codecta

Case Study
Digital Health

Overview

Country or Region:
Germany

Customer Profile
Hospital – private property

Business situation
Private hospital chain has the similar reasoning as any other private business, to have satisfied customers and to generate the profit. Money in health sector is usually in the pocket of Health insurances. Insurances demand that high payments goes only with highest quality of service. To improve the service, Hospitals are in need of service digitalization and constant improvement of customer experience during the patient care, but also prior and after visiting the Hospital facility.

Solution
Digital platform solution for significant improvement of Patient Journey and its Hospital experience required flexibile solution which we successfully built on microservice architecture and integrated it with Clinic Information System, using JavaEE, RedHat Identity Access Solution, NodeJS, AngularJS, MongoDB and native Android and iOS technologies.

Benefits
Getting connected with patient before reaching the hospital, during patient care within Hospital and after patient's stay, puts Hospital and patient on another level of relationship. This at same time increases patient satisfactions and simplifies effort to the Hospital staff.

Digital Transformation of Patient Journey

Hospitals in general are the large facilities, with numerous staff and equipment required to give the best possible treatment to the patient which enters the hospital. Handling the primary patient need, performing the various treatments, primary focus as it should always goes by resolving acute problems and there the story ends. Most information patient gets within the hospital itself, and mostly only by direct contact with physician or nurse.

Serving the primary needs, it is not easy to track what information patient gets, is he really satisfied with provided service, how to inform the patient to be as much as possible prepared before he/she comes to the hospital, and how to preserve the communication and increase the promotion of hospital services after patient's treatment is completed and he/she leaves the hospital.

As privately held hospitals seek for the ways to increase the service which will directly increase the revenues, there was a need to engage software companies to build a digital solution which will provide various information to the customers, but also give more options as soon as the hospital knows the customer is arriving soon. Hospitals want to keep their Clinic Information System, as legacy solution on which they rely on. As very valuable source of information Clinic Information System is the base data repository for the treatment information, but many other services are needed to be built as a layer above this integration.

Clinic Information System providers as specialized providers in general avoid to leave their proprietary scope, which gives enough space around to build and gather many non-medical information helpful to the patient and staff members.

Without internal IT department hospitals rely on many service providers, so we were responsible to collect the requirements, implement the solution and connect it with the Clinic Information System and other parties. All of this had to be delivered in a reasonable time, as all stakeholders were eager to see such a solution taking place in their operational activities.

Situation

No internal IT department, and a need for next level of Patient Journey requested engagement of some external partner who will handle the implementation of a software solution to support today's needs. Health insurances are those which mostly cover citizen's health care expenses in EU countries. In order to charge more for your services, and to give quality reason to health insurances to allow patient's treatment within your hospital, you have to offer better services than other competitive hospitals.

The hospital wanted to inform the patients, who were about to come to the hospital in next period, to provide him/her with clear instructions and help, about hospital information itself, but also what customer has to bring, and to fill questionnaire which will help hospital to welcome patient at its best. During patient's stay, they wanted to remind patient on the various treatments which patient have to attend, and often treatment is performed on another flor or even another building. Some of the hospitals offer meals, and it was quite important to know what are the meals patient complains on and which meals they bless. Numerous of questionnaires would be helpful to be filled by the patient at any stage of the journey, which can be used to improve the service and treatment.

Solution

Requirement were dynamically changed, and as there were no similar solution on the market, and hospital was in need to be determinate which features would resolve the urgent need.

As experienced team of architects, Codecta gave the effort to consult on many topics, including the business domain with related technical solution.

Dynamic change in the requests, required flexible Architecture, which would grow horizontally and vertically, handle various medical and non-medical data, and at the same time preserve data privacy and policies, mandatory for such sensitive data as the patient data are. We built Microservice architecture based on Java Spring Boot and NodeJS services, supported by AngularJS frontend and MongoDB as

big data solution for database. Technologies chosen are high performant and easy maintainable, which is important for the platform which dynamically grows.

Since Clinic Information System is the ground data provider, we approached to finish such integration first. By using HL7 FHIR standard, ADT, MDM messaging, we made our solution interoperable with other systems which could arrive in the future.

Features implemented as components, based on Angular material, enabled flexibility and fast development of the user's experience. Vital data were collected from various sources, from the device itself, but also trough data exchange with companies connected to data pool of Fitbit, Polar and similar tracking devices and their cloud systems.

The whole solution was deployed within hospital's network environment, although its environment agnostic, and can be easy settled to Azure Cloud, or AWS.

As main Identity Access Management solution we have used Red Hat's IAM, called Keycloak. The Keycloak itself had major functionalities ready, but in some cases we had to build our own provider specifics, like 2FA with email. IAM itself offers identity federations and SSO, which opened us even more integrative solutions with other patient data providers, such Health insurances.

Besides technical options, the solution was built to be easy to use and acceptable from child to senior's patient types.

Benefits

The idea to give another sort of experience to the patients was proven soon after the solution was released. Many current patients bring their devices and mostly it's the main toy during their stay within the hospital.

The promotion moment is even more out in public, as patient leaves the hospital, and many people get curious about the hospital and their new services.

Hospital gets instant feedback good or bad, and can fast react on the patient treatment at any

stage of patient journey.

Reporting data, questionnaire answers, meal ratings and similar information gives key insight on the patient relation to the hospital.

Flexible platform architecture offers fast tryouts and implementation of new ideas which can be offered to the customers, like integration with newspaper online services, or video service providers, where trough the internal network user is able to watch various content.

Patient gets notified to devices for any change in information, from treatment to meal change, or other useful content which became enabled.

Patient can get insight and prepare or perform excercises created and delegated specifically to himself.

Listed features are only step forward to the multiple options and integrations to other services which give patient another experience on the treatment process, and increase quality for patient and generates additional revenues to hospitals.