Vinted

Analysis of the Push up feature performance

Anja Hrvatič

Introduction

At Vinted, sellers showcase their items in hopes of finding buyers. While it's common for supply to outstrip demand, the priority is ensuring seller satisfaction. To empower sellers and maximize their selling opportunities, the "push up" option is available, designed to enhance item visibility.

The "push up" feature amplifies an item's exposure on the platform for three days following its purchase, leading to increased views from potential buyers. Currently priced at 2€, this feature aims to boost the chances of successful sales.

However, Vinted is exploring the effectiveness of this monetization strategy and seeks data-driven insights to evaluate its impact. As an intern, my task is to propose a comprehensive approach to assess the existing "push-up" monetization strategy and provide recommendations for enhancing platform monetization and ensuring sustainable long-term growth.

1. Current situation evaluation

1.1 Defining a success metric

First, we defined a success metric, which measured how much users were interested in the "push up" feature. We defined it as the ratio between revenue from push-ups and the number of listings. It tells us how much revenue on average each listing brings. If clients are interested in it, the feature will be used more times and this metric will be higher. The average ratio value across all categories was 0.073, meaning each listing brings 7 cents of push-up revenue. The best-performing category was strollers and the best-performing subcategory was men formal. Figure 1 shows the 10 best-performing categories and subcategories.

1.2 Alternative metric

Another way to define a metric to measure interest is the average listing price. It is expected that the price will be higher when sellers choose to push their listings. Also, more expensive items will have a lower 2€/item_price ratio, making it easier for the seller to spend 2€ on the feature. To check if the assumptions true we refer to hypothesis testing:

- H0: There is no significant monotonic relationship between the average listing price and revenue per listing (as defined in 1.1).

- H1: There is a significant monotonic relationship between the average listing price and revenue per listing (as defined in 1.1).

We choose the Spearman rho to test for correlation because the variables don't seem normally distributed. Additionally, we check the scatterplot to visually inspect the relationship.

Figure 2 shows there is a linear monotonic relationship between the two chosen metrics. Results of Spearman's test ($\rho = 0.8021$, $p < 0.01$) reject the null hypothesis in favour of the alternative hypothesis that says there is a correlation between both metrics.
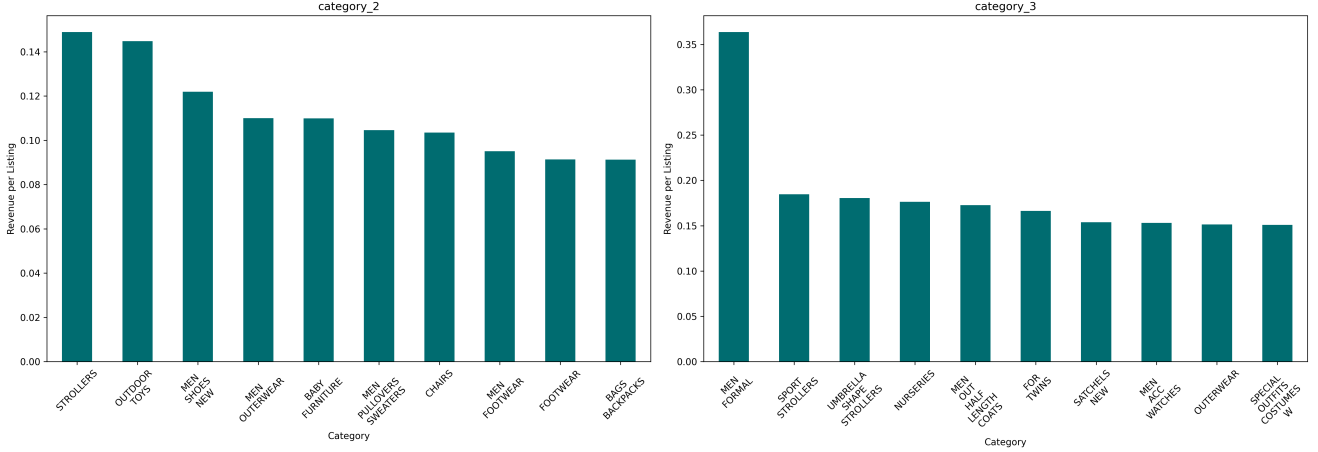
1.3 Push up feature performance

The metric shows that on average each metric brings 7 cents from the push-up feature. Since there are many listings this brings in a lot of revenue. But if we look closer, this means that only around 3.5% of listings get pushed. Overuse of this feature is not wanted, as additionally promoting a listing, where every listing is promoted is useless, but the current situation is far from there. Customers try to find a way around paying for this feature by uploading listings again and optimizing listings by taking better pictures and writing better, more detailed descriptions.

1.4 Customers paying for Push-up for inexpensive listings

In the GIRLS_CLOTHING / FOR_BABIES category, the price of the push-up feature is more than half of the average listing price. However, there are still sellers willing to pay for the feature. These items are usually inexpensive, which is why the ratio between the listing price and push-up price is so high. Only 0.35% of listings have been pushed. These listings might be the ones with the above average price and paying for push-ups made sense. Since the average listing price is the only data available (we don't even have the standard deviation) we could only guess the real reason behind sellers deciding to use the feature. Maybe they prefer to get a euro or two instead of just donating the item.

2. Alternative strategies

Figure 1. Push up feature use in different categories. 10 best-performing categories and subcategories according to the ratio between revenue from push-ups and the number of listings in each category.
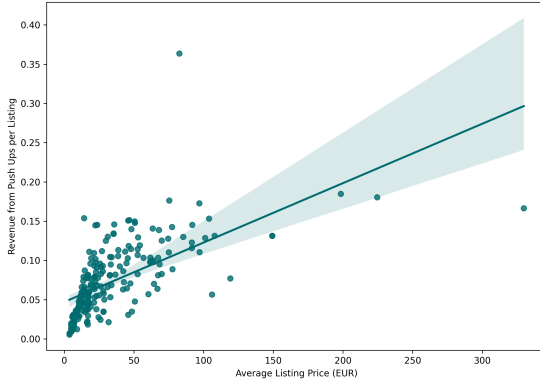
Figure 2. Correlation between Average Listing Price and Revenue from Push Ups per Listing.

2.1 A different fixed price for the push-up feature

A price increase may lead to decreased demand from sellers who find the feature less cost-effective. Sellers may become more selective in using the feature, opting to promote only their highest-value or highest-margin listings. This could lead to a concentration of promoted listings in certain categories or price ranges, affecting the overall diversity and balance of listings on the platform. If competing platforms offer similar promotional features at lower prices, sellers may choose to allocate their marketing budget elsewhere. This could result in a loss of market share and decreased visibility for listings on the platform compared to competitors.

A lower price for the push-up feature may stimulate increased demand from sellers, as the feature becomes more accessible and cost-effective. This could lead to a higher volume of promoted listings on the platform, potentially increasing revenue from this source. It may encourage more sellers to use it even for lower-value listings. This could enhance the diversity of products seen by the buyers. If the price is too low, however, too many listings would use it. Promoting a listing if every listing is promoted is not effective. While each promotion generates lower revenue due to the decreased price, the overall revenue from the "push up" feature may increase if the increase in demand outweighs the price decrease.

2.2 Dynamic pricing strategy

Another option for pricing the push-up feature is to set it to a certain percentage of the listing price. The higher the listing price, the higher the feature price. We checked what percentage would be the best for this. The naive approach would be to look at how the percentage of listings with push-ups varies with relative feature price percentage. This would disregard any information about the item category which might influence the optimal percentage.

As the price (percentage of listing price) increases we expect fewer units sold. This is an optimization problem. First, we defined the function to optimize:

$$R \propto lpp \times P(push-up), \tag{1}$$

In the equation 1 the total revenue R is proportional to the product of the listing price percentage (lpp) and the probability of the customer choosing to pay for push-up (P(push-up)). As we know this probability will decrease as the listing price percentage increases. As the highest total revenue is the goal we need to minimize the negative of this function that follows a quadratic shape. To evaluate uncertainty the quadratic function was fit on 1000 bootstrapped samples and the optimal listing price percentage was evaluated each time.

Figure 3 shows the average fit function and the mean optimal listing price percentage to be set for the push-up feature price. The maximum revenue was at 24.36% with a standard error of 0.0745.

To evaluate if this is better than using a fixed price of 2€ we would need more data that would help us evaluate the probability of the customer buying the feature. A naive
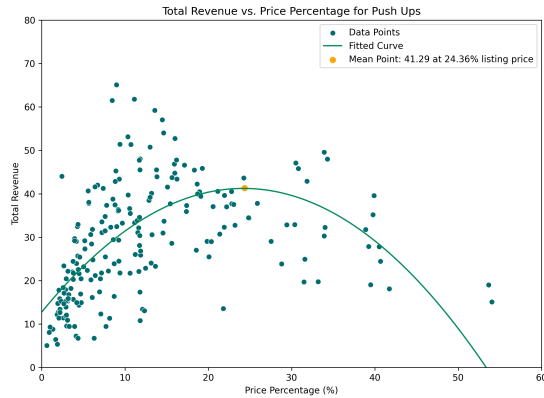
Figure 3. Optimal listing price percentage as a dynamic push-up feature price.

approach would be to assume the customers who paid for the feature when the listing price percentage was higher than 24.36% would use it again. The customer who previously had to pay a lower percentage would not buy it. This is a very pessimistic approach and it results in the dynamic pricing performing worse than fixed pricing of 2€. More precisely, when using fixed pricing the total revenue from push-up was 887728.0 € and with this approach, it was 696213.65, which is 191514.35€ less. An optimistic view would be that all the customers who bought the feature before would buy it again with the new pricing mechanism. This would give a drastically better result as the total revenue would be 3430003.51€ which is 2542275.51€ than the current pricing.

2.3 Uncertainty
Some concerns regarding the uncertainty were explained in section 2.2. There is not enough data to support individual customer's behaviour. For some listings, the price of push-up will decrease and for some, it will increase. The decision behind using the feature might also depend on the category of the item being sold. To account for the uncertainty of our approach we used bootstraping to get different fit parameters and consequentially different optimal points. The 24.36% is the mean over all bootstrap samples. Figure 4 shows the distribution of obtained optimal points. This approach also enabled us to evaluate the standard error which was 0.0745.

3. Next steps

3.1 Preparation for fully scaling dynamic pricing
Before fully scaling dynamic pricing, we should conduct pilot tests or experiments to evaluate the effectiveness of dynamic pricing. Test different pricing strategies and algorithms on a small scale to assess their impact on revenue, customer engagement, and user experience. Gather feedback from users and stakeholders to refine your approach before full implementation.
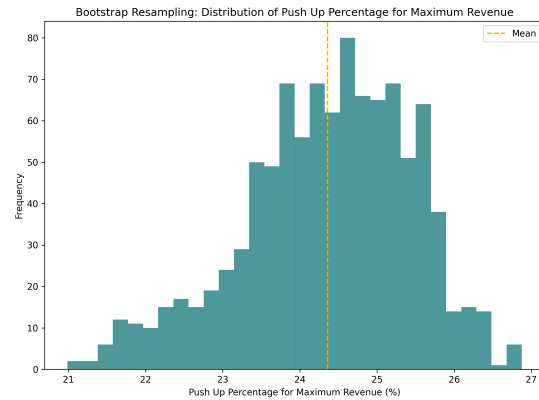
Figure 4. Optimal listing price distribution.

3.2 Minimum fixed price
Some listings have a low price, resulting in the feature price being very low, when using dynamic pricing. For this reason, there should be a minimum fixed price of 2€. This can be especially useful for category GIRLS_CLOTHING where items are inexpensive, and 2€ represents more than 24.36% of the listing price.

3.3 Increasing the number of push-up users
The number of push-up users could be increased in several ways. The first one is promotions. For example, every n-th push-up could be free, or discounted. This would make it more attractive, especially for sellers with many listings. Another way would be to create an algorithm that would suggest to the customer, which listings to push. This means the customer will see the feature more often and it will make it easier for them to decide when to use it. The push feature could be sold as a subscription, where the customer would pay each month to be able to push a certain amount of listings every 3 days. The push-up period could be 5 days long instead of 3, making it more attractive as the item is promoted longer. Or there could be several options for how long you want your listing promoted, having different pricing.