SUCCESS STORY.
Kinematics Based Mobile App Development For Medical Device Company

About the Client

The client has over 20 years of orthopedic design and manufacturing experience, providing proven and reliable total joint implants and instruments to the global market. Located in northern California, the client specializes in high quality manufacturing of hip and knee implants, with a reputation for performance and reliability. Their focus also remains on patient care and clinician relationship.

Business Challenge

Tracking patient rehabilitation post knee-joint-replacement-surgery was a manual exercise, with no real time alternative to help patients & doctors to know their program details, exercise plans, weekly rehab progress reports, pain scores etc. This also hindered useful data & analytics that could be collected, related to postoperative range of motion and rehabilitation.

The client approached Infogain to design and develop a mobile application for patients (PAT App) & doctors (HP App) to track and access real-time data related to kinematics of the knee or hip. The application would push this data to a server side database residing on the Cloud, and sends back analysis to the applications for the patients and doctors to use.

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Infogain Solution

The application back end was developed on the Microsoft.NET platform, while the front end was made accessible from a smartphone, with options for Apple and Android devices. Infogain .NET and Mobile Experts developed a web service that tracks and pushes kinematics data gathered from the wearable implants via Bluetooth from the implant to the Mobile app, and there on using Wi-Fi or any internet access medium to push the data to an MS Azure Cloud database.

The web service gathers information such as the Range of motions (ROM), body temperature, number of steps, extreme changes in acceleration, and pain scores, pushing this data to an Azure Cloud storage. Another module analyses the data in the Cloud and pushes the results into the mobile apps, enabling patients to view real−time biofeedback. The patient application also allowed patients to upload a photo of their wounds, and request physician help on a real-time basis.

The back-end web application (called the Healthcare Professional Web Interface or HPWI) was developed in .NET and C#, connecting the front-end application to the Cloud database, & pushing the data on the web dashboard and vice versa.

The web application also had a UI, allowing administrators to perform the following functions:

- Patient Management (Add, update, view profile details, reset password etc.)

- Provider Management (Add, update, view profile details, reset password etc.)

- Internal Users (Technical Support, Admin)

- Settings (setting weekly rehab plans)

- Reminders (patient recovery status, pain score etc)

Infogain leveraged the Azure Cloud environment to deploy the web interface, to connect the patient and provider apps. SQL Azure Cloud services was used to store data.

Technologies Used

IDE
Android Studio 1.5.1, Android SDK, Xcode 7.3, Visual Studio 2015

LANGUAGE
C#, Core Java, Objective C

DEPLOYMENT AUTOMATION TOOL
Microsoft Azure Cloud Services.

FRAMEWORK
.NET 4.5, Entity Framework

DATABASE
SQL Azure

Client Benefits

REVOLUTIONIZED POST-SURGERY RECOVERY PROCESS
The applications developed by Infogain changed the post-surgery rehabilitation phase for both the patient and the care giver by providing real time kinematic data as opposed to the time delay associated with the previous process. In addition, doctors can send patient exercise videos, reminders, notes, and update configuration in real time.

ENHANCED PATIENT EXPERIENCE
The application enabled proactive treatment, improved diagnosis accuracy, data integrity and enhanced treatment, outcomes that led accountable care that is highly trusted amongst patients.