Instagram

Recommendation System Business Case

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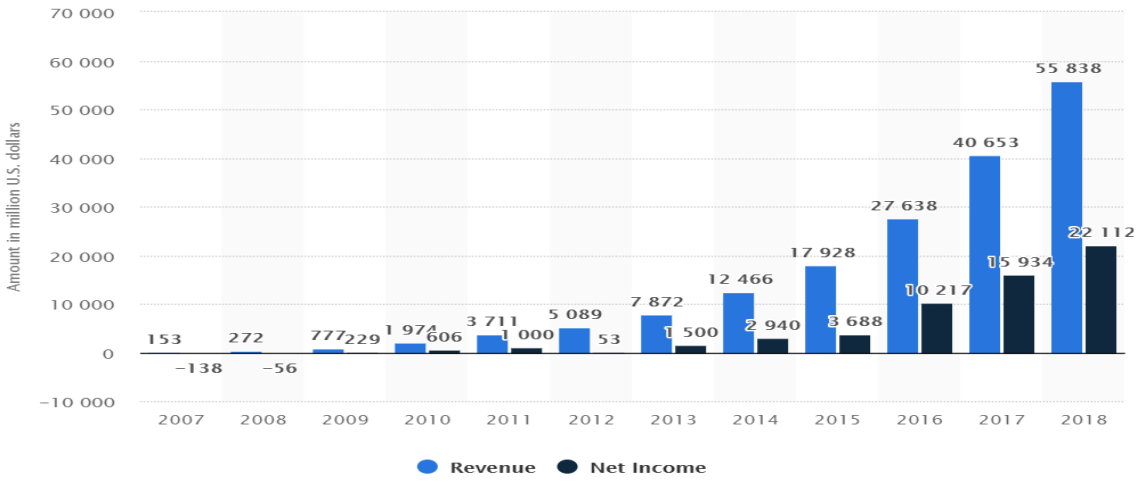
Instagram has been one of the fastest growing and most popular applications since its inauguration in 2010. The core purpose of the application has remained more or less the same over the decade; nevertheless, there have been small but impactful developments over the years.

The main driver of that incredible growth Instagram has been going through in the last few years is undoubtably the artificial intelligence backed recommendation engines to enhance and optimize the users experience. Indeed, by using recommendation engines, Instagram became the almost perfect application, that constantly generate targeted content that keep the users entertained with topics that interest them. In addition to this, Instagram became a platform for targeted advertising, for companies to promote their products and services through 'influencers'.

In 2019, Instagram had 800 million active users and 70 million photos are uploaded daily. Users interact with those posts by liking commenting and following these posts and accounts. This activity creates massive amount of data. Instagram has elaborated algorithms that analyze this data in order to enhance the customer experience and create a tailor-made platform. On top of that, creating such algorithms allowed Instagram to develop new services that allow it to generate billions of dollars of revenues, through targeted ads. Targeted ads are a huge opportunity for companies/start-ups to get exposure on the market and have their products/services and targeting only potentially interested users.



RECCOMENDATION ENGINES CURRENTLY IN USE

Instagram relies mostly on 3 ranking signals in its recommendation engine system: **Relationship, Interest and Timeliness.**

The accounts with whom a person interacts the most (likes, comments, messages) will appear higher in the feed. By using this recommendation system algorithm, Instagram is providing to its users a unique experience, that will allow them to interact with their close circle of friends which makes the application more enjoyable.

Another way Instagram uses recommendation engines algorithm is by analyzing data on a user's behavior and social activity to predict posts he will potentially like and 'follow'. For instance, if a certain user has been heavily interacting with "Topic A", the algorithm will recommend him more posts related to that Topic A. This is an interesting usage of recommendation engines but that has some limitations that will be discussed later in the report.

The recommendation systems algorithm also analyzes the data of a user's application and frequency of usage in order to always show him interesting and relevant posts even if he uses the application very frequently.

Timeliness is another metric used to recommend posts to users, it shows the most recent posts, but not in a chronological order in order to maintain an order in the relevance of the posts.

Using the aforementioned signals, Instagram's algorithm sorts through the available inventory to ensure the posts it thinks you'll care about most appear first in your feed.

LIMITATIONS AND SOLUTIONS

Although the recommendation engines used by Instagram have revolutionized the application, the way companies make use of social media for promotion and advertising, and the way users interact with a more than ever personalized platform, the algorithms have some limitations that could be improved.

One of the limitations is the fact that the recommendation engine recommends very redundant posts that could potentially become boring for the users – bubble effect. In fact, Instagram uses a collaborative filtering method to suggest posts using the memory-based item-item approach. In fact, recommended accounts and posts are solely based on our interactions with other posts. Therefore, what will be recommended to users will be definitely interesting, since it will be based on posts they previously interacted with, but it risks becoming very repetitive. That's why, Instagram should implement a more hybrid approach to its algorithms and add a more user-user twist to the recommendations. By doing so, a user will get recommendations based on what he previously interacted with, but also posts that the users that are considered the most similar to him (close friends) have liked it. This will provide a more diversified platform that will prevent the users from getting bored from the same and repetitive content.

In the quest of making the application more interesting, they could also add a weekly trends option such as Spotify to allow the users discover the trendy topics rather than only seeing posts similar to the ones they have in their feed. Doing so will allow the user to keep in touch with subjects that matter to him, but also discover new contents that are trending in his region for example using a content based algorithm ; or that are trending among users that are similar to him using the user-user memory collaborative method that uses nearest neighbor to asses who are the most similar users.

Another limitation, that if fixed would become an additional revenue stream for Instagram is the *SHOP* feature. So far, items recommended in the shop section are based on the memory-based item-item approach because the items recommended are based on liked posts, comments or interactions with users. Getting recommended items to buy based on that is not always relevant. I personally am passionate about cars and watches so the recommended items I get to buy are watches and cars, which represent items that I will never buy, at least spontaneously on social media. Therefore, Instagram could potentially generate extra revenues by suggesting items to buy following a content-based algorithm that would take into account features such as age of the user, demographic information, trends, in addition to the posts and accounts he interacts with. By doing so, the user will be offered a more diversified portfolio of items to purchase that will contain items he will be more likely to purchase, which represents many advantages for Instagram such as additional revenues, and attraction of new customers knowing Instagram will recommend their products to targeted users.

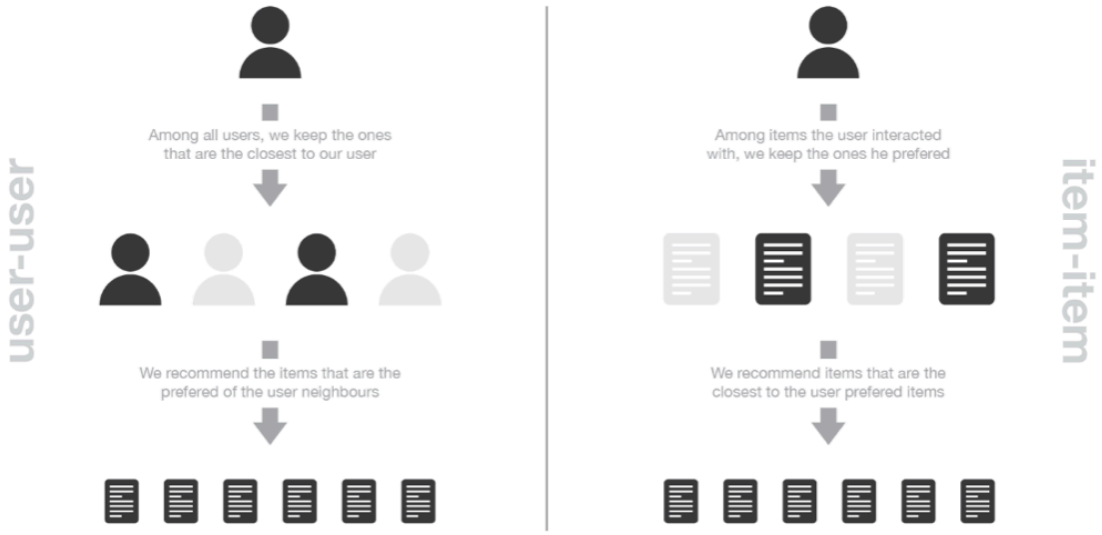


Illustration of the difference between item-item and user-user methods.

The illustration above shows the difference between the user-user approach and item-item approach and gives an idea on how recommendations would be given if they decided to use an algorithm more focused on users.

CHALLENGES

The proposed solution could improve the Instagram model if the algorithm is able to bypass some challenges that I will pinpoint.

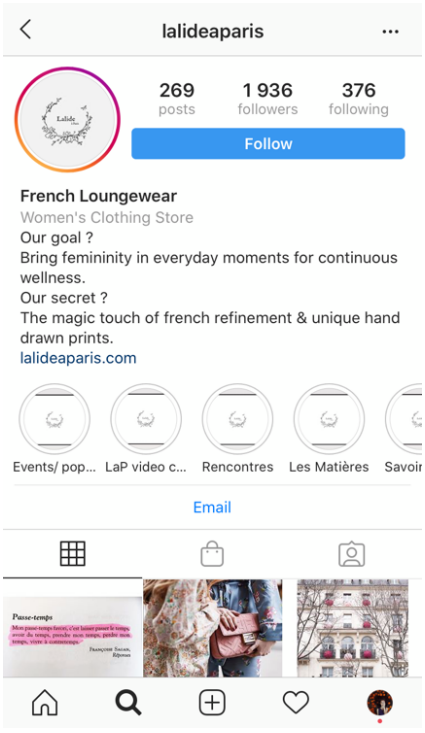
One of the main challenges is that we don't want the algorithm to recommend such diversified content that it doesn't interest the user anymore. With the current model, the suggested posts can become redundant and repetitive, nevertheless they are from topics that interest the user.

If Instagram wants to rely on more hybrid approaches, it has to test its new recommendation system algorithm with online testing in order to see how users respond to this novelty and also eventually introduce feedback loops that would allow users to say if they think certain posts are relevant or not.

Therefore, if Instagram wants to keep on entertaining the users, but offer more diversified content, it has to be sure that they develop a perfectly measured and balanced algorithm that will recommend posts based on posts that they interact with and therefore satisfy him with content he enjoys. But also provide him with other topics to which he hasn't shown past interest but that will potentially interest him because users similar to him have enjoyed them, with a certain limit to be sure that the recommendations become too broad.

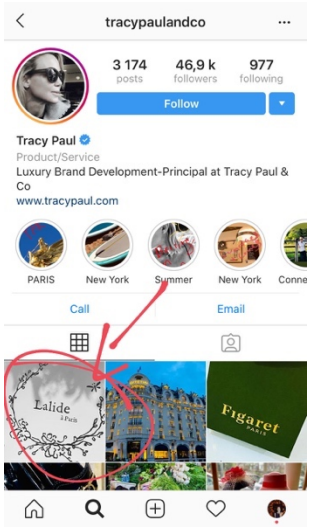
A NEW REVENUE STREAM

Finally, we will explore the possibility that Instagram have to create a new revenue stream. The goal here would be to create a new feature that would connect companies with Instagram influencers.



Let's first look at an example to explain this new service: we will take for instance this new French Women Loungewear, Lalide a Paris. Lalide just started their clothing business in Paris, and they know that the key to success is to gain a reputation. For this they created an Instagram account, but the brand was just launched and isn't very well known yet. Their first goal is to launch the brand notoriety and popularity. One very quick way of doing this is through social media with the help of influencers. They would like to contact some French influencers to publish about their brand on their Instagram account. The influencer they are looking for needs to fulfil a certain number of criteria, like having a strong Parisienne community, a woman with a French style, that communicate femininity and a cozy environment. After hours of research they finally find multiple influencers that correspond to their image. They now need to contact each one of them to see if they would be interested in talking about their brand, but they will have to wait for their

answer. A lot of them didn't even respond or were asking for too much money. They finally found Tracy Paul that agreed to publish a photo about Lalide a Paris. Now this process took a lot of time and effort. And they would need to do this process several times to be able to reach the maximum amount of people. After several months, thanks to their French influencers, the brand has gain sufficient popularity in France to be able to expand abroad, but should they expand to London, Hongkong, New-York or Milan? For this the French brand would like to conduct a market survey and what a better way again than by asking an influencer with followers from those different cities to post a poll in their stories to see the reaction of their followers. Again, this would need some hours of research to find the right influencer that correspond to the brand image. This is where Instagram could expand and offer this service directly to companies. Help Lalide find the right influencer for the service they need. Let's say they have found a British and American influencer that could post some stories asking their followers for their opinion, such as which style they prefer or whether they like the brand style in general by just posting some simple stories. Instagram could offer this service and be the intermediate that would make everything simpler, from finding the right influencer to gathering all the data from these polls and sending them to the companies.



For who will this new service be beneficial? Every company that needs to communicate about their brand or needs to conduct a survey and every Instagram influencer.

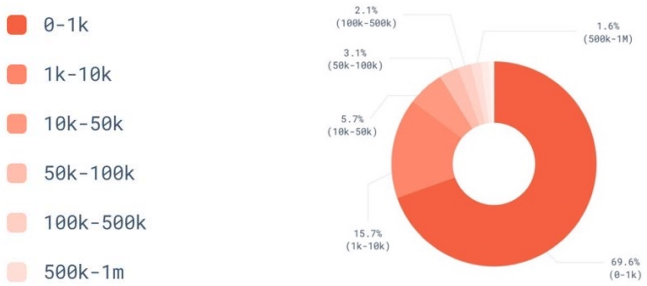
Who needs this service? Most business are going to come across a point in their journey where they will need this service, whether it is to broaden a company scope, penetrate a new market, test customer satisfaction, launch a new product, a startup looking to validate their business model, a student conducting a market study or a statistical office collecting relevant market data.

Why would they use this new service rather than conducting it on their own? According to a Cision and PRWeek survey: "Only 39% of US marketers feel confident in their ability to identify the right influencers". And also, with "more than 500 million people watching Instagram Stories every day" this recommendation system could solve the major challenge that influencer campaign face.

Targeting the right people to communicate your brand or to answer some business question could take a lot of time. It is also hard to get precise and accurate data.

This will allow influencer seekers to have an easier and faster way to find them. Why will this be easier? Instagram will take care of gathering all the influencers that are willing to provide this kind of services and will arrange them in a Matrix with different feature categorizing them. Whenever someone needs an influencer for a service it will instantly be proposed different options meeting their requirements. Following all the data gathered could be directly transferred back to the company (whether it is how many users viewed the post/story, who answered what, their age, cities, gender, their purchasing power).

Who are the Instagram influencers? Given that 1 billion people uses Instagram every month and we can consider a user with more than 1k follower an influencer which is 30% of the users. This new service can target many users.



Why would influencer or Instagram user conduct these surveys by posting polls in their stories? Since 2020 Instagram has a new algorithm for the order of the post that will appear in someone feed. This algorithm now takes into account not only the time of when the picture or video was posted but also the interaction you have with the person posting it. If you get involved in someone's Instagram feed or their Stories by sending some kind of reaction, the algorithm will remember that. Simple communication will be understood as friendship, and you will appear more frequently in their feeds. Influencers have to engage massively with their audience in order to have a good score. This new feature will enable influencers to engage more with their audience by asking question in their stories and posting about a given business.

How will Instagram assign the right influencer to the people seeking one? This is where a solid recommendation system is needed to create this new service.

In our case the user would be the companies and the items would be the influencers since we will recommend them. The best appropriate recommendation system for our problem would be to use a content based on the available "features", that explain the observed user-item interactions. There are different features that should be taken into account when looking at the items (influencers) we will list some of these variables:

- Their number of follower (important to compare it with the engagement rate, engagement rate tends to decrease as follower count grows)
- Reach: What's their network/ social reach? The number of unique users who saw your content, already calculated by Instagram.
    - Engagement rate
        - On post = (like/comments/shares)/followers * 100
        - on stories = nb of views/followers * 100
        - on poll of stories = nb of answers/nb of views * 100
- Match your target audience: align the business desire with influencers with the right audience. For example, if you're a fitness brand, it makes sense to partner with influencers who share a similar audience to your ideal customers, such as yoga instructors or powerlifters.
    - geographic distribution (where are the influencer's followers located)
    - age breakdown (how old they are)
    - gender
    - language
    - approximate income

- Content match: categorizing their content in different variables to match then with the business target. (like travel, fashion, sport, music, entertainment, parenting,)
- How much they charge (a bin of how much they want for a post, a story, a long-term partnership, …)
- Caption length
- Resonance: How much of a leader they are around the specific topic or area of interest? See if they are positioned as a leader on other online publications. How often an influencer's content is quoted or referenced by others. Also, do they openly share information and insight around the particular topic?
- Authority: A person with many followers that not only listen but also act is an elite influencer. If they have an army of followers to who they can give orders.
- Intent: When others hear insight from this influencer, what's their intent to purchase? This is will be harder to track. However, we could look at interactions, if influencer talks about "A", will "A" increase.

Once those variables are defined and all the influencers are categorized, business could very easily be assigned some influencers that would fit to their image. The algorithm will also have to understand the different features of the business seeking for an influencer and match them together. If we look at our previous example of Lalide a Paris with their Instagram page, the algorithm will identify that it's a French loungewear clothing brand for women, the price range of their cloth and with their # that their values are sustainability, authenticity, made in France, feminine, chic, homewear, cozy, relax, natural and precious. They will only have to connect with their Instagram account and provide the request they want from the influencer and the algorithm will match them with the right influencers. In our case the Lalide wants influencer from different big cities.

Why is this Beneficial for Instagram? This will be beneficial for Instagram for many reasons, but the three main ones are it will create more engagement and interaction on the app which in term will be beneficial for our first problem (keeping the platform interesting). It will also allow Instagram to gather more data on the users, the influencer and on the business. And finally, it will be a new revenue stream for Instagram since the business will pay the influencer through the app and Instagram could keep a commission for the service.

Moreover, we can take this new revenue stream even further. Using the answer of the user on the poll to target even better future advertisement and post recommendation.

CONCLUSION

Instagram has been the fastest growing social media app, thanks to its recommendation system that make the platform so entertainable. However, those recommendation systems could be improved by implanting a more hybrid form that would not only suggest what you may have seen, but also suggest what your close friends have liked. Furthermore, to not overwhelm the user with useless information the option of seeing the followers with whom they interact the less and being able to unfollow them directly could be a solution to the overload of pictures, videos or stories that one could suffer from. Finally, Instagram could implement a new revenue stream with the creation of an additional service connecting businesses to an influencer that match their image and their need, using a content based recommendation system.