Boeing Drone Project: Marketing Plan

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1. Executive Summary

Drone technology has been used for many industrial applications including agriculture monitoring, construction photography, emergent goods delivery, and so forth. Recently, drone for logistics has been explored by some E-retailers or logistics providers including Amazon, DHL, UPS, Google, and so forth. With the growing numbers of both on line shopping customers and commercial drones, this creates great opportunity for Boeing to move forward and provide robust SkyExpress drone technology to those giant E-retailers such as Walmart, Apple, Walgreen, Macy, Nike etc.

According to market research, U.S online retail sales are expected to grow 57% by 2018 and estimated revenue value of $574.5 billion by 2019. There will be about $89 billion in cumulative spending on UAVs globally over the next 10 years. In addition, FAA is overseeing the gradual development of rules and systems that will guarantee safety, as well as privacy. This market research information justify that drone for logistics is an emerging market trend.

US E retailers have been selected as geographic market segmentation, due to its larger portion of on line customer and revenue. E-retailers including Walmart, Apple, Walgreen, Macy, Nike, and Barnes & Nobles are chosen because the products or packages provided match the priority of on line shoppers and limitation of drone delivery.

From customers' viewpoints, cost, convenience, and eco-friendly are recognized as value drivers with a focus on speedy delivery, low cost, and reducing ecological footprints. By considering drone delivery business model, the total drones to be sold has been estimated as 519,870 units for the next 5 years. This will come with 4.2 Billion revenue and 2.2 Billion of profits for Boeing SkyExpress. By looking at the drone technology life cycle, beachhead and whole product strategy are proposed to be used to cross the chasm and further increase the market share. Considering this industrial marketing nature, direct sale and channel model are applied and performance monitoring mechanism is implemented for maintaining competitive advantage in drone for logistics delivery market.

2. Introduction

UAV (Unmanned Aerial Vehicle) or Drone technology has been used for military intelligence, Surveillance, and Reconnaissance (ISR) for years. Currently, more business usages such as monitoring, photography or product delivery have been found in agriculture, energy, construction and other industries. These applications are considered to be driven by drone technology characteristics including the low cost, 3 D maneuverability, and speedy delivery.

These drone applications inspires more innovative logistics implication and exploration. By observing the benefits of speedy delivery, Amazon and DHL have launched pilot study or research project regarding shipping goods via Drone technology. More logistics applications have been seen in transporting pizza, books, medicine, and so forth. With more on line shopping customers and growing of commercial Drone market, the market of "Drone for logistics" is considered promising. This creates opportunity for Boeing to leverage its aerospace expertise and design competitive drones to be used for packages delivery.

The objective of this marketing plan is to analyze this market opportunity and to develop marketing strategies as well as identifying the customer segments, conducting competitors' analysis and estimating the future revenue and profits.

3. Company Analysis

3.1 Background

Boeing was founded in 1916 in the Puget Sound region, WA. Now it is a leading producer of military and commercial aircraft. Their major businesses include jetliner, military, satellite systems as well as network technology and financial solution. The total revenue in 2014 is $90.8 Billion and there are 165,000 employees worldwide [1].

Technically, Boeing specializes in large scale system integration, life cycle solution, and lean global enterprise. They also strive for focusing detailed customer knowledge and technical excellence in order to maintain its leadership position in aerospace industry. In addition, Boeing is committed to zero growth in greenhouse gas emissions, aiming to design future products with more sustainability consideration.

3.2 UAV experiences

The "commercial aircraft" as well as "Defense, Space, and Security" are considered two major businesses in Boeing. From military sectors, Boeing has experiences in designing and developing Unmanned Aerial Vehicle (UAV) including "Phantom Eye", and "ScanEagle". Phantom Eye is a high-altitude long-endurance (HALE) UAV for performing intelligence, surveillance and reconnaissance (ISR) missions, whereas ScanEagle is a small, low-cost, long-endurance UAV and also used for ISR purpose [2,3]. This indicates that Boeing has built extensive and sophisticated UAV technology competencies and remote flight control expertise for years. The success of deploying these UAV in war zone together with large commercial aircraft market share highlight its leadership position in both military and commercial aircrafts market sectors.

4. Product Analysis

4.1 Technology Assessment

There are different types of UAV or Drone used for different industrial applications including Energy, Agriculture, Forestry, Construction, Environmental Protection, Emergency Response, Film, Photography and so forth. In terms of shapes, there are fixed wing, Tilt wing, Unmanned Helicopter, and Multicopter. For source of power used for Drone, there are electric engine with zero emission

[1] Boeing, Boeing overview, 2015.
[2] http://www.airforce-technology.com/projects/phantomeyeunmannedae/
[3] http://www.casr.ca/bg-mini-uav-scaneagle.htm

and internal combustion engine with longer distance capability [4]. With the characteristics of low cost, agility and 3D maneuverability, the above UAVs or Drones technology are used mainly to provide monitoring or goods delivery functions under specific business context or emergent circumstances.

From logistics stand point, drone technology can be used for delivering goods in either urban or rural areas. This drone for logistics application was demonstrated by several examples as follows:

- Amazon Prime Air: Using Drone for product delivery from fulfillment center to door within 30 minutes.
- DHL parcelcopter: Using Drone for transporting medicine across North Sea for pick up.
- Zookal: Textbook delivery service via UAV.
- AMP Horsefly: Using mobile Electric Truck and Drone for last mile shipping.

Among these drones for logistics applications, Amazon and DHL are considered two of the most influential companies in current Business context, which will be analyzed further for product benchmarking.

4.2 Product Benchmarking

4.2.1 Amazon Prime Air

Amazon is currently a world leading E-retailer and provides customers on line shopping with various shipping options. Owing to its relatively high shipping cost and the success of Amazon Prime (speedy delivery), Amazon announced their intention of shipping packages within 30 minutes via drone or so called octocopter. Their idea is that a drone will be ready from one of the fulfillment centers, after the order is received and preparation process has been conducted. Then the drone as depicted in figure 1 will be guided to the location via GPS and land in the designated location (door or house) [5].

Although there are some issues reported including protection, battery, weather, privacy, security and so forth, the CEO of Amazon, Jeff Bezos seems to be optimistic about the future of the Amazon Prime Air. He said to CBS"I know this looks like science fiction – it's not," "It will work and it will happen. It's going to be a lot of fun."[6] Jeff also said that "When you invent something new, if

[4] DHL Trend Research, Unmanned Aerial Vehicles in Logistics, pp. 6-11, 2014.
[5] http://www.amazon.com/b?node=8037720011
[6] http://www.ibtimes.com/amazon-prime-air-5-major-weaknesses-proposed-drone-delivery-service-1491978

customers come to the party, it's disruptive to the old way."[7] Indeed, Amazon's move has attracted public attention with the following attributes:

- 30 minutes delivery time
- 5 lbs package weight limit
- 400 feet height limit
- 86% of Amazon packages applicable
- Serving customers living within 10 miles

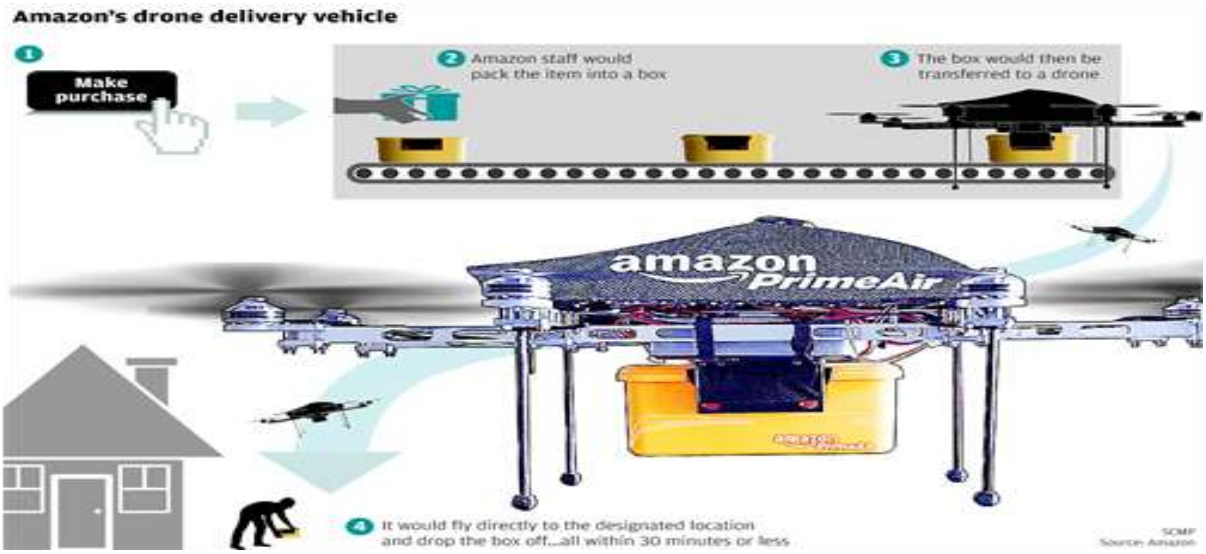

Figure 1: Amazon Prime Air Delivery Process

Source: http://www.scmp.com/news/world/article/1371340/amazon-testing-octocopter-drones-fly-packages-customers-door

4.2.2 DHL Parcelcopter

In Sep. 2014, DHL launched a research project aiming to transport a medicine across the North Sea to the island of Juist by using a Parcelcopter. The flight route is about 12 kilometers with possible interference from wind and temperature. When the DHL personnel load the needed medication to the compartment, the Parcelcopter can fly autonomously and beyond visible line of sight. This

[7] http://www.cbsnews.com/news/amazons-jeff-bezos-looks-to-the-future/

project was approved by German government and the feasibility of Drone Delivery across sea was verified [8].

Jürgen Gerdes, CEO of Deutsche Post DHL's Post - eCommerce - Parcel Division said that "Our DHL parcelcopter 2.0 is already one of the safest and most reliable flight systems in its class." This parcelcopter is based on MD 4-1000 Drone developed by Microdrones GmbH as shown in Figure 2. With the support of the Institute of Flight System Dynamics at RWTH Aachen University, this parcelcopter is equipped with the following features [9]:

- Autonomously operated with Pre-programmed GPS Waypoints
- BVLOS (Beyond Visual Line of Sight)
- Distance 18-20 Kilometers
- Altitude of 50 meters
- Speed of 18 meters per second
- Carbon Fiber body
- Water proof and Aerodynamic payload compartment
- Sea fog resistant and night mission applicable

Figure 2: DHL Parcelcopter

[8] http://www.pcworld.com/article/2687872/dhl-parcelcopter-drone-to-deliver-medicines-to-european-island.html
[9] http://www.dhl.com/en/press/releases/releases_2014/group/dhl_parcelcopter_launches_initial_operations_for_ research_purposes.html

4.3 Boeing SkyExpress product description

Based on the technology assessment and product benchmarking, the Boeing SkyExpress is designed to have the following basic specification capable of providing drone delivery either from store to door or from truck to door.

Basic specifications:

- Speed: 50 miles/ hour
- Payload: 10 lbs
- Flight Height : 400 feet
- Distance: 15~20 miles
- flight control systems:
- Sense-and-avoid sensors
- Autonomously operated with Precision GPS
- BVLOS (Beyond Visual Line of Sight)

With the extensive experience in aerospace and UAV, Boeing SkyExpress will incorporate the following enhanced Features:

- State of Art UAV flight technology
- Embedded with Artificial Intelligence control capability
- Extended Battery capacity
- Life cycle product support

The Boeing SkyExpress is depicted in Figure 3 [10].

Figure 3: Boeing SkyExpress Conceptual Drawing

[10] Source: http://www.dreamstime.com/royalty-free-stock-images-delivery-drone-post-package-d-concept-image36242209

5. Market Analysis

5.1 Market Trends

Currently, the global online retail sector has been growing very strongly. Also, e-retail sector has a predicted growth potential based on the number of industry forecasts. According to Forrester Research Inc, U.S online retail sales are expected to grow 57% by 2018 [11].

According to another survey (MarketLine, 2014) 'MarketLine U.S. online survey', by 2019, the United States online retail sector is forecast to have a value of $574.5 billion, an increase of 88.3% since 2014 and the compound annual growth rate of the e-commerce sector in the period 2014–19 is predicted to be 13.5% as shown in figure below. Comparatively, the European and Asia-Pacific sectors will grow with compound online growth rate of 11.9% and 22% respectively, over the same period, to reach respective values of $594.2bn and $752.4bn in 2019 [12].

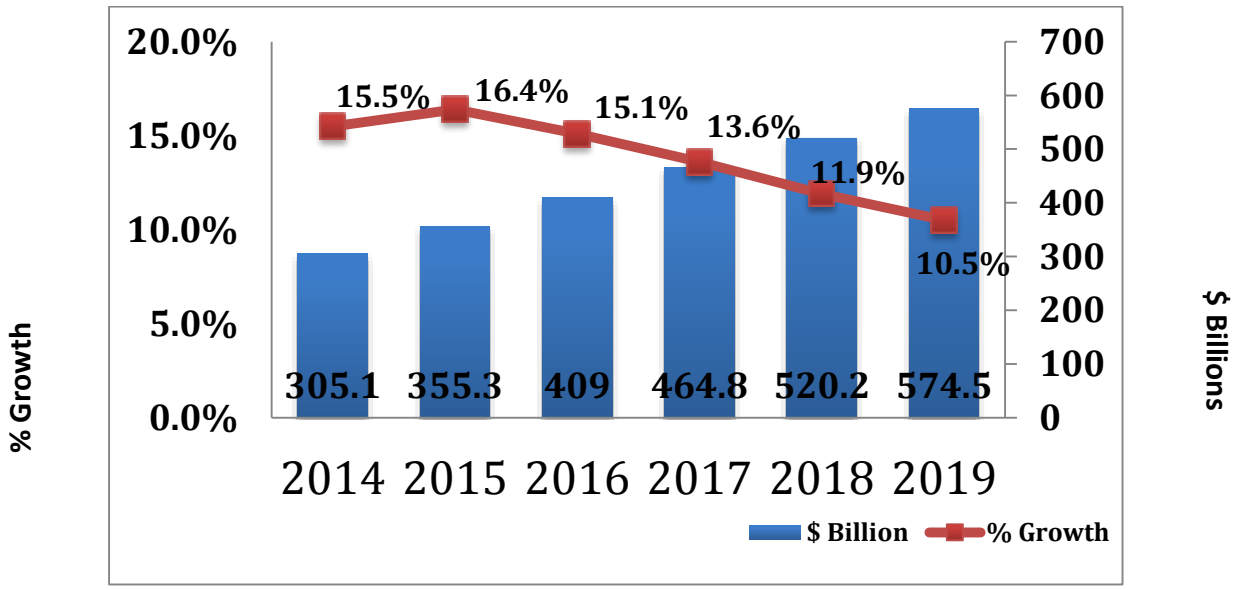

Figure 4:U.S. online retail sector value forecast (2014-2019)

[11] A. Enright, "U.S. online retail sales will grow 57% by 2018," 12 May 2014. [Online]. Available: https://www.internetretailer.com/2014/05/12/us-online-retail-sales-will-grow-57-2018.

[12] M. Line, "Online Retail in the United States," WWW.MARKETLINE.COM, 2014.

Another research estimated that in 2014, the U.S. accounted for 11.6 % of the total online retail share of total market and 55% of population prefers shopping online [13].

Drone Market: Currently, military applications dominate the global Unmanned Aerial Vehicle market, but commercial applications will quickly rise over the next 10 years. It is projected that 12% of total cumulative spending of estimated $98billion on aerial drones over the next decade will be for commercial purposes particularly after 2020 [14].

In recent times, drones have number of other applications such as:

- Agricultural drones
- Photography and Journalism
- Security and Monitoring
- Disaster recovery
- Industrial applications such as -Inventory Management, Surveillances (in huge power plants so on)
- Real Estate
- Package Delivery
- Medical and Health Care Industry

The Teal Group forecast suggests that annual spending on aerial drones will reach $11.6 billion in 2023, including a civilian and military application, that's up from about $5 billion in annual spending now.

[13] S. Market Charts, "Estimated E-Commerce Share of Total 2014 Retail Sales, US and Europe," 20 March 2014. [Online]. Available: http://www.marketingcharts.com/online/estimated-e-commerce-share-of-total-2014-retail-sales-us-and-europe-41500/.

[14] R. Rubin, "DRONES: Quickly Navigating Toward Commercial Application, Starting With E-Commerce And Retail," Bussiness Insider, 2014.

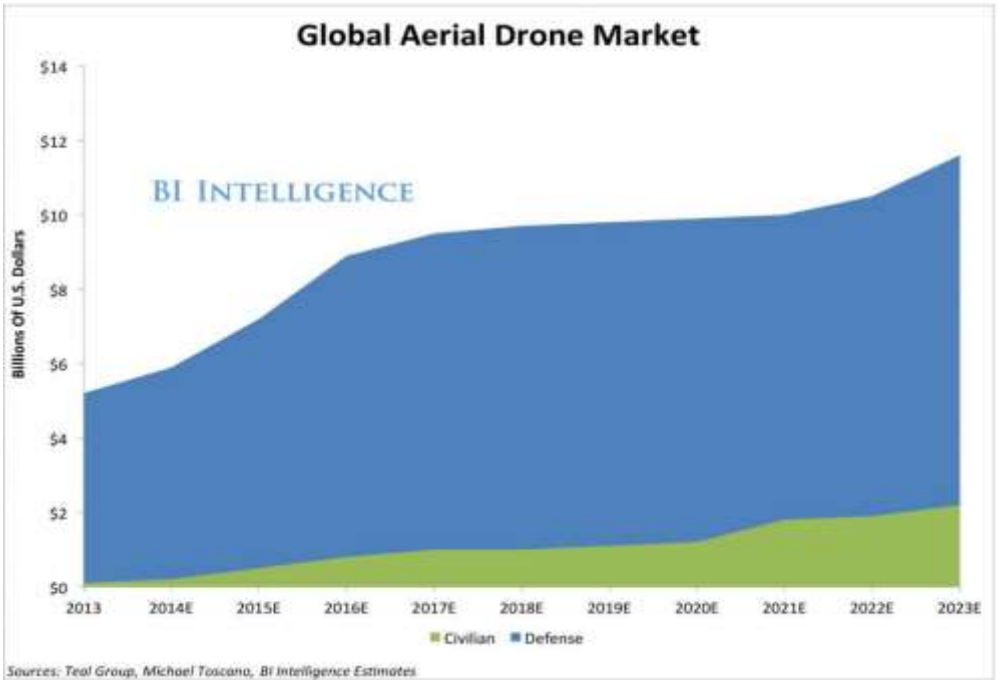

Figure 5: Global Aerial Drone Market (Rubin, 2014)

There will be about $89 billion in cumulative spending on UAVs globally over the next 10 years. Some $8.2 billion of that amount will be spent on commercial and civilian drone uses. All the above statistics indicates that there is market for drones and it is surely growing and trending towards commercial applications apart from just military uses.

Changing Laws of Federal Aviation Administration

FAA is overseeing the gradual development of rules and systems that will guarantee safety, as well as privacy for using drones commercially (Rubin, 2014).

In early 2014, the FAA chose six test sites most of them universities in Alaska, Nevada, New York, North Dakota, Texas, and Virginia to further test drones. Would-be commercial aerial drone suppliers — including firms that are currently defense contractors — will be among the companies allowed to conduct their own test flights and experiments at these sites (Rubin, 2014). The current FAA regulations around drone use commercially are[15]:

- Flying altitude should not be more than 500 feet and speed limit not to exceed 100mph

[15] M. Kosoff, "Amazon won't be able to fly its delivery drones under the FAA's proposed drone rules," Business Insider, 15 Febraury 2015. [Online]. Available: http://www.businessinsider.com/amazon-faa-drone-regulations-2015-2.

- Drones are allowed to fly only within line of sight of the operator – with operator/pilot having special pilot certificate
- Drones are not allowed to fly at night.

The FAA rules are changing gradually and they are making room for restricted but alternative and safe regulatory methods to allow drone use.

5.2 Market Need

Over the years, retail business has been dependent on transportation innovations for major advances and E-commerce would not have been possible without the modern air and ground shipping (Rubin, 2014). To be competitive in market place, there is a need for firms to invest on developing more enhanced ways to deliver products and acquire major customer base by reaching out to more customers.

Amazon "Prime Air" drones delivery research is one such initiative - as they understand that the next winner in retail will be the company that pioneers the next phase in the logistics race (Rubin, 2014). Beyond increased customer satisfaction due to timely delivery, a service like Prime Air would allow Amazon to control its distribution, rather than rely on third party transportations - FedEx and UPS (Rubin, 2014). For online retailer, Amazon seems to dominate the market with 67.9 billion total sales in 2013 as shown in chart below [16].

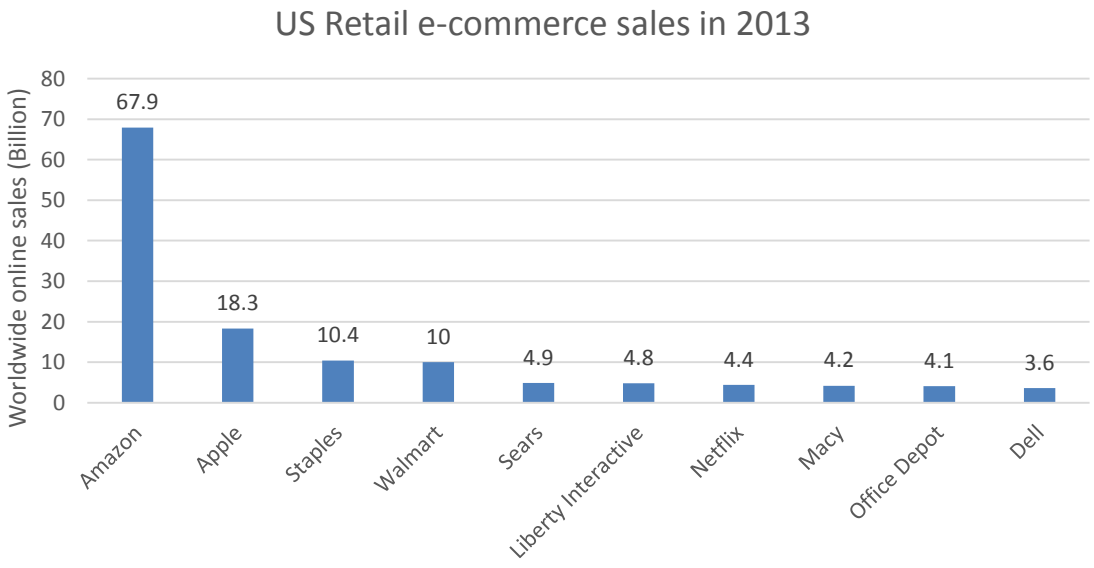

Figure 6: US Retail e-commerce Sales 2013

[16] M. Goldin, "Amazon Dominated Online Retail Sales in 2013," Mashable.com, 7 May 2014. [Online]. Available: http://mashable.com/2014/05/08/amazon-sales-chart/.

According to business insiders report, drones might be the missing link in the shipping chain that allow for nearly immediate e-commerce deliveries.

There is a need for other e-retailer to catch-up by improvising their operating efficiency and logistics of delivering products to gain competitive advantage in instant delivery race. Our product "Boing SkyExpress" is inline with the needs of this booming retailer market.

5.3 Market Opportunity

In the US, factors such as significant investment in multichannel capabilities such as endless-aisle capabilities, in-store pickup so on, by large retailers [17] and, increasing use of tablets, mobile phones, apps for shopping are the key drivers of the continued growth in the online retail sector. By 2018, mobile e-commerce alone is projected to generate total revenue of $500 billion in the U.S. The product segments that are predicted to be attractive from the point of view of online retail market are consumer electronics, Clothing/Apparel, Personal and health care products.

The electronics segment is expected to be the most lucrative sector with total revenues of $66.6bn, equivalent to 21.8% of the sector's overall value (in 2014) and the apparel/accessories/footwear segment will contribute revenues of $52.2bn equating to 17.1% of the sector's aggregate value (in 2014) as shown in figure below:

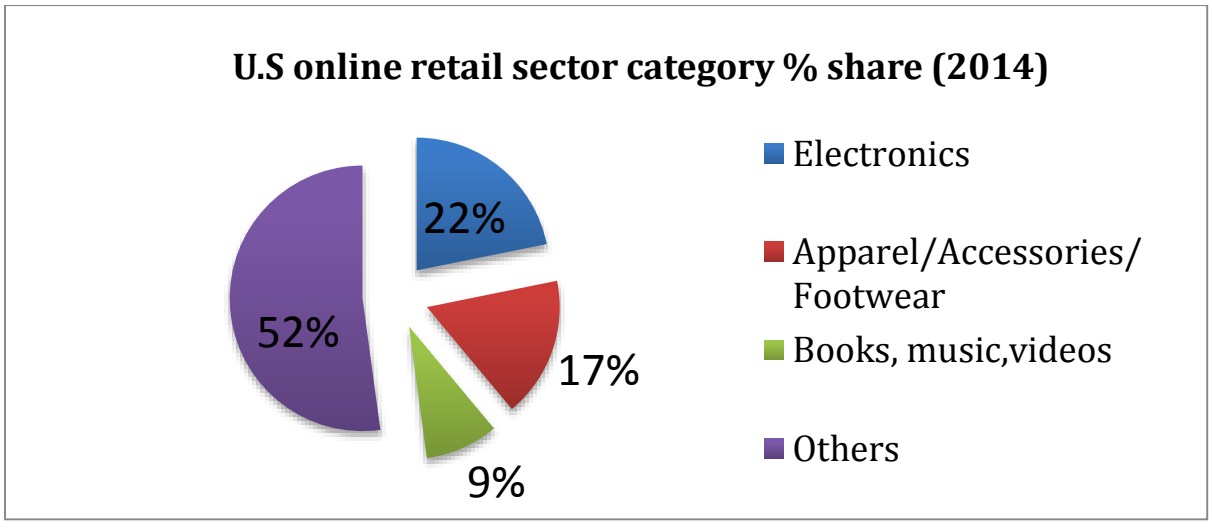

Figure 7: U.S. Online Retail Sector

[17] S. Levine, "US Online Retail Sales To Reach $370 Billion By 2017," Forrestor.com, 13 March 2013. [Online]. Available: https://www.forrester.com/US+Online+Retail+Sales+To+Reach+370+Billion+By+2017/-/E-PRE4764.

To determine the most appropriate target market customer and capitalize on the e-retail market opportunity, we needed to identify what are the consumer preferences for having a package delivered by drones and what products are mostly ordered by them.

As per a survey [18] of "Drone Analyst" people are willing to use drones in certain situations:

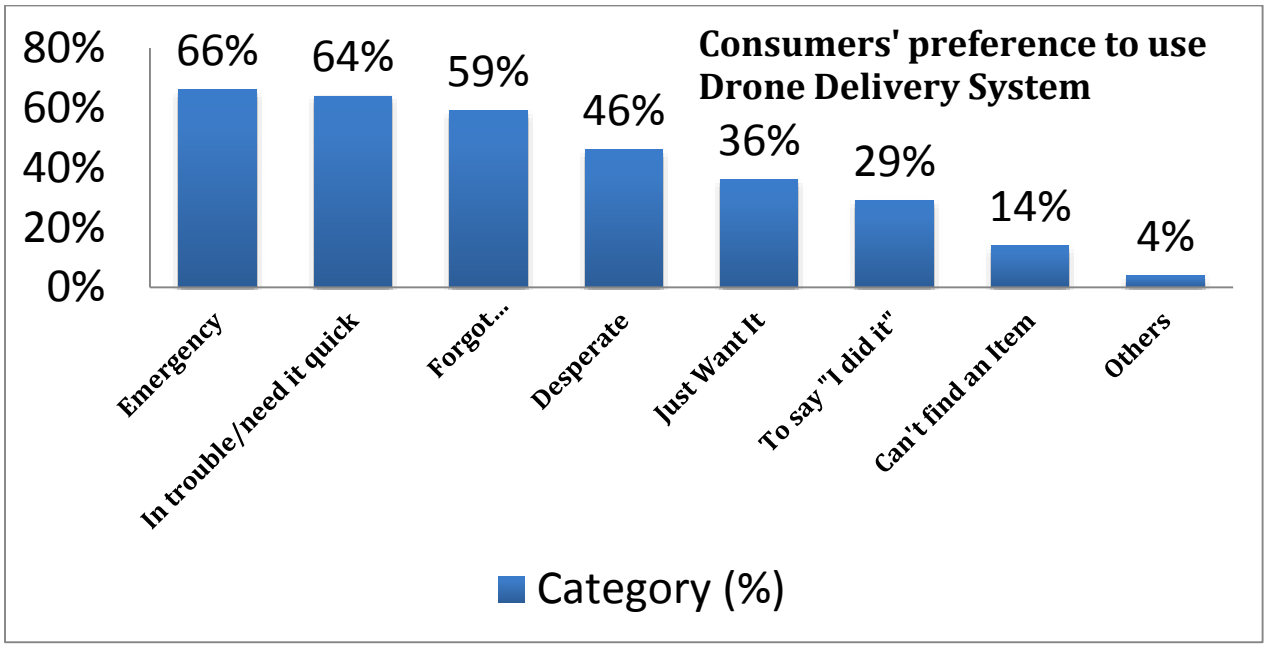

Figure 8: Consumer Preference to use Drone Delivery System

Since there is significant opportunity for e-retail drone for package delivery and sufficient growth profitability estimated from the data mentioned above, we think that targeting top retail companies that sell products both in-store and online will be the appropriate target customer. Also, there is vast application of drones in warehouse settings such as inventory management, monitoring and tracking products so on, which can be further business model for Boeing in later years as this concept is still in testing stages.

5.4 Target Market

In order to identify our target market segment, we began identifying which e-retailer will be the best fit. For determining the customer segmentation more specifically, the target market segmentation is an important step. Based on the literature research on market trend and market

[18] C. Snow, "DRONE DELIVERY: BY THE NUMBERS," Drone Analyst, 2014.

need identification, we selected e-retailers who have both in-store and online shopping option as our initial market segment.

Based on the geographic variable, North America is selected as further narrowed market segment as U.S. accounted for 30.9% of the global online retail sector value (MarketLine, 2014). Demographically, the market was segmented based on the company size and U.S growth rate percentage; large business enterprise with more customer base and growth potential is identified as our initial target market.

The highlighted blocks determine the final selection of the target market segment and last product category segment considers all the products meeting the limitation criteria as shown in figure below.

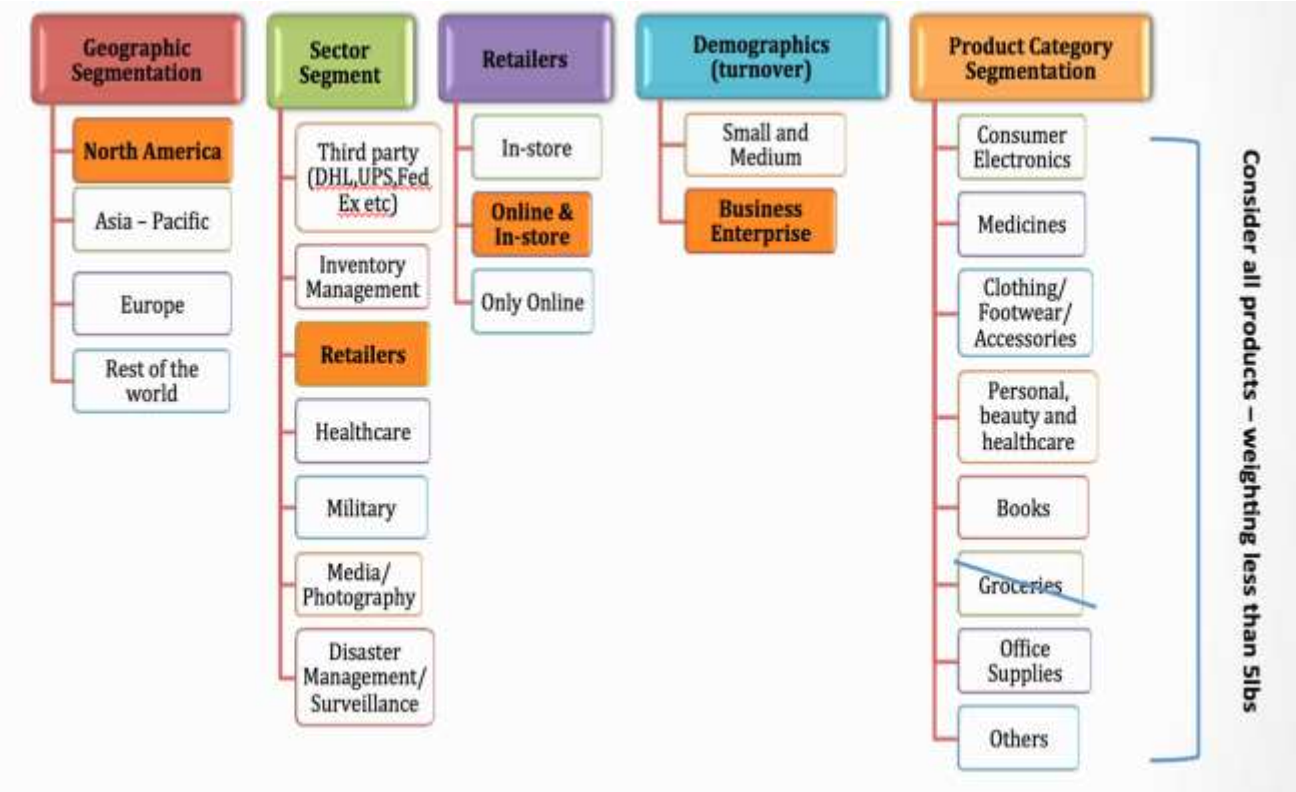

Figure 9: Target Market Segmentation

6. Customer Analysis

6.1 Online Sales

Customers order varieties of products online by using electronics means. The retailers need to have a strong supply chain and delivery system to capture this customer base. The table below shows total percent of e-commerce sales of different products. Majority of the items below can be supplied by 3-4 major retailers, based on the numbers below we identified out target customers which are discussed in more detail on the next section of this document [19].

Merchandise Line	E-Commerce as percent of total sales
Books and magazines	76.4
Clothing and clothing accessories (included foot-ware)	74.9
Computer hardware	49.9
Computer Software	55.1
Drugs, health aids , beauty aids	8.4
Electronics and appliances	80.4
Food, beer and wine	61.2
Furniture and home furnishings	75.2
Music and videos	83.7
Office equipment and supplies	72.1
Sporting goods	68.6
Toys, hobby good ,and games	60.8
Other merchandise(jewelry, souvenirs, auto parts, accessories)	48.3
Non merchandise receipts(auction commissions, shipping and handling)	67.9

Table 1: Online Sales

6.2 Target Customer

Based on the target market segment, target customers were identified. The target customers are as follows:

a) **Walmart Stores Inc**. is a multinational retail corporation that runs chains of largest discount departmental stores and warehouse stores. It is global e-commerce sales which grew 30%to over

[19] http://www.census.gov/compendia/statab/2012/tables/12s1056.pdf

$10 billion .It is world's third largest public corporation run by family business. Walmart has announced a $451 million expansion plan that will build 35 superstores [20].

b) **Walgreen Company** is the largest drugstores chain in USA with net sales of $76.4 billion in the year 2014. A quarter of the Walgreens customer order medicine online. 8217 stores are operated in USA. In the year 2014 Walgreen Company purchased the remainder of the stocks of its partner Alliance Boots and merged to form a new holding company Walgreen Boots Alliance Inc. Walgreens also runs many online stores such as Beauty.Com, drugstore.com and Visondirect.com. This makes Walgreens Online presence very strong and hence a good target customer for our business model [21].

c) **Macy** is our third target customer. It is a mid-range chain of department stores owned by American Multinational Corporation. Macy's, Inc. Online sales of Macy has increased by 40% since 2010. It is nearly around $25-28 billion annually [22].

d) **Apple Inc**. is the largest publicly traded company in the world by market capitalization. It is also the first US Company to be values at over 700 billion. The annual revenue in the year 2014 was $182 billion. It has the highest sales online after Amazon and has shown most growth in online sales for last two years. Apple is the largest music retailer but a bulk of its sales revenue comes from online sale of devices [23].

e) **Nike** is an American multinational corporation that is engaged in the design, development, manufacturing and worldwide marketing and sales of footwear, apparel, equipment, accessories and services. Nike has 30% of growth in e-commerce sales over 2013 and 2012. Online sales of Nike is approximately $ 2.1 billion [24].

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[20] http://cdn.corporate.walmart.com/66/e5/9ff9a87445949173fde56316ac5f/2014-annual-report.pdf, http://cdn.corporate.walmart.com

[21] http://en.wikipedia.org/wiki/Walgreens

[22] http://en.wikipedia.org/wiki/Macy's

[23] http://en.wikipedia.org/wiki/Apple_Inc

[24] http://en.wikipedia.org/wiki/Nike,_Inc

Company	Year					Total
	2015	2016	2017	2018	2019	Total(2015-2019)
Walmart	17035	27256	37477	47698	57919	187385
Walgreens	0	41145	65832	90519	115206	312702
Macy		0	3945	6312	8679	18936
Nike			0	1605	2568	4173
Apple				0	1325	1325
Total(units sold per year)	17035	68401	107254	146134	185697	524521
Accumulated	17035	85436	192690	338824	524521	524521
Numbers of Drone	**5**	**8**	**11**	**14**	**17**	55

Table 2: Target Customers

Our strategy is to provide drones to the largest customer Walmart first and provide them with the largest number of drones eventually. We plan to provide each customer 5 drones per distribution center for the first year of engagement. For calculation simplicity we in the above table show the calculation based on current number of distribution/stores present for each customer. In the second year of engagement with any customer we plan to increase the drones/center by three. This increment is consistent year over year. These are just projected numbers we plan to adjust and revise and market evolves.

7. Competition Analysis

7.1 Competition

Brand: Boeing's strong position in the global aerospace and defense industry provides economies of scale, as well as an enhancement of the company's brand image.

The radar chart (Figure 10) indicates the competitive analysis with Boeing and what is perceived as their main competitors, namely Amazon and DHL's Parcelcopter. As can be seen, Boeing ranks higher than its competitors concerning factors such as reputation, speedy delivery, end-to-end solution from a reliable supplier and maximum flexibility as a logistics hub. While Boeing may not have much experience in terms of using drones for commercial services, the company scores higher than its competitors in most of the attributes that all three companies were ranked again.

7.2 Competitive Analysis

Attributes	**Boeing**	**Amazon**	**DHL Parcelcopter**
Reputation	5	5	3
Quality (Service, Product)	5	4	3
Time to manufacture	5	4	4
Experience (Comm Drones)	4	3	5
Experience (UAV)	5	1	1
Cost	4	4	4
Reducing Ecological Footprint	4	4	4
Maximum flexibility as logistics hub	4	3	3
End-to-end solution from reliable supplier	5	4	2
Speedy delivery	5	4	4

Table 3: Competitive Analysis

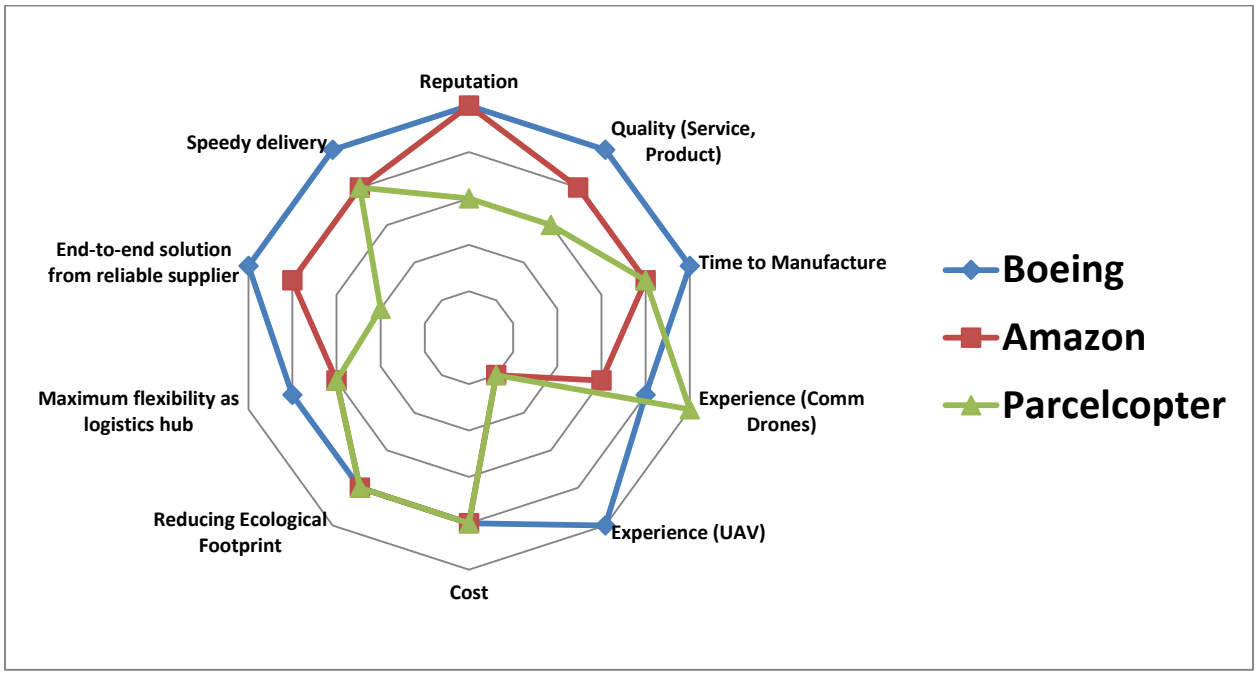

Figure 10: The Radar Chart of Competitive Analysis

7.3 SWOT Analysis

Boeing's SWOT analysis is demonstrated in Table 4. Boeing's strength lays in its strong market position and brand image, strong research and development (R&D) and an institutional bias, which will provide it with credibility when dealing with huge retailers.

Boeing's over-reliance on subcontractors and suppliers for provisions such as raw materials, integrated components, sub-assemblies and production commodities. Delivery delays and other performance problems may result in Boeing's inability to meet customer commitments; ultimately increasing operating cost and profitability.

Diversifying operations into the retail sector, apart from providing Boeing with more visibility and notice, will also position them to take advantage of the potential growth in the retail sector by boosting sales and revenue.

Indications are that there is, and would be intense competition in the drone market space, which could result in the erosion of market share for the players. This, together with the concentration of customer portfolio could pose a threat to Boeing's operations in the retail sector.

Strengths	Weaknesses
• Strong market position that enhances brand image and competitive advantage • (R&D) allows maintaining robust market position • Institutional bias would provide credibility when dealing with huge retailers • Increasing operational performance to help fund future growth plan	• Used to higher operations with higher user bias, such as big government contracts/long projects • Dependence on subcontractors and suppliers can increase operating cost and profitability
Opportunities	**Threats**
• Growing retail market would help boost sales and revenue • More visibility and notice for Boeing in other spaces in addition to their traditional areas • Shift into the drone delivery space could provide growth for company	• Intense competition in the drone market space could erode market share • Concentration of customer financing portfolio could affect earnings and cash flow

Table 4: SWOT Analysis

8. Value Analysis

8.1 Value Drivers and Value Proposition

"Why wait when you can DRONE"

Current scheme of logistics management lacks flexibility and consumes a lot of time in last leg of delivery (final warehouse to customer). This challenge can be met by using small and efficient delivery vehicles like drones that can go to each customer individual. This will not only reduce cost but also help in speedy delivery Using drone is very attractive due to aforementioned reasons. However there are challenges around licensing, maintenance and cost effectiveness if every retailer maintains their own fleet of drones. Boeing has the engineering capability and technical knowhow to provide drone delivery to multiple customers. This helps customers realize the benefits of drones delivery without worrying about licensing, maintenance and liability overheads. This also helps the retailer to reduce ecological footprints.

8.2 Compelling Reason to Act

Amazon has, and continues to capture greater part of market share with key drivers pertaining to low cost delivery and operational efficiency. For example, in 2013, US retail e-commerce sales showed that while sales for Amazon was $67.9 billion, the other nine companies in the top ten category had a combined sales of $64.7 billion, indicating that a radical shift in approach in terms of e-retail is required on the part of these companies in order to halt the Amazon's dominance.

8.3 Technology Adoption Life Cycle

The Boeing drone is not the first mover for commercial delivery. However, Boeing plays an important role as a technical market leader in commercial drone delivery because Boeing has whole products through differentiated value propositions. Boeing's market first market segment is the Walmart that is the early stage of Early Majority (Pragmatists) heading for the mainstream market rather than Innovators or Early Adopters in the early market (Figure 11). So target segments like Walmart indicate prudent managements and tend to stay with in "reasonable" and within budget [25]. Walmart want to expand their market share in e-retail market and the e-retail business depends on transportation innovations beyond increased customer satisfaction due to timely delivery. For the niche market, Boeing should use direct sales to open up the niche, identify a beachhead and provide whole product not product.

[25] Moore, G. A., Crossing the chasm, 2002

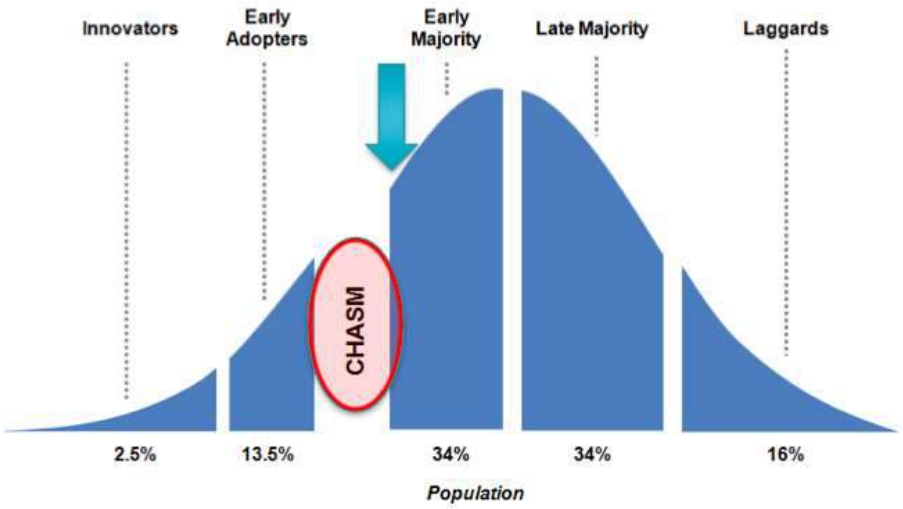

Figure 11: Boeing Drone Position in the Technology Adoption Life Cycle[26]

To successfully cross the chasm, Boeing will supply evolved drones that are differentiated but standardized types from Boing SKYEXPRESS-drone to E&P (Eco & Power) drone via Jet-drone. The selected beachhead, Walmart provides Walgreens and Top 10 e-retailors as adjacencies and contiguous segments (Figure 12).

Pragmatist market requires the development of a completed, end-to-end solution for customers' need, or the whole product. Figure 16 displays the whole product of Boeing drone such as cost merit, brand value, customization, technical quality, mass-manufacturing standardization, global distribution, and full package service (Figure 13) These whole product function as various solutions for customers' business and technical problems.

[26] Mohr, J. J., Sengupta, S., & Slater, S. F., *Marketing of high-technology products and innovations*. Pearson Prentice Hall pp. 239-249, 2009.

Figure 12: Bowling Alley Market Development of Boeing Drone

Figure 13: The Whole Product of Boeing Drone

9. Marketing Strategy

9.1 Product Strategy

In view of the growing need of speedy delivery in E retailing market, Boeing needs to adopt the Focus strategy by leveraging its system engineering expertise to provide robust drone products for niche market with customization attributes. With the extensive experiences in aerospace and strong brand reputation, Boeing can develop the SkyExpress with unbeatable specification and performance with competitive price. In addition, by adopting the concept of common platform, Boeing can develop variants of drones for the customers with specific needs. Namely, the Product strategy eventually need to aligned with customers' requirements including speedy delivery, cost efficiency and customer delight as depicted in Figure below.

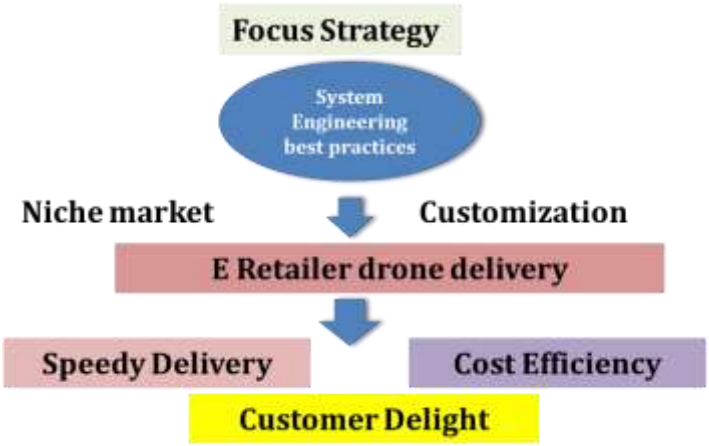

Figure 14: Boeing SkyExress Product Strategy

9.2 Pricing Strategy

9.2.1 Financial Objectives

The Financial Objectives for Boeing Drone Project is listed as follows:

- Best performance with a competitive price: This will sustain Boeing's strong brand image and retain customers' loyalty.
- Leverage past UAV development cost control experience: With extensive UAV experiences, cost efficiency can be enhanced by robust cost estimating and control system.
- Consistent profit growth: By entering this emergent E retailer drone delivery market, the profit growth rate should be maintained to align Boeing corporate growth target.

9.2.2 Pricing Analysis

Based on the benchmarking study, unit price may range from $5000~$9000. Monthly units sold are estimated: 1000~2000. Marginal income shows that "$8000" will be more likely to obtain the highest marginal income and profit as shown in the Figure below.

Revenue and Variable Cost Matrix (monthly)

Selling Price Range	Est Sale Units per month	Revenue	Variable Cost: 4500 (High)	Variable Cost: 3000 (Low)	Marginal Income at H VC	Marginal Income at L VC
			4500	3000		
5000	2000	10000000	9000000	6000000	1000000	4000000
6000	1700	10200000	7650000	5100000	2550000	5100000
7000	1500	10500000	6750000	4500000	3750000	6000000
8000	1300	10400000	5850000	3900000	4550000	6500000
9000	1000	9000000	4500000	3000000	4500000	6000000

item	Fixed Cost (high)	Fixed Cost (low)
Depreciation	250000	250000
Corporate	50000	40000
Operations	2700000	1810000
Staff	1500000	1500000
Total Fixed Cost	4500000	3600000

Fixed Cost Matrix

Selling Price Range	Profit at H VC+FC	Profit at L VC+FC
5000	-3500000	400000
6000	-1950000	1500000
7000	-750000	2400000
8000	50000	2900000
9000	0	2400000

Profit Matrix

Figure 15: Pricing Analysis

9.2.3 Breakeven Analysis

Under the estimation and assumption of Unit Price: $8000, Fixed Cost: $4,050,000, and Variable Cost: $3,750, the breakeven analysis can be conducted to identify the minimum quantities for balancing profit and cost. The result shows that 953 units is the breakeven point, meaning that the profit becomes zero at this point and will start to obtain positive profit after this point.

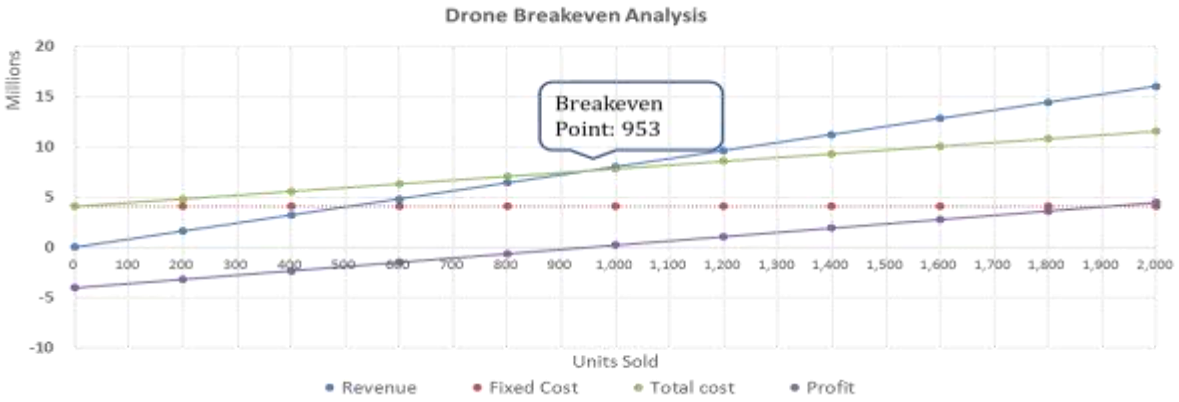

Figure 16: Breakeven Analysis

9.2.4 Customer Requirement and Benefit Analysis

In addition to estimating the cost and price of the Boeing SkyExpress Drone, we may need to conduct customer requirement and benefit analysis, in order to convince customers to accept Boeing products and to make clear how Boeing products can provide benefit to customers in financial sense. Walmart will be used as an example to illustrate this analytical process. Firstly, we need to calculate the quantities of drone required for each Walmart store under business scenario of store to door drone delivery business model. By collecting global customers and percentages of US and on-line portion information, the potential weekly customers of using drone delivery is estimated as 5.46 million. With the estimation of 60% packages applicable to drone shipping and 20 daily deliveries, the averaged numbers of drone needed daily is estimated as 5.18. The analytical process is depicted in the table below [27,28].

Walmart customers and drone delivery analysis						
Global Customers Weekly	US customers weekly	On line customers in US weekly	US drone delivery weekly	Drone delivery in each store weekly	Drone delivery in each store daily	Averaged Numbers of Drone Needed daily
250,000,000.00	150,000,000.00	5,460,000.00	3,276,000.00	725.42	103.63	5.18
Walmart Weekly Customers in 27 countries is 250 million.	US accounts for 60% of total Global customers.	Walmart on line sale is 10 billion, which is 3.64% of the total revenue of 274.4 Billion in US 2013.	60% Walmart Packages applicable for Drone Delivery.	Walmart US: 4516 stores	7 days in a week.	Estimate 20 deliveries per drone in a day.

Table 5: Walmart customers for drone delivery analysis

Secondly, for customer benefit analysis, we compare the benefits of same day delivery and drone delivery for Walmart. It can be assumed that averaged drone delivery cost will be about 70% of that same day delivery by truck, due to the relatively higher cost of diesel fuel compared with that of electricity used by drone. Higher fee as $18 paid by customer is estimated, owing to the perceived advantage of speed delivery. With the estimation of 20 deliveries daily, the drone saving multiplier

[27] Walmart, Walmart annual report, 2014.

[28] http://www.statista.com/statistics/293163/e-commerce-sales-of-us-retail-chains/

is calculated as 6.2 times of the same day delivery by truck. Namely, the saving comes from both the direct cost reduction as well as higher fee paid by the customers as shown in Table below [29,30].

Walmart Drone Delivery Benefit Analysis						
Walmart Delivery Options	Estimated Averaged Cost	Estimated Averaged Fee	Estimated Balance	Estimated Numbers of Deliveries daily	Estimated saving daily	Measure of Saving Multiplier
Same day delivery	8	12	4	10	40	1
Drone delivery	5.6	18	12.4	20	248	6.2
Notes	The drone cost is estimated 70% of the truck delivery, considering lower cost of electricity.	Customers will be likely to pay more, due to speed delivery.	Balance is equal to the difference between Fee and cost.	By Assuming 30 minutes delivery, a drone can conduct 20 deliveries daily.	Saving is equal to Balance multiplied by numbers of deliveries	Drone delivery saving estimates to be 6 times more than truck delivery.

Table 6: Walmart Benefit Analysis

9.2.5 Sales Plan

Based on the average growth rate of 0.37, the units sold are estimated as follows: 2015: 17,035 units, 2016: 68,401 units, 2017: 107,254 units, 2018: 146,134 units, 2019: 185,697 units, Total: 524,521 units. With these units sold data, 5 Years Sales Forecast and accumulated summation are conducted as shown in the figures below, which bring Total Revenue: 4.2 Billion and Total Profit: 2.2 Billion for Boeing.

[29] http://help.walmart.com/app/answers/detail/a_id/276/~/shipping-costs

[30] http://robohub.org/the-economics-of-amazons-delivery-drones/

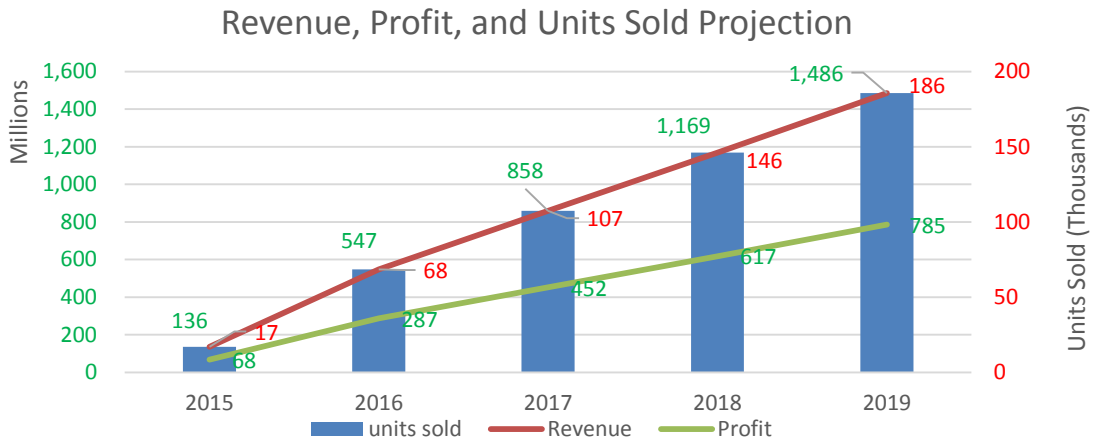

Figure 17: 5 year Revenue, Profit, and Units Sold Projection

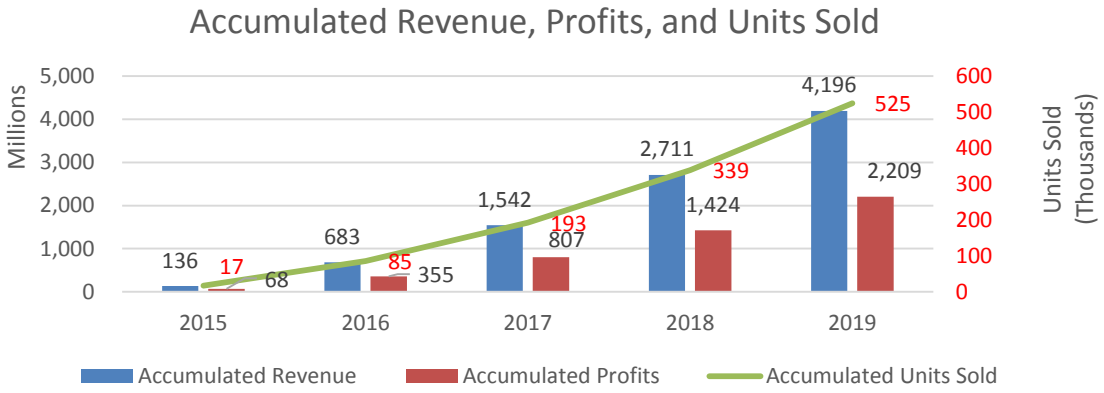

Figure 18: Accumulated Revenue, Profits, and Units Sold

9.3 Promotion Strategy

Boeing Drone promotion strategy will satisfy following key objectives:

- ✓ Boeing Drone initiates strong awareness
- ✓ Distinctive Boeing Brand value – Top in the sky
- ✓ Boeing Drone helps your biz success from e-retail to retail
- ✓ Customer Relationship Management for B2B retailors
- ✓ Win market share over e-retailor delivery

The marketing communication plan will used to deliver the key messages for our segments, top 11 e-retailors, and potential segments like other e-retailors and retailors (Figure 19). Our business strategy is focused on B2B marketing first. For this achievement, our primary communication method will be personal selling (sale force) and vertical marketing. It means that customer

relationship management is one of key strategies by key account managers working with leaders who are decision-makers in top of Figure 20. The starting point of the marketing communication will be personal selling but next communicating methods like catalogue, whitepaper, mail contact and trade show will be used for diffusing Boeing drone awareness. As the next step, public relations can be developed to install a positive image consistently to the Federal Aviation Administration (FAA) (Figure 20).

Figure 19: Steps in Planning and Executing Promotion of Boeing Drone

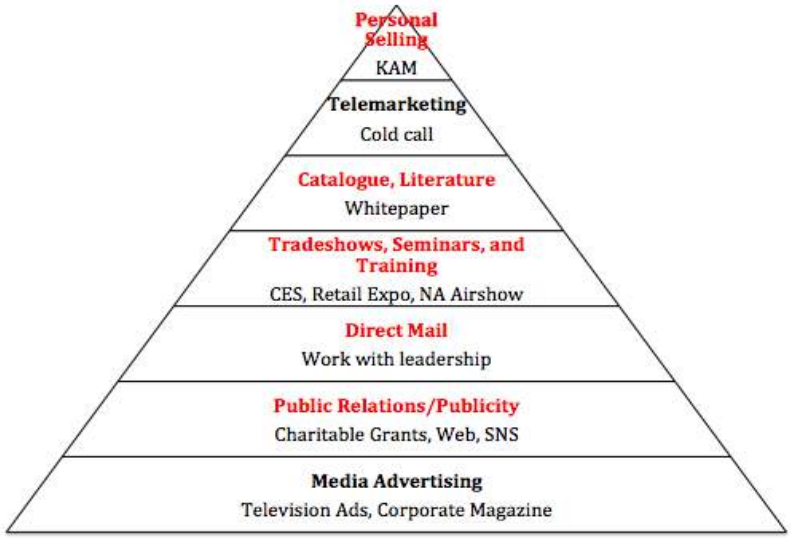

Figure 20: Marketing Communication Methods

9.4 Place & Distribution Strategy

Boeing is reliable technology mover that standardization quickly is possible in mass-manufacture and has best brand power in service and quality. These strengths help our customers (Top 10 e-retailors) make particular business in efficiency, productivity and cost-merit. Nevertheless, because

the drone product is not familiar to the customers, we will utilize direct channels like company sale force, company website, and company-owned branches or subsidiaries (Figure 21). Pragmatists prefer minimum distribution and our approach is suitable for its' preference. Boeing has a few of representative big branch in US local sites such as Washington, California, Missouri, Alabama, Arizona, Kansas, Pennsylvania, South Carolina, Texas, Others. Of course, Boeing will be available to respond even further to the expanded e-retailors and retailors segments because of its superior global supply chain.

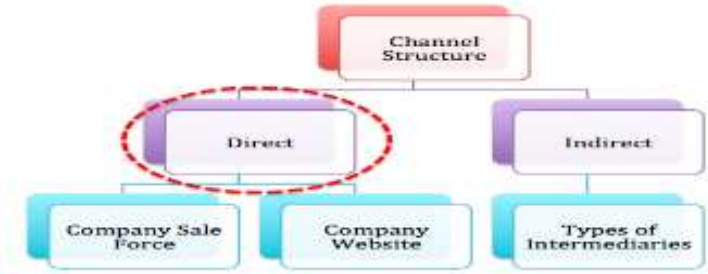

Figure 21: Channel Structure of Distribution[31]

10. Marketing Plan Performance Monitor

The Boeing Sales and Marketing Organization (BSMO) team will be responsible for the implementation of this marketing plan and managing the marketing budget through quarterly checkpoints (Figure 22). The BSMO team and relevant teams will work together for the best implementation of marketing plan. The progress of CRM-centered marketing plan and efforts for new customers can be monitored on a quarterly basis. The team will check the industry trends by deploying benchmarking in the end of the first year. Assessment monitoring like financial, growth, and promotion should be addressed as important as initiatives in marketing plan. The pathway to such performance monitor is clear. First, it makes sense to survey the company's current marketing plan landscape. Next, throughout all this activity, managers must communicate clearly about marketing goals and processes. Therefore, the performance of the marketing plan should be monitored periodically over the short and long terms.

[31] Mohr, J. J., Sengupta, S., & Slater, S. F, *Marketing of high-technology products and innovations*. Pearson Prentice Hall pp. 318-333, 2009.

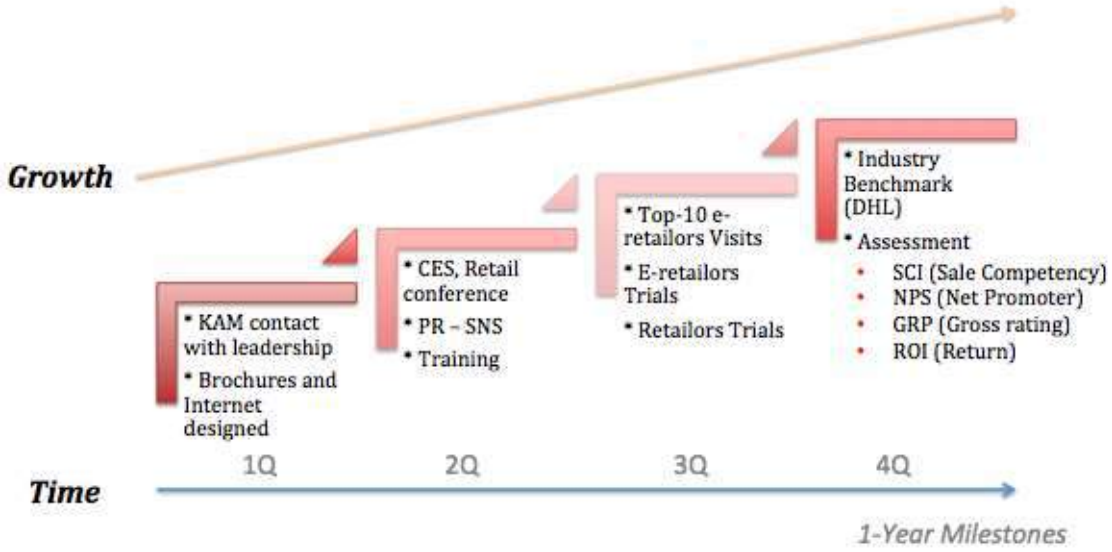

Figure 22: 1-Year Milestones

11. Technology Roadmap

The first Boeing Drone focused on reasonable efficiency to cross the chasm and supporting technology to reduce risks by market-pull. To penetrate the core of mainstream market, Boing should provide not only mass-customized drone but also standardized drone. Main goal is to reduce complexity, increase proliferation. However, on the other hand, technically differentiated novel drones should be developed and provided continuously for expanding new segments. Boeing's use of resources as well as the combined ideas through benchmarking or the alliance relationships will contribute to opening up new market (Figure 23).

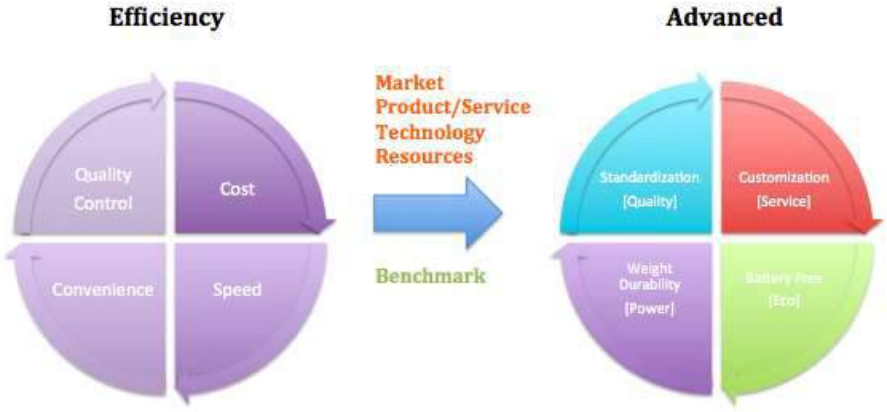

Figure 23: Technology Roadmap for Boeing Drone

12. Marketing Organization and Budget

12.1 Marketing Organization

Considering the characteristics of drone delivery and the content of marketing plan, a marketing organization is proposed to include several departments including market research, Technical support, Product managers, Social media, and Customer Relation. The Chief Marketing Officer (CMO) can supervise all the marketing activities with a focus on market research, social media, and customer relation. CMO can appoint a deputy marketing officer, who can specialize the technical aspects of marketing tasks such as technical support and product management.

Figure 24: Marketing Organization Chart

12.2 Marketing Budget

The marketing budget is estimated by the percentage of revenue. With the 5 years assumption of 20%, 5%, 4%, 3%, and 2% from 2015 through 2019, the marketing budget is set to be $27, $27, $34, $35, and $30 million respectively. Although the budget ratio gradually declines, the budget will be maintained at about averaged 30.6 million dollars to support all the required marketing efforts each year.

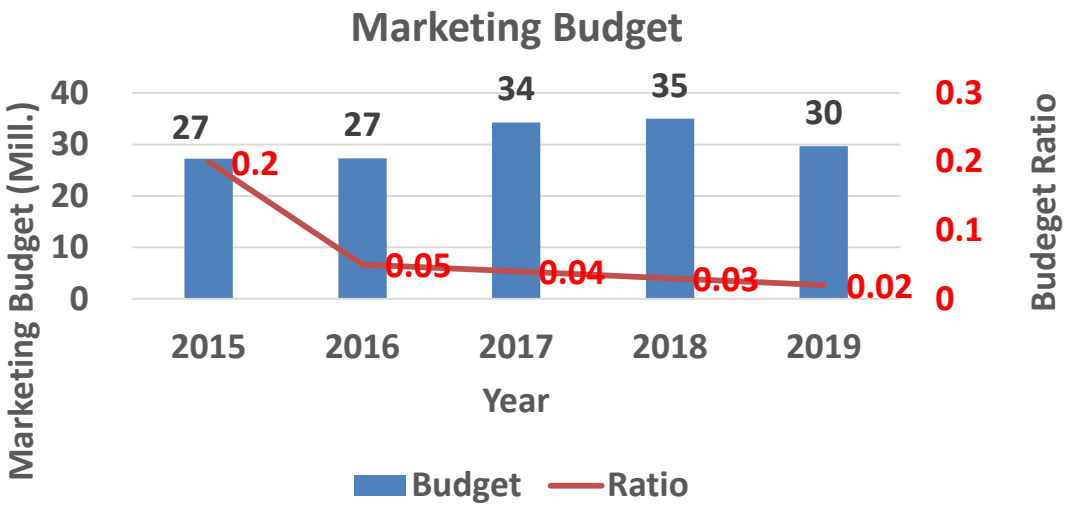

Figure 25: Marketing Budget

13. Conclusion and Recommendations

With the market growing in Internet Retailing and Commercial Drones Application, the Drone Delivery can be considered as an emerging market opportunity in the future. By leveraging technical expertise and extensive experiences in aerospace, Boeing can provide efficient, reliable, and more competitive drone products to E Retailer customers.

Based on the market, customer, and price analysis, the estimated revenue is promising with ecological sense as a plus. FAA law regulation is a limitation and key to the success of this marketing proposal, which requires Boeing and other competitors to strive for conquering the challenges or creating other innovative drone delivery business model.

Drone Delivery system is still a niche market and there are many unknowns. At this point the risk to reward ratio seems too high to venture into. This is especially a big risk for large corporation due to the liability risks involved. Till there are more regulations and safety features defined for Drone aviation, this area of investment has more risk than reward. But as time progresses this area could be lucrative investment. So our recommendation would be to drive for industry wide consensus on safety and other guidelines before investing into manufacturing drones

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