Last mile delivery: A pain point of online shopping

March 2017
**Key takeaways**

Express delivery companies used to be the key players in last mile delivery. Lately, they earn less than ever. Some of them go public to raise capital for future growth and business diversification.

Other than thin margin, express delivery companies have to fight against high cost and lack of labour supply. Also, some of them have to strive a balance between service quality control and achieving economies of scale via franchisees.

To enhance the consumer experience, major e-commerce players in China seek total logistics solutions. Some stakeholders invest in innovative last mile delivery solutions.

Problem facing last mile delivery is just the tip of the iceberg of the entire e-commerce logistics sector. More works are needed for improving logistics efficiency.

Adoption of big data analytics is one of the critical success factors for e-commerce logistics.
Waiting for the online purchase is not always an exciting experience

What are the pain points of online shopping in China?

- Last mile delivery
- Product quality
- Fake goods
- Information security
- Intellectual property

Source: China E-commerce Research Centre, compiled by Fung Business Intelligence
Sina Weibo counted the number of blog posts related to last mile delivery in 2016. The most mentioned problems related to last mile delivery were:

<table>
<thead>
<tr>
<th>Problem</th>
<th>Blog Posts</th>
</tr>
</thead>
<tbody>
<tr>
<td>Damaged parcel packaging</td>
<td>4,333,894</td>
</tr>
<tr>
<td>Poor services</td>
<td>4,181,423</td>
</tr>
<tr>
<td>Long delivery lead time</td>
<td>3,703,847</td>
</tr>
<tr>
<td>Parcel loss</td>
<td>2,074,845</td>
</tr>
<tr>
<td>Damaged goods</td>
<td>1,500,259</td>
</tr>
</tbody>
</table>

Source: Sina Weibo, compiled by Fung Business Intelligence
Who handles the last mile delivery?
Traditionally, express delivery company is the major player providing basic door-to-door delivery services.
More online shopping, more e-commerce parcels… but do the express delivery companies earn more?

- Transaction value of online shopping reached RMB 5,160 billion in 2016, which was 40 times more than the value in 2008.
- The surge in online shopping also stimulates the demand for express delivery. The number of parcels handled by express companies in 2016 was 31 billion, up from 1.5 billion in 2008.
- The annual growth rate of parcels number has outweighed the annual growth rate of the transaction value of online shopping since 2012. It reflects that the average value of parcels is decreasing.

No, China’s express delivery companies earn less than ever. Average domestic express charge per order dropped sharply from RMB 30 in 2006 to RMB 13 in 2015

• The reduction in average express shipping charge per order may due to:
  – Some express delivery companies expand their network coverage and reach economies of scale by adopting franchise model. Hence, delivery cost has been gradually reducing, but sometimes, service quality may not be fully controlled by the headquarter
  – Some express delivery companies compete for the market by using cut-throat price war, but sometimes, give up the service quality

Source: Industrial Securities, compiled by Fung Business Intelligence
Box 1: The Chinese couriers have to work very hard for a living

- Daily steps: 16,000
- Daily travel: 20 km
- Daily calls: 100
- Daily parcels delivered: >200 pcs (peak seasons)

There are 1.2 million couriers in China.

The total distance travelled by all couriers in one year equals the distance travelling round the earth 217,000 times

Do they earn a lot?
Monthly salary, % of survey respondents*

- RMB <2,000: 11.9%
- RMB 2,001 – 4,000: 53.4%
- RMB 4,001 – 6,000: 28.6%
- RMB 6,001 – 8,000: 5.4%
- RMB > 8,000: 0.7%

*Survey respondents n = 4539
Source: Aliresearch, people.cn, compiled by Fung Business Intelligence
### Box 2: The decline in average express charge varied among different cities

<table>
<thead>
<tr>
<th>Top 20</th>
<th>City</th>
<th>Total revenue of express delivery (RMB billion, 2016)</th>
<th>Average revenue per order (RMB, 2016)</th>
<th>Changes in average revenue per order (RMB, 2016 vs. 2015)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Shanghai</td>
<td>71.0</td>
<td>27.3</td>
<td>0.6</td>
</tr>
<tr>
<td>2</td>
<td>Shenzhen</td>
<td>29.8</td>
<td>14.6</td>
<td>-1.3</td>
</tr>
<tr>
<td>3</td>
<td>Guangzhou</td>
<td>27.5</td>
<td>9.6</td>
<td>-0.4</td>
</tr>
<tr>
<td>4</td>
<td>Beijing</td>
<td>25.7</td>
<td>13.1</td>
<td>0.2</td>
</tr>
<tr>
<td>5</td>
<td>Hangzhou</td>
<td>19.6</td>
<td>10.8</td>
<td>-0.6</td>
</tr>
<tr>
<td>6</td>
<td>Dongguan</td>
<td>12.3</td>
<td>11.5</td>
<td>0.1</td>
</tr>
<tr>
<td>7</td>
<td>Jinhua (Yiwu)</td>
<td>12.0</td>
<td>7.1</td>
<td>-0.8</td>
</tr>
<tr>
<td>8</td>
<td>Suzhou</td>
<td>11.4</td>
<td>13.4</td>
<td>-2.3</td>
</tr>
<tr>
<td>9</td>
<td>Chengdu</td>
<td>6.9</td>
<td>11.3</td>
<td>-0.5</td>
</tr>
<tr>
<td>10</td>
<td>Tianjin</td>
<td>6.3</td>
<td>15.5</td>
<td>-1.5</td>
</tr>
<tr>
<td>11</td>
<td>Nanjing</td>
<td>6.1</td>
<td>12.8</td>
<td>0.9</td>
</tr>
<tr>
<td>12</td>
<td>Wuhan</td>
<td>6.0</td>
<td>11.0</td>
<td>-0.5</td>
</tr>
<tr>
<td>13</td>
<td>Ningbo</td>
<td>5.8</td>
<td>11.5</td>
<td>-1.6</td>
</tr>
<tr>
<td>14</td>
<td>Zhengzhou</td>
<td>5.2</td>
<td>12.2</td>
<td>-0.8</td>
</tr>
<tr>
<td>15</td>
<td>Wenzhou</td>
<td>4.8</td>
<td>8.3</td>
<td>-1.2</td>
</tr>
<tr>
<td>16</td>
<td>Quanzhou</td>
<td>4.6</td>
<td>8.3</td>
<td>-0.5</td>
</tr>
<tr>
<td>17</td>
<td>Wuxi</td>
<td>4.5</td>
<td>12.9</td>
<td>1.2</td>
</tr>
<tr>
<td>18</td>
<td>Chongqing</td>
<td>3.9</td>
<td>13.7</td>
<td>-0.2</td>
</tr>
<tr>
<td>19</td>
<td>Foshan</td>
<td>3.7</td>
<td>12.6</td>
<td>-0.8</td>
</tr>
<tr>
<td>20</td>
<td>Jiaxing</td>
<td>3.6</td>
<td>10.8</td>
<td>-0.6</td>
</tr>
</tbody>
</table>

Source: State Post Bureau, compiled by Fung Business Intelligence
Other than thin margin, more challenges facing the express delivery companies ...
Challenges facing the last mile delivery

High cost of providing door-to-door delivery service

- Express delivery companies have a difficulty to strive a balance between achieving economies of scale via franchisees and controlling service quality.
- It is not cost efficient for the express delivery companies to invest in delivery resources at the same level throughout the year; however, without preparing for the peak promotional seasons, they may not able to fulfill massive orders.

Different expectation on delivery time and poor consumer experience

- Many online shoppers prefer receive their parcels during off hours at home. However, express delivery companies try to provide delivery services during day time, as the cost of night shift couriers is higher than that of day shift staff.
- Couriers may have to fulfill a single order by paying more than one visit to a shopper, as either party missed the delivery appointment. Cost efficiency and productivity are very low.

Keen competition for labour

- More online shopping, more parcels to be fulfilled. There is excess demand for couriers.
- Express delivery companies compete for the delivery personnel by offering better compensation packages, which incur a higher cost.
- On the other hand, many online takeaway platforms emerge in China. Some couriers quit their job and join online takeaway companies, which offer a higher unit wage per meal delivery order and flexible working hours.

Source: compiled by Fung Business Intelligence
Innovation in last mile delivery

Challenges

- High cost of providing door-to-door delivery service
- Different expectation on delivery time and poor consumer experience
- Keen competition for labour

Solutions

Crowd-sourced delivery service
- The services are mainly provided by part-time workers or freelancers, who spend their idle time
- Flexible supply of delivery personnel reduces the risk of e-commerce companies and express delivery companies

Parcel pick-up point
- Some e-commerce companies and express delivery companies set up pick-up points or partner with local stores to provide parcel pick-up services
- Online shoppers can pick up their parcels at their convenient time

Smart locker
- Other than establishing pick-up points, setting up smart lockers is another innovative solution tackling the shortage of courier supply
- Couriers can unload the parcels to smart lockers. Their overall efficiency is improved, as they no longer need to wait for the shoppers and able to deliver more parcels
- Again, online shoppers can pick up their parcels at their convenient time

Picture source: Internet
Source: compiled by Fung Business Intelligence
Today, express delivery companies...
Express delivery companies diversify their businesses from providing basic last mile delivery services to offering inter-city delivery services, warehouse services, e-commerce, logistics finance, etc.

Facilities and network coverage of the listed express delivery companies in China

<table>
<thead>
<tr>
<th>Company</th>
<th>Number of delivery terminals in China</th>
<th>Average orders handled per delivery terminal (p.a.)</th>
<th>Number of franchisees</th>
<th>Number of distribution centres</th>
<th>Number of planes owned</th>
</tr>
</thead>
<tbody>
<tr>
<td>SF EXPRESS</td>
<td>12,000+</td>
<td>196,900</td>
<td>0</td>
<td>294</td>
<td>38</td>
</tr>
<tr>
<td>STO EXPRESS</td>
<td>10,000+</td>
<td>256,800</td>
<td>1,495</td>
<td>82</td>
<td>0</td>
</tr>
<tr>
<td>YTO EXPRESS</td>
<td>24,000+</td>
<td>126,300</td>
<td>2,610</td>
<td>82</td>
<td>5</td>
</tr>
<tr>
<td>YUNDA EXPRESS</td>
<td>24,000+</td>
<td>108,400</td>
<td>2,800+</td>
<td>57</td>
<td>0</td>
</tr>
<tr>
<td>ZTO EXPRESS</td>
<td>23,000+</td>
<td>128,100</td>
<td>7,700</td>
<td>74</td>
<td>0</td>
</tr>
</tbody>
</table>

Source: Industrial Securities, compiled by Fung Business Intelligence
Major privately-owned express delivery companies in China go public to raise capital for future growth plans

- **ZTO Express**: Listed on NYSE in Oct 2016
- **YTO Express**: Listed on SHSE, completed backdoor listing in Feb 2017
- **STO Express**: Listed on SZSE, completed backdoor listing in Dec 2016
- **Yunda Express**: Listed on SZSE, completed backdoor listing in Jan 2017
- **SF Express**: Listed on SZSE, completed backdoor listing in Feb 2017
Problem facing the last mile delivery is the tip of the iceberg of China’s e-commerce logistics sector. More works are needed for improving the efficiency of the sector.
E-commerce logistics not only involves express delivery, but also is supported by many upstream stakeholders providing holistic logistics solutions.

### Market landscape in China

<table>
<thead>
<tr>
<th>Self-operated logistics by e-commerce company</th>
<th>Third party logistics service provider</th>
<th>Crowd-sourced delivery</th>
</tr>
</thead>
<tbody>
<tr>
<td>JD Logistics 唯品会</td>
<td>LF LOGISTICS 德邦</td>
<td>人人快递 点我达</td>
</tr>
<tr>
<td>Gooday RRS.com</td>
<td>KERRY EAS LOGISTICS 百世</td>
<td>NewDada 新达达</td>
</tr>
<tr>
<td>Suning 苏宁</td>
<td>BEST LOGISTICS</td>
<td>可靠 配送 便捷 到家</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Express delivery</th>
<th>Logistics park</th>
<th>Warehouse</th>
<th>Smart locker operator</th>
</tr>
</thead>
<tbody>
<tr>
<td>ZTO申通快递</td>
<td>Transfar传化物流</td>
<td>Global Logistic Properties</td>
<td>丰巢</td>
</tr>
<tr>
<td>YTO圆通速递</td>
<td>LINZIN广东林安物流集团</td>
<td>心怡科技物流</td>
<td>速递易</td>
</tr>
<tr>
<td>YUNDA韵达快递</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Logistics data analytics platform</th>
<th>Line-haul truck matching platform</th>
<th>City logistics matching platform</th>
</tr>
</thead>
<tbody>
<tr>
<td>CAINIAO菜鸟网络</td>
<td>LORI罗计</td>
<td>货拉拉</td>
</tr>
</tbody>
</table>

Source: compiled by Fung Business Intelligence
To reduce the “pain” level of online shoppers, major e-commerce players in China seek total logistics solutions

Adoption of different logistics models

**Partnership model**

- Warehouses are mainly owned by Cainiao, a 47%-owned affiliate of Alibaba Group, and operated by partners, e.g. Alog, Best Logistics, etc.
- Warehouse network covers 250 cities; in which, 200 warehouses are equipped with smart storage system
- Outsource delivery: partner with YTO, STO, ZTO, Yunda, SF Express, Best Express, EMS, etc.

**Self-operated model**

- Self-operated warehouses: 7 smart fulfillment centers and 254 warehouses
- Hybrid model in delivery
- Total 6,780 delivery stations and pickup stations in 2,646 counties

- Own Pinjun Express, handling 90% of the orders of VIP.com

### Market share of the major B2C e-commerce players in China, 2016

<table>
<thead>
<tr>
<th>Player</th>
<th>Market Share</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tmall.com</td>
<td>56.6%</td>
</tr>
<tr>
<td>JD.com</td>
<td>24.7%</td>
</tr>
<tr>
<td>Suning.com</td>
<td>4.3%</td>
</tr>
<tr>
<td>VIP.com</td>
<td>3.5%</td>
</tr>
<tr>
<td>Others</td>
<td>10.9%</td>
</tr>
</tbody>
</table>

Source: iResearch, company websites, compiled by Fung Business Intelligence
Partnership model:
Alibaba is keen on acquiring logistics companies. Its affiliate, Cainiao, orchestrates the stakeholders via big data analytics

Company background

- Cainiao Logistics is a 47%-owned affiliate of Alibaba Group
- It operates a logistics data platform that leverages the capacity and capabilities of logistics partners to fulfill e-commerce orders

Milestones (domestic e-commerce)

2013
Cainiao was established by a consortium. Major shareholders include Alibaba Group, Chinese retailer Intime Group, Chinese conglomerate Fosun Group, SF Express, and four Chinese courier companies: STO, YTO, ZTO and Yunda Express

2014
Cainiao invests in KXTX, a line-haul truck matching platform
Alibaba invests in Alog, a LSP and warehouse operator
Cainiao allies with China Post

2015
Alibaba invests in YTO Express
Alibaba invests in Suning. Cainiao allies with Suning logistics
Cainiao launches a cloud-based logistics platform in China

2016
Cainiao obtained a RMB 10 billion financing from top sovereign fund investors including Singapore’s GIC and Temasek, Malaysia’s Khazanah Nasional Berhad and China’s Primavera Capital Group
Cainiao invests in Dianwoda, a crowd-sourced delivery platform

2017
Alibaba increases its investment in RRS logistics, an affiliate of Haier Group. Cainiao allies with RRS logistics

Core services (domestic e-commerce)

- Provide warehouse solutions for e-stores on Tmall and Taobao marketplaces
- Orchestrate express companies, warehouse operators and LSPs on Cainiao system via big data analytics
- Offer one-stop-shop rural e-commerce logistics solutions
- Support store pick-up and return goods services for online shoppers at physical Cainiao terminals and local stores

Source: company websites, compiled by Fung Business Intelligence
Adoption of big data analytics is the solution for fulfilling numerous orders within a very short period of time.

11.11 Singles’ Day: Annual examination of China’s logistics sector

Number of parcels generated on 11.11.2009: 0.26 million

Number of parcels generated on 11.11.2016: 657 million

Number of days spent on fulfilling 1st 100 million parcels generated on Singles’ Day is decreasing.

2013
- Nov 11
- Nov 12
- Nov 13
- Nov 14
- Nov 15
- Nov 16
- Nov 17
- Nov 18
- Nov 19

2014
- Nov 11
- Nov 12
- Nov 13
- Nov 14
- Nov 15
- Nov 16

2015
- Nov 11
- Nov 12
- Nov 13
- Nov 14

2016
- Nov 11
- Nov 12
- Nov 13
- Nov 13 ½

Why so fast?
- Big data analytics assists in demand forecasting, inventory management, consolidation, route planning and real time tracking
- Upgrade of logistics facilities and infrastructure

Source: Alibaba, compiled by Fung Business Intelligence
Box 3: Interesting facts of Singles’ Day 2016

- 657 million parcels were generated on 11.11.2016. If laid side by side, the parcels span five times the area of Macau.
- Around 2.68 million couriers delivered parcels during the Singles’ Day period, with some delivering more than 200 parcels per day.
- Average value per parcel reduced from RMB 236 in 2011 to RMB 184 in 2016.
- Guangzhou ranks first in terms of the number of parcels sent.
- The cities with the largest number of snack orders are Wuhan, Shanghai and Beijing.
- 60 orders were made at the world highest Cainiao terminal, Mount Everest. Of which, the most expensive order is a pair of Dr. Martens.
- The cities with the most requests of goods returns are Nanchang, Wenzhou and Hefei.

Source: Alibaba, compiled by Fung Business Intelligence
Self-operated model:
JD.com invests heavily on logistics technology and strives for a higher level of customer satisfaction

Company background
• JD Logistics is the wholly-owned logistics unit of JD.com

Core services
• Provide integrated warehousing services, express delivery services and logistics analytics services
• Capable to handle small parcels, bulk cargo, cold chain products, etc.

Milestone

<table>
<thead>
<tr>
<th>Year</th>
<th>Event</th>
</tr>
</thead>
<tbody>
<tr>
<td>1998</td>
<td>Richard Liu established Jingdong Century Trading Co., Ltd in Beijing</td>
</tr>
<tr>
<td>2004</td>
<td>Jdlaser.com, a B2C platform, went online</td>
</tr>
<tr>
<td>2007</td>
<td>Company name was changed to Jingdong Mall. 360buy.com is the new domain name. JD started to run their own logistics team</td>
</tr>
<tr>
<td>2009</td>
<td>Jingdong Mall purchased a land with an area of 140,000 sq metre for logistics usage</td>
</tr>
<tr>
<td>2010</td>
<td>Jingdong Mall started to offer same day delivery services to selected cities</td>
</tr>
<tr>
<td>2011</td>
<td>Jingdong Mall received Round C funding of US$1.5 billion and invested in establishing a central distribution centre</td>
</tr>
<tr>
<td>2012</td>
<td>Jingdong Mall started to run their own line haul truck delivery to transport cargo between cities</td>
</tr>
<tr>
<td>2013</td>
<td>Company domain name was changed to JD.com</td>
</tr>
<tr>
<td></td>
<td>JD smart locker system was available in Beijing and Shenyang</td>
</tr>
<tr>
<td>2014</td>
<td>The first Asia No.1 logistics centre of JD starts operation in Shanghai. The smart logistics centre equips with automated system</td>
</tr>
<tr>
<td>2015</td>
<td>JD launched crowd-sourced delivery service, JD daojia</td>
</tr>
<tr>
<td>2016</td>
<td>JD announced a plan of using JD drone for rural e-commerce in 2017</td>
</tr>
<tr>
<td></td>
<td>JD gave a trial on robot delivery</td>
</tr>
<tr>
<td></td>
<td>Richard Liu revealed his digitized logistics plan for coming 12 years</td>
</tr>
<tr>
<td></td>
<td>JD daojia and Dada merged and formed a new crowd-sourced delivery company, named New Dada</td>
</tr>
<tr>
<td></td>
<td>JD opens their logistics services for e-sellers on JD platform and offers total logistics solution services to brand owners</td>
</tr>
</tbody>
</table>

Source: Head SCM, compiled by Fung Business Intelligence
Closing
Changes in shopping habits and consumer expectation are the key drivers for the upgrade of China’s logistics services

<table>
<thead>
<tr>
<th>Shopping habits</th>
<th>Business models</th>
<th>Delivery</th>
<th>Warehouse</th>
</tr>
</thead>
<tbody>
<tr>
<td>Traditional retail in the past: Consumers buy goods from stores</td>
<td>B2B</td>
<td>Project logistics operated by • Third-party logistics service provider, LSP • In-house logistics unit</td>
<td>Logistics parks • Basic warehouse functions</td>
</tr>
<tr>
<td>E-commerce in 90’s: Consumers started online shopping</td>
<td>C2C, B2C</td>
<td>• Line haul transportation • Express delivery</td>
<td>Logistics parks, city depots, stores, pick-up points • Technology for warehouse: automation, robots, IOT, wearable tech</td>
</tr>
<tr>
<td>E-commerce today: Consumers buy goods anytime, anywhere</td>
<td>B2C, B2B2C, O2O, C2C, C2B, C2M</td>
<td>• Line haul transportation • To B: Warehouse to warehouse • To B: Inter-city delivery to depots • Last mile delivery: • To B: Intra-city delivery to store • To C: door-to-door delivery + crowd-sourced delivery + pick-up points + lockers • Truck matching platform</td>
<td>Logistics parks, city depots, stores, pick-up points • Technology for warehouse: automation, robots, IOT, wearable tech • Data analytics services managing online and offline goods for same brand</td>
</tr>
</tbody>
</table>

Source: compiled by Fung Business Intelligence
Changes in shopping habits and consumer expectation are the key drivers for the upgrade of China’s logistics services (cont’d)

• Without proper order fulfillment, running e-commerce business would be a nightmare.
• E-tailers and brand owners are no longer satisfied with basic delivery and warehouse services. They may either run their own logistics arm or look for capable logistics partners who can provide total logistics solutions.
• The line between express delivery services and other forms of delivery services is blurring. Express delivery companies are facing keen competition from the self-operated logistics units of e-commerce players and other logistics counterparts, e.g. last mile solution providers, on-demand services providers (e.g. takeaways, car sharing), line-haul delivery companies, etc.
• Some express delivery companies are now moving up the value chain by diversifying their services from providing basic last mile delivery to total logistics solutions and adopting logistics technology.
• In 2017, it is expected more express delivery companies, logistics companies and retailers/ e-tailers will form alliances, so as to achieving scaled economies, expanding market coverage and capturing a larger market share.
• Finally, adopting data analytics is the one of the critical success factors for e-commerce logistics sector and resolving the pain point of the online order fulfillment issue in China.
Forthcoming

Has China’s line haul delivery sector been disrupted in the Internet era?

One of the major differences between last mile delivery and line haul delivery

**Last mile delivery**
- Parcels: 0 – 30kg

**Line haul delivery**
- Cargo: > 30 kg

Source: compiled by Fung Business Intelligence
Contact

Management Theories and Business Models

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