Backoffice Analyst Test

Tasks - Understand the Industry

- Explain the money flow and the information flow in the acquirer market and the role of the main players.

The market for card acquirers is a complex ecosystem with numerous players and processes. Its primary function is the processing and settlement of electronic payment transactions between cardholders and merchants.

Companies that provide the infrastructure and standards necessary to enable electronic payments are known as card networks. They are in charge of authorizing transactions and sending them to the right issuing bank for approval. It is also responsible for establishing rules and procedures regarding risk management and minimum operational aspects to be met by participants. Visa, Mastercard, American Express, and Discover are the major card networks.

On the other hand, acquirers are businesses that enable electronic payment acceptance by working directly with merchants. They supply the software and hardware required and are responsible for the accreditation of commercial establishments and for the capture, transmission, processing, and financial settlement of operations carried out with cards.

Issuing banks represent the final players in the card acquirers' ecosystem. They are financial institutions or not, authorized by the brands to issue credit cards. Also accountable for charging cardholders for the costs they incur using these cards and transferring the collected funds to acquirers for payment by commercial establishments.

To avoid errors and fraud, the payment information must be secure and accurate. When the cardholder enters the store to make a purchase and hands the card he received from the issuer to the cashier, the information flow begins.

The trader then runs the card through the machine he got from the acquirer. It records the purchase, enabling the card networks to bridge the market divide between the two sides: that of the receiving merchant and the paying customer. After that, the card networks get in touch with the issuer to see if the transaction should be allowed. If it is, the card network tells the acquirer, which gives to the merchant the go-ahead for the purchase.

Approximately 28 days after the purchase, the issuing bank transfers the sales found to the acquirer. Within 2 days, the acquirer transfers the amount received to the merchant's bank account, minus any fees or charges associated with processing the payment.

- Explain the difference between acquirer, sub-acquirer, and payment gateway and how the flow explained in question 1 changes for these players.

The essential distinction between an acquirer, sub-acquirer, and payment gateway is the job that every element plays in the payment process.

An acquirer processes electronic payments in the interest of merchants. They are responsible for validating transactions and ensuring that the funds are transferred properly.

Sub-acquirers, though, are typically smaller businesses that work with specific industries or regions. They can offer additional services like chargeback management and fraud prevention and carry some of the risk and liability associated with processing transactions. In summary, they help to simplify the payment procedure by acting as intermediaries between acquirers and merchants.

Last but not least, a technology platform that links merchants to the acquirer or sub-acquirer is known as a payment gateway. They are the interface between the merchant's website or point-of-sale system and the financial institutions that processes payments, encrypts, and transmits sensitive data.

To recap, the acquirer processes transactions, the sub-acquirer acts as a link between the acquirer and the merchant, and the payment gateway is a technology platform that lets merchants securely process online transactions. Although sub-acquirers and payment gateways can add layers to the payment processing ecosystem, the fundamental money and information flow largely remains unchanged.

- Explain what KYC (Know Your Customer) is and how it's important to the company and the entire payment industry.

KYC (Know Your Customer) is a process that verifies the identity of the company customer and identifies any potential risk associated with doing business with them.

It's necessary for companies to comply with legal and regulatory requirements, such as anti-money laundering and counter-terrorism financing. KYC consists in collecting personal information from the customer, government-issued identification, and conducting background checks to ensure they are not involved in any illegal activities.

Implementing a robust process can help companies to build trust and confidence among customers, retaining existing and attracting new ones. Also, it can reduce the risk of reputation damage in case of any security breaches or financial crimes.

KYC is important not only for companies but also for the entire payment industry. By ensuring that the payment information is accurate and secure, KYC prevents fraudulent transactions, which can harm all parties involved.

Tasks - Get your hands dirty

- Create a query in SQL that shows us all the CNPJs, the dates of purchase and how long it took us to approve each merchant (in hours and in minutes).

```
SELECT
	c.cnpj AS CNPJs,
	MAX(s2.data_horario_do_status) AS date_of_purchase,
	TIME_FORMAT(
		TIMEDIFF(
			MAX(s1.data_horario_do_status),
			MAX(s2.data_horario_do_status)),
		'%H:%i:00')
	AS time_of_approval
FROM
	clientes c
	JOIN `status` s1 ON c.user_id = s1.user_id
	JOIN `status` s2 ON s1.user_id = s2.user_id
WHERE
	s1.`status` = 'approved' AND s2.`status` = 'pending_kyc'
GROUP BY
	c.cnpj
ORDER BY
	date_of_purchase DESC
;
```

- Calculate the average time of approval, and the maximum and minimum time of approval. For that, you will create three queries.

Average time of approval:

```
SELECT
	TIME_FORMAT(
		SEC_TO_TIME(AVG(TIME_TO_SEC(time_of_approval))),
		'%H:%i:00')
      AS avg_time_of_approval
FROM
	time_of_approval
;
```

Maximum time of approval:

```
SELECT
	TIME_FORMAT(
		SEC_TO_TIME(MAX(TIME_TO_SEC(time_of_approval))),
		'%H:%i:00')
      AS max_time_of_approval
FROM
	time_of_approval
;
```

Minimum time of approval:

```
SELECT
        TIME_FORMAT(
                SEC_TO_TIME(MIN(TIME_TO_SEC(time_of_approval))),
                '%H:%i:00')
      AS min_time_of_approval
FROM
        time_of_approval
;
```

- Was there any negative number? If so, why do you think that happened?

There were no results with negative numbers in none of the queries. As all data were relative to the passage of time, by convention negative numbers were not expected.

If any had appeared, it would indicate an error in the query or failure in the data processing. For example, switching the order of dates in the calculation or dates stored with different time zones.