



## INDUSTRY

Information and Communication Technology



## PARTNER

[www.clavax.com](http://www.clavax.com)



## EMAIL

[info@clavax.com](mailto:info@clavax.com)



## PHONE

1-8444252829

## ABOUT THE CLIENT

Fujitsu is the leading information and communication technology company based in Japan that offers a wide range of technology services, products and solutions. With more than 1,40,000 people working deliberately to support customers in 100 countries, Fujitsu is listed among the largest IT services provider in Japan ranking 7th in the world.

Digital Annealer is a futuristic approach of computing initiated by our client that aims to solve the most challenging problems, businesses face by taking the full advantage of Quantum & Classical Computing. The motive of the project is to introduce this new technology that will resolve large-scale combinatorial optimization problems through a portable and scalable frontend website on the cloud-based platform.

## GOALS OF THE PROJECT

When the client approached Clavax with their project idea, they already had a presence of Digital Annealer Cloud service in Japan, but they wanted to reach out to a larger and global consumer base. To serve this purpose, Clavax needs to develop an API service for the Fujitsu Digital Annealer Global Commercial Service using public cloud service (AWS) & provide access to users across the world.

Clavax set some goals that need to be implemented for the client along with few enhancements and additional features that will enhance the website functionality:

- ✔ **Development of a frontend website/ API Service** based on AWS platform to provide quantum-computing
- ✔ **User Management Portal** to connect the frontend services with already developed backend at Equinix
- ✔ **API Token Management** to enable users in generating and managing the API Gateway token used for secured access to the information

powered by

Clavax

## ● CHALLENGES

Working with an iconic brand in information & communication industry like Fujitsu was a great experience as its area of expertise is quite unique from the projects handled before. Listed below were some of the issues faced during the development stage of the project, which was tackled successfully with appropriate solutions:

### ✔ SERVERLESS BACKEND

Since this project that doesn't involve the use of servers, the team had to ensure that the applications and services are built successfully on the servers managed by AWS cloud services such as AWS Lambda function.

### ✔ DATA PROTECTION & SECURITY

One of the main challenges of using AWS cloud services is to ensure advanced data protection and security of the user sign up, sign in and access control, as it involves skilled expertise from not just AWS team but also from the client side.

### ✔ SCALABILITY

While developing the frontend system using AWS services, it is important to keep in mind the number of customer visit and data size, which will eventually help in selecting the AWS instances as per the business requirements.

## ● SOLUTIONS

To cater the above-mentioned challenges effectively, Clavax team came out with some solutions after having few brainstorming sessions with the client. Here's a glimpse of them:

### ✔ AWS CLOUD STRUCTURE

Since backend has been already implemented at Equinix, Clavax focussed on the development of frontend website based on cloud platform using AWS Cognito for user authentication and AWS API Gateway for three main functionalities i.e. User portal, Management portal, and Application marketplace.

### ✔ USER MANAGEMENT

To manage users' accounts and make authentication easy without the database of its own, Amazon Cognito user pool is created enabling customers to sign up as a new user, verify their personal details and log in to access the Digital Annealer (DA) services.

### ✔ MANAGEMENT PORTAL

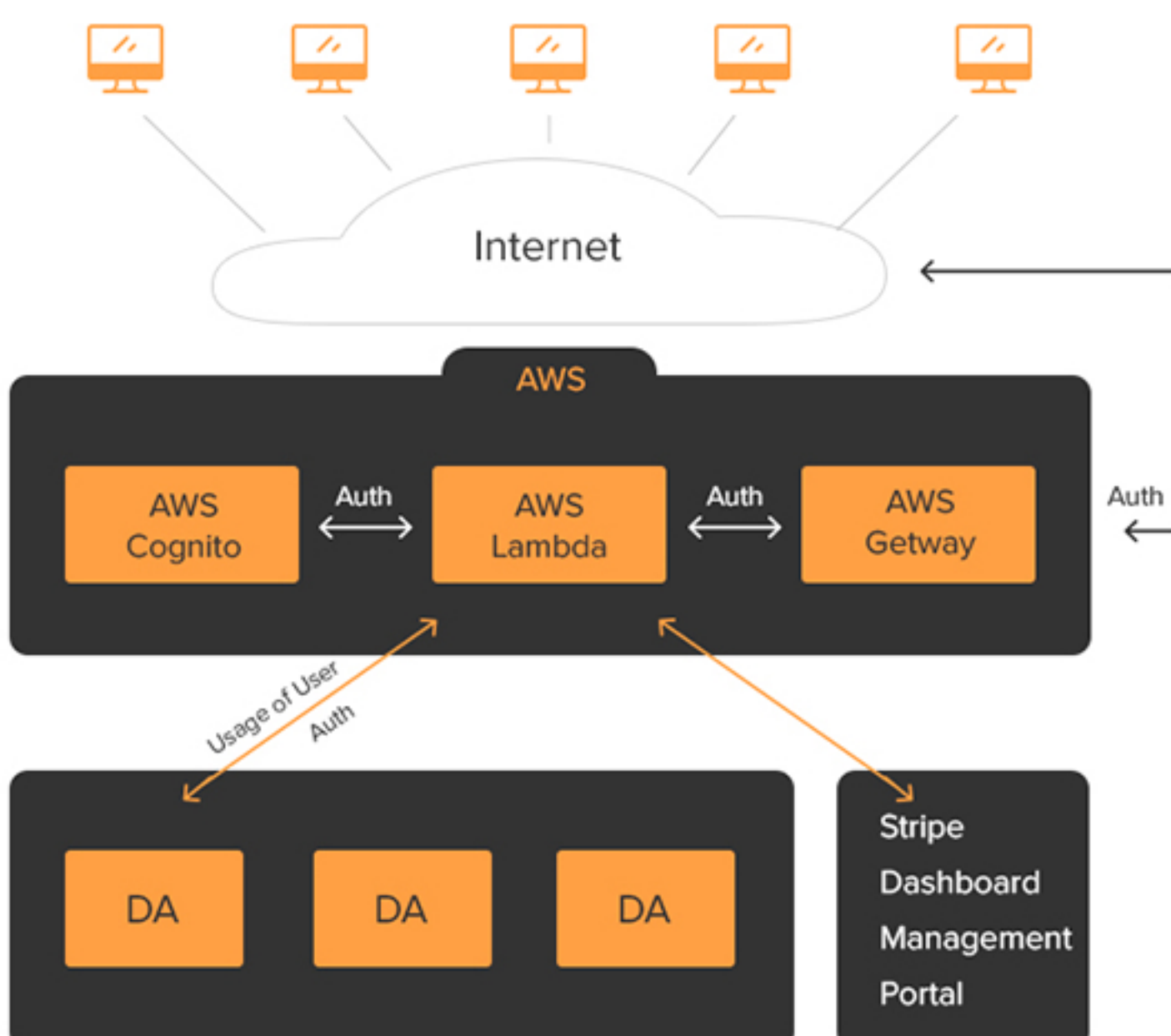
As there are many users registered to access DA services, it was difficult to manage the orders and contracts purchased by the users. The management portal helps in managing the user portal components easily along with API keys and gateways.

### ✔ CONTRACTS AND ORDERS MANAGEMENT

Registered users can visit the contract and orders page to purchase new service plans (standard synchronous or standard asynchronous) and modify current services. All type of contracts will be published on the front end of the user portal.

### ✔ API TOKEN MANAGEMENT

When users purchase the plans for DA services, they will get an API token on user portal and API request is sent with it to the API gateway, where the flow of requests is managed between the frontend and backend system.



## ● TECHNOLOGIES USED

Below is the stack of tools & technologies that were used by the team of Clavax for the development of the website on the Cloud-based platform:

- APIs                                      AWS Services
- Scripting Languages                  Angular 5
- Platform Environment                Node JS, AWS Lambda Function
- Database                                AWS Cognito Services
- Project Management                 JIRA
- Version Control                        GitHub
- Payment Gateway                      Stripe

## ● RESULTS

The leader in information and communication technology takes quantum computing to the next level with the Digital Annealer Cloud Service enabling easy access to all users across the globe. Fujitsu gets a game-changing digital transformation of their technology with the global interface to solve the toughest problems that the classical computers cannot even deal with. The perfect coordination with the client and Clavax team helped in delivering the project within the set deadline, which turned out to be a great success for Fujitsu leading towards a much broader audience.

