



Customer Success Story

Enabling Shifo Foundation to leverage technology to curb preventable diseases across the world through 95% improvement in data quality



Customer: Shifo Foundation
Country: Sweden
Industry: Healthcare
Our Role: Team Augmentation



About the Client

Shifo is a Sweden based non-profit organization that uses the power of data and technology to drive improvements in the healthcare sector. Its vision is a day when no child dies or suffers from preventable diseases. Shifo utilizes reliable, relevant and transparent data to identify and close the gaps in health service delivery by working together with its partners. Shifo addresses some of the toughest challenges in reaching every child with preventive health services by enabling child registration, empowering parents with knowledge, enabling effective work processes for health workers, and providing reliable and relevant information for improved decision-making. In addition to that, Shifo works with social angel investors, private sector, foundations, philanthropists, nonprofit organizations, multilateral organizations, and higher education institutions to provide better healthcare to every child and mother in need. Shifo is currently serving Uganda, Afghanistan, Kenya, Tanzania, Gambia and recently Haiti was added to the list of countries.

99%
accuracy in data
generation

60%
reduction in manual
administration time

95%
improvement in
data quality

141,000+
automated follow-ups



“Through our journey of developing different IT solutions, it was important to have talented people that can work to help us build and scale up and that’s how we came across Daffodil where we partnered together to make sure that we can actually develop a scalable platform which can work in different countries.”

Rustom Nabiev,

Director, Shifo Foundation

The Situation

Shifo Foundation was using its proprietary data reporting solution for managing its processes, generating KPIs and reports, and storing healthcare information. Its web application was built on an obsolete version of the Python platform and had many technical and functional lags. The performance of the web application was not up to the mark which impacted its usability. The application was not easily scalable and as Shifo dealt with a monstrous volume of data, there was a critical requirement for better scalability. Along with this, the application also required data loading improvements, security advancements, and easy identification of errors in the existing processes. The organization also wanted to augment its team with expert Python developers to ensure full-time support and continuous improvements and up-gradation for its web application.

Shifo Foundation was in search of a technology partner that could not only improve and upgrade its current application but also provide them constant support of web developers to regularly enhance their software application. Daffodil Software with its expert team of Python developers and astute healthcare industry experience showcased the superior ability to fit in the requirement and was welcomed aboard by the Shifo Foundation to fulfill its technical limitations.

The key challenges Daffodil faced during the engagement were:

- To upgrade the existing Python-based web application and make it more scalable and high-performance to ensure faster and more efficient data loading and processing.
- To provide trained and experienced Python developers to work with the Shifo team ensuring a constant technical and development support.
- To automate the data loading and report generation process as it was a cumbersome and inefficient process to do manually.

The Solution

The Daffodil team understood and analyzed the requirements that Shifo provided regarding the issues with their web application. The application code was scrutinized by our team of skilled Python developers. The developers monitored the use of 'collections' in the code such as dict, list, set, and tuple to eliminate over usage that impacts the scalability of the application. The generator function was also used to improve the scalability of the application by reducing memory usage. In addition to that, the Python codes were intelligently iterated to ensure a high code performance which provides a better user experience. We used Python data libraries such as 'pandas' which was used for data manipulation and analysis, 'NumPy' for fast and easy to use data structures and better runtime behavior, 'Redis' as an in-memory database, and 'RQ' for asynchronous task execution. PostgreSQL database management system was used for the application as it is extensible and additional features could be added to it as per requirements.



Apart from the enhancements of the existing proprietary application, a team of skilled Python developers having at least 5+ years of experience was added to the Shifo IT team to continuously maintain and improve the application as part of a long-term engagement with Daffodil Software. Some major improvements that Daffodil has made in Shifo's proprietary application include:

Data Loading Improvements: The information required for issuing health cards for every child is collected manually through forms. Details about child registrations, vaccine indicators, vaccination drives (%), dropouts (%), missing registrations, amount of wastage, the number of children covered, and stock details are collected in hard copy form. This data is first scanned into the Flexicapture database before it is transferred to the PostgreSQL database. Our team of developers ensured that this reloading of data is a seamless process, ascertaining that accurate data is transferred from the hard copies to the database of the proprietary solution. Also, for every country, there are different cards and vaccines for children and therefore there are different forms in accordance with that. To handle this and ensure that the data from all the forms are added systematically to the main database, a reload module was written in Python.



Report Generation and Automated sharing: Shifo shares a report of its health services to the high authority of the state. The supported format for reports generation was changed to Excel instead of the old PDF format for better data readability. The feature also automated the process of sending the official reports and important data statistics to the government official, it helped in a reduction in human intervention and maintained report records in an organized manner.

Daffodil is currently working with Shifo to create a POC to fulfill the vaccination and healthcare record management requirements and reporting for the Haiti healthcare sector. Shifo aims to achieve the same positive impact in Haiti that they previously experienced in the other counties they worked for.

The Impact

Daffodil was successful in fixing the issue of the skillset crunch that the Shifo Foundation was facing. Daffodil also upgraded their proprietary software to a more scalable, high-performing and seamless version. This project has shown a major impact on the African healthcare sector especially for the child care sector with better data recording, procession and reporting processes. The application had a huge social impact and has been successful in generating quality data with 99% accuracy according to the WHO data quality review toolkit. It has also reduced administration for frontline health workers by at least 60% with the help of innovative technologies integrated by Daffodil.



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Technology Stack













- Database- PostgreSQL
- Python Libraries: Pandas,
- Numpy
- Redis and RQ

About Daffodil

Daffodil Software is a software engineering partner to 100+ organizations across the globe and has been helping them in making their software products more robust, teams more productive and processes more efficient. Our ability to look beyond technologies to deliver innovative solutions with scale and speed has been lauded by our clients as well as the tech community worldwide.

Since our inception, we have invested in organic growth; building on our engineering capabilities, organizational processes, and culture required to deliver a truly collaborative ecosystem for solving technology challenges. At the core of Daffodil lies a culture rooted in innovation, learning and a result-oriented mindset.

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