Travel Agency Inc. Business case

TL;DR;

This business case studies uncertainty in complex software engineering projects with high numbers of engineers and engineering teams, decision-making, goals, metrics, and people management. We present different learnings and possible solutions.

Context

Travel Agency Inc. (TA) is a travel agency that organises trips worldwide. Multiple destinations, tour packages, ticketing and hospitality. Its services are varied, but all related to the transport of people worldwide. It has branches on all continents. It was born over 10 years ago in a 100% digital environment. Its staff is 1,000 employees, 600 people in engineering and 400 in operations, marketing, HR, and other departments.

The company has native Apps on iOS and Android and the Web version. Capture B2C customers through the three platforms. In addition, on the web, it also manages B2B clients.

The engineering department works in teams (squads) and applies agile methodologies to organise its work. Each squad enjoys sufficient autonomy to make decisions within its scope. Squads are distributed throughout all offices worldwide and work in different time zones. Some squads are just back-end engineers, some are front-end, and some are cross-functional. Each team has 1 Engineering Manager and 1 Product Manager, both managers leading the team. A cross-functional has as engineers: 3 Backends, 2 Web engineers, 2 Android and 2 iOS engineers. In addition, the team has extra support from 1 full-time Data Scientist, At part-time 1 User Research and 1 Designer specialised in UI and usability.

The engineering department has a typical career ladder in technology/software product companies. It consists of six levels, starting at L1 as a junior to L6 as principal engineer/director of engineering (aligned with Radford levels). The department organises 2 performance review cycles, where the engineers present their performances/achievements, managers ask for feedback, and an individual assessment is delivered with the Performance Review. This assessment follows this scale: needs improvement, sometimes meet expectations, meet expectations and outstanding. Engineers who are classified as needs improvement must participate in a Performance Improvement Plan (PiP) for no more than 6 weeks. At the end of this period, if there are no notable changes, the person is layoff for poor performance.

Engineering is divided into several independent Business Units, each with its Engineering Director and Product Director. In addition, there may be several Senior EM and Senior PMs that group teams and business domains. Each BU has several squads. The product BUs are Growth, Cars, Flights, trains and Hotel. And the Platform BU, where several teams bring

support to the product teams. Platform operates the low-level technology infrastructure so product teams can focus on building new businesses.

BU Flights is one of the most complex. They manage airline tickets, both searching and booking/check-in, and support to customers in the event of possible circumstances in transfers between flights. This BU has 10 teams. So far, It is one of the largest in the engineering department.

Situation

Flights BU pipeline consists of 5 stages:
1) Acquisition: 3 squads, managing the company's API to receive plane ticket prices from partners and multiple scrappers to capture prices from other airlines.
2) Storage: 2 squads, to store prices and debug errors.
3) Integration: 2 squads, to integrate with the airline's booking/api (when there is a commercial agreement).
4) Searching: 2 squads, to index prices in a way that is accessible to customers, applying complex logics such as to avoid impossible connections between flights.
5) Booking: 1 squad, integrate the airline's booking within the agency's system and manage customer support during the flight.

In the first stage (acquisition), the third team was recently created to improve the quality of the prices ingested, all engineers are back-end. This API is shared between the three teams. The BU leadership has agreed to measure the team's performance with the following KPI: number of prices ingested into the system. Following the same logic as the other two teams. The Goal assigned to the team based on the KPI was to reach 100M prices ingested in 6 months. Also, leadership motivates the team to avoid mapping the airline-by-airline data structure manually, the team must be able to create a scalable solution. That is, the cost of integrating a new airline must be marginal. The product is developed from scratch, and there is no technical debt.

The PM outlines the work plan, creates the first epics and stories in JIRA and organises the first two sprints to start working.

The team organises itself into one-week sprints, daily standup, except Monday when there is sprint planning. Thursday backlog refinement for the next sprint. On Friday, sprint review and demo. Retrospective every two weeks.

Difficulties appear

After the first 2 months of work, the first airline is integrated and the its fees appear in the flight search engine. But the first concerns arise in the Storage teams, the system will not be able to support the number of new fees ingested as foreseen. The leadership decides not to

publish the fees until the storage is stabilised and asks the team not to post prices in the system but to continue ingesting prices at the same rate.

After the first 6 months, the KPI achieved is very low. It does not reach 1M ingested prices. Each time a difficulty is resolved, several new ones are opened, forcing the work plan to be modified. The team is demoralised. The squad decided to keep the KPI, but instead of ingesting fees from different airlines, the idea is to bet on a fee aggregator that will provide 20 airlines with a single integration. The project's scope has been shrinked to focus on integrating a single API, and the initial project has been abandoned. The team is modified to add more backend engineers.

A year, the 10M fees ingested are hardly reached in the system. The team has a high turnover of engineers, and the squad's atmosphere is unhealthy. The leadership has lost trust in the team management.