

CASE STUDY

From Automotive, Through Consumer Electronics, to Healthcare Comarch's Mobile Apps for Variety of Industries



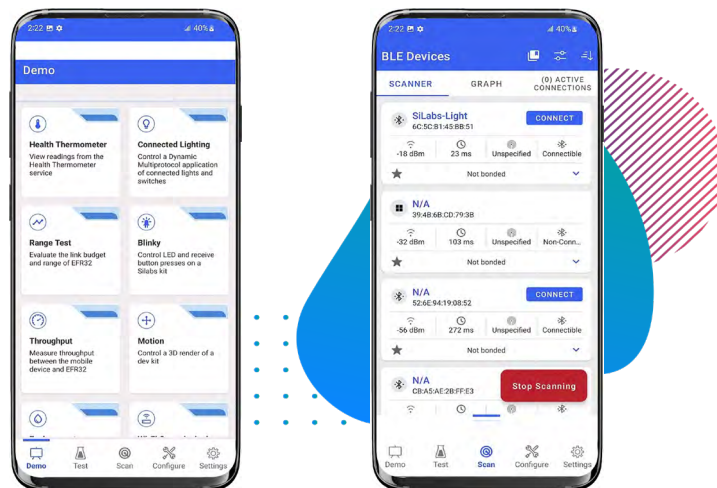
Comarch specializes in delivering high quality mobile applications across a wide range of industries. Our extensive expertise enables us to tackle complex projects, effortlessly integrating advanced connectivity solutions, robust back-end systems, and the latest trends and innovations in mobile application development. In this document, we showcase successful collaborations with our customers, highlighting our ability to create innovative solutions tailored to the unique needs of different industries.

Semiconductor industry

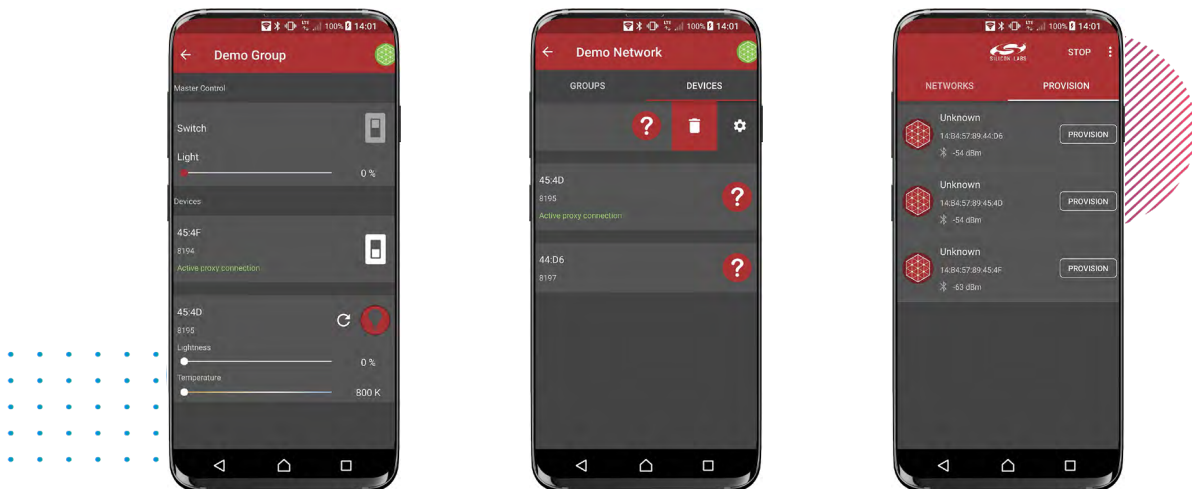
Native iOS and Android Applications for Silicon Labs

Goal of the project: to demonstrate the possibilities of various IoT boards with Bluetooth Low Energy and Bluetooth Mesh.

The EFR Connect application has been developed in response to the specific requirements of Silicon Labs, aiming to provide the best possible experience for the end user. EFR Connect consists of various demos (such as Throughput, Connected Lighting and Health Thermometer) and separate views (BT Scanner, RSSI Graph, Interoperability Test, GATT Configurator).



Another application for Silicon Labs, the BT Mesh application, can be used for device provisioning and adding them as nodes into a Bluetooth mesh network. It supports configuration of the mesh models, publish and subscribe settings as well as grouping of nodes. The application also implements light and lightning Bluetooth mesh models, so it can be used to control Bluetooth mesh nodes that implement the same models.



Technologies: Kotlin, Swift, Java, Objective-C, Bluetooth Low Energy, Bluetooth Mesh (v 1.1), UIKit front-end framework.

Automotive

Infotainment system application for OEM automotive client

Goal of the project: to allow users to control functions available on the vehicle's panel via an application.

Our engineers have developed the application using Java and Objective-C for Android and iOS, respectively. It enables driver and passengers to set navigation, air conditioning, control radio, and more from their smartphones. The application was later enhanced with additional features that enable sharing music and playing movies on several tablets simultaneously. The issue of audio synchronization in the car between devices has been solved using the UPnP protocol. Bluetooth HFP and A2DP protocols were integrated to manage audio streaming and hands-free communication. We utilized the Cinemo library to ensure simultaneous movie playback.

Technologies: Android, iOS, Java, Objective-C.



Integration of Amazon Alexa with the Infotainment System for SEAT

Goal of the project: to implement an application that acts as an intermediary for communication between the SEAT infotainment system and Alexa.

Utilizing our experience and knowledge of automotive systems from previous collaborations with OEMs, Comarch engineers integrated Amazon Alexa with the infotainment system in SEAT cars. We implemented a mobile app as an intermediary for this communication, allowing users to utilize the voice assistant through the car's built-in functions. **This was the first integration of its kind to be introduced to the European market.** Comarch specialists demonstrated an excellent knowledge of automotive systems and achieved the desired outcome using the mobile app.

Technologies: Amazon Alexa, TypeScript, Node.js, AWS (Lambda, CloudFormation, Fargate, DynamoDB, S3), Google Places API, Cucumber.js



Audio management

Headphones Companion Applications for OEM Audio Client

Goal of the project: to develop the audio device management applications for Android, iOS and Windows.

Our team of engineers developed a mobile application designed to elevate the functionality of a high-tech headset. This app empowers users with a suite of advanced features, including seamless OTA updates, real-time battery and volume monitoring, personalized presets, and a sophisticated equalizer for a truly customized audio experience. Beyond the mobile app, we developed embedded firmware that brings the headset to life with active noise cancellation, intuitive interactive controls, and advanced audio filtering for crystal-clear sound. To meet the unique demands of the project, we also enhanced the capabilities of the Qualcomm chipset, extending the boundaries of performance.

Technologies: React Native, Bluetooth Classic, Bluetooth Low Energy Audio, Bluetooth profiles (A2DP, HFP, AVRCP).



Demonstrative Application for WS Audiology Hearing Aids

Goal of the project: to support our client in creating a new generation of hearing aid devices that will support Bluetooth protocol connectivity.

For WS Audiology, we created an application that enabled our client to configure and present the hearing aids functionality to the end user. The app was used in showrooms, where it served as an element of demonstration and product personalization for the end customer. It was an integral part of the product development work and allowed, among other things:

- Scanning unknown devices and filtering discovered ones through advertising data service filter;
- Battery and volume characteristics: discovering, reading and notifying about changes;
- Classifying scanned devices as a single or a pair;
- Connecting to scanned and bonded devices (bond created upon creating the first connection – if agreed of course).

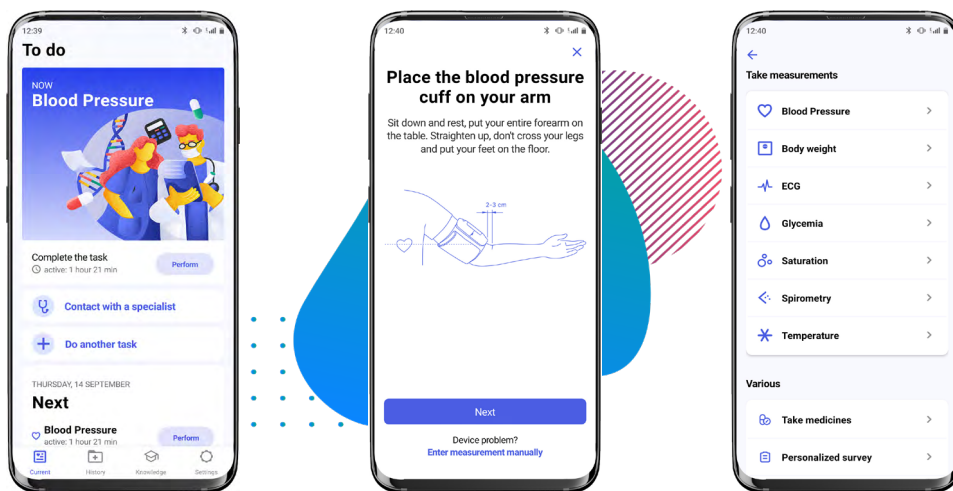
Healthcare

Comarch Healthcare 2.0 Application

Goal of the project: to develop an application that is an element of remote monitoring of patients' health conditions (e.g., chronically ill or after hospitalization).

We designed and implemented an application that can be used in a one-user (for a single patient) or multi-user (for many patients) mode. It guides patients through measurements, reminds them to perform certain actions, and sends results to the Comarch e-Care 2.0 telemedicine platform. The remote patient monitoring solution includes the Comarch HomeHealth 2.0 application and the integrated measurement devices, such as: blood pressure monitor, glucometer, spirometer, event ECG, scales body composition analyzer, thermometer, and pulse oximeter.

Technologies: React Native, Android and iOS.

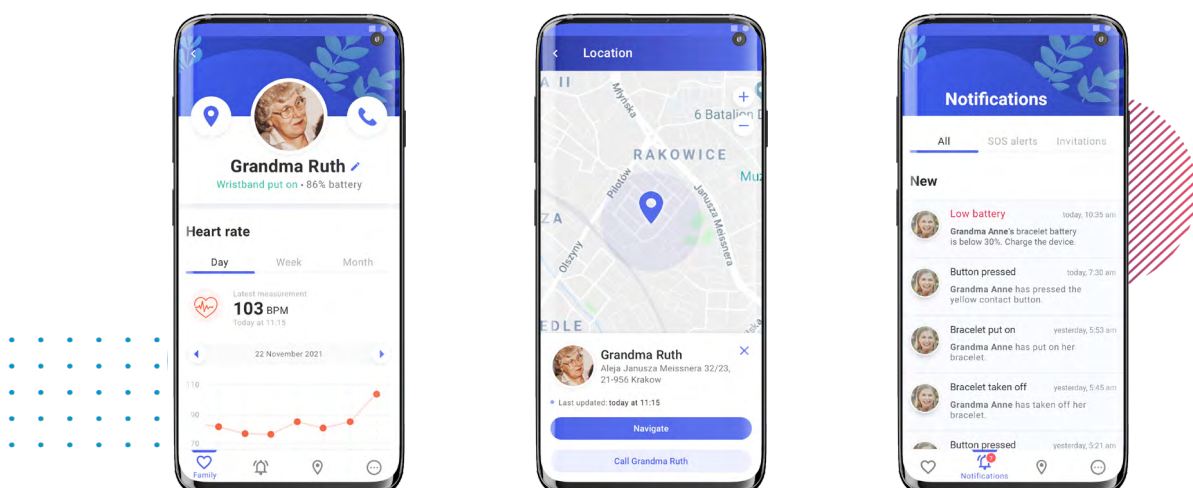


Comarch CareMate Application

Goal of the project: to develop an application as a part of comprehensive care service offered by Comarch.

We have built an app that was integrated with a Comarch Wristband device, enabling quick contact with medical rescuers or designated emergency contacts. It allows for summoning help in life-threatening situations, facilitating user location tracking, and conducting basic vital signs measurements. In the app, users can create two types of profiles – the Caregiver and the Caretaker. The former one can directly monitor the vital signs of a senior or a chronically ill person that is close to their heart.

Technologies: React Native, Android and iOS.



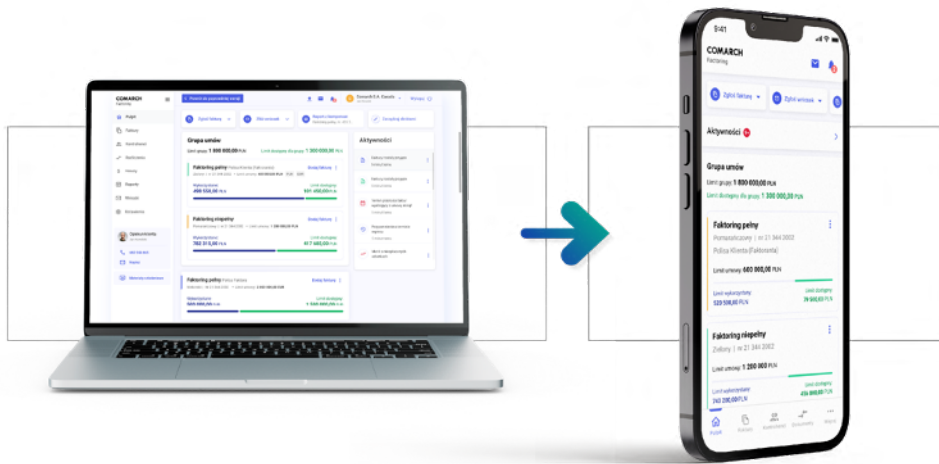
Other applications

Comarch Mobile Wrapper

Goal of the project: to develop a solution for building mobile application based on the existing WEB applications with the support for Responsive Web Design.

We developed a hybrid solution for companies with existing web applications that use responsive web design and seek to easily and securely extend their services to mobile platforms. By combining the native elements of mobile applications, particularly in terms of security, with the technologies used in web applications, businesses can quickly adapt to market trends and expand their reach into the mobile channel.

Technologies: Swift, Android, CocoaPods, Java 11, PostgreSQL, Spring Boot 2.0.



For more information

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