Revolut Operations Hometask - Improving KYC
Guilherme Covas
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Problem Description

As a financial institution regulated by the FCA, Revolut has the obligation to verify the identity of all customers who want to open a Revolut account. Each prospective customer has to go through a Know Your Customer (KYC) process by submitting a government-issued photo ID and a facial picture of themselves to our partner, Veritas.

Veritas then would perform 2 checks – a Document check and Facial Similarity check. The customer will 'pass' the KYC process and get onboarded if the results of both Document and Facial Similarity checks are 'clear'. If the result of any check is not 'clear', the customer has to submit all the photos again. The "pass rate" is defined as the number of customers who pass both the KYC process divided by the number of customers who attempt the process. Each customer has up to 2 attempts.

The pass rate has decreased substantially in the recent period. The goal is to try to find the root causes and possible solutions.

Data Analysis

Revolut, founded in 2015, has seen a substantial growth in the last few years. Due to that development and popularity, more and more customers try to get on board, and although this is a proof of business acceleration, it is also witnessed the KYC process pass rate, authenticated by Veritas in 2 stages, is decreasing – almost 30% since the beginning of June 2017 until the end of October 2017 (Figure 1).
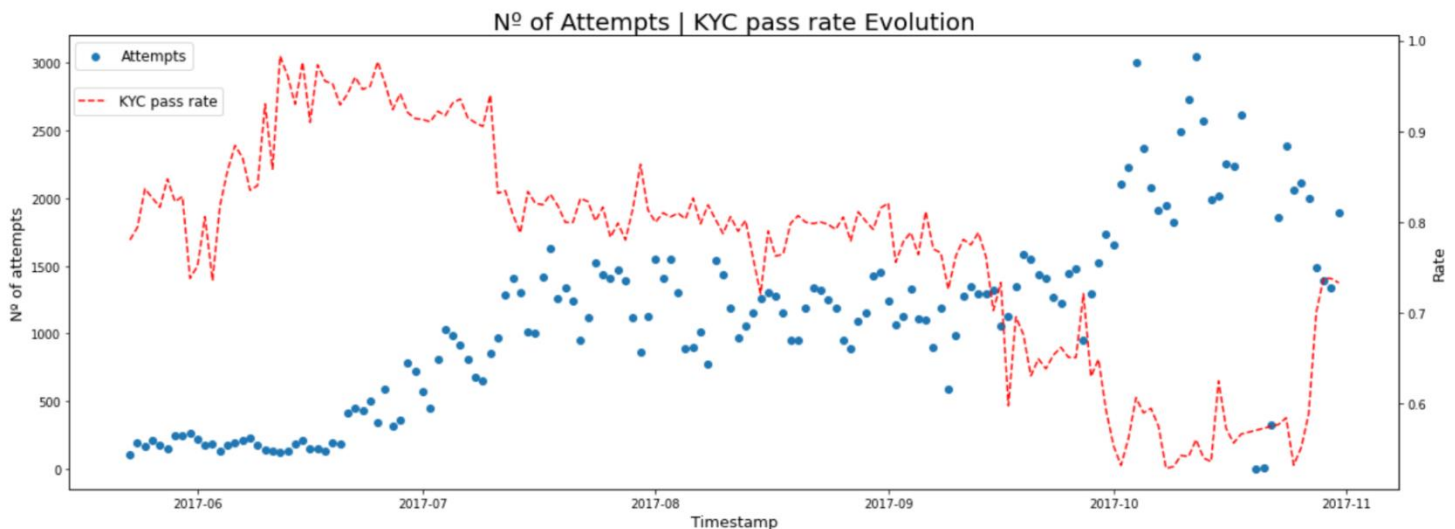

Figure 1 - Increasing of attempts to open a Revolut account vs Pass Rate

To understand why, it is vital to know how Veritas performs these 2 checks, Document check and Facial Similarity check, each one of them with multiple features to authenticate.

- Document check: To verify that the photo ID is valid and authentic. It has as breakdowns the following reports:
  - Image Integrity, Image Quality, Data Validation, Police Record, among others. It is important to state that when a customer fails this authentication check, a sub-result category will give further details of the why.

- Facial Similarity check: To verify that the face in the picture is the same as that on the submitted ID. It has as breakdowns the following reports:
  - Face Comparison, Image Integrity and Visual Authenticity. A score result is also given to this check.

From the analysis made, it became noticeably clear the Document check stage is the main cause of the decrease of the KYC process pass rate (see Figure 2 and Figure 3).
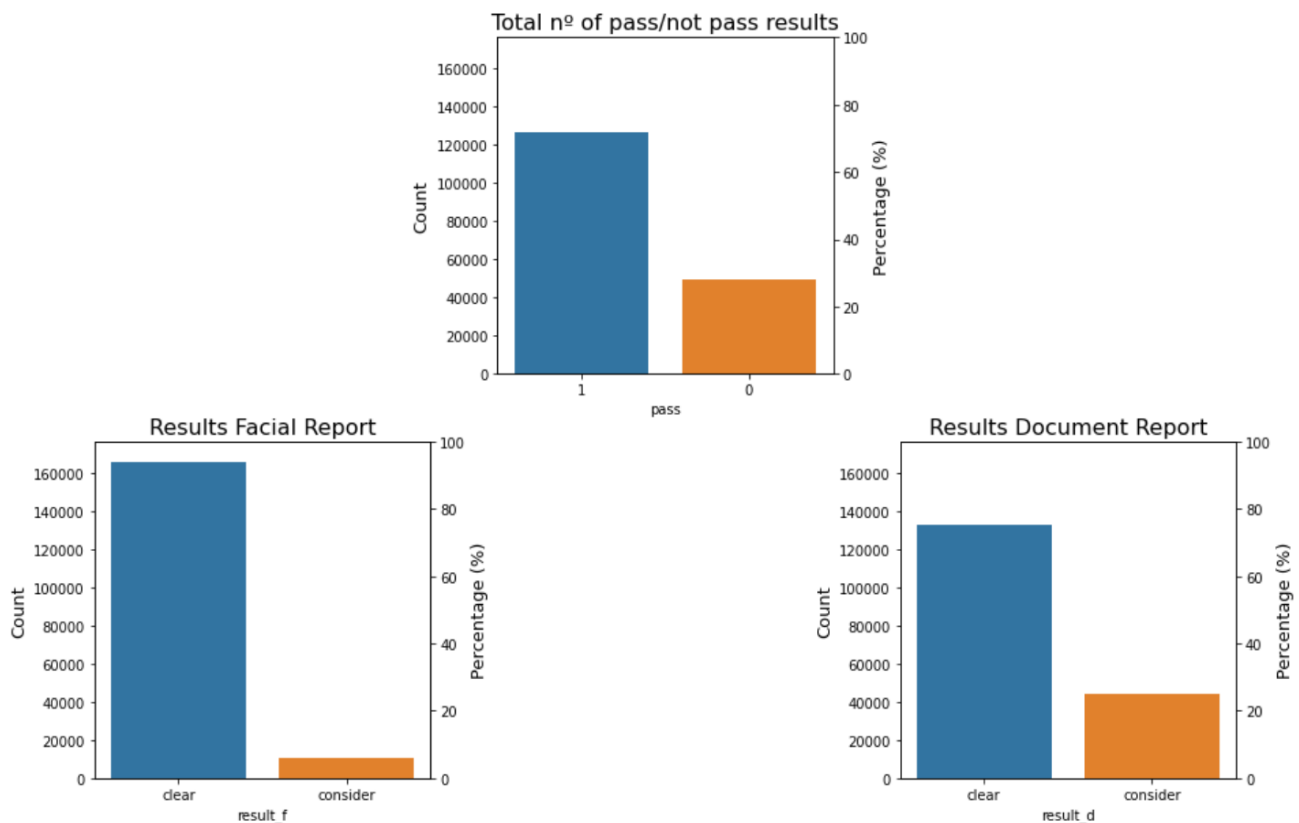

Figure 2 -Bar plots of KYC "pass" result, above, and results of Facial and Document report, below
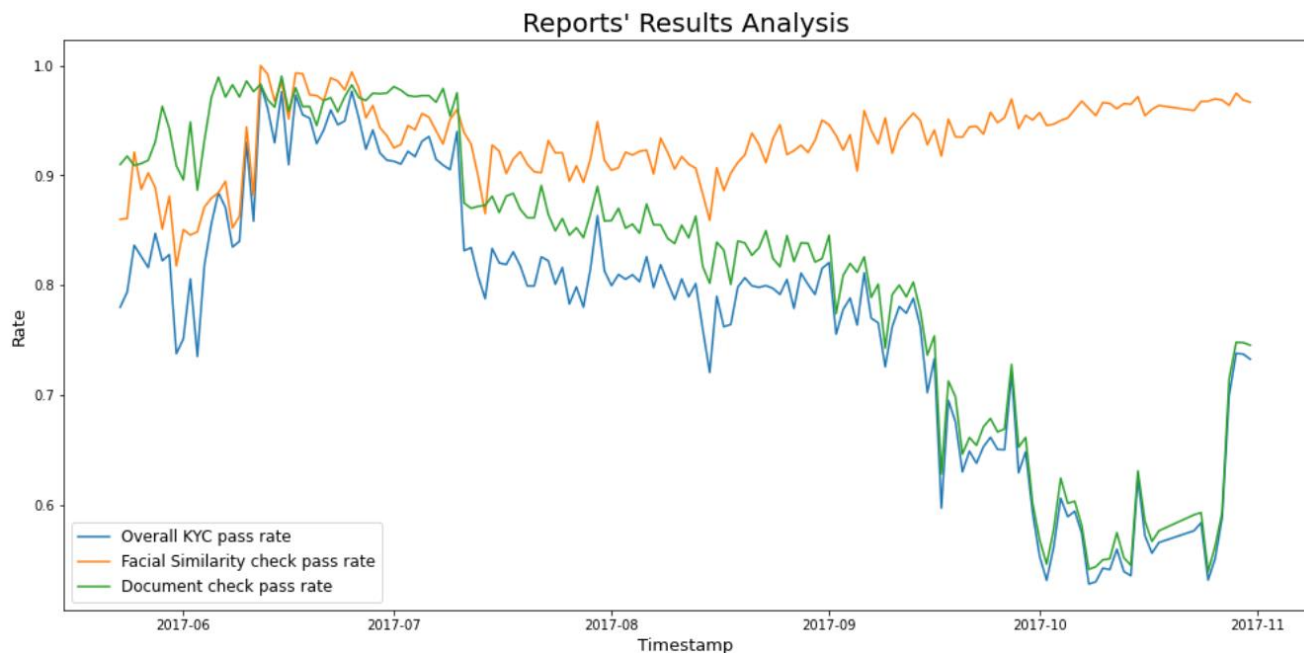
Figure 3 - KYC pass rate, Facial Similarity check pass rate & Document check pass rate

Considering the deductions made from the plots above, it is safe to say the KYC pass rate, as said before, is being directly influenced by the Document check, where the unsuccessful attempts from this stage represent around 89% of the KYC total negative results, within the period analyzed (May 23, 2017 – October 31, 2017).

It was also noted that at the beginning of June, the KYC pass rate was most affected by the Facial Similarity check but, by middle of July, it became more affected by the Document check, continuing this tendency until the end of the evaluated time range. Finally, the KYC pass rate has seen sharp drops by middle of July, middle of September and beginning of October.

Diving deeper into the Document check stage (Figure 4), it was concluded that the pass rate of this check is directly connected with the Image Integrity Result (from the Veritas API documentation, it asserts whether the document was of sufficient quality to verify), which has as sub-breakdowns the Image Quality, Colour Picture and Conclusive Document Quality results. It is interesting to see that the parameter Conclusive Document looks like it was not even in production until middle of August, where only after one month the pass rate starts to decrease significantly. Since it was implemented, it became the determining factor of the Image Integrity Result, and consequently of the Document check pass rate.
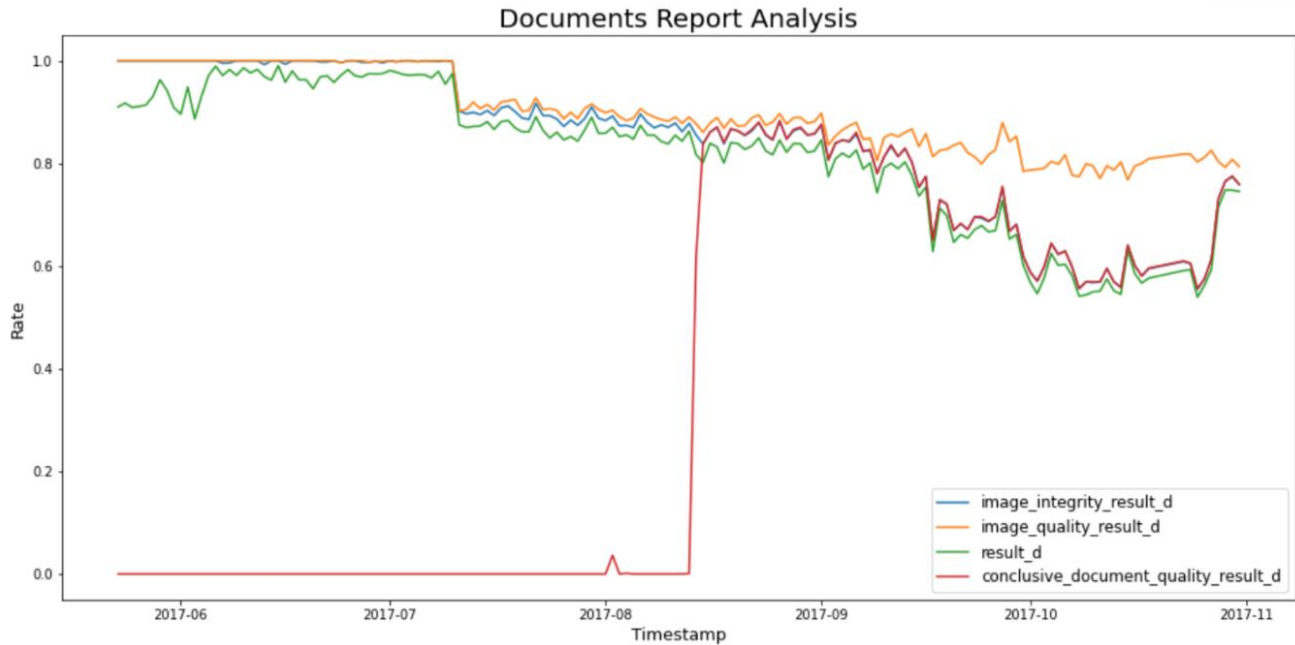
Figure 4 - Document check Breakdowns Analysis

Finally reaching the sub-results of the Document check (Figure 5)., in July it can be observed a surge of the Rejected submissions (report has returned information where the check cannot be processed further - poor quality image or an unsupported document), analogous to the Image Quality Result decline. Similarly, in September, a growth in the Caution sub-result is noticed, one month after the introduction of the Conclusive Document Quality breakdown, and correspondent decay.
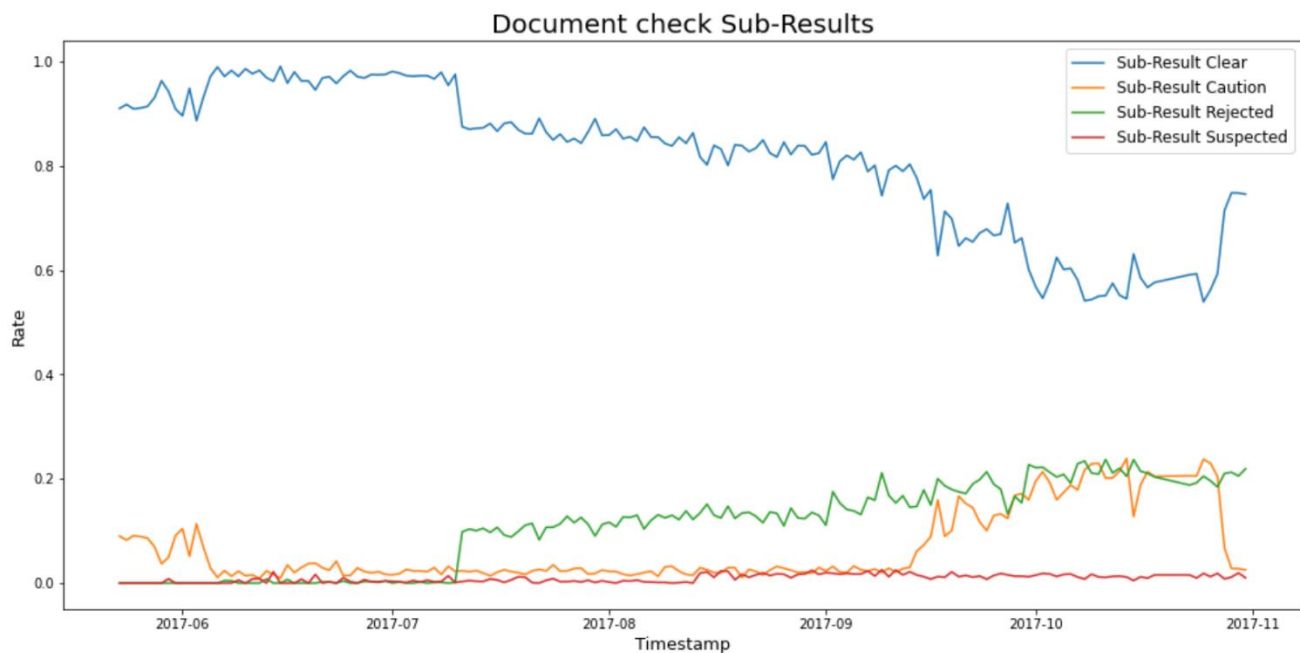

Figure 5 - Document check Sub-Results

Conclusions

In this section it is presented a summary of the conclusions drawn from the analysis:

- The KYC pass rate decreased due to the Document check performed by Veritas.

- Although it was pointed out the "acute" decrease of the KYC pass rate in July, the correspondent root cause was not completely identified. It was concluded it was due to the Document check, Image Quality breakdown, but it does not seem plausible the users started to update bad quality photos suddenly. A more coherent assumption would be that Veritas made some changes in its parameters/thresholds regarding the Image Quality breakdown, making it slightly harder to pass. The 'clear' rate of this feature was 100% before.

- Since the Conclusive Document Quality result, sub-breakdown of Image Integrity, was introduced into production, the pass rate started to rapidly fall.

- It is seen a mirroring correspondence between the Image Quality result and the sub-result Rejected. Equally, the Conclusive Document Quality sub-result is more classified as Caution.

- No reason was found to assume that the decrease of the pass rate was due to fraudulent prospective costumer.

Solutions

In this section it is presented the possible solutions to increase the pass rate:

- Schedule a meeting with Veritas to understand if they actually made some changes in the Image Integrity report's evaluation method, like constated above, and if so, comprehend why and how. One solution may be reducing the threshold of the Image Integrity Report.

- Although Revolut is a financial institution regulated by the FCA, that needs to verify the identity of all possible future customers, the actual evaluation process seems to be too "heavy". The times we are living in require simplicity and celerity. Giving users the opportunity to get on board easier and faster, even if they fail at the first attempt, can give a huge boost to the company. Nowadays, a good feedback can spread almost instantly, bringing new users to Revolut and leveraging the business.

Future Work

In this section it is presented just one point that was noticed in the current analysis, for future work:

- It was found that a small quantity of users passed, for example, at the 3rd attempt (Figure 6), leaving the question if a user really "has up to 2 attempts". If it is a premise that "each customer has up to 2 attempts" how and why is this observed?

user_id	attempt_id	pass	n_of_attempt
e0bb9eec6bc64173bc62bf6e89e05df3	837cca7f44a544cd826b5b59c938e91a	0	1
e0bb9eec6bc64173bc62bf6e89e05df3	f955c5b0cee44b9ca85f18a4fef089a7	0	2
e0bb9eec6bc64173bc62bf6e89e05df3	fc06e6821bee4be88206ce948023b637	1	3

Figure 6 - Example of a user who passed at the 3rd attempt