



Company: Texas Industries

Location: Dallas, TX

URL: <http://www.txi.com/>

Industry: Construction Materials

Technologies & Services:

- Oracle JDeveloper / Oracle ADF
- Oracle ADF Mobile
- Oracle WebLogic Server
- Oracle Database
- Oracle EBS
- Oracle BI
- Apple Push Notification service (APNs)
- Google Cloud Messaging service (GCMs)
- REST/JSON Web Services
- Google Maps
- Trimble for Real time Location
- Command Alkon Dispatch Application

Project Scale:

- 2 ADF Developers
- 3 BI Developers
- 10 weeks to develop and go live

Credits:

Terry Marshall, TXI

Bala Venkataraman, TXI

Oracle Product Management

TEXAS INDUSTRIES

“Our first Oracle ADF Mobile application took 10 weeks from beginning to end and now we can roll out updates as well as a new application in 4 weeks. One week to build the application, two weeks for testing and user feedback, 1 week to release to the Apple App Store (Google Play is considerably quicker). True rapid application development (RAD) with releases on a monthly basis!” – Bala Venkataraman, TXI Chief Architect

Overview & Goal

TXI, Texas Industries, is in the construction industry supplying cement, aggregates and concrete to customers for over 50 years. TXI is the largest supplier of cement in Texas and has significant operations in California. TXI annual revenues are roughly \$900 million, employs 2200 people and is publicly traded on the NYSE under the symbol TXI..

The concrete process from mix to pour has a window of 90 minutes to complete before the concrete becomes unusable. Considering the time sensitive nature of each job, Ready Mix (concrete) customers regularly called the TXI Dispatch Customer Service asking, “Where is my truck?” TXI recognized the need for a business-to-consumer (B2C) mobile application that customers could easily download to their mobile devices and quickly check their orders and truck details securely without having to call TXI.

Organization

The intended users of the mobile ReadyTrac application are construction customers that have placed large orders for concrete. These customers needed the ability to track concrete delivery trucks en route for timed precision of scheduled pours.

“In the concrete business time is of the essence with a max window from mix to pour of 90 minutes before the concrete has begun to solidify. Oracle ADF Mobile allowed us to rapidly develop our ReadyTrac mobile application which integrates with our Command Alkon system allowing our customers to precisely schedule their jobs and track the concrete vehicles en route to their site in real-time.” – Terry Marshall, TXI CIO

Solution & Results

Oracle ADF Mobile allowed TXI to reuse existing web services and go-to-market with their mobile application in 10 weeks time. This included development, QA and time to release the application through the Apple and Google Play app stores. With Oracle ADF Mobile, one code base was used to deploy native applications for both iOS and Android devices.

The capabilities provided by ReadyTrac include:

- Get alerts when trucks leave TXI’s plant and arrive on the customer job site.
- Monitor how many cubic yards of concrete have been poured and how many are still en route.
- See the date, time, order number, cubic yards ordered, location and more details for past and future pours.
- Track trucks’ locations utilizing GPS technology from the time each truck leaves the plant to the time it arrives on the customer job site.

In addition to the ReadyTrac Mobile B2C application, TXI has 3 additional Oracle ADF Mobile production applications:

- **TrackMan** – This mobile application is leveraged by TXI's internal sales team and provides summary detail by region on all customer activity. Considered a sister application to ReadyTrac, TrackMan allows the TXI sales team to view every customer and every plant of TXI with drilldown functionality as seen in the ReadyTrac application. This application took 8 weeks from development to production.
- **WaitTime** – WaitTime is also an internal application for TXI sales cement division and this solution exposes Oracle BI information. Every TXI customer truck is provided with a tracking toll tag which allows for monitoring of the number of trucks in line at a plant and how long it actually takes a truck to get through the plant with a load. This application took 8 weeks from development to production.
- **TXI Calc** – TXI Calc was the original proof of concept application for Oracle ADF Mobile. A first attempt was to develop a mobile application using Xcode and Objective C. This took 3 weeks to develop and was specific to iOS devices. **TXI then looked to Oracle ADF Mobile and the same application was developed in 4 hours and that code base was used to deploy two native applications for iOS and Android devices.**

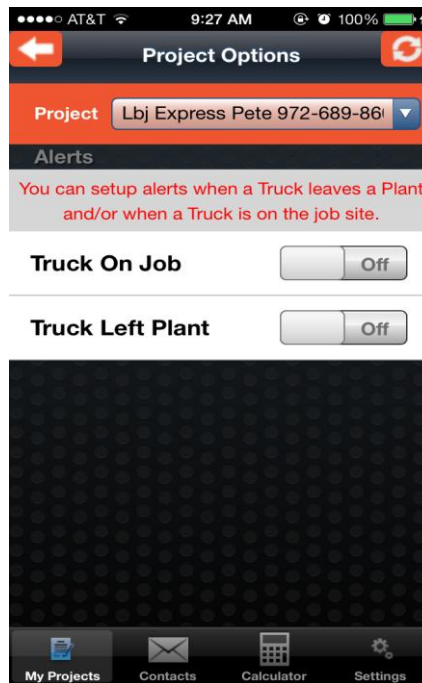
Technical Details

TXI had previously developed a web based application using Oracle ADF to track concrete trucks to customer sites. Additional functionality included the ability to monitor how many cubic yards of concrete had been poured and how many were still en route. Oracle ADF Mobile allowed TXI to reuse this existing code base and expose the information through REST/JSON web services which were consumed by TXI's ReadyTrac application. The web services delivered order information, truck data and additional detail originally captured in TXI's Command Alkon Dispatch system. The real-time location of the delivery trucks was captured via a Trimble Navigation sensor which provided another integration point using REST/JSON web services. The service layer was built from scratch using Oracle JDeveloper, the same tool used to develop the mobile application. TXI developed EJB/JPA entities that were exposed via REST web services that exposed data as both XML and JSON.

ReadyTrac customers can subscribe to **push notifications** inside the mobile application such that they will get alerts whenever a truck leaves the plant and/or the truck reaches the job site. The customer can turn on push notifications at a project level. The push notification is supported on both iOS (Apple Push Notification service – APNs) and Android (Google Cloud Messaging service – GCMs) platforms. There are two components to this process.

Client Side

- The customer is prompted if they would like to allow push notifications when they access the ReadyTrac application for the first time. If the customer allows push notifications, a unique device registration token is captured and stored in TXI's backend server using a REST web service. This is used to send the push notification payload to APNs or GCMs depending on the device.
- The customer stores their push notification alert preferences at a project level under project options as seen below. TXI also stores the customer preferences in their backend server using a REST web service.



ReadyTrac Application Project Options page

Server Side

- There is a java program that runs every 3 minutes in Oracle WebLogic server (WLS). This program creates a JSON payload based on each customer's preference. This payload is stored in a queue on TXI's backend server.
- In the case of APNs, TXI configured the APNs certificate and included it in the keystore.
- The JSON payload is then sent to APNs or GCMs depending on the customer device type. An error code is returned if there was a problem sending the payload to the device. If a problem exists, TXI captures the error code and updates the queue table accordingly. This typically occurs when the customer has received a new device or has stopped accepting push notifications.

By leveraging device native push notification services, Oracle ADF Mobile fully and seamlessly integrates into device's notification and alert capabilities. Oracle ADF Mobile also provides hooks to allow push notifications to trigger custom logic that can set the proper application context for end users. Push notifications are critical to TXI's ReadyTrac application in order to ensure the customer on the job site gets ample notification to prepare for a pour.

For authorization TXI assigns a private key to each customer at the time of registration. Every REST URI request from a mobile device is hashed using that private key based on the user log-in. The hashed value is passed as a parameter in the REST service call. On the server, TXI compares that hash value with the hash value generated on the server side for the URI and the uid's private key. Only a match will allow the call to go through, otherwise an error is raised.

When it comes to authentication, TXI stores ReadyTrac users in WLS under the security realm. This is done after a ReadyTrac user registers and their account is

activated. WLS stores the password as a hashed value. A REST web service uses the WLS java api to validate uid/pwd combinations when the ReadyTrac user tries to login using their mobile application. **This will be replaced using Oracle ADF Mobile's security model in a future release.**

Business Value

ReadyTrac solves critical issues for TXI in that it reduces the wait time on calls into the TXI Dispatch Customer Service from what could be minutes during peak hours down to instant access with the Oracle ADF Mobile solution. This increases customer productivity and provides cost savings in scheduling resources along with complete transparency and knowledge of where customer trucks are in real-time.

Mobile Benefits: Improved customer satisfaction

- Differentiator from a sales perspective in closing deals. No competitor mobile applications in this space.
- Reduced staffing costs for Dispatch Customer Service as customers can now check status via their mobile application in real-time.

Oracle ADF Mobile Benefits:

- True rapid application development resulting in faster time to market for the applications
- No development training required saving training and staffing costs
- One code-base to deploy two native applications on iOS and Android resulting in significant cost-savings
- True multi-channel deployment through extending existing web-based application to mobile devices

Ongoing Development

Development already underway or on the roadmap for the future at TXI includes updates to the ReadyTrac mobile application and exposing Oracle E-Business Suite (EBS) services.

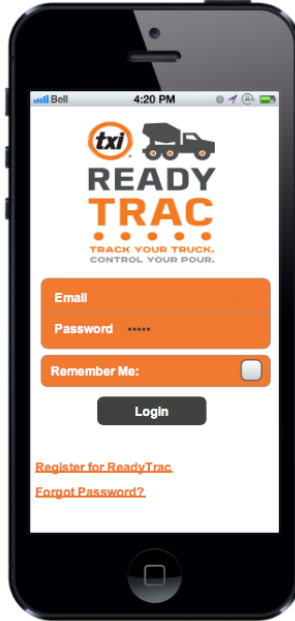
- ReadyTrac – A new feature to be included in the ReadyTrac app is one called NearMe. The idea is that if you're at a job site you have visibility into jobs that are going on within a 2 mile radius of your location. This feature is designed for external users.
- Oracle EBS – The intent is to expose common business functionality internally in order to increase employee productivity by creating easy to use applications with real-time integration into TXI's ERP platform. The current functionality planned for mobile development includes;
 - View AP invoice status
 - Receive goods and services
 - Approval Worklist

Application View

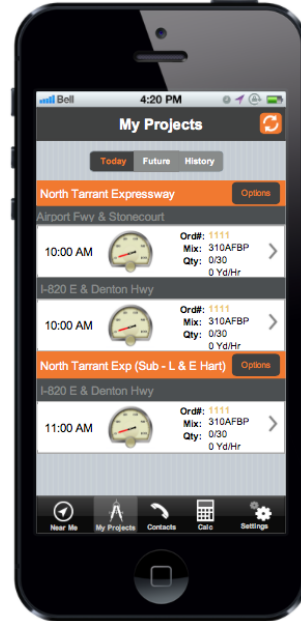
TXI's ReadyTrac Mobile Application has a rich interactive user interface. From left to right you have the splash screen, login, a view into your projects with data visualization gauge component, truck tracking with GPS integration and truck tracking details.



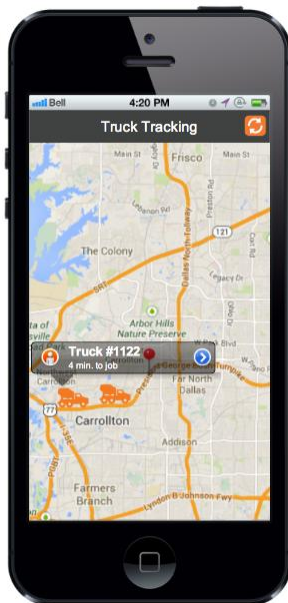
ReadyTrac Splash Screen



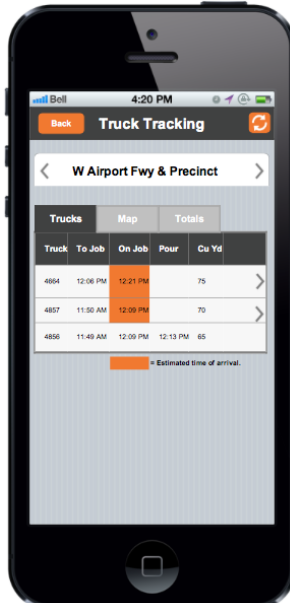
ReadyTrac Login



ReadyTrac My Projects



ReadyTrac Tracking Map



ReadyTrac Truck Tracking Screen