Overview:

The goal of this application is to enable nurses to monitor patients assigned to them efficiently. This is a classic example of a smart and proactive healthcare monitoring system which is non-invasive and highly effective in improving care delivery; besides enhancing the quality of life of patients. The application is built on a patented sensory technology developed by the client.

Client details:

Name: Confidential | **Type:** Healthcare IT | **Location:** USA

Technologies:

Android SDK (Android version 4.0.3 to Android version 4.4, API level 15 to API level 19), Android Development Tools v23.0.2

Project Description:

Any form of proactive healthcare initiative requires a robust monitoring system. The client for this project had built an innovative smart bed technology solution. It involved having a touch-free sensor located under any mattress to enable continuous detection of trends in heart rate and respiration rate, motion and bed-presence. The platform is cloud enabled and HIPAA compliant and can transform any bed into a "smart" bed.

The underlying belief is that since resting or sleeping or recuperating on a bed are essentially inevitable events, they offer an opportunity to collect valuable data which can be used to improve care. Data pertaining to heart rate, respiration rate trends, body movement, bed exits and position changes can offer critical insights to conditions in people and can be effectively used by providers and consumers to their advantage. In order to leverage its patented technology, the client wanted to develop solutions which would be non-invasive yet highly effective.
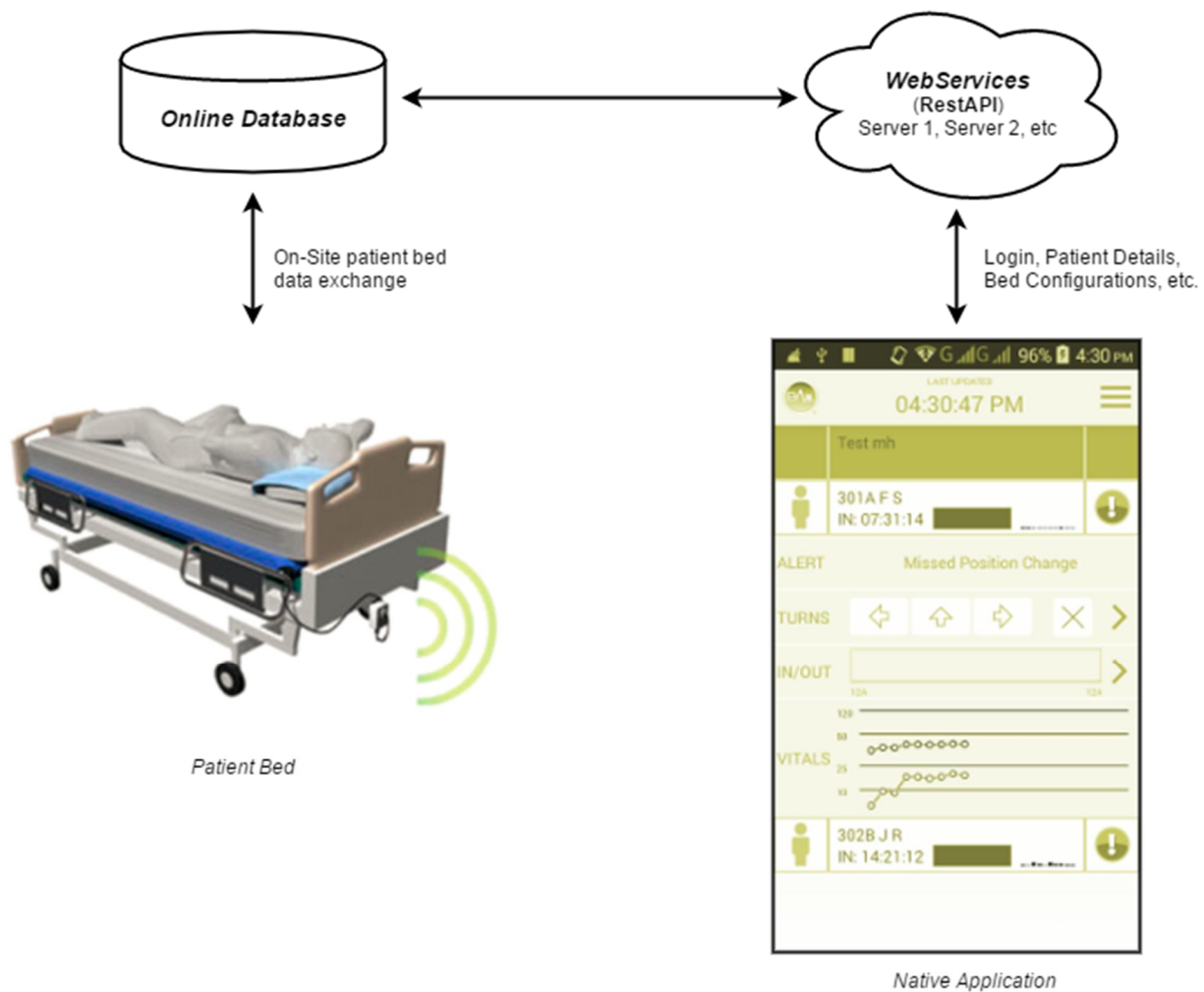
The application which the team at Mindfire developed allows Nurses to view health information wirelessly, anytime and from anywhere, of patients assigned to them such as Alerts, Vitals History, Position Change History, In/Out History, Pressure and Connectivity of
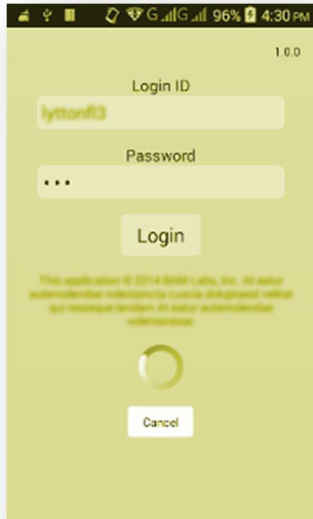
bed. The application also enables Nurses to input the turn-events of patients, calibrate the bed, and change their room numbers. Access to data is possible either on desktops or web-enabled mobile devices. Data is illustrated using logical graphs which results in improving the readability.
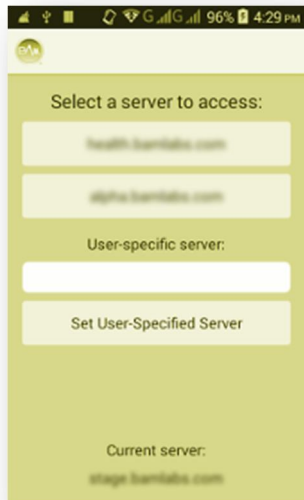
Architecture:

Online Database

WebServices
(RestAPI)
Server 1, Server 2, etc

On-Site patient bed data exchange

Login, Patient Details, Bed Configurations, etc.

Patient Bed

Native Application

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Screenshots:

Login Screen: This screen allows users to put their credentials into the fields and start the login process by clicking the "Log In" button. Users can also cancel the login process by pressing "Cancel" button.

Server Change Screen: This screen allows users to switch between servers in order to fetch patient details.

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Smart Bed - sensor-based tracking

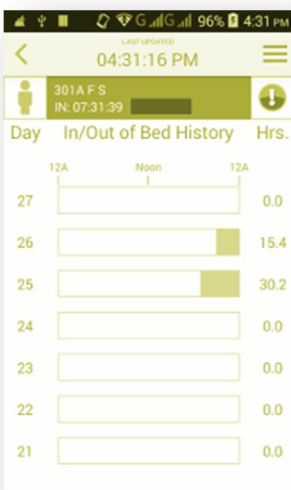**Home Screen:** This screen shows a list of all the patients assigned to a logged in user.

Every row in the list contains the following details about the patients:

- Name
- Room Number
- Duration
- In Bed/Out Bed Status
- Graph about current position of patient
- Graph about Patient's motion.
- 2 images showing In/Out events and Alerts

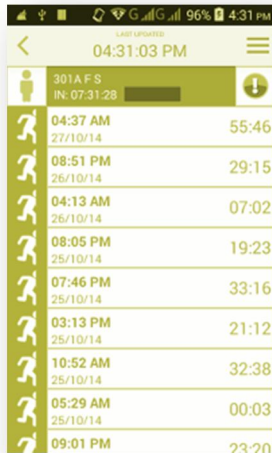Tapping on any row reveals another list of details, which are as follows:

- Descriptive text about Alert
- Today's In/Out event History Graph
- Buttons to input turn events
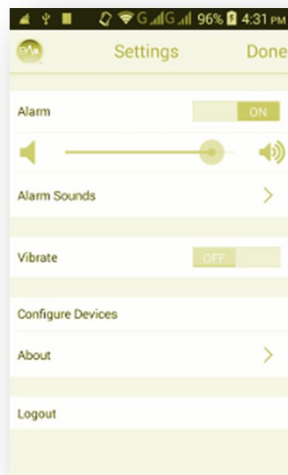- Heart Rate and Respiration Rate graphs

In/Out History Screen: This screen shows the list of graphs for In/Out events for the last 7 days. Along with these graphs the patient details, for which this screen is opened, are also shown on top with a highlighted background.
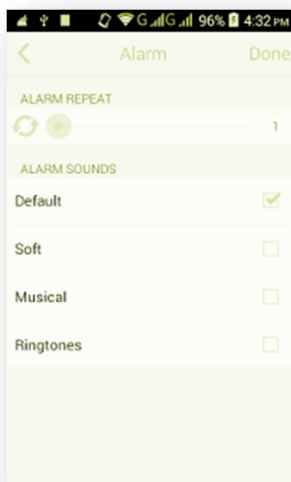
Position Change History Screen: This screen shows the list of turn-events and the time & date when a patient turned. Along with this list the patient details, for which this screen is opened, are also shown on top with a highlighted background.
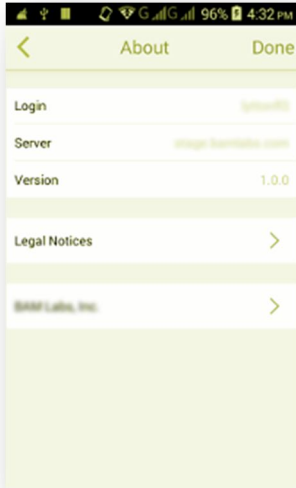
Settings Screen: This screen has options to show Configured Device details, enable/disable alarm and vibration, show alarm change screen, show about screen, control alarm volume and the provision to logout from the application,
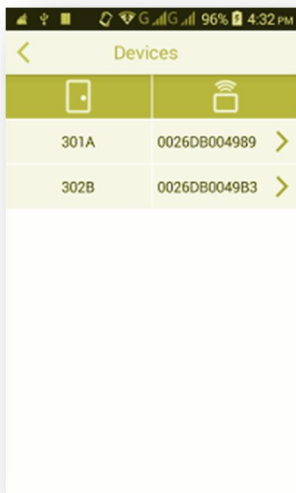
Alarm Change Screen: In this screen user can set any alarm tone out of the 4 options which are available. The repeat count of alarm can also be altered.

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About Screen: This screen contains the details about the current server, logged in user, version of the application. There are also two buttons to show the Legal Notices and information about the organization.

Devices Screen: This screen shows list of all the beds/devices attached with the current user and their room numbers. On selecting any device from the list, graphs for its current pressure and connectivity signal are shown, along with the descriptive text about pressure and signal. A User can also change the room number for any selected device.

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