

## Success Story

Helping the UK's leading health tech company to modernize their patient engagement application.

### Customer

Leading health-tech company

### Country

United Kingdom

### Industry

Healthcare

## About The Client

The client is the UK's leading digital telehealth platform offering the world's first peri-hab solution for all treatment pathways, with expertise in cancer care. The client aims at delivering better health outcomes for patients and lowering the costs of clinical complications. To enable the same, the client offers a hyper-personalized, digital health coaching solution that delivers personalized support during patients' treatment to help them recover better.

### How the app works?

The app develops an all-encompassing health profile of patients, both physical and psychological, by utilizing real data and interaction with coaches. This comprehensive profile, which is continuously updated and refined, enables them to proactively identify and control health risks before they become severe.

## Technology Stack



## Business Situation

The client faced several challenges in their coaching system that not only hindered operational efficiency but also jeopardized the service quality, user satisfaction, and the overall reliability of their platform. Addressing these problems became imperative to prevent the risk of suboptimal patient care and potential financial losses.

The client sought Daffodil's expertise to address these pressing challenges:

### Obsolete Technical Architecture

At the project's outset, the team gained access to the client's existing admin portal and mobile apps (Android & iOS). However, the platform suffered from an outdated technical architecture riddled with multiple bugs in the code. This resulted in a suboptimal user experience, as users encountered unexpected errors and glitches.

### DevOps Automation Challenges

The client grappled with numerous challenges in DevOps automation:

- ✔ The project followed a multi-branching approach which is not supported by AWS. Thus, the development team had to manually update the branch name in the AWS CodePipeline, every time a new release was planned.
- ✔ The Cloudfront cache had to be manually invalidated with each new deployment.
- ✔ The team was frequently confronted with downtime and production issues. The alert system was not prompt, and the lack of sufficient evidence or data impeded the team's ability to conduct an effective Root Cause Analysis (RCA).
- ✔ The manually provisioned infrastructure led to inefficient management.

### Lack of Testing Mechanism for Production

The absence of a robust testing mechanism also posed a significant risk to the production environment. Without proper testing, changes and updates were pushed directly into the production environment without validation, increasing the likelihood of critical failures or disruptions in the live system. This presented a substantial risk to the stability and reliability of the healthcare coaching platform. Compounding the issue was the absence of a regression test pack.

### Additional Features to be Implemented

The project involved the implementation of specific features on the home page and the admin portal to enhance the coaching system and patient experience.

### Test Case Development:

The client's demand for the creation of exhaustive test cases encompassing all system components posed a substantial challenge. This challenge was amplified due to constraints related to time and resource allocation, and notably, the absence of Test-Driven Development (TDD).

## The Solution

A cross-functional team of Daffodil's dedicated developers, quality analysts, and DevOps professionals engaged with the client to understand the core needs. Recognizing the critical need for a solution, a multifaceted approach was taken to modernize and optimize various aspects of the healthcare coaching platform. The same included:

### New Home Screen Features:

In order to modernize the application, a host of new features were seamlessly integrated into the platform, such as:

#### ✔ Symptom Tracker:

Patients could log their daily symptoms and moods, and these entries were retained for future reference. For cancer patients, in particular, the symptom tracker played a vital role. Coaches collaborated with patients on a timely basis based on the symptom reports. Severe symptoms triggered alerts on the portal, enabling coaches to provide timely guidance and intervention.

#### ✔ Health Target:

Patients could set personalized health targets, such as daily water intake and exercise goals through the health target feature. These targets were configurable from the Admin Portal, allowing coaches to tailor recommendations to individual patient needs. The flexibility of setting start/end dates, task frequencies etc., added another layer of customization and adaptability to the coaching process.

We also enhanced the feature, introducing both recurring and non-recurring targets to provide users with more flexibility in setting their health goals.

#### ✔ Mood Tracking:

Mood tracking in the app is a unique addition that allows users to track and monitor their emotional well-being over time. Patients can log their mood at any time throughout the day, providing valuable insights into their emotional patterns and triggers. This data is crucial for coaches in identifying a pattern and providing tailored treatment options.

#### ✔ Chat with your Coach

The Chat with your Coach feature in the app is a direct communication channel between patients and their health coaches. This feature allows patients to ask questions, seek advice, discuss their progress, and receive personalized feedback from their coaches. The real-time nature of the chat ensures that users can get immediate responses, making it easier to address concerns and clarify doubts as they arise. This feature not only enhances the user's engagement with the app but also reinforces the personalized support that is crucial in their health journey.

### Chat Interface Upgrade & Front Chat Integration:

To further enhance the coaching system, Front Chat, a dynamic communication tool that facilitates immediate, live interactions with customers across various applications was integrated as a third-party solution. This integration was driven by the need for an interconnected system to optimize coaching processes. The revamped Chat screen, along with the integration of Front Chat, significantly improved the coach-patient communication dynamic.

Further, in the development cycle, the client requested to implement a new chat interface for both users and coaches with a threaded conversation system. This module made it easier for patients to choose & converse with either coaches or physiotherapists & get access to more streamlined & focused information.

The UI/UX of the chat screen was also made more intuitive and user-friendly, enhancing the overall interaction between users and coaches.

### **360° Rebranding:**

Upon client's request, Team Daffodil revamped the entire app's UI with a modern, visually appealing design. This included an entire updation of color schemes, typography, and graphical elements to create an aesthetically pleasing interface. Design elements were standardized across the app to ensure a cohesive and consistent look and feel. This consistency helped patients navigate the app more intuitively.

### **Upgrades in the Admin Portal:**

One of the fundamental improvements was the inclusion of an "Alert" feature that enabled coaches to access patient health conditions directly from the Admin Portal.

The introduction of an alert feature within the admin portal was a significant milestone. Coaches could now mark alerts as unresolved, resolved, or resolve with reply, facilitating efficient & faster issue tracking and resolution. This enhancement ensured that important messages and issues were not overlooked.

#### **What all could the admin portal do?**

Among its many functions, like record-keeping of patient's details, symptoms & health target information; users could also sync their app with wearable devices like Fitbit and Apple Watches. This integration facilitated real-time health data tracking, enabling coaches to monitor patients' progress via the admin portal and make data-driven recommendations for better health outcomes.

Coaches could also provide their patients with educational resources, articles and information directly through the portal, empowering them with valuable insights into their health and well-being.

### **Fitbit integration & authentication:**

Our team undertook a significant task of integrating Fitbit , overcoming a major hurdle related to authentication. Previously, the app's data tracking functionality would become inactive after every 8-hour period. This inconsistency was detrimental, as it prevented coaches from analyzing past data accurately, which is essential in making informed decisions about patient care and treatment plans.

We successfully resolved this problem, ensuring uninterrupted data tracking beyond the 8-hour window, thereby increasing the reliability of the data and enabling coaches to perform comprehensive analyses of past data.

### Overcoming DevOps Automation Challenges:

To resolve the DevOps automation challenges, Daffodil's team backed the DevOps services with AWS Lambda, which is an event-driven, serverless computing platform for cloud applications.

To resolve the manual branch updation problem in the CI/CD pipeline, a Lambda function was used.

### ✔ Comprehensive Monitoring, Logging, and Alerting were done using CloudWatch:

Team implemented AWS CloudTrail for activity tracking. This improved the overall RCA experience with less debugging time and quick response/action to the issue

### ✔ Ensuring Security & Cost Optimized Implementations:

While implementing the tasks we followed security best practices like using AWS secrets manager for secret management, using KMS for encryption etc. in the complete project.

### The Need for TDD (Test-Driven Development):

Initially, Test-Driven Development (TDD) was not a part of the project. However, recognizing its importance, Daffodil Software's developers adopted TDD as a fundamental practice. This enabled them to implement TDD principles for the client and write test cases, greatly enhancing the project's quality assurance process.

#### Why was TDD necessary?

TDD became crucial for ensuring the reliability and robustness of the newly developed features. It allowed developers to write test cases before writing code, ensuring that each feature met its intended functionality. This proactive approach minimized defects, reduced debugging time, and improved overall system stability.

### Regression Testing:

To address the issue of recurring bugs, the team established a dedicated regression testing phase. This phase involved systematically retesting of existing functionalities after every code change or enhancement to ensure that no new issues were introduced. The introduction of regression testing significantly reduced the recurrence of bugs and improved the system's stability.



# The Impact

## Why was regression testing important?

Without this essential testing mechanism, developers could not effectively verify if the new code changes introduced unintended side effects or broke existing functionalities. This could lead to the recurrent emergence of bugs even after previous issues were addressed, creating a frustrating cycle of problem-solving.

By addressing the initial challenges, the app became more engaging, accessible, and aligned with the client's goal of having a top-tier healthcare coaching platform. The enhancements to the Admin Portal, Chat Section, and Home Screen have collectively contributed to a more effective, user-friendly, and data-driven healthcare coaching platform.

Our innovative solutions significantly accelerated the deployment process, resulting in a 40% increase in speed for API and portal deployments, and a remarkable increase of over 60% for app deployments. This has dramatically improved efficiency and productivity.

This underscores the commitment and expertise of the development team at Daffodil Software in delivering transformative solutions quickly & efficiently.

40%	rise in deployment speed   For API and portal
60%	rise in deployment speed   For apps
20%	Code coverage in TDD

## Services Used

- DevOps
- Telehealth Solutions
- Software Modernization

**Have a software product vision in mind?**

Setup a personalized consultation with our technology expert.

Let's Talk