

Overcoming the Limitations of Software Legacy

Modernizing the Water Billing System

Problem Definition

Even today, in our increasingly digital world, many outdated systems still require unnecessary manual work or rely on very old software. One such example is the old-fashioned water billing system still used in some cities (e.g. Maribor Slovenia, Bitola Macedonia). In short, this system works as follows: field employees physically visit households or companies to record the water meter value in m³, after which they either enter the data into a mobile app or write it on paper and later record it into the system or database. This approach is time consuming and of course error prone. Furthermore, many of these billing systems are built using very old programming languages and frameworks, such as Delphi. Also, all the data is stored on a local server. Developers with the expertise to manage or update such legacy systems are becoming increasingly rare. These systems are incompatible across cities and countries, and cannot easily scale or adapt to today's digital needs. This creates obstacles in terms of modernization, maintenance, and future system development.

Proposing a Solution

The proposed solution is a software system for automated water billing and management. It includes a web application for administrators, a mobile app for users and field staff, and a cloud-based backend for data storage and processing. The system enables both IoT connected meters and manual data entry, allowing real-time access to consumption data and meter readings. Developed with modern, maintainable technologies, it replaces outdated Delphi-based systems and provides a reliable and scalable approach to water billing. All data will be stored in a normalized database making it easier to query and maintain.

Basic Requirements

Firstly, the system must be able to respond and scale for a large number of users. The system must provide an admin panel for managing users, water meters, and billing data. It should support both IoT connected and manually entered meter readings. It should enable real-time monitoring of water consumption and automatically calculate and generate bills based on usage. Users must be able to access their accounts through a web or mobile application, where they can view their bills, consumption history, and receive notifications about irregular usage or billing updates. The system also must ensure data security.