


Age of the Manufacturer  Age of the Retailer  Age of the Customer
Current Situation in a Nutshell

“Nothing else matters if the right goods aren't available when, where, and how the customer wants them. The days of customers accepting what suppliers and retailers push in front of them are over. The customer is in control.”

Craig Menear, Home Depot's chairman, president and CEO
U.S. Retail E-Commerce Sales Forecast to 2018

U.S. E-Commerce Retail Sales Forecast 2010 - 2018

- 2010: $167.3 billion, 4.4% of total retail sales
- 2011: $194.3 billion, 4.7%
- 2012: $225.3 billion, 5.2%
- 2013: $263.3 billion, 5.9%
- 2014: $304.1 billion, 6.4%
- 2015: $347.3 billion, 7.0%
- 2016: $392.5 billion, 7.6%
- 2017: $440.4 billion, 8.2%
- 2018: $491.5 billion, 8.9%

U.S. Retail E-Commerce Sales $Billions
E-Commerce as a % of Total Retail Sales
Amazon Sales Growth 1999 - 2014

Amazon Sales Revenue $Billions

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<tr>
<th>Year</th>
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<td>2013</td>
<td>$74.5</td>
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<td>2014</td>
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Amazon – A Look Back in Time

• Amazon started out as a company that established its U.S. operations in ‘Tax-friendly’ states - it only established fulfillment centers in states where it did not have to collect sales tax

• As a result, many of the company’s early fulfilment centers were geographically located in places far away from large metropolitan cities where demand is highest

• By 2008 – 2010 tax legislation started to reform by state and Amazon could no longer fight the tax collection war
  - Today Amazon collects tax on 77% of its U.S. sales

• Since then Amazon has been on an unprecedented spending frenzy to set up fulfillment centers closest to the highest population centers across the country. The company is in the process of establishing the highest possible service levels in retail through speed to market.
Amazon Fulfillment & Sortation Center Facilities in North America

Amazon Fulfilment & Sortation Centers in North America

- Amazon Fulfilment Centers
- Amazon Sortation Centers

2 0 1 5
Amazon North America Distribution Sq Ft By YE-2015: 62.5 M Sq Ft (FC & SC)
Amazon USA / Canada Fulfilment Center (FC) Network

• As at Q3, 2015:
  - 70 Fulfillment Center facilities in North America are active
    ▪ Small sortable fulfilment centers (FCs), large sortable FCs, large non-sortable FCs, 3PL FCs, Specialty FCs, Redistribution/replenishment facilities and returns centers
  - 54 Million Sq Ft currently shipping
  - Historic CapEx per sq ft in the USA has been $101 based on published data from 29 recent projects. This figure is up from $89 in 2013 due to higher investment into automation
  - 9th Generation FC underway with increased levels of automation

• Known New Fulfillment Center Projects:
  - 13 new FCs to come on line between now and 2017 that we know of
  - Est. 7.6 Million FC Sq Ft to come on-line 2015-2017
  - Estimate an additional $770+ Million in CapEx
Amazon USA / Canada Sortation Center (SC) Network

• As at May, 2015:
  - 21 sortation centers (SCs) in North America are active – 3 within FC facilities and 18 standalone buildings
  - This network has been added in 2014 – 2015 to sort last mile cartons and reduce shipping expense
  - Typically smaller buildings ranging between 50 – 600,000 sq ft
  - 5.6 Million Sq Ft
  - Historic CapEx per sq ft in the USA has been $74 based on published data from 4 recent projects. Lower cost due to reduced equipment requirements.

• Known New Fulfillment Center Projects:
  - 3 new SCs to come on line between now and 2017 that we know of
  - Est. 400,000 Sq Ft to come on-line 2015-2017
  - Potential to add another 20 – 25 of these buildings over the next 1 – 2 years to extend same day reach to top metropolitan cities in North America
Amazon Fulfillment Center Network
69 Active Facilities + 14 Set to Open in Next 24 Months
Amazon Sortation Center Network

21 Existing Locations and More to Follow
Amazon Sortation Network
How It Works
Inside an Amazon Sortation Center
Amazon Same Day Shipping Capability

- Amazon Prime members now receive free shipping in over 500 cites and towns in the US.
- Estimated 26.5% of NA market currently has same day delivery service for a reach of close to 93 Million people
- We estimate this could increase to 32% by end of 2015

<table>
<thead>
<tr>
<th>City Pop. Rank</th>
<th>Name</th>
<th>Metro Area 2012 Population</th>
<th>Closest Amazon Fulfilment Center</th>
<th>Distance (Miles)</th>
<th>Currently Same Day?</th>
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<tbody>
<tr>
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<td>Robbinsville, NJ</td>
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<tr>
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<td>San Bernardino, CA</td>
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Subtotal Amazon Same Day: 93,199,000
Total Population in USA and Canada: 351,931,000
% Population Same Day: 26.5%
Amazon Prime

- **Amazon Prime:**
  - $99/year membership
  - Free 2-day shipping on millions of eligible items with no minimum order size; for all other items, standard or no-rush shipping is also free
  - Amazon Locker service is also free
  - Same-day shipping currently offered in 15 NA. metro areas
    - For Prime members, it costs $U.S. 5.99 per order
    - For non-members it costs $U.S. 9.98 per Order + $U.S. 0.99 for each additional item
  - Cut-off times vary from 7am to 12:15pm
  - All same day deliveries arrive before 9pm
Amazon Prime Fresh

- Amazon Prime Fresh:
  - $299/year for Prime Fresh membership (Seattle, Los Angeles/Orange County, San Francisco/Bay Area, New York City, Northern NJ, Philadelphia)
  - For minimum $35 order, free same-day or early next day delivery
  - Customers can shop fresh groceries from local merchants, products from neighborhood shops and restaurants, everyday essentials, and over 500K Amazon.com items.
  - Order cut-off is 10:00am for delivery by 6:00pm
    - Doorstep Delivery or Attended Delivery options
  - New wave of at least 11 Grocery Pickup locations opening in Bay area, Portland, Seattle
Amazon Prime Now / Flex Hubs
Coming to Your Neighborhood Soon

• Since Same Day is not fast enough anymore, Amazon now offers its Prime Now service

• Guarantees 1-hour and 2-hour delivery on tens of thousands of daily essentials through a mobile app

• Two-hour delivery is free, and one-hour delivery is available for $7.99 from 6 a.m. to midnight

• Available in Manhattan, Baltimore, Dallas, Miami, Atlanta, Seattle, Portland and Austin and more cities to come in 2015

• Use of bike messengers, crowd sourcing & other local resources to make deliveries
Amazon “On My Way”
Coming to Your Neighborhood Soon?

• “On My Way” is an experimental application for the use of crowdsourcing to execute the shipping function
  - This is the equivalent of “Uber-Taxi” for the shipping industry
  - Pay normal people to deliver packages
  - Amazon's shipping costs swelled by 31% in 2014 so the company is trying out innovative ways to reduce expenses
  - It is to be seen how customers perceive an unexpected stranger at the door instead of a uniformed driver and how the freight liability will be managed for lost or damaged goods in transit
Key Trend Line to Watch
(Mix of 1P and 3P Fulfillment Expense)

40% of Units Shipped are Now 3P Which Distorts This Chart

Amazon Fulfilment Expense % to Product Sales

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<thead>
<tr>
<th>Year</th>
<th>Fulfillment Expense %</th>
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<tbody>
<tr>
<td>1999</td>
<td>17.6%</td>
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<td>2003</td>
<td>9.1%</td>
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<tr>
<td>2014</td>
<td>15.4%</td>
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<tr>
<td>2015</td>
<td>16.1%</td>
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Amazon Rolling Out KIVA Automation in their 8th / 9th Generation FCs

- Paid $775 Million for KIVA
- Recently rebranded as Amazon Robotics
- Amazon now has 15,000 KIVA robots deployed at 10 FCs as at YE14
- Online orders now being processed in as little as 15 minutes with Kiva robots
- These machines cannot be applied to every FC due to facility constraints
This is a responsible attempt to deconstruct and reconstruct the expected productivity rates at a typical Amazon small sortable fulfillment center using a manual versus automated GTP KIVA system.

These results indicate a 47.6% reduction in labor cost per unit for each unit moved through the automation system.

### Efficiency Gain from Kiva Automation at a Small Sortable FC

<table>
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<tr>
<th>Manual Environment</th>
<th>Estimated Units per Hour (UPH)</th>
<th>Labor Cost</th>
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<td>Direct Labor Job Function</td>
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<td>High</td>
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<td>Receiving</td>
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<td>500</td>
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<td>Putaway</td>
<td>80</td>
<td>100</td>
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<td>Picking</td>
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<td>Packing</td>
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<td>240</td>
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<tr>
<td>Shipping</td>
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<td>640</td>
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<tr>
<td><strong>Total Labor Cost per Unit Using Manual Labor</strong></td>
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<table>
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<tr>
<th>KIVA Automation</th>
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<td>Direct Labor Job Function</td>
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<td>Shipping</td>
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<tr>
<td><strong>Total Labor Cost per Unit Using GTP Automation</strong></td>
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<tr>
<td><strong>Projected Labor Savings per Item Shipped</strong></td>
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<tr>
<td><strong>Projected Labor Savings as a % of Total Direct Labor</strong></td>
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</table>
What’s Up Next? Amazon Glasses

- Amazon has filed a patent US20150168727 on June 18, 2015 for pointer-tracking for eye-level scanners and displays
  - Smart Glasses with an imaging device and a sensor that automatically recognize bar codes, alphanumeric characters and objects
  - Network-transmission of task instructions via built-in display
  - Hands-free
  - Reduces errors
  - Increases worker productivity

Source: Uspto.gov
Amazon Wants FAA Approval to Begin Drone Testing in 2015
Amazon UK

- 8 Fulfilment Centers
- 4.8 M Sq Ft
- 15 Delivery Depots
- 2 New FCs Planned
- 10,000 associates
Amazon Spain

- 1 Fulfillment Center
- 344K Sq Ft
Amazon France

- 4 Fulfillment Centers
- 2.6 M Sq Ft
- 4,700 associates
Amazon Germany, Poland & Czech Republic

- 13 Fulfillment Facilities
- 12.8 M Sq Ft
- 1-2 New FCs Under Construction
Amazon Japan

- 10 Fulfillment Centers
- 6.2 M Sq Ft
Amazon China

- 15 Fulfilment Centers
- 8.6 M Sq Ft
- 1 New facility planned
Amazon India

- 12 Fulfilment Centers
- 1.1 M Sq Ft
Amazon Rest of World Expansion Opportunity

• Overseas Markets:
  - Vast opportunity for growth remains in existing and new markets
    ▪ Logical candidates for new market expansion include:
      ▶ Australia (Sydney, Brisbane, Melbourne)
      ▶ Mexico (Mexico City, Monterrey)
      ▶ Singapore / Hong Kong
      ▶ South Africa (Cape Town)
      ▶ Brazil (São Paulo, Rio de Janeiro)
      ▶ Argentina (Buenos Aires)
Amazon and the Impact of Same/Next Day on the Market

• Amazon now controls about 20% of the US retail e-commerce market and this is expected to continue to increase

• As Amazon enables 1-hour, 2-hour, same-day and next-day shipping into the top 50 US markets, this will continue to drive market share away from traditional retailers with more expensive shipping options

• This is causing an unprecedented level of retail disruption and some companies are now spending Billions to achieve a flexible high-speed / high-service level offering to the customer

• In some cases, e-commerce sales can enter into negative margin due to the high cost of service and technology so this is very much about defending market share
It’s Becoming a Mad, Mad, Mad, Mad, Mad World Out There

Tomorrow is just not fast enough anymore...
E-Commerce Penetration of Total Sales on the Rise in Retail

E-commerce penetration of total sales

- Restoration Hardware: 50%
- Kate Spade: 20%
- Lululemon: 19%
- Tumi: 16%
- Fossil: 8%
- Tiffany: 6%
- Ulta: 5%
- Signet: 5%
- Michael Kors: 3%
- Urban Outfitters: 26%
- Abercrombie & Fitch: 23%
- Vera Bradley: 20%
- American Eagle: 19%
- Gap: 16%
- L Brands: 15%
- Ascena: 13%
- Nordstrom: 15%
- Macy's: 12%
- Kohl's: 11%
- Hudson's Bay: 5%
- Target: 3%
- Costco: 3%
- Wal-Mart: 3%

Source: Cowen and Company, Company Filings & Transcripts
Google Shopping Express
Google Shopping Express

- Google Shopping Express officially launched in San Francisco in April 2013
- Same day service in San Francisco/San Jose/Bay Area, West LA, Manhattan, Chicago, Boston, Washington DC
- 32+ national and local retailers participating
- Membership fee now $95 per year (or $10 per month)
- Members get free delivery for orders $15+ or $3 for orders < $15; Add $5 for non-members
- Customer places order and specifies 4-hour delivery window
- Fresh produce, alcohol, and refrigerated goods on the way
- Same day delivery service can now reach to 7 Million people
Google’s Project Wing Being Tested in Australia
Walmart.com Fulfillment Strategy

- Walmart is now the #4 Internet Retailer
- Global e-commerce sales account $12.2 Billion in 2014 accounting for 2.5% of sales
- 21.6% growth rate in fiscal 2014
- Walmart now under severe pressure from Wall Street
- Walmart.com is as a separate business unit and the company will invest $1.5 Billion into its e-Commerce platform in 2015
  - Walmart's hope is to use its thousands of stores not just as potential pick-up locations (order on-line, pick up in store) but as the base for local e-fulfillment
  - Offering a locker approach in its own stores so that the customer need not go to a service desk (This has been a source of complaints due to lengthy wait times)
  - New Shipping Pass Program: $50 annual fee for free unlimited 3-day shipping
Walmart has a U.S. Network of 3658 Large Format Retail Stores & 9 Planned E-Commerce DCs
Walmart’s E-Commerce Distribution Strategy

- **DC Strategy** – reach 90% of the US population with next day delivery from dedicated e-commerce DC’s
- Walmart continues to expand their next generation E-Commerce DC build-out strategy
- Walmart acknowledges that its ecommerce operation is not yet profitable

<table>
<thead>
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<th>City</th>
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<td>9,688,160</td>
<td>2,475</td>
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</tr>
</tbody>
</table>

- The new DCs will use both human labor and automation
- The DCs will be part of a network for filling online orders that includes traditional buildings, plus 11 existing smaller e-commerce centers and 83 Wal-Mart Supercenters that have been designated “ship-from-store” locations.
Walmart Same Day Grocery Service

- Walmart Grocery Same Day now being experimented in San Jose, Phoenix, Denver, Bentonville and Huntsville
- Offers customer the choice of same day home delivery service or local store pickup
- Click and Collect is free – customer picks up their order
- Shoppers can select a 2-4 hour delivery window from 7:00am to 11:00pm.
- Delivery fee varies and is free for orders > $125
Target.com Rush Delivery

• 2014 online sales est. at $3.0 Billion (3.0% of revenue). No. 18 in top 500 e-Retailers.
• By YE 2015 Target will have 5 dedicated direct to consumer fulfillment centers in the USA
• Rush Delivery is an experimental same day service available in Boston, Miami and Minneapolis for $10

<table>
<thead>
<tr>
<th>City</th>
<th>State</th>
<th>Year Opened / Converted</th>
<th>Square Feet</th>
<th>Full Time Ass.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tucson</td>
<td>AZ</td>
<td>2008</td>
<td>975,000</td>
<td>220</td>
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<tr>
<td>Ontario</td>
<td>CA</td>
<td>2009</td>
<td>725,000</td>
<td>250</td>
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<tr>
<td>Woodbury</td>
<td>MN</td>
<td>2010</td>
<td>325,000</td>
<td>107</td>
</tr>
<tr>
<td>Memphis</td>
<td>TN</td>
<td>Q2 2015</td>
<td>900,000</td>
<td>400</td>
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<tr>
<td>York</td>
<td>PA</td>
<td>Q3 2015</td>
<td>624,800</td>
<td>400</td>
</tr>
<tr>
<td>Total</td>
<td></td>
<td></td>
<td>3,549,800</td>
<td>1,377</td>
</tr>
</tbody>
</table>
Home Depot

• Home Depot lumbers into E-Commerce:
  - Retailer puts a Lid on New Stores, Embraces the Web's Logistical Challenges
  - 3 new dedicated e-commerce DCs enable 2-day shipping to 90% of consumers
  - Home Depot now offers more than 600,000 items on its website as compared to 35,000 in a typical store

<table>
<thead>
<tr>
<th>City</th>
<th>State</th>
<th>Opening Date</th>
<th>Square Feet</th>
<th>Full Time Ass</th>
</tr>
</thead>
<tbody>
<tr>
<td>Locust Grove</td>
<td>GA</td>
<td>Q1, 2014</td>
<td>1,100,000</td>
<td>300</td>
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<tr>
<td>Perris</td>
<td>CA</td>
<td>Q4, 2014</td>
<td>859,000</td>
<td>300</td>
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<tr>
<td>Troy</td>
<td>OH</td>
<td>Q2, 2015</td>
<td>1,500,000</td>
<td>300</td>
</tr>
<tr>
<td>Total</td>
<td></td>
<td></td>
<td>3,459,000</td>
<td>900</td>
</tr>
</tbody>
</table>
Home Depot e-Commerce Strategy

- Home Depot had 2014 revenues of more than $83 billion and increased online sales by 36% (~ $1 Billion of revenue)
- The company already allows customers to place online orders and pick them up at the store.
- Now testing "Buy Online and Deliver From Store" program at several of the company’s 2,000 stores
  - Online users can order goods and specify a narrow time window for their deliveries
  - Product is pulled from store inventory, loaded onto one of the company's vehicles, and delivered to the end customer’s home or to a job site
Macy’s

- Macy's expanding a pilot program for same day delivery service
  - Aimed at customers in 17 markets
    - Atlanta, Boston, Dallas, Honolulu, Las Vegas, Miami, Fort Lauderdale, New York, Long Island, Orange County, Philadelphia, Chicago, Houston, Los Angeles, Northern New Jersey, San Francisco, San Jose, Seattle and Washington, D.C.
    - Uses crowdsourced same-day delivery provider Deliv
  - Macy’s is also turning all of its 885 brick-and-mortar store locations into mini-fulfillment centers to ship online orders from the nearest store to the consumer
    - Now the 8th largest e-Retailer in the US
- The Bloomingdale's chain will also offer same-day shipments in Chicago, LA, San Francisco and San Jose.
Instacart

- Instacart - grocery delivery service in 1-2 hours
- Instacart serves Costco, Kroger, The Food Emporium, Super Fresh, etc.
- Recently announced partnership with Whole Foods
- Test pilot to start in Austin and Boston
- Service to expand to 15 cities currently served by Instacart:
  - Atlanta; Austin; Boston; Boulder; Chicago; Denver; Houston; Los Angeles; New York City; Philadelphia; Portland, Oregon; San Francisco; San Jose; Seattle and Washington, D.C.
- $4 for 2-hour delivery; $6 for 1-hour - min. $35+ order
- $8 for 2-hour delivery; $10 for 1-hour – below $35 order
Key Takeaways

- Amazon is raising the bar with its massive push towards same day and next day fulfillment to the top 50 US markets
- Wall Street is continuing to reward Amazon for market share growth despite not being profitable
- Being profitable at ecommerce is challenging even for the most world’s most efficient companies
  - Completely different distribution system
- Increasing Speed and lowering shipping cost to the consumer are key weapons in the new battleground for online market share
- This pressure will work its way through the supply chain as retailers are forced to respond to competitive threats
Conference Cloud
Additional Resources

The Science of EDGE
THE KNOWLEDGE TO MASTER THE NEW SUPPLY CHAIN
Questions