

MIS 362: Social Media Analytics and data-driven innovations.

Assignment 2 – Academic Report.

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This report generates some key insights about Airbnb business model, its key structures and operations. It also depicts and illustrates how Social Media Analytics can help the San Francisco-based company initiate and implement organizational as well as technology change for better customer experience.

INTRODUCTION.

Airbnb - Rental and sharing market leader using good designs and AI for innovation.

Among all companies which provide online services and platforms regarding lodging, looking for the best tourist activities to engage or renting out spaces to people in need during their vacations, Airbnb tends to emerge as the leader in the market. The San Francisco-based company has successfully incorporated Big Data Analytics, Machine Learning and Artificial Intelligence to innovate its services and improve user experience.

Better Search Rankings powered by AI algorithms from Airbnb helps customers find the best results, considering their interests, preferences, booking history, etc. Airbnb also makes use of predictive analytics and data analysis to do smart pricing, which offers most attractive rentals (Dependent Variable) to customers based on some predictor attributes such as seasons, hotel ratings, property values, etc (Independent Variable).

Efficient and sophisticated Computer Vision as well as NLP techniques also helps the American firm gather feedback not merely from their own app and website but also via social media platforms. Topic modelling and sentiment analysis are performed on social media data to see how customers react and comment on Airbnb's services at a specific city or local area. Image classification in conjunction with text and behavioural analytics can reveal customer trustworthiness and credibility by scanning through their social media profiles and activities, which is an innovative way of building trust and safety for property owners.

Having realized the importance of good communication between tenants and house owners, Airbnb continuously enhances the designs of its platforms so that hosts can trust people looking to stay in their houses; vice versa, travellers can easily find the most suitable accommodations for their trips. Its partnership with photographers also allows users to see lots of impressive tourist destination photos and wisely choose the ones catering to their travelling preferences. **Figure 1** depicts how good GUI design helps hosts and guests know more about each other by getting travellers write a concise and formal introduction to property owners.

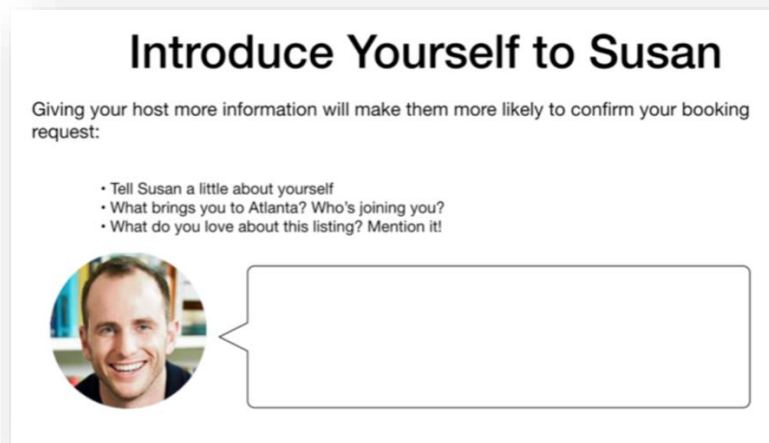


Figure 1: [Joseph Michelli](#) (2019) depicts Airbnb design that allows guests introduce themselves to property owners.

ORGANISATIONAL BACKGROUNDS AND ANALYSIS.

The firm's market share and expansions.

According to Rowan Clifford 2020, Airbnb has the market share of 20% of the whole tourism and vacation rental industry. In 2020, the worldwide vacation rental industry market value is estimated to be 87 billion dollars, which indicates that the total revenue generated by the American firm is around 18 billion dollars.

Since its establishment in 2008 by Brian Chesky, Joe Gebbia and Nathan Blecharczyk, Airbnb now has 34 offices worldwide, serving more than 650000 hosts and welcoming countless numbers of customers every day. The number of listings on Airbnb platform is around 6.1 million, giving travellers an incredibly wide range of options for their vacations. The picture (**Figure 2**) below shows several cities coming with the most Airbnb listings with the dominations from Paris, London and New York.



Figure 2: Lewis T (2020) listed cities with the most Airbnb listing.

Airbnb Business Model.

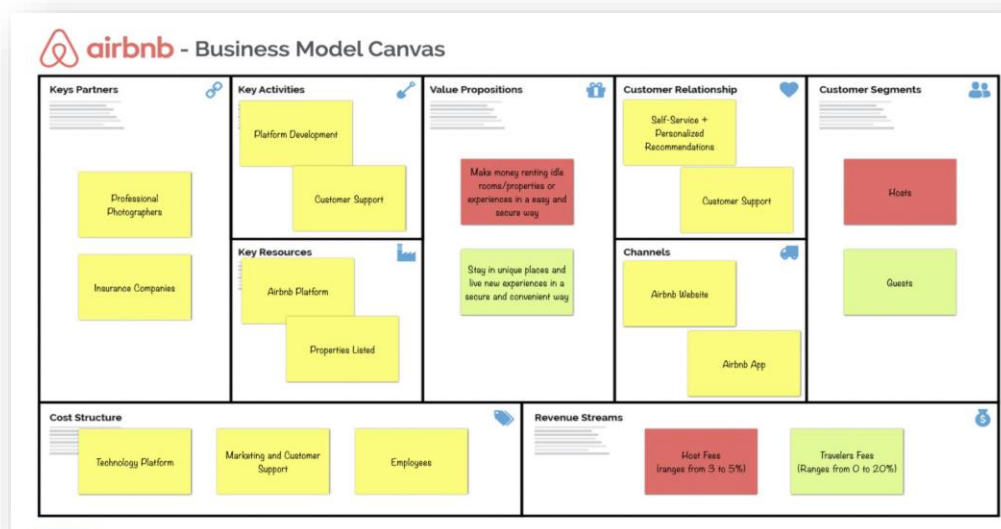


Figure 3: Daniel Pereira (2021) structures high-level Airbnb business model.

Figure 3 illustrates the high-level overview of the firm, including its value proposition to all customer segments on all channels, customer relationship improvement, different operation costs as well as the key partnerships.

Value propositions of the business model to hosts and guests.

Guests can choose to stay in private rooms, shared spaces or whole properties, depending on their demands and budgets. The American firm does not own the property but rather acts as the connection between customers and hosts, generating profits by taking commissions from every transaction between travellers and house owners. Business problem solved by Airbnb is that people might find it expensive and inconvenient to find as well as book a hotel at a busy local area. Online booking and rental services provided by the firm facilitates communications between hosts and guests with the use of In-app Message Classification, which analyses customer texts and automatically gives instructions in case hosts are busy and inactive on Airbnb app.

Another big step that the sharing service provider took is to introduce 'Airbnb Vacation', which plays the role of a tourist guide recommending which local activities to engage, how many days should be spent in a particular city as well as all must-try cuisine. Previously, people found it quite time-consuming and frustrating to gather data, information and classify them from lots of web searches at their leisure in exchange for well-structured trip plans. Fortunately, 'Airbnb Vacation' that is strongly supported by social media analytics and AI models emerged as a perfect solution to this pain. It is really interesting to note that Airbnb app and website is perceived as social media platforms where user data is provided and kept for analytics and recommendation systems. For example, the number of days John should stay in Paris during his vacation and how long it takes to travel from the capital of France to other European cities are precisely recommended to him based on insights extracted from data of similar trips. John can easily customize his itinerary with his own preferences, accurate travelling time estimation and tourism activity recommendation on the platform. John's online payment processes are also secured and completed through Airbnb systems.

It is free for everyone to sign up an account as a host or customer at Airbnb. With property listings in nearly 200 countries and 34000 cities, customers can easily find homestay for their vacations based on preferences set on the accounts, preferred prices and other criteria. No fee is paid until our booking request is accepted by a host.

On the other hand, property owners are encouraged to upload the best pictures of their spaces as well as detailed information about places. Availability and all fees can be sorted out by owners and guests communicating with each other. Hosts and guests can give feedback, reviews and ratings on each other after stays are completed, which might refer to quality of property amenities, cleanliness and how travellers maintain and treat hired spaces. Highly rated clients and places can be recommended to other hosts or guests, building good trustworthiness and credibility among all Airbnb platform users. In other words, hosts' hesitation and fear of letting a stranger stay in their property has been eliminated by the trust-building mechanism, contributing to the success and popularity of Airbnb all over the world. In case of any vandalism which is caused by tenants, compensation will be given to the hosts according to insurance policy from the American firm.

Cost Structure.

Unlike a traditional hotel which mainly uses its operation expenses on property maintenance, renovation, utility and so on, Airbnb operating costs come with 3 categories. The first one is platform development which comes with the focus on good designs and personalized services. Secondly, the firm finds it pivotal to have suitable marketing strategies and customer support. Lastly, salaries paid to employees also occupy a significant proportion of the total operating cost.

Key partnerships.

Airbnb has strongly developed its relationships with insurance companies, which facilitates the compensation process in case hosts' properties get damaged. Additionally, lots of online portfolios with decent photos of property interiors have positioned themselves as strong partners of Airbnb, allowing travellers to see the best quality and professional photography before deciding which place to visit.

Competitors.

Some other key players in the sharing economy whose services are comparable to Airbnb's are HomeAway, VRBO, WimDu, FlipKey, etc. There are strong similarities between Airbnb's business model and its competitors'. However, the leader constantly upgrades its platform design and makes substantial investments in AI technologies, providing customers with the best personalized services, convenient but secure online payment and easy-to-use user interfaces.

RECOMMENDATIONS.

For Airbnb product innovation recommendations, we use Social Media for Open Innovation Implementation Framework (Mount, M. and Martinez, M.G., 2014. Social media: A tool for open innovation. California Management Review, 56(4), pp.124-143). This framework consists of three parts ideation, R&D and commercialization.

Ideation.

Since several competitors are competing with Airbnb in terms of service and user experience improvements as well as trying to replicate innovative platform features previously introduced by the firm, it is essential for the American company to make itself outstanding by constantly upgrading its platforms and addressing issues faced by users.

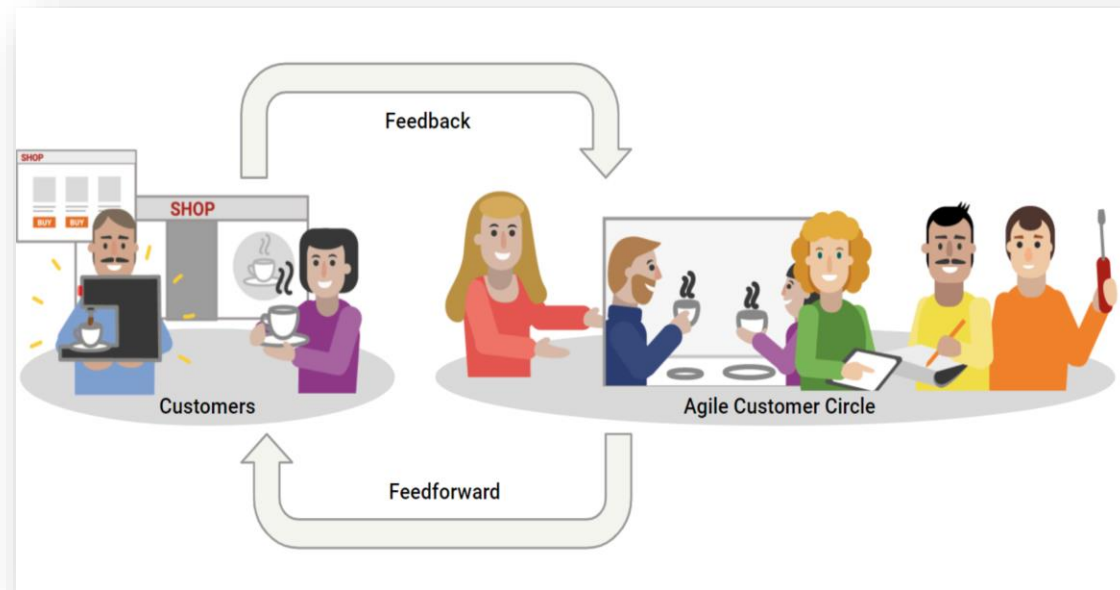


Figure 4: Paul Norton and Kurt Nielsen (2021) illustrates the feedback-feedforward loop of Agile Customer Relationships.

Apart from the innovation framework introduced by Mount, M. and Martinez, M.G., 2014, Airbnb has adopted agile management techniques (**Figure 4**) that help the firm periodically enhance and innovate its platform features through various iterations, taking into consideration customer feedback and using it to identify what product versions in the future should look like.

One of the tools that is used for service innovation by the American firm is social media analytics. Having visualized the polarity and subjectivity distribution in **Figure 5** regarding 1000 tweets from Twitter, we can see that Airbnb is mentioned in a substantial number of tweets with both positive and negative sentiments.

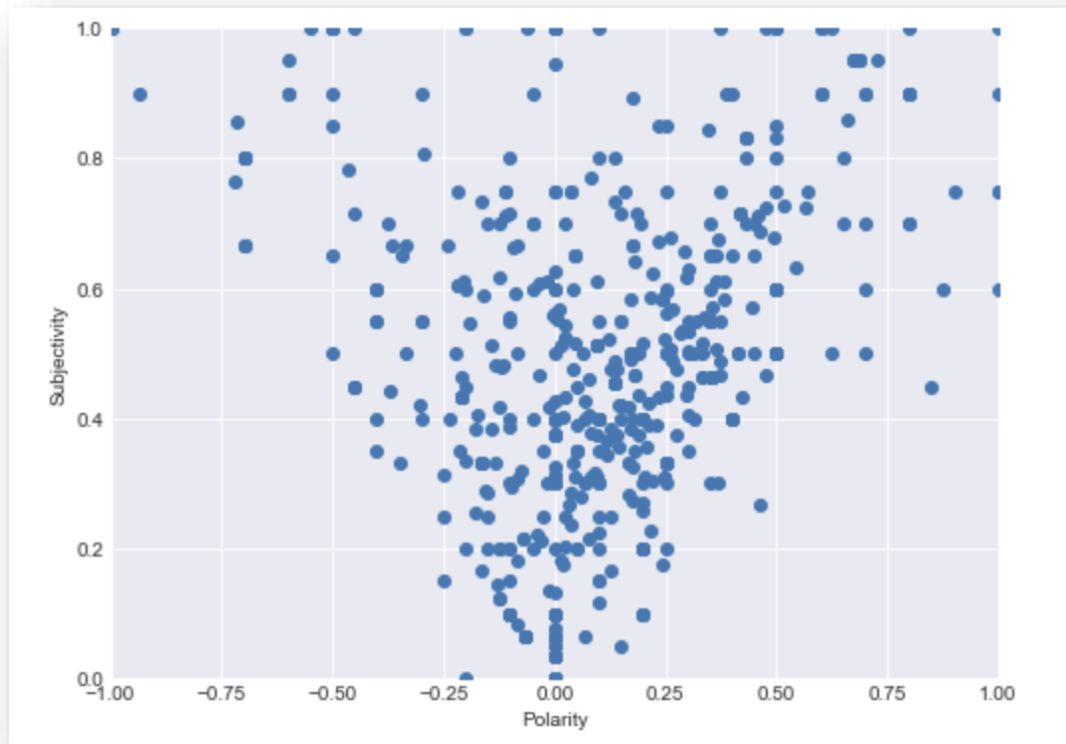


Figure 5: Sentiments of 1000 Airbnb-related tweets from Twitter ([Jupyter Hub, 2021](#)).

Twitter is a social media platform where people prefer to retweet instead of creating all contents on their own. As a result, WordCloud or Topic Modelling can illustrate what problems customers face in common when using Airbnb services. **Figure 6** tells us travellers are concerned about the quality and privacy of their hired spaces, emphasized by some frequent words such as 'room', 'water dripping', 'room water', 'dripping ceiling' and 'hidden camera'. Water leaking tends to be the reason why lots of customers tweet about Airbnb in negative ways and are dissatisfied with service quality. Furthermore, travellers also find it insecure and intimidated when there are some rumours that a number of rooms listed on Airbnb platform are equipped with hidden cameras, illegally spying on stayers and invading their privacy. It is urgent for the firm to solve both of the problems in order to retain customers and maintain its position as a leader in the sharing economy in the long run.



Figure 6: WordCloud extracted from 1000 Airbnb-related tweets from Twitter (*Jupyter Hub, 2021*).

Having gathered feedback from users through social media, done some analytics and precisely identified the roots of complaints, the next step that should be performed by Airbnb is to decide which features to improve and add to the next version of their platforms. It would be really helpful if hosts can contact nearby plumbers for plumbing system check-ups or repairs and align it with existing bookings. This feature makes it convenient for property owners to choose the right people and right time to renovate their assets, helping them get better reviews on Airbnb platforms. After adding the functionality to its platform and receiving sufficient feedback from hosts directly on Airbnb app plus website, it would be clear for the firm to know how the new product should be adjusted during another iteration of Agile Management Methods. On the other hand, travellers may properly no longer complain about water leaking at properties that they choose to stay at.

Additionally, bigram visualization can potentially be used to illustrate what pairs of words are frequently tweeted by people on Reddit about the firm services. It is illustrated by **Figure 7** that people on Reddit are mostly concerned about Airbnb policies regarding refunds, reservation withdrawal and cancellations. As a result, it is also necessary for the firm to adjust or customize those policies in different countries or regions where customers generate their feedback.

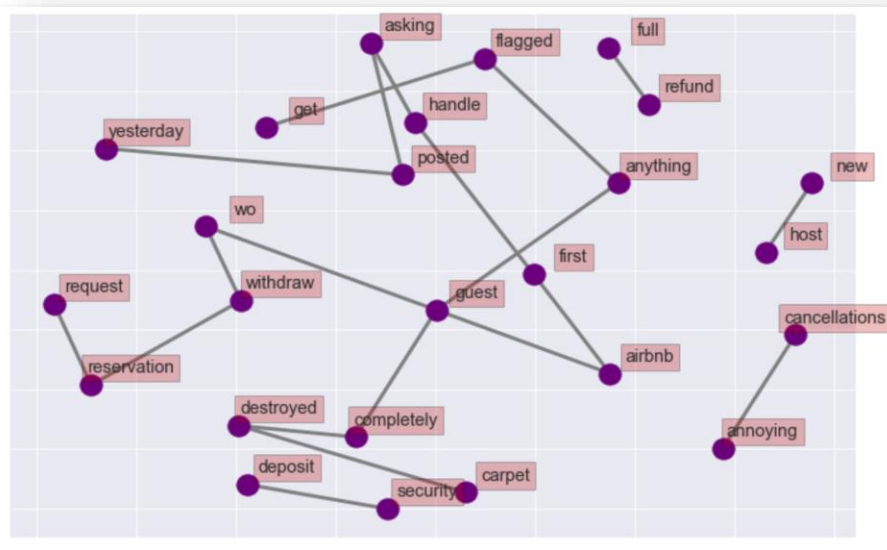


Figure 7: Bigram visualization extracted from 1000 Airbnb-related tweets from Twitter (Jupyter Hub, 2021).

R&D.

Assume that Airbnb would name the feature on their platform that helps hosts fix their plumbing system in their property PlumbFinder. As a company with the strengths and expertise in AI, Data Analytics as well as possession of a large social media community (Airbnb app and website), PlumbFinder would be introduced with personalized recommendations. Hosts can see contacts of all nearby plumbers according to the fees, location and other criteria that they prefer. Seeing ratings and leaving comments on plumbers' profiles after check-ups or repairs are completed is also an easy task on Airbnb website. It is also easy for property owners to make bookings and synchronize it with their schedules.

Based on the technological features and business model characteristics of Airbnb, PlumbFinder would be released with the emphasis on:

- Convenience.
- Personalization.
- Trust-building mechanism.

Basically, there are two factors that help Airbnb mitigate the risk of development. First, making use of Agile Software Development Methods would make sure that PlumbFinder is updated periodically after user feedback is gathered and analyzed for user-friendliness and app convenience. This way of testing and learning would make PlumbFinder an user-centered feature on Airbnb that comes with trust, easy-to-use features and personalization.

There are several apps that have already been released with the same features and used by users for a period of time. Similar apps existing in the market is a good opportunity for the American firm to take advantage of, which is the situation when Social Media Analytics come into play. With the experienced teams of Data Scientists and AI engineers in Natural Language Processing, it would be an easy task for Airbnb to extract insights of customer opinions on those apps preceding PlumbFinder. The company can capitalize on all those user comment analytics as a means of avoiding pitfalls other app owners have fallen into and getting ahead in the market.



There are not many customer comments or tweets about TurnoverBnB on social media platforms. Around 20 comments of people who have used and known about Turnover are extracted from two posts from Reddit (**Appendices – part 3**). **Figure 10** shows that people mostly display their positive comments on services provided by TurnoverBnB. Specifically, most of the tweets come with positive polarity and some words with high frequencies highlighted by the WordCloud (**Figure 9**) are ‘Great’, ‘Good’, ‘Love’ and ‘Thanks’, illustrating that customers really love TurnoverBnB.

As a result, PlumbFinder seems to be a viable feature for Airbnb to release on their platforms. Additionally, the firm can also unveil another one similar to TurnoverBnB if hosts' demands for cleaning bookings are substantial.



Figure 8: TurnoverBnB – [OptimizeMyBnB.com](https://optimizeMyBnB.com)

Commercialization.

Apart from developing a new feature on Airbnb platform, it is really essential that the American firm unveil and make it available in the market in a way that maximizes its exposure to customers. Popular news channels and influencers on Twitter and Youtube would be a good tool for Airbnb for their promotional strategies alongside with Airbnb social media accounts. As a result, people and news channels that seem closely related to Airbnb should be targeted as third parties that help to raise customer awareness of PlumbFinder.

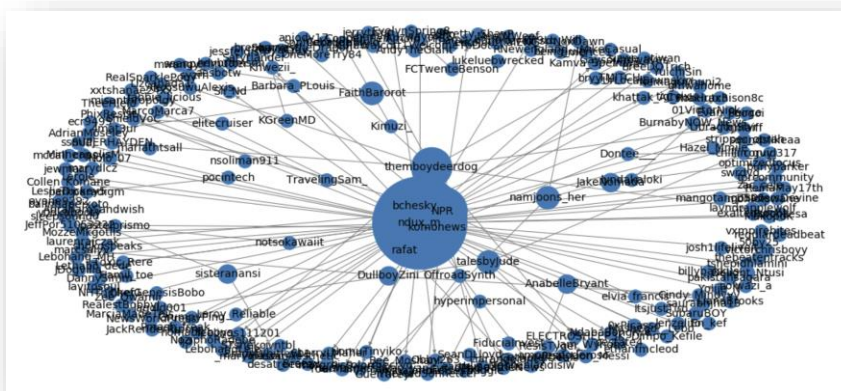


Figure 11: Network analysis of Twitter users tweeting or retweeting about Airbnb ([Jupyter Hub](https://jupyterhub.com), 2021).

Figure 11 shows that Brian Chesky - CEO of Airbnb, NPR and Komonews are the most influential person and news channels among all retweets of Airbnb on Twitter. Utilizing Brian Chesky's Twitter account and both of the American news channels is an ideal way to get social media users know about the new feature Airbnb is about to introduce.

NPR seems very popular on Twitter with more than 8 million followers on this social media platform. Airbnb account on Twitter followed by nearly 740 thousand people is also a perfect tool for PlumbFinder promotion. Brian Chesky is the most popular and followed one among 3 co-founders of the American company with 373 thousand people keeping track of his activity on Twitter; meanwhile, Joe Gebbia and Nathan Blecharczyk have 102 and 34 thousand followers respectively. Advertising PlumbFinder using the news channel, Airbnb account and endorsements of its own co-founders seems to be a promising strategy that can lead to large customer adoption of the new service.

Another platform for Airbnb to promote their new product is Youtube thanks to its gigantic traffic and conducive designs for advertising, marketing as well as business sponsorship. Affiliate marketing can be done on Youtube channels of some famous travel vloggers to promote PlumbFinder. Additionally, some news hubs on Youtube which have high influence on social media users with enormous numbers of likes and followers have been used to broadcast Airbnb news. There is a high probability that news about PlumbFinder unveiling can reach millions of potential customers through Youtube coverage.

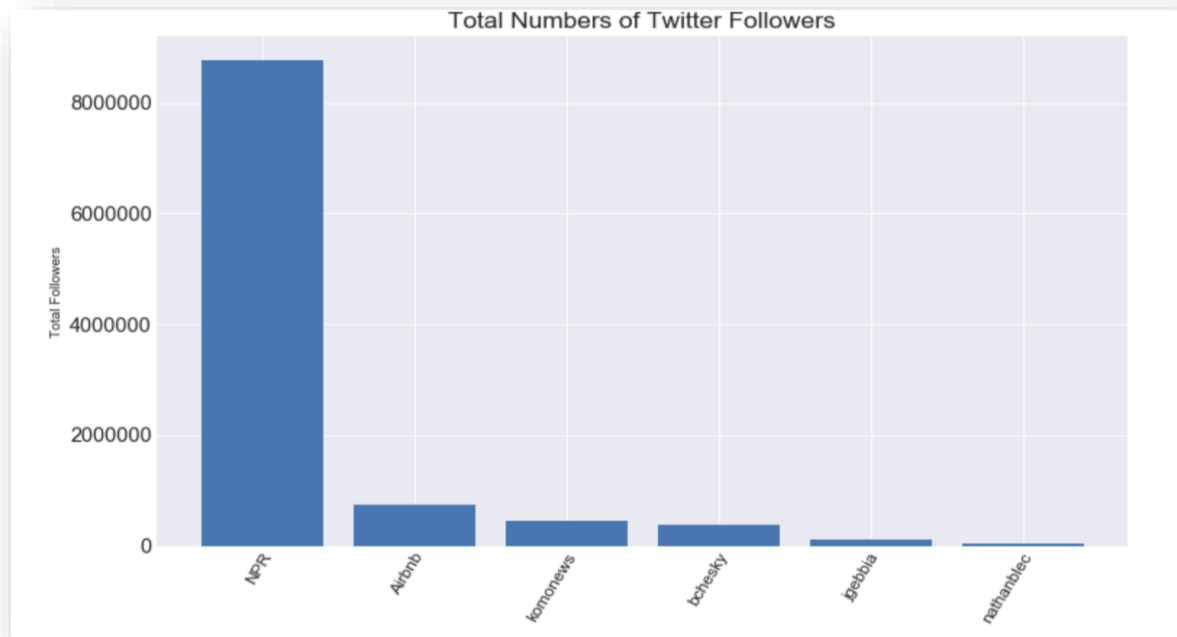


Figure 12: Twitter users tweeting or retweeting about Airbnb and their numbers of followers (Jupyter Hub, 2021).

Apart from Airbnb and Airbnb Automated, some news channels that are ideal for Airbnb's new product commercialization are ABC News, Wall Street Journal, Techboomers, considering their substantial numbers of 'likes' and marginal 'dislikes' on Youtube. Two vloggers with strong expertise in travelling and housing reviews that are strongly favoured by viewers such as Ben Morris and Robuilt are potential third-parties that can help American firm's new products gain popularity and trust among the public.

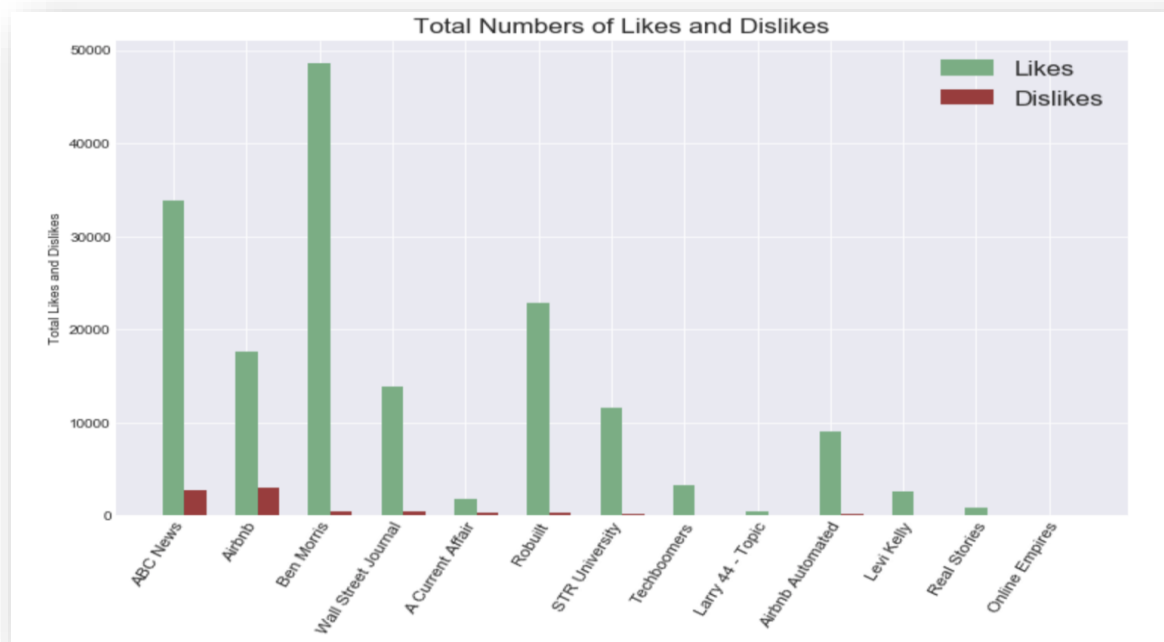


Figure 13: Numbers of likes and dislikes of several Youtube channels that can be used to promote Airbnb products (Jupyter Hub, 2021).

CONCLUSION.

By using technological features and advanced machine learning techniques, Airbnb always looks forward to solving problems and offering more convenient service to people renting properties during their vacation or ones listing their spaces on the platform. Convenience, Trust and Personalization are the cores of business strongly emphasized by the American firm. That is why they have remained as the leader in the sharing and rental industry for a long time.

Agile Software Development Methods and constant scrutiny of customer feedback through Airbnb platforms as well as social media would make sure that the American firm responds to client demands early enough to retain them, by either introducing new features on the platforms or upgrading existing services. It is also worth a mention that Social Media Analytics makes customer complaints more visible and helps Airbnb come up with innovative features such as PLumbFinder which seems promising to enhance customer satisfaction.

A good commercialization plan for new product promotion is really important since it needs consumer awareness. It is a must for Airbnb to leverage all of their social media channels and well-known people from the firm to popularize PlumbFinder. Third parties such as publicly favored news channels and famous travel vloggers seems promising at a part of PlumbFinder commercialization plan.

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Appendices.

1) TurnoverBnb allows hosts to book cleaning services.

The screenshot shows the 'New Property' form with a progress bar at the top indicating four steps: 1. Property Information, 2. Rental Website, 3. Cleaners, and 4. Property Address. The form fields are numbered 1 through 5:

- 1. Name your property: Cozy Apartment
- 2. Check-Out Time: 11:00 AM, Check-In Time: 3:00 PM
- 3. Property Description: Use this to give useful information to cleaners, such as existent parking lots or general guidelines.
- 4. Number of Bedrooms: 2, Number of Bathrooms: 1
- 5. Unit of measurement: ft², Approx. Size: e.g. 800 ft²

Buttons for 'Cancel' and 'Continue' are at the bottom.

Figure A: TurnoverBNB – [OptimizeMyBnB.com](https://optimizeMyBnB.com) shows TurnoverBnb cleaning booking service.

2) TurnoverBnb allows hosts to sync cleaning time with existing bookings.

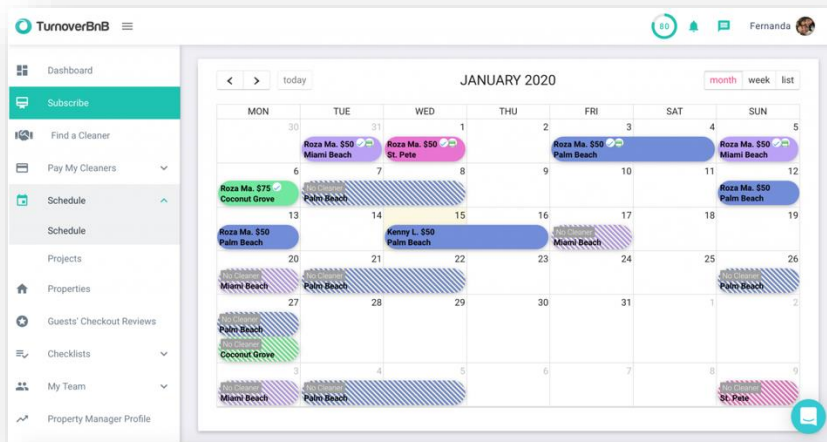


Figure b: TurnoverBNB – [OptimizeMyBnB.com](https://optimizeMyBnB.com) shows TurnoverBnb allowing users to schedule cleaning booking service and rental time.

3) Links of two Reddit posts regarding Turnoverbnb services.



Figure C: First post on Reddit about Turnoverbnb service.Link: https://old.reddit.com/r/AirBnB/comments/o98itb/how_is_turnoverbnb/



Figure D: Another post on Reddit about Turnoverbnb service. Link: https://old.reddit.com/r/AirBnB/comments/o98itb/how_is_turnoverbnb/