

Case Study

AltexSoft & Cornerstone Information Systems

Building a Cloud Web Dashboard as a Corporate Travel Management Solution



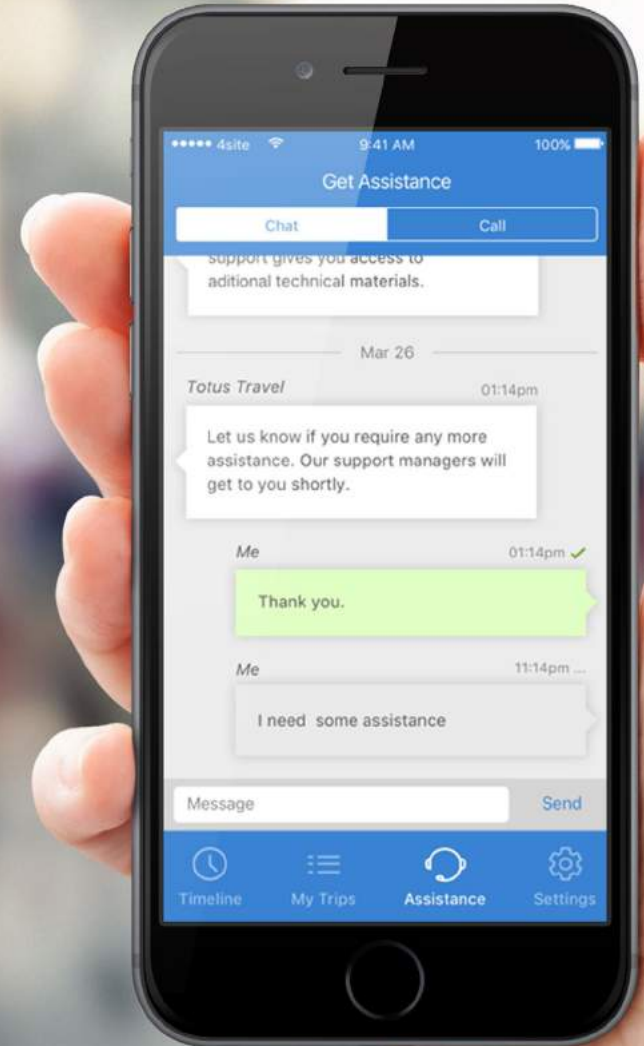
Travel, AWS Lambda, ReactJS, React Redux.

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, with a callout for 'Isabelle Hogan Phillips' showing a check-out time of 'Feb 12, 07:07am' and location 'Hotel Calif'. A list of travelers is shown on the left, including Evelyn Lowe, David Clarks, Hilda Bowers, Ada Sandoval, Catherine Douglas, Isabelle Hogan, and David Clarks. The list includes status icons (VIP, needs assistance) and actions like 'Help', 'Release', and 'Case closed'.

Traveler details - Timeline

The 'Traveler details - Timeline' view for 'David Clark' shows contact information (Phillips, david.clark@phillips.com, 1-046-930-2766) and a chat history. The chat includes messages from David Clark and Lawrence Cruz. The timeline section shows events for March 24 and 26, including flights (AA 3097, AA 2058, AA 3097) and a train (Chicago - New York). The timeline events are as follows:

Date	Time	Event	Status
Mar 24	01:41 pm	Flight AA 3097, BOS - IND	Landed on time
Mar 24	07:12 pm	Flight AA 2058, IND - ORD	Landed with 25 min delay
Mar 24	07:12 pm	Flight AA 2058, IND - ORD	On time
Mar 24	09:00 pm	Train Chicago - New York	
Mar 26	00:30 am	Hotel Check-in Hilton Garden Inn Chesterton	
Mar 26	2:00 pm	Hotel Check-out Hilton Garden Inn Chesterton	
Mar 26	2:29 pm	Car Drop-off Hertz	
Mar 26	2:48 pm	Flight AA 3097 ORD - IND	On time

UI

Traveler details - Reservations

The image displays two overlapping screenshots of a travel management system interface. The background window shows a chat conversation with Lawrence Cruz and a list of reservations for David Clark. The foreground window shows a detailed flight status for David Clark, including flight details, carrier information, and status updates.

Chat Window:

Search by traveler name or email

Companies Agency Users Lawrence Cruz

David Clark ⁹⁰⁸

Philips david.clark@philips.com
1-046-930-2766 Online More App Info

Chat

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

12:57 am Lawrence Cruz
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.

7:54 pm Lawrence Cruz
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
Thank! 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

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

Chicago, ORD - Indianapolis, IND

- 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, 08:44 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 Veol	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 Philips	DL 221	Delta	DAL - DEN	Apr 1, 05:16 pm Apr 1, 08:43 pm		Canceled		Help
Roy Matthews Walmart	AA 1001	American Airlines	BOS - AUS	Apr 1, 10:57 pm Apr 2, 01:35 am	Apr 1, 10:57 pm Apr 2, 01:03 am	Scheduled	1h 30min	Release
Carol Ryan Veol	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	Sprint	MSP - SLC	Apr 5, 06:17 pm Apr 5, 10:33 pm		Scheduled		
Elitea Rowers								

Flight Status

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



“ I’ve had the pleasure of working with AltexSoft on various projects including both web and mobile applications development. They brought together great people, including excellent project and account management leadership. AltexSoft technical talent was fantastic and worked well with our scrum teams and helped us to deliver consistent results. They were always helpful and accommodating to our schedules and deadlines. I highly recommend AltexSoft for your next software development engagement.

”

Mat Orrego,
Co-Founder and CEO, Cornerstone Information Systems

AltexSoft & Cornerstone Information Systems

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