



Using process mining to find missed opportunities for improved customer experience

This e-commerce company wanted to find new ways to improve customer experience to build business advantage amid rising sales volumes and increased competition. Their solution: Capturing accurate data about existing process enabled detailed analysis using Apromore to identify opportunities for improved customer experience.





Overview

This 30-year-old company entered the e-commerce arena around 20 years ago. As of 2020, the business offered more than 500,000 products in their online shop, ranging from electronics to sports equipment, white goods, cosmetics, toys, and apparel. The business had spent years streamlining the process via digitization and automation efforts. Despite securing additional workforce, the increasing online sales volumes post-COVID made it harder to provide the same level of fulfillment to their customers. Rising employee workloads were causing unnecessary stress, overworking, and both employee and customer dissatisfaction. The need for targeted and timely process improvements, to continue satisfying customer demands, had become urgent.

The company's own manual analysis had not identified many opportunities for improvements and did not uncover the root causes of challenges the company was now facing. To move forward quickly the firm wanted to use data-driven methods to find new improvement opportunities within its operational internal process for handling online orders.

Using Existing Data to Create Business Advantage

Because online sales processes are data-heavy, including customer reactions and company systems activity logs, they are a natural fit for process mining. However, many companies do not use available data as efficiently as they could, missing opportunities for improvement. Since e-commerce is increasingly competitive, gaining an edge in performance could help the company stay ahead of its rivals.

The e-commerce company had set the business goal of reducing its process cycle time to be more efficient and deliver orders to consumers faster. Online sales fulfillment is influenced by resources (employees), suppliers, delivery partners and a number of other possible attributes. Therefore, to impact time per order, it could reduce employees' workload, possibly even reduce costs, and use resources more effectively with varying results. Process mining helped to gauge what would make the most impact.



Applying Process Mining Techniques to Retail Data

The company had a total of three information systems that logged data for online orders: the e-commerce frontend and two backend systems supporting a range of process activities related to order confirmation, sourcing, warehousing, packaging, logistics.

Separate logs were extracted from each system, each which used different identifiers. These differences were reconciled by relying on tables that related the customer order identifiers with the identifiers used for different subprocesses on the backend. The team performed data extraction incrementally. Apromore's open-system approach makes it easy to ingest data from multiple systems into the platform. Graphical no-code extract, transform, and load (ETL) tools that are now part of the platform automate the loading of data without requiring any intervention on the part of an internal IT team.

The event log processing and data analysis were illustrated and explained using figures and screenshots from the Apromore portal.

The first stage of analysis inspected the current process flows and identified a number of key areas for improvement. Four Apromore templates - step-by-step guides explaining which techniques to use for what type of analysis - were used to guide the analysis. Apromore's templates offered detailed instructions on how to detect bottlenecks, compliance and flow issues, and resource utilization by using process mining to visualize processes.

Each template starts with a table summarizing what needs to be analyzed and how it should be done. Then, the templates continued with explaining each of the phases and techniques even further.

Looking at the current processes, issues regarding incomplete cases and incompatible systems were detected with cycle-time inefficiencies that needed to be addressed. Looking in more detail, fulfillment within the expected timeframe was the main issue that surfaced. Revisiting the variant analysis, the root causes of not delivering orders on time were found. Investigating and visualizing handoffs allowed the team to detect unnecessary manual tasks, as well as explanations regarding SLA fulfillment challenges. A review of the last 12-months showed the company had fulfilled over 75,000 sales transactions. The pathways these orders had followed were very diverse. The team found a total of 267 different pathways for order fulfillment (case variants).

In addition, the operational processes showed problems around scalability in highdemand time periods. A process performance evaluation further confirmed the bottlenecks around suppliers, invoicing, and delivery. These results were coupled with an assessment of resource utilization, where the uneven workload was the main issue for employees carrying out operational processing activities.

Using Apromore dashboards, the team gained an overview of resource utilization as well as demand frequencies. Additional log slicing and filtering were done to compare different variants of the log in the dashboard.

First, extraction was performed manually for a handful of sample orders. Once this sample was validated, the extraction process was automated and used to extract one year's worth of data, leading to an event log of over 1.5 million events.

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Results and Benefits

The process mining effort identified a number of areas where operational processing and customer experience and satisfaction could be improved to provide substantial benefits.

Increasing SLA Fulfillment

The analysis showed that over 26% of orders were delivered late, meaning that over 19,500 packages were delivered to disappointed consumers. When looking at the bottlenecks in the results, invoicing had the most considerable delay in the process. By changing the systems processes to automate supplier order workflows could increase the chance of orders arriving within the service level agreement by 10%.

Decreasing Order Cancellations and Refunds

Around 25% of refunds happened directly after payment confirmation when the customer received the letter with the estimated time of arrival. Cancellations and refunds also happened when customers purchased items with different delivery times but expected the order to arrive according to the shortest time. There was customer confusion over order Expected Time of Arrival (ETA). An estimate from sales specialists was that around 350 refunds per year happen due to this error, and one refund takes 5 minutes to handle.

Process Improvements

Processing improvements led to total effort savings of 10% and increased the percentage of on-time fulfillments by several percentage points – a remarkable achievement given that the company had already spent years streamlining the process via digitization and automation efforts. By showing the ETA in the shopping cart before order confirmation the customer can see the total delivery time for the whole order before it is confirmed and money is transferred. This redesign decreased cancellations, and by association the workload on employees who must handle the refunds. Additionally, customers were more satisfied since they are not disappointed after order confirmation when they find out the ETA is longer than they thought.

Looking Ahead

A recent study from PWC found that between 32%-49% of consumers say they will walk away from a brand they love after just one bad experience, with speed ranking high among satisfaction criteria. Retailers implementing continuous monitoring of customer journeys using process mining will be able to spot problems quickly and address potential issues, mitigating the impact on business outcomes.

Conclusion

The competitive nature of business, and e-commerce especially, has pushed companies to improve their processes to increase efficiency. Due to COVID-19, the rise in demand has increased the need for change even more. By using process mining techniques, the company was able to narrow its focus to the changes that would help them make the most progress toward its goal of improving customer experience. The Apromore process mining platform helped the team to easily ingest the data and guided the process mining team in how to structure and perform common analysis. The results were combined with redesign heuristics to propose improvement ideas for transforming the as-is process to enable the organization to better compete through improved customer experience.

About Apromore

By providing an easy-to-use, fast-to-deploy process mining solution, the Apromore platform enables business teams to quickly visualize and analyze their business processes to unlock value in existing processes or identify strategies for transformation or optimization. The result of over a decade of extensive research and innovation from leading universities, Apromore's mission is to help organizations maximize value from their business processes by leveraging the full potential of process mining.

Ready to learn how to adopt or scale process mining in your organization?

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