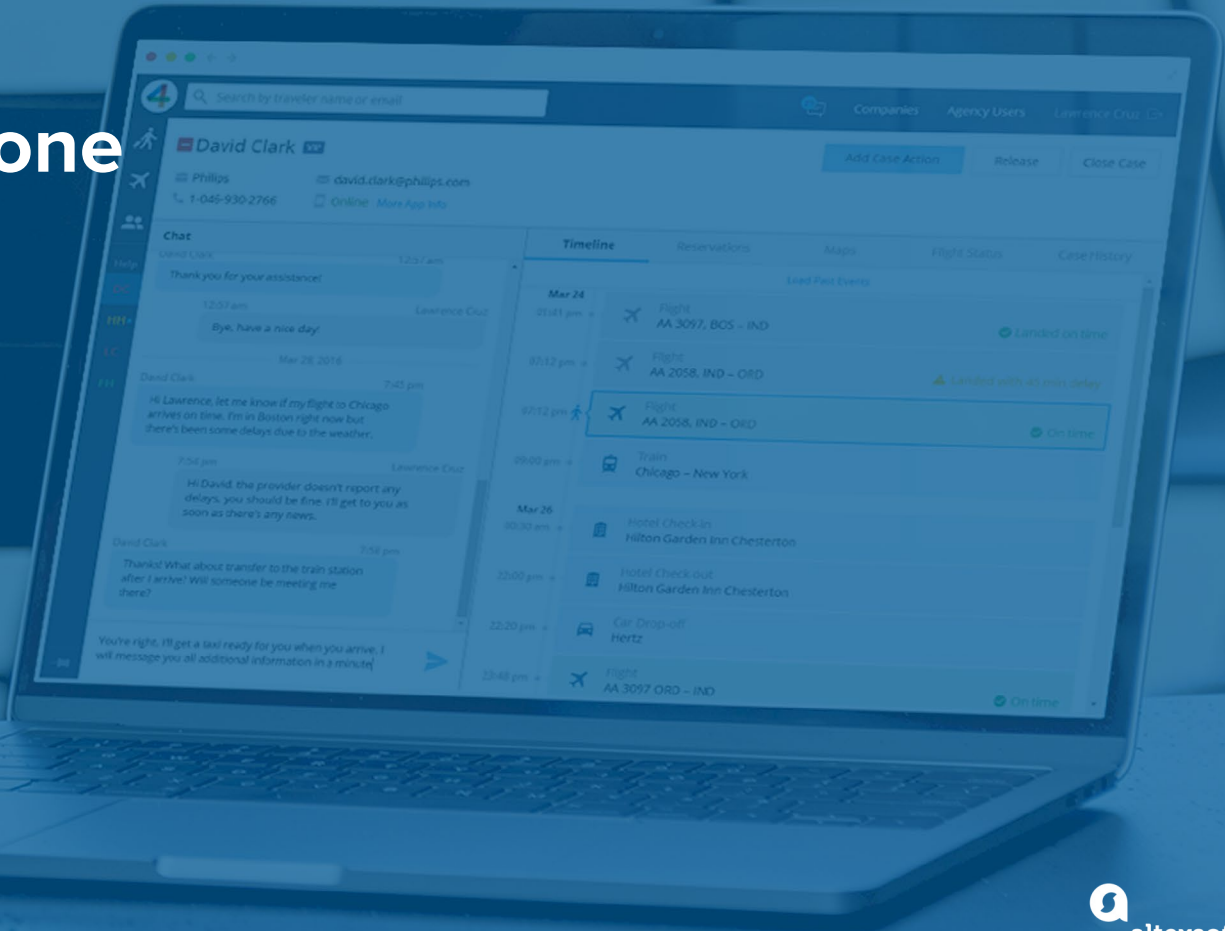


Case Study

AltexSoft & Cornerstone Information Systems

Building a Cloud Web Dashboard as a Corporate Travel Management Solution



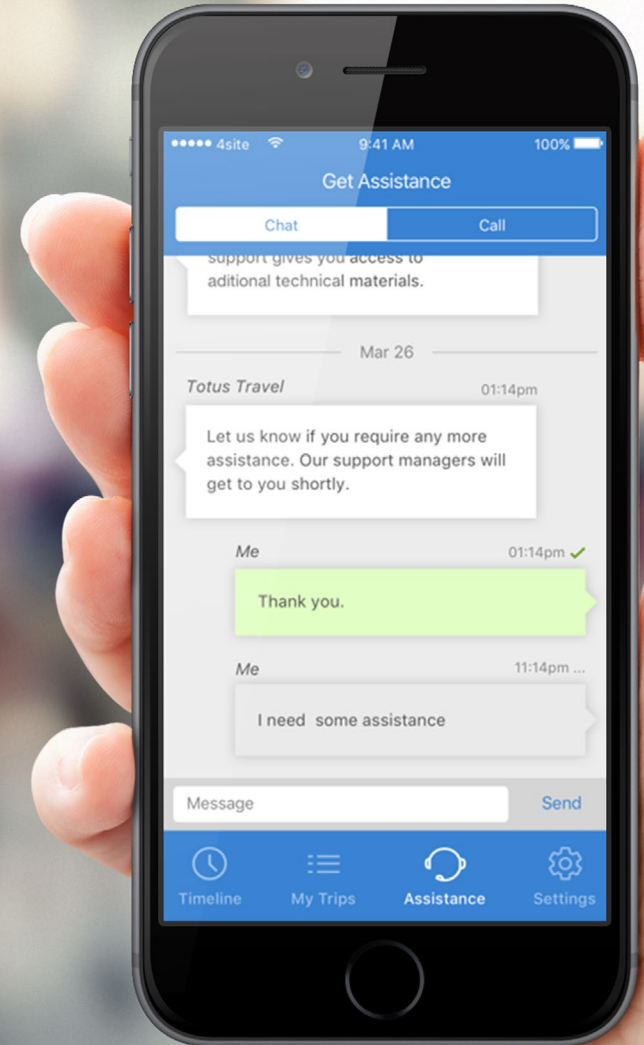
Travel, AWS Lambda, ReactJS, React Redux.

Background

Cornerstone Information Systems (CIS) is a global SaaS technology provider that helps travel companies and corporate buyers do business more efficiently. CIS engaged AltexSoft to build 4site, a journey management tool, that allows travel agents to proactively respond to flight disruptions and recover their customers – business travelers – by rebooking the flights.

Business travel is particularly sensitive to flight disruptions as any delays can jeopardize critical meetings and negotiations. Traditionally, travel agents use the consoles of global distribution systems (GDSs) to find, book, or rebook flights for their customers. As GDSs usually don't have visual interfaces and notification systems, the travel agents wouldn't know about disruptions until their clients contact them directly from airports, when the schedule change is already underway. By then, rebooking opportunities for needed destinations keep dwindling as time flies by.

The core value of the 4site product is the ongoing, real-time data sourcing from GDSs. It allows travel agents to be notified about disruptions as early as possible ensuring the highest chances of rebooking and saving the client's travel from disruption.



Challenges

The 4site service goal was the creation of a web dashboard for travel agents and a mobile application for travelers. The dashboard had to provide timely and critical information about flight disruptions.

The mobile application was to be used to notify travelers about disruptions and provide a channel for live communication with agents. Building this set of services entailed the following challenges:

1.

Provide intuitive and clear UX both for the desktop dashboard and the mobile app

2.

Build a scalable and cost-efficient architecture

3.

Enable web-based dynamic interface for the web dashboard

4.

Find the ways to simulate disruption events to provide quality assurance

Value delivered

AltexSoft UX, mobile, and software engineering teams were challenged to build the entire SaaS solution from the ground up.

1. Consistent and intuitive user experience.

The team of five AltexSoft specialists, including UX designers, a software architect, and business analysts collaborated for two weeks with the client on-site to ensure better communication during the design phase. The UX design cycle included 1) requirements specification, 2) mapping roles and entities, 3) identifying user journeys, 4) making an MVP based on prototypes, 5) creating the final design. Now, with the implemented UX and UI design in place, the travel agents can message directly with their clients, see the dynamic map of airports and disruptions, track the alerts feed, and check their clients' itineraries in real time including transfers, rail travel, and car rentals.

2. Real-time web dashboard and browser notifications

The web dashboard is fully asynchronous. As soon as a disruption happens, the travel agent sees an alert notification and can react to it. The web dashboard is built using the [ReactJS](#) library and the [React Redux](#) data processing framework. To make the messaging between agents and business travelers rapid, the team used the [PubNub API](#), which allows the web environment to send messages to client apps directly, bypassing the server layer.

3. Reduced infrastructure cost due to the cloud architecture.

The server-side architecture is deployed on the [Amazon Lambda](#) platform. The architectural pattern of the platform is resemblant of the microservices architecture and consists of the smallest independent functions – lambdas. The AltexSoft back-end team leveraged this design to build the the Node.js system that provided high performance and scalability of the 4site solution.

4. Realistic disruption testing through emulation environment.

Traditionally, web products use testing servers to conduct all quality assurance procedures. As 4site is meant to utilize real-time data from GDSs about disruptions, the engineering team was challenged to emulate multiple disruption scenarios. The developers created an additional set of lambdas that allowed for imitating scenarios ranging from routine operations like aircraft take-offs, in-flight maneuvers, landings, and terminal changes to such disruptions as flight delays, cancelations, and diverts to the departure airports. The emulation ensured comprehensive testing of the 4site product within any disruption scenario.

UI

Active travelers

The 'Active Travelers' dashboard features a search bar at the top with the text 'Search by traveler name or email'. Below the search bar, there are tabs for 'Locations', 'Airports', and 'Flights'. A map of the United States is displayed, showing various cities and states. A tooltip for 'Isabelle Hogan Phillips' is visible, indicating a check-out at Hotel California on Feb 12, 07:57am. The main list of travelers includes:

- Evelyn Lowe (VIP) - Helped by Eve Land
- David Clarks - 4m
- David Clarks (Royal Dutch Shell) - Case closed
- Hilda Bowers (VIP) - 10m - Release
- Ada Sandoval (Sinopec) - Case closed
- Catherine Douglas (VIP) - 10m - Help
- Isabelle Hogan (VIP) - 4m - Help
- David Clarks - 4m

Traveler details - Timeline

The 'Traveler details - Timeline' view for David Clark (VIP) shows a chat window and a timeline of events. The chat window includes messages from David Clark and Lawrence Cruz. The timeline shows the following events:

- Mar 24 01:41 pm: Flight AA 3097, BOS - IND (Landed on time)
- 07:12 pm: Flight AA 2058, IND - ORD (Landed with 45 min delay)
- 07:12 pm: Flight AA 2058, IND - ORD (On time)
- 09:00 pm: Train Chicago - New York
- Mar 26 00:30 am: Hotel Check-in Hilton Garden Inn Chesterton
- 22:00 pm: Hotel Check-out Hilton Garden Inn Chesterton
- 22:20 pm: Car Drop-off Hertz
- 23:48 pm: Flight AA 3097 ORD - IND (On time)

UI

Traveler details - Reservations

Search by traveler name or email

Companies Agency Users Lawrence Cruz

David Clark VIP

1-046-930-2766 Online More App Info

Add Case Action Release Close Case

Flight delay: 17 min
AA 1061, AUS - DAL

Chat

David Clark 12:57 am
Thank you for your assistance!

Lawrence Cruz 12:57 am
Bye, have a nice day!

Mar 28, 2016

David Clark 7:45 pm
Hi Lawrence, let me know if my flight to Chicago arrives on time. I'm in Boston right now but there's been some delays due to the weather.

Lawrence Cruz 7:54 pm
Hi David, the provider doesn't report any delays, you should be fine. I'll get to you as soon as there's any news.

David Clark 7:58 pm
Thanks! What about transfer to the train station after I arrive? Will someone be meeting me there?

You're right. I'll get a taxi ready for you when you arrive. I will message you all additional information in a minute!

Timeline Reservations

View Past Reservations

Boston - Indianapolis - Boston

Flight Reservation
Reservation Canceled

David Clark, Frank Little, Adam Meyer

Boston - Indianapolis, Mar 21-22, 2016

AA 1583
Boston, BOS - Seattle, SEA
Operated by DELTA

1h 25min layover

AA 1583
Seattle, SEA - Chicago, ORD

2h 52min layover

AA 3691
Chicago, ORD - Indianapolis, IND

Indianapolis - Boston, Mar 25, 2016

AA 1583
Indianapolis, IND - Chicago, ORD

Flight Status

Search by traveler name or email

Companies Agency Users Lawrence Cruz

Flight Status

Filters 56 travelers of 457 Clear Filters

All Companies All Carriers All Airports Needs Assistance VIP Only

Traveler	Flight	Carrier	O/D	Scheduled	Est./Actual	Status	Delay	Help Status
Melissa Lopez Saudi Aramco	DL 221	Operated by Delta	ORD - IND	Mar 30, 10:57 pm Mar 31, 00:33 am	Mar 30, 10:57 pm Mar 31, 00:33 am	Landed	On time	Release
Alan Woods Walmart	DL 4636	Operated by Northwest	IND - BOS	Mar 31, 03:44 am Mar 31, 05:56 am	Mar 31, 01:41 pm Mar 31, 04:30 pm	Landed	10h 57min	Helped by Eve Land
Roy Matthews Walmart	AA 1061	American Airlines	BOS - AUS	Mar 31, 09:57 pm Mar 31, 11:33 pm	Mar 31, 10:57 pm Apr 1, 01:03 am	In flight	1h 30min	Case Closed
Brenda Evans Vitol	DL 4636	Operated by Delta	ORD - IND	Mar 30, 10:57 pm Mar 31, 00:33 am	Mar 30, 10:57 pm Mar 31, 00:33 am	In flight	On time	
David Clark Phillips	DL 221	Delta	DAL - DEN	Apr 1, 05:16 pm Apr 1, 08:43 pm		Canceled		Help
Roy Matthews Walmart	AA 1061	American Airlines	BOS - AUS	Apr 1, 10:57 pm Apr 2, 01:33 am	Apr 1, 10:57 pm Apr 2, 03:03 am	Scheduled	1h 30min	Release
Carol Ryan Vitol	DL 4636	Operated by Northwest	MSP - SLC	Apr 2, 09:17 pm Apr 2, 11:33 pm		Scheduled		
Sean Armstrong Doyal Dutch Shell	DL 4636	Operated by Northwest	AUS - DAL	Apr 3, 09:17 am Apr 3, 11:33 am		Scheduled		
Amber Gilbert Sinocpec	DL 4636	Spirit	MSP - SLC	Apr 5, 06:17 pm Apr 5, 10:33 pm		Scheduled		
Hilda Romero				Apr 5, 09:17 pm				

Approach and Technical Info

The 4site web dashboard UX was covered by two UX specialists and a business analyst. The front- and back-end were created by the dedicated team consisting of two **Node.js** back-end engineers, two front-end **JavaScript** developers, and two quality assurance experts. A software architect was partly engaged during cloud engineering operations.

The project required a complete mobile and web UX and UI design delivered by two UX and UI specialists.

The technology stack included: **Node.js, AWS Lambda, ReactJS, React Redux, and PubNub API.**

The web dashboard development was completed in **4 months**. The overall 4site project, including elaboration phase and UX design, took **6 months**.

Testimonial



“ Rarely can I say that someone not only exceeded my expectations, but actually created an entirely new standard for achievement like AltexSoft. They demonstrated an in-depth, practical knowledge of the business needs and actual business case value for what we wanted in a product. Most importantly, everyone was fully able to understand technical design and development, techniques and constraints with the confidence, vision, and capabilities to manage our project from the planning to the implementation and delivery stages cost effectively and on-time. ”

– **Rock Blanco, Senior Vice President, Product Innovation at Cornerstone Information Systems**

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