Stitch Fix: A Company Driving Personal Style through Data Science

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Table of Contents

Abstract

Stitch Fix is on a mission to change the way people buy clothes using the combination of data analytics and human judgement which results into delivering the personalized attention to every customer. This unique ability differentiates this company from highly aggressive e-commerce sector. This research paper focuses on understanding the quick evolution of this company and technology behind it such as machine learning algorithms. This paper concludes by suggesting two recommendations which can help this company to grow further in size and revenue.

Brief Corporate History

The data-driven world we live in today clearly has no limitations on where it can be applied. But only a true innovator like Katrina Lake could see the simple-yet-formidable marriage between the $334 billion-dollar US apparel industry and the trillion-dollar phenomenon called Big Data (Smiley, 2019). Lake started her journey with Stitch-Fix in 2011 with Erin Morrison Flynn and ran operations out of her apartment in Cambridge, Massachusetts during her time at Harvard Business School (Smiley, 2019). Although working with a much smaller team then, Lake and Flynn quickly began to realize the power of algorithms in optimizing customization and delivery logistics to customers.

Fast forward to today and Lake now heads a successful start-up that is valued at $2 billion, crossing the $45 million earnings mark in 2018 and already generating a revenue of $366 million in Q1 2019 (Smiley, 2019). All this in the face on competition that is arguably the biggest e-commerce organization in the world – Amazon. Lake owes that success to the differentiating factor Stitch-Fix embodies in its services. With 3900 stylists and over 75 data scientists, Stitch-Fix lets its algorithms dictate its every move (Smiley, 2019).

The company has been a medium through which “lazy buyers” have easy access to everyday fashion, starting with only women’s apparel but expanding into men’s, children and plus-sized categories until very recently crossing the waters to start operations in the UK as well (Smiley, 2019). With a plan to cater to more countries in the very near future, Lake sees her company take over the world of easy fashion, tying up with suppliers and brands that see Stitch-Fix as a channel through which inventory flows away from their brick and mortar alternatives. The model has seen success until now too, with Stitch-Fix being able to rotate its inventory 6 times per year as compared to 4 times a year by stand-alone apparel retailers (Smiley, 2019).

The company can only turn in such extraordinary numbers when it is able to collect information that feeds its machine learning models. The raw ingredient is user data and feedback, which allows Stitch-Fix to evaluate clothing styles and pass it along to its stylists, who validate and correct the model's recommendations based on past-purchases and customer feedback to finally ship 5 customized items to the buyer suiting in the comfort of his/her home. The company charges $20 as a styling fee, a one-time charge that gets credited to the purchase if the buyer decides to keep at least one of the shipped items. They also allow for returns, giving buyers 3 days to decide if they want to keep the shipped merchandise.

A 1000 and growing number of suppliers give stylists a plethora of options to choose from while recommending apparel to customers. If this wasn't enough, Stitch-Fix has started manufacturing its own brand of attire and proudly states that it makes up 20% of items in every accepted shipment (Smiley, 2019). The short timeline between recommendation, shipping and returning is what keeps inventory circulating at Stitch-Fix, an important process allows the right item with the right fit to reach the right person. Such innovation is what is keeping Stitch-Fix afloat while so many iterations of e-commerce companies are sinking despite multi-million-dollar funding rounds. The fact that it has taken only 7 years for a company like Stitch-Fix to scale exponentially and turn so profitable that behemoths like Amazon want to enter the same space and compete, is evidance to the fact that Stitch-Fix finds itself on the list of the top 50 most innovative companies in 2018 and 2019.

The Recommendation Algorithms

Such is the power of data-driven decisions that most content and service centric companies are using some sort of in-house descriptive and predictive data model to process their

unstructured data into meaningful decision-making metrics. Ever since Netflix entered and conquered the video-content market with its recommendation algorithm, we've seen more and more services channel their efforts towards data science and how it can make them achieve greater market penetration (Smiley, 2019; Budds, 2017). Stitch-Fix is one of the new companies applying the same practices to its apparel retail platform. What makes it innovative is following VG's first box of managing the present by intelligently pairing their data inflow with the offerings of the apparel industry, a previously unheard-of methodology (Govindarajan, 2016).

The model requires Stitch-Fix to request all its customers to give it a brief background about their likes and dislikes in their wardrobe. There is also the option to link their social-media accounts like Pinterest and Instagram where they post content that defines their personality and style preferences (Budds, 2017). Their in-house artificial intelligence takes care of the rest, not only matching warehouse inventories with the customer preferences but the nearest warehouse for delivery to the logistics company, the best-path to the item within the warehouse and the appropriate item specifications and style that was recommended (Smiley, 2019).

The model's work isn't done yet. As the CEO mentions, a major factor of the company's success is training their model to know each client better (LaPorte, 2017). The model welcomes feedback using natural language processing and customer notes on their website in the case of a return and processes it to realize what data points in the previous order were interpreted incorrectly. This helps the artificial intelligence to learn more about the client and use this new-found information to recommend apparel that is fine-tuned to customer needs.

If this were all Stitch-Fix did, then it wouldn't be nearly as successful than it is today. But they've managed to practice VG's third box of creating the future by leveraging their data to model new items using the best features of their most highly rated items (Govindarajan, 2016).

Fondly called ‘Hybrid Design’, the initiative identifies opportunities in the market by detecting gaps i.e. customer needs that are not fulfilled by current items in the catalog (Budds, 2017). These creations make a mere 1% of the total inventory and are not atrocious combinations of other items, but simplistic and fashion-forward designs that are being very well received by clients (Budds, 2017).

The Chief Algorithm Officer states there are two simple criteria’s as to why their business model works for the average Joe – people have the need to fit in while also maintaining an individualistic identity (Budds, 2017). The artificial intelligence being built and used at Stitch-Fix is programmed to cater to both needs.

The Human Element

As much as data models are helpful in guiding business decisions, they are prone to errors, no matter how fine-tuned they are. Stitch-Fix keeps Doz’s seventh rule in mind and allocates a fair share of their resources to the human element of their decision making (Wilson & Doz, 2012). It’s not that their artificial intelligence is incapable of fantastic item recommendations, but the organization believes that humans add a layer of personalization to the entire process that computers are incapable of (Smiley, 2019).

So rather than be a completely data-driven firm, the employees at Stitch-Fix fine-tune their artificial intelligence algorithms to provide item recommendations which are then given to stylists who further enhance the options based on customer preferences and past-experiences. The benefit to this is two-fold – there is a medium of communication that is established between client and stylist that can be used as effective input on client feedback, while also shedding light on details that are more human readable than machine readable.

The match score that the algorithm publishes along with each recommended item is duly considered by each stylist, but is weighed based on past purchases, returns and customer notes. This tangible feedback is translated back to its brand partners and highlights not just the purchase probability of the item in their catalog, but also why the probability of it being purchased is higher or lower (Smiley, 2019). This makes brands more aware of their styles and fit, providing critical insights in the marketplace, which improves their quality should they choose to act on it, which rounds back to better experiences of Stitch-Fix's platform. Clearly a win-win situation for all.

The Feedback Dimension

Stitch-Fix seems to have figured out what to do with the data they have, but that wasn't always the case. Due to process of their model, it seemed like customers were only willing to give feedback, if any, about the 5 items that were shipped to them. This created a gap in their data model which prevented them from receiving input on most of its inventory. Since cycling through inventory rapidly is the only way Stitch-Fix gathers data about its customers, their data-scientists had a new problem on their hand.

Chris Moody, a data manager at Stich-Fix since 2015, is one such innovator who took the problem of lacking data and decided to figure out a solution. Moody argues that the only way a customer will provide information and feedback is if there is a clear incentive to do so (Smiley, 2019; Marr, 2018). The result is a structured and intuitive app that resides on mobile platforms to directly feed its entries into training the styling data model. The user-interface presents itself almost as a game with simple swiping gestures that let customers and app-users browse through Stitch-Fit's inventory and rate each item.

The app doesn't just present random apparel choices but takes the initial set of individual preferences and selectively presents matches that are tailored to the user. With every decision to like or dislike a certain item, the data model trains itself to better understand the user and thus provides refined recommendations for when the user attempts to buy items (Smiley, 2019; Budds, 2017).

The advantage of such a simple yet powerful innovation doesn't just trickle down as value for the customer but leaves room for Stitch-Fix as a company to comprehend what are the trends that people are following. This relay of information allows them to communicate customer needs to their suppliers and maintain a healthy supply of inventory that caters to their customer demands.

Recommendations

For an industry that is going to maintain a steady growth rate of 1.3% until 2023, the competition is fierce to capture the majority of the market share (O'Connor, 2018). Brick and mortar stores as well as online retailers are all maintaining cut-throat margins to keep prices cheap while exposing themselves to the largest audience. In the midst of all this competition, Stitch-Fix has carved out a small niche for itself and has proved a boutique-startup powered by Big Data to take on the titans in the industry.

Stich-Fix will have to continue innovating in its space if it wants to remain ahead of the curve and even relevant. Some of the things it could do are as follows –

1) Globalization is the natural choice for the future of Stitch Fix. For a company that leverages a data model to train its artificial intelligence to drive fashion recommendations,

Stitch-Fix finds itself perfectly placed to cater to international markets and personalize its catalog based on individual market demands. Their policy of organic and steady growth is enviable in a time where tech startups have exaggerated funding. Having already proved that they can be profitable without the unreasonable amounts of money venture capitalists tend to throw at startups, Stitch-Fix has the bold decision to make if they are ready to take on the globe. Having already set plans into motion for a launch in the United Kingdom, Stitch-Fix can avoid missing a trick by first targeting markets closer to home, with Canada, Mexico and even Brazil being top choices for high growth economies. This would allow them to learn about foreign markets who have new but similar tastes like the American market but also expose its artificial intelligence to different style trends. Stitch-Fix would be better served if they attempt to conquer one continent at a time rather than have multiple operations in different locations without any exposure to BRIC-like economies.

2) The market for accessories is also enveloped with apparel and Stitch-Fix finds itself in a prime position to leverage this advantage. With 3900 in-house stylists, Stitch-Fix can leverage this knowledge base to complement its apparel services with accessories that are sourced from top-designer houses as well as mainstream suppliers on a much larger scale. Since the apparel industry has a market segmentation of 67.7% for women and children and the market segmentation for the same in the accessories industry is 75.5%, Stitch-Fix could benefit from being a gateway for all things fashion for the average customer, who's average disposable income is forecasted to rise by 1.3% till 2023 (O'Connor, 2018; Cohen, 2018). Moreover, this would provide a medium of feedback and therefore personalization in the accessories industry, which is struggling to keep up with individualistic demands on one hand and price-pressure from retail chains on the other.

Conclusion

Stitch-Fix is a young company in a marketplace that has seen immense price competition in recent years. While everyone seems to be running towards the cheapest price, Stitch-Fix tries to break the mold by essentially focusing on customer satisfaction rather than a price-war. With state-of-the-art data solutions built in-house driving the coherent decision-making of top-management, Stitch-Fix takes the fight to conventional as well as e-commerce stores, innovating the process of personalized selling with every item they sell. If its top management can keep a level head regarding their success and continue to scale keeping Box 3 in mind, Stitch-Fix could well be on its way to overhauling the apparel industry.

References

Smiley, L. (2019, February 20). *Stitch Fix's radical data-driven way to sell clothes–$1.2 billion last year–is reinventing retail*. Retrieved from https://www.fastcompany.com/90298900/stitch-fix-most-innovative-companies-2019

Budds, D. (2017, June 08). *How Stitch Fix Is Using Algorithmic Design To Become The Netflix Of Fashion.* Retrieved from https://www.fastcompany.com/90128248/how-stitch-fix-is-using-algorithmic-design-to-become-the-netflix-of-fashion

Govindarajan, V. (2016). *The three-box solution: A strategy for leading innovation*. Boston: Harvard Business Review Press.

LaPorte, N. (2018, February 27). *Stitch Fix CEO Katrina Lake Talks Data, Amazon-and Hot Tubs*. Retrieved from https://www.fastcompany.com/40525485/stitch-fix-ceo-katrina-lake-talks-data-styling-and-hot-tubs

Marr, B. (2018, May 25). *Stitch Fix: The Amazing Use Case Of Using Artificial Intelligence In Fashion Retail.* Retrieved from https://www.forbes.com/sites/bernardmarr/2018/05/25/stitch-fix-the-amazing-use-case-of-using-artificial-intelligence-in-fashion-retail/#193c87743292

Wilson, K., & Doz, Y. (2012, October). *10 Rules for Managing Global Innovation.* Retrieved April, 24, from https://hbr.org/2012/10/10-rules-for-managing-global-innovation

O'Connor, C. (2018, December). *IBISWorld Industry Report 44814. Family Clothing Stores in the US.* Retrieved May 02, 2019 from IBISWorld database.

Cohen, A. (2018, November). *IBISWorld Industry Report 44833. Handbag, Luggage & Accessory Stores in the US.* Retrieved May 02, 2019 from IBISWorld database.