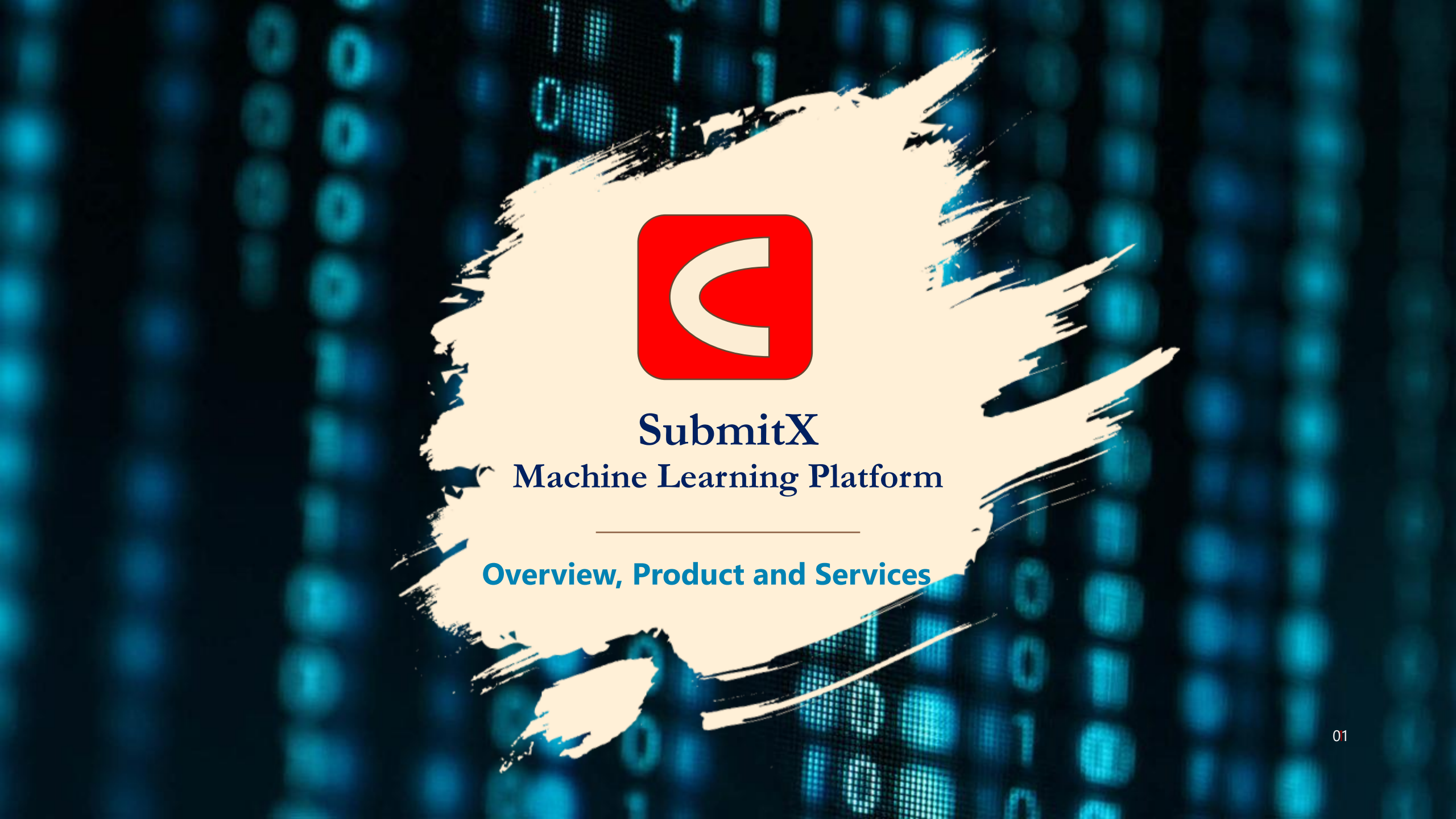


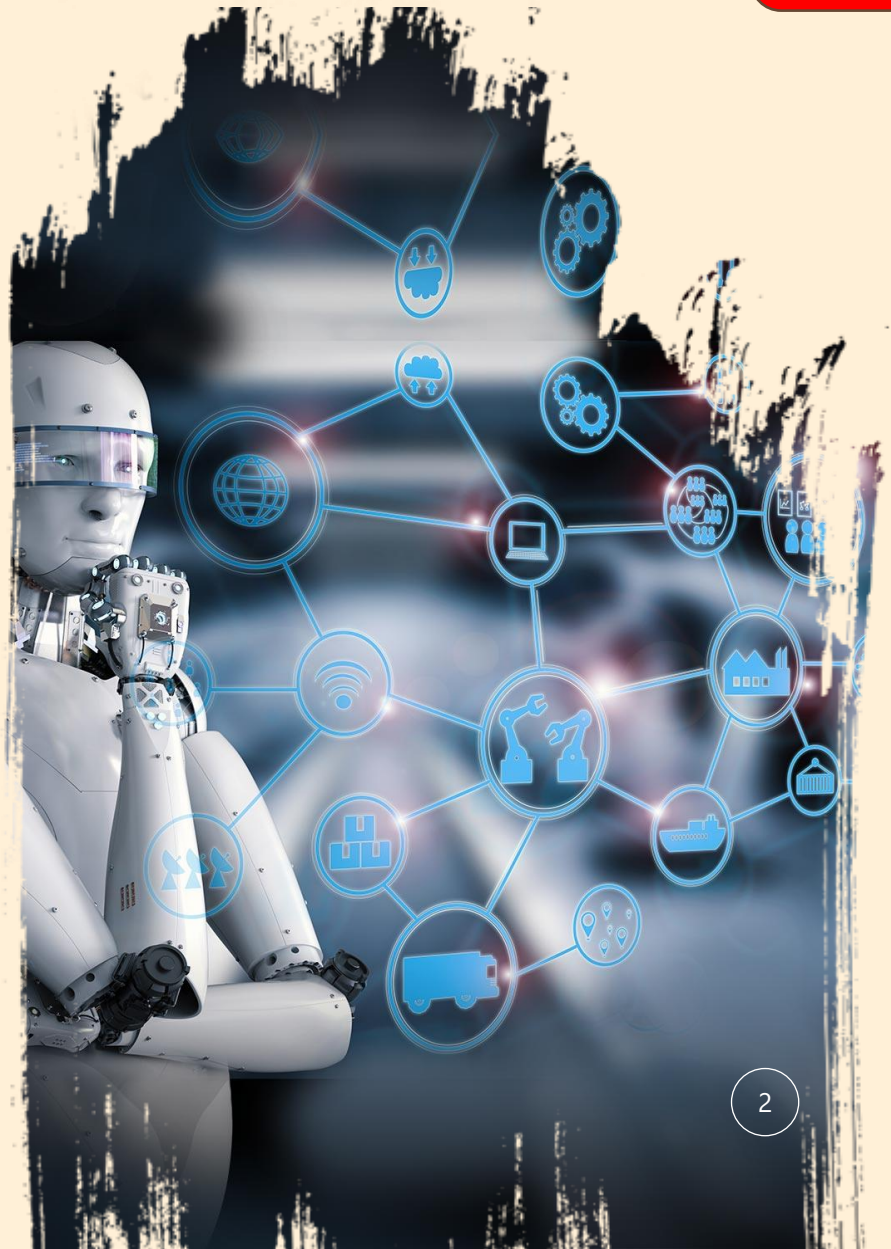
SubmitX

Machine Learning Platform

Overview, Product and Services

AGENDA

1. Mission & Vision
2. Energy Consumption by ICT
3. Market Trends
4. Shift of Computing
5. SubmitX ML Platform & Architecture
6. Key Differentiators
7. Solution components
8. How we can Partner
9. Data Science Solution Acceleration Service



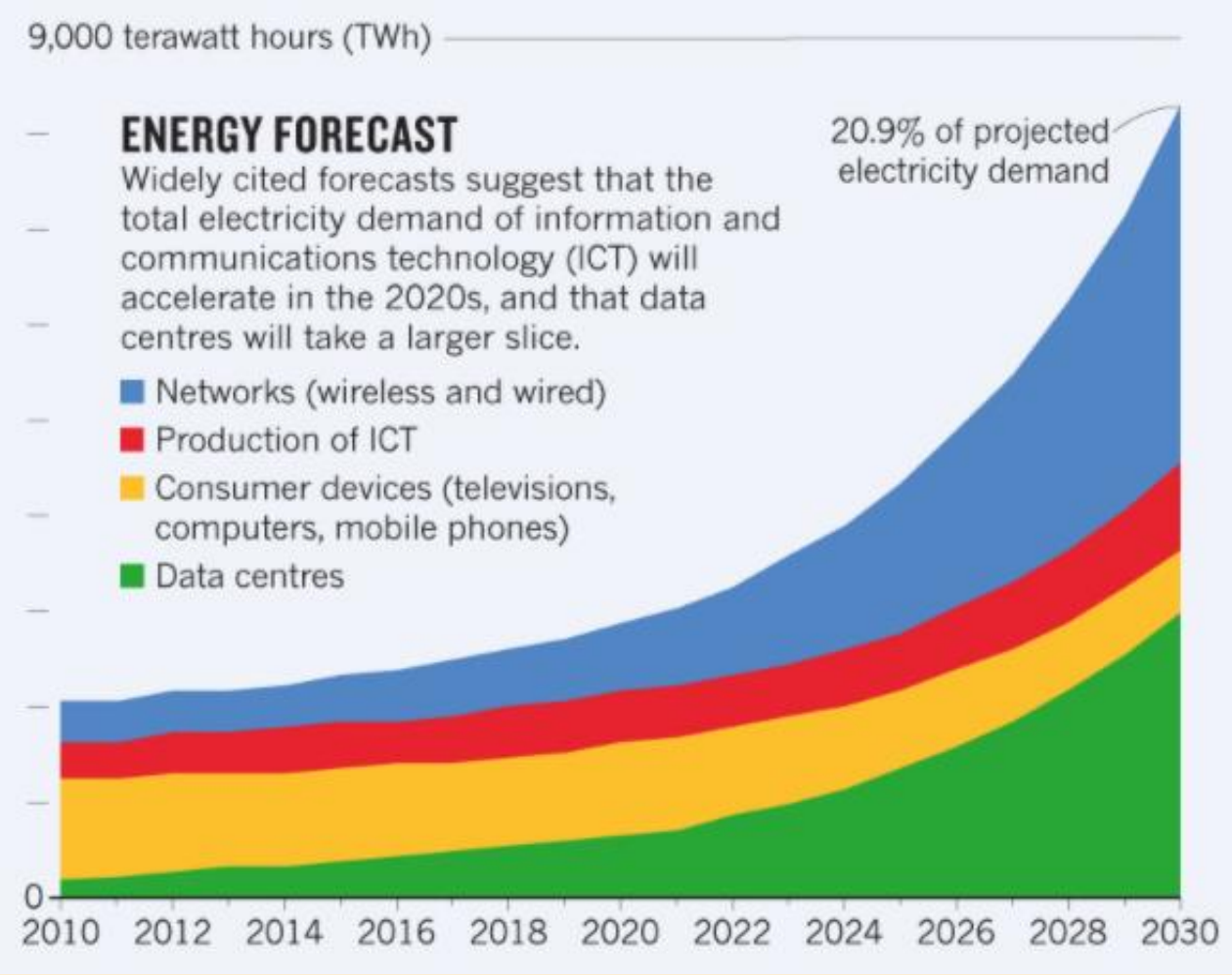
A Connected and Greener Planet

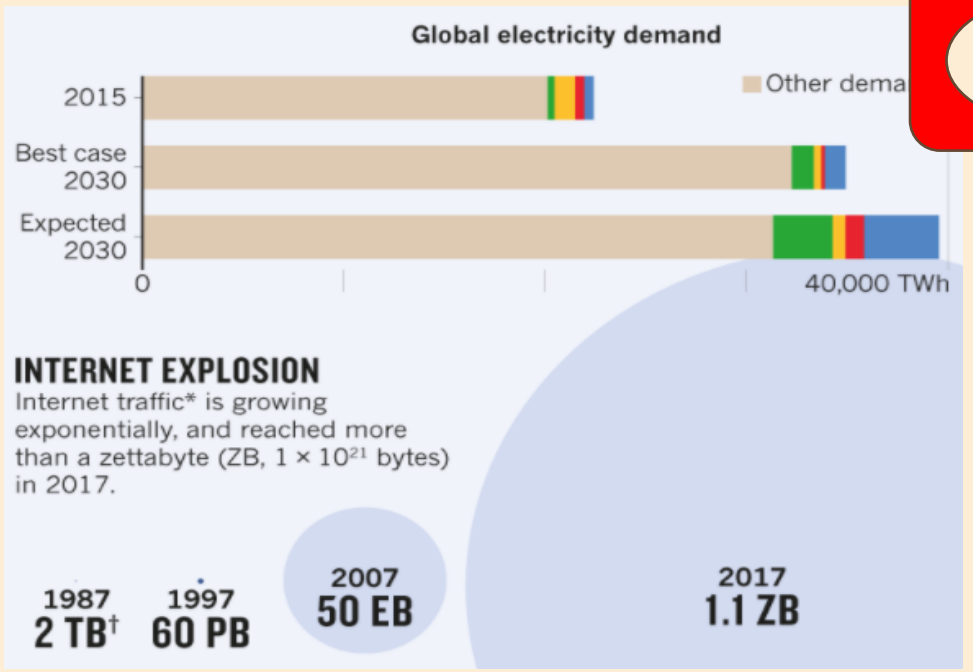
Vision & Mission

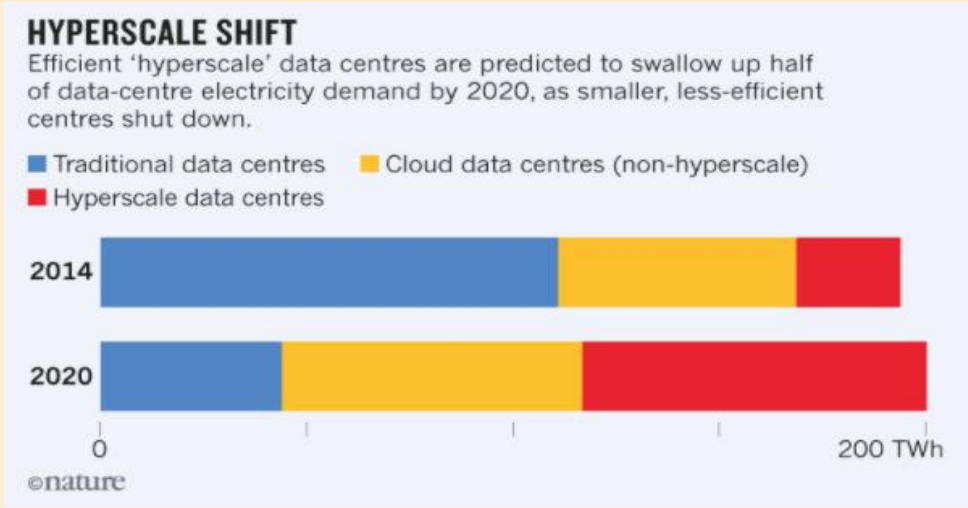
To change the way how people collaborate around data and how it is used for the betterment of society.

Energy Consumption by ICT

(source : Nature)







MARKET TRENDS

Data & Analytics

300,000 kg CO_2/NLP training

Shift of Computing

Training a single big language model is equal to around 300,000 kg of carbon dioxide emissions. Reducing the carbon footprint of artificial intelligence | MIT News | Massachusetts Institute of Technology

35%

Data Marketplaces & Exchanges

By 2022, 35% of large organizations will be either sellers or buyers of Data via formal online data marketplaces, up from 25% in 2020. (Gartner)

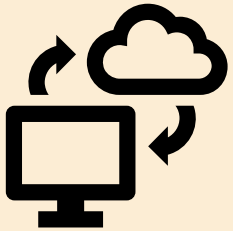
25%

A New Genre of contributors (non-coders)

25% of data and analytics decision-makers whose firms are adopting AI said they are planning to implement AutoML software within the next year. (Forrester).

By 2024,the spectrum of roles will extend from traditional data and analytics roles in IT to information explorer, consumer and citizen developer. (Gartner)

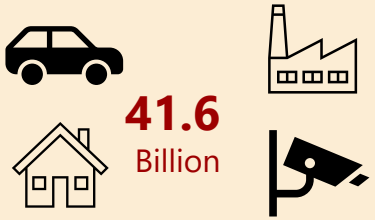
Shift of Computing
to improve energy efficiency



Backhaul (Fibre)

Air Interface

79.4 ZB of data by 2025



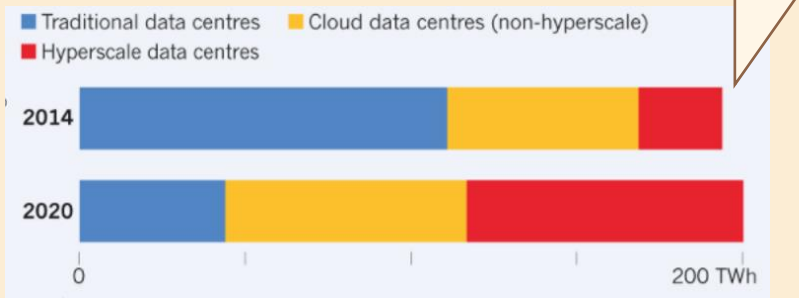
41.6 Billion

Cloud Computing

1. Farthest from device
2. Centralized Hyper-Scale Data-Centres

Edge Computing

1. Nearest to device
2. Traditional Data Centres
3. Difficult to get 3 phase supply in remote location



Device Computing

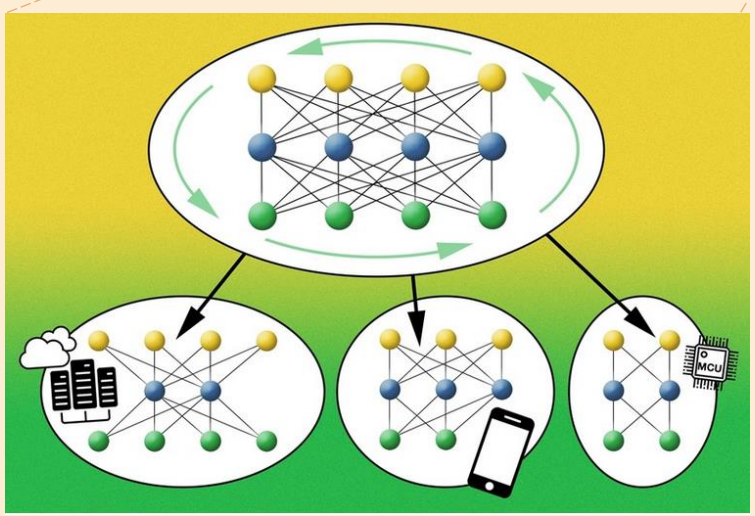
1. Machine Learning on device
   - More MOORE (< 10 nm difficult)
   - High leakage current of SRAM/DRAM memory.3D-NAND Flash not cost effective.
2. Inference on device. Learn in Data Centre
   1. Vendor specific model (ONNX formed)
   2. Huge model size, millions of neurons
   3. Monopolistic market

SubmitX ML Platform

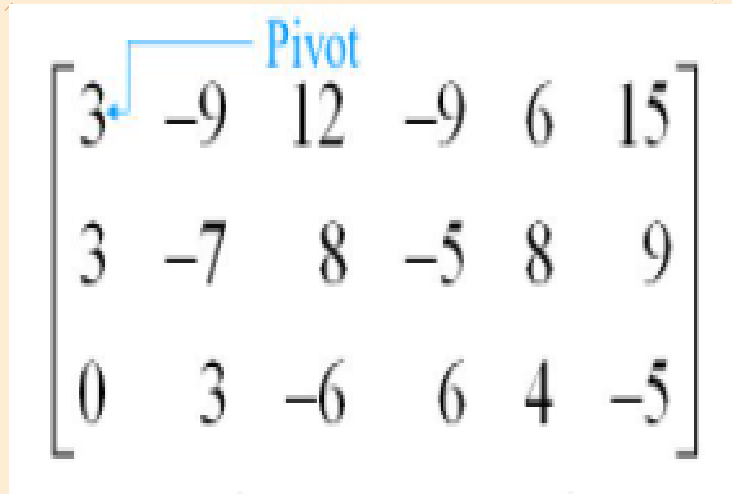
Energy Efficient Machine Learning + Ease-of-Use

Optimize → Train → Save → Deploy

- AutoML for quick search of optimal hyperparameters
- Graphically editable during design (NO-CODE)
  - Convolution layer
  - Activation layers
  - Decision trees
  - Feature engineering

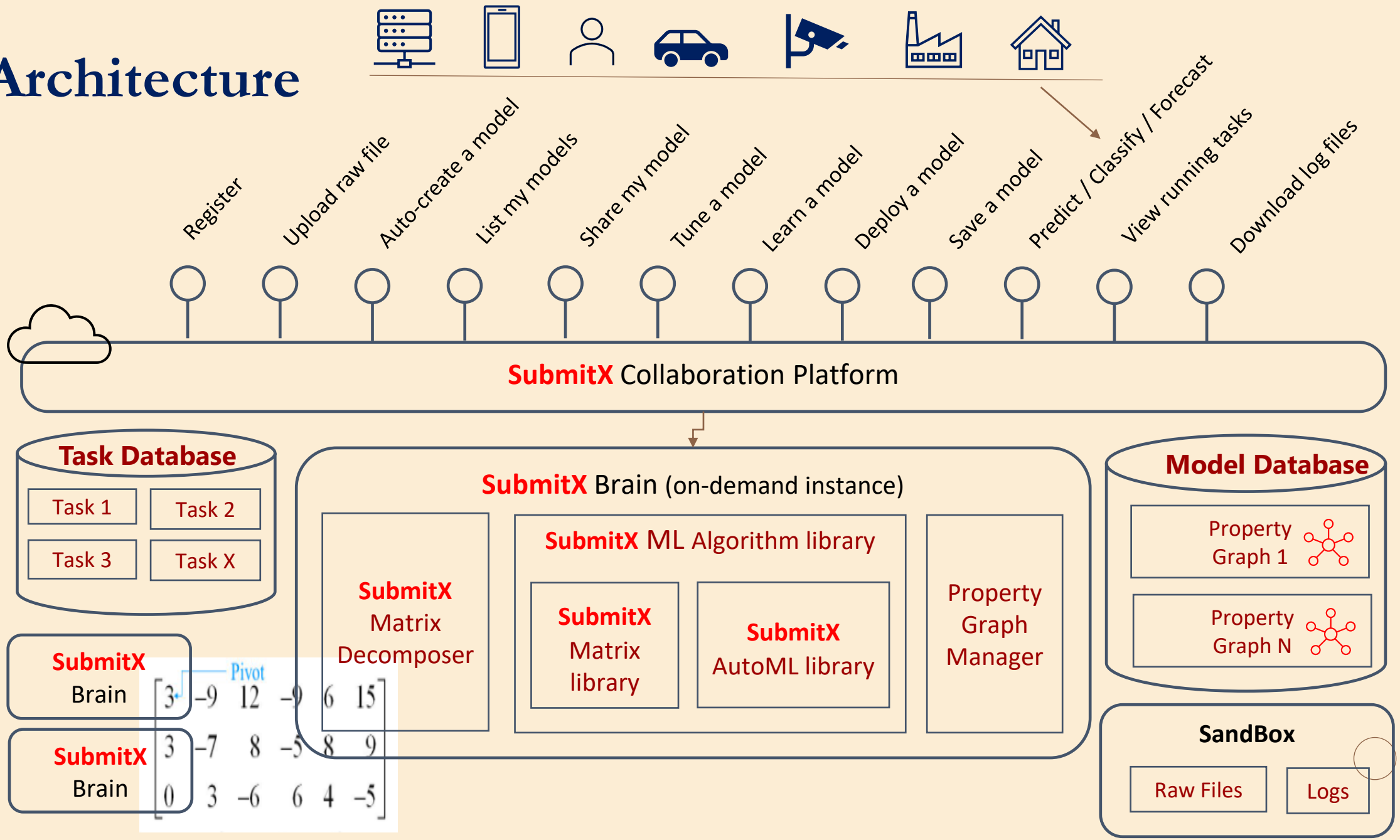


- During learning
  - Proprietary ML library
  - Model parallelism
  - Automated dimensionality reduction
  - Superior memory management
  - Optimized Matrix Algebra



- **BRAIN FILE :** Single compact property graph to store the complete set of learnt parameter, encodings, feature engineering rules, descriptive statistics
- Transportable to any device. Can be read by any software language

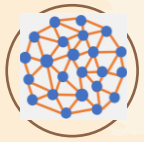
Architecture



SubmitX Key Differentiators

Compact Model Representation

- A single **brain file** can store data transformation rules, descriptive statistics, feature importance, encoders and learned parameters (like big-decimal coefficients, decision trees, deep neural network layers along with the activation weights) in a very compact format. Suitable for resource constrained devices like IoT chipsets.



Language agnostic model file

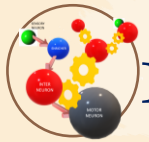
- The brain file stores the information as Directed Property Graphs. It can be read by all software languages.

No-code data transformation

Drag & Drop designer tool for feature engineering.

10X speed on commodity h/w

10X improvement in learning time using "Divide & Conquer"(D&C) + computational workload distribution over multiple worker nodes running on commodity hardware.



Efficient Algorithms

Our improved Extreme Learning Machines (ELM) and STATMODMIX algorithm **requires 70% less space** compared to traditional forward-backward propagation based neural network for classification tasks. Suitable for storing brain files trained with ELM in resource constrained devices.

AutoML capability

Automatically chooses the optimal set of hidden layers and activation neurons for a neural network that minimizes the probability of misclassification.

SubmitX Solution components

Products & Services

Visual Designer & Instant Publisher

1. Graphical desktop app to **create rules to transform raw data** (from sensors, actuators etc.) into features.
2. Provides a graphical view and allows **repurposing of the neural network architecture and decision trees** to reduce time and space complexity.
3. Helps in **Agile DevOps** activities, for example, iterative development of a model, testing and publishing model as REST API and **access control** for external consumption.
4. Exports the repurposed model to target system.

Technology : Java Swing

SubmitX Brain

(on-demand compute)

1. Manages the lifetime of **a model as an Object.**
2. Uses the proprietary machine learning high-precision libraries written in Java.
3. **Executes the automated ML pipeline** designed by the user and writes detailed log.
4. **Provides AutoML** features.
5. **Updates a model** with the learnt parameters and saves it into Knowledge Hotline service after learning.

Technology : Java 8 + proprietary GraphDB written in Java

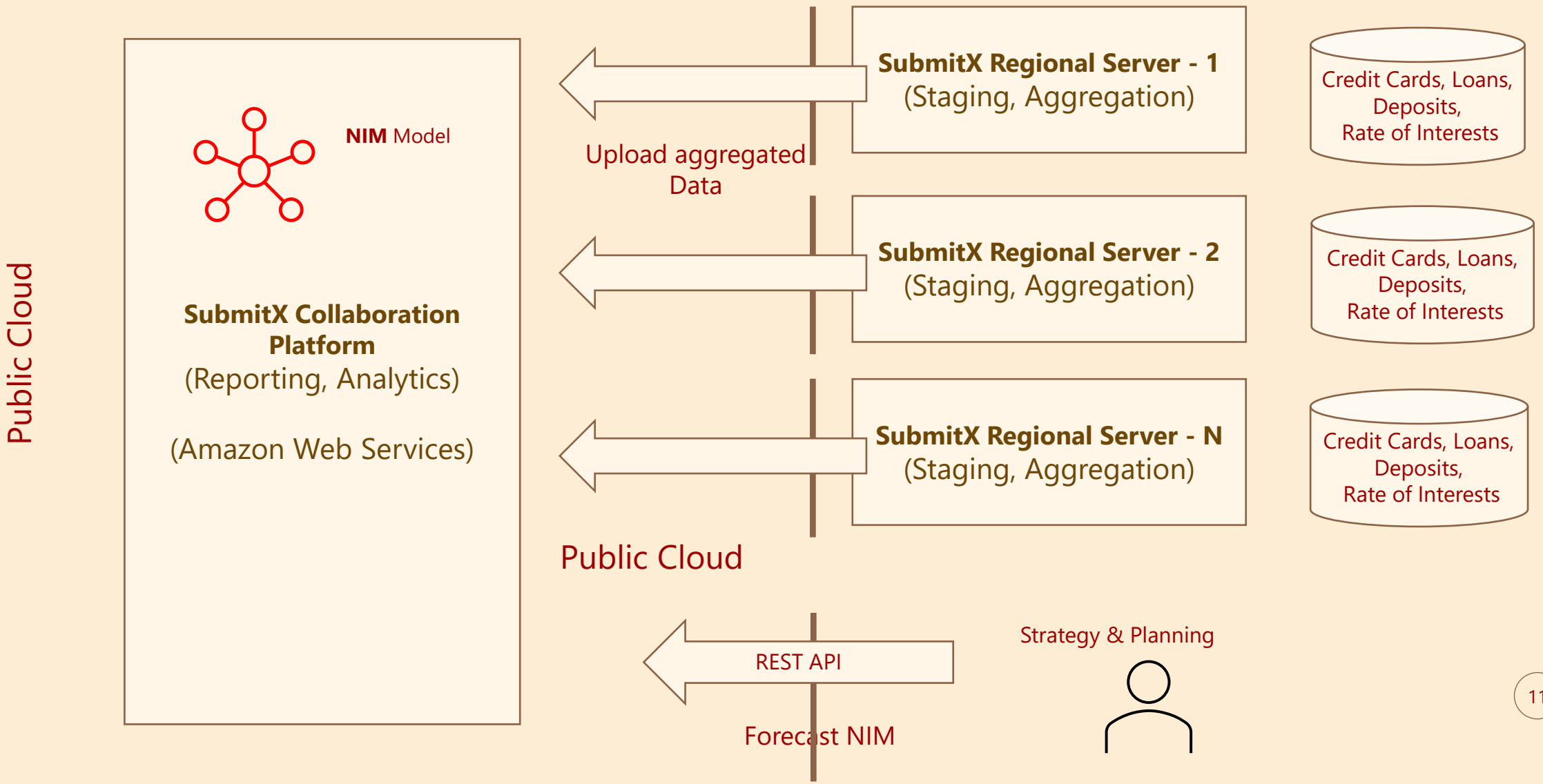
Collaboration Platform (Hosted)

1. A cluster of compute nodes that runs behind an elastic load balancer and supports multiple operation on model objects in parallel from multiple users.
2. A repository of pre-trained models providing "access token" based access to model objects. Models can be
   - **accessed as a REST resource** over HTTP for near real time classification, prediction or forecast
   - **Downloaded and installed** in resource constrained devices
3. Performs **user registration** of model contributors and model consumers and **monitors user activity**.
4. Exposes REST API for administrative activities.

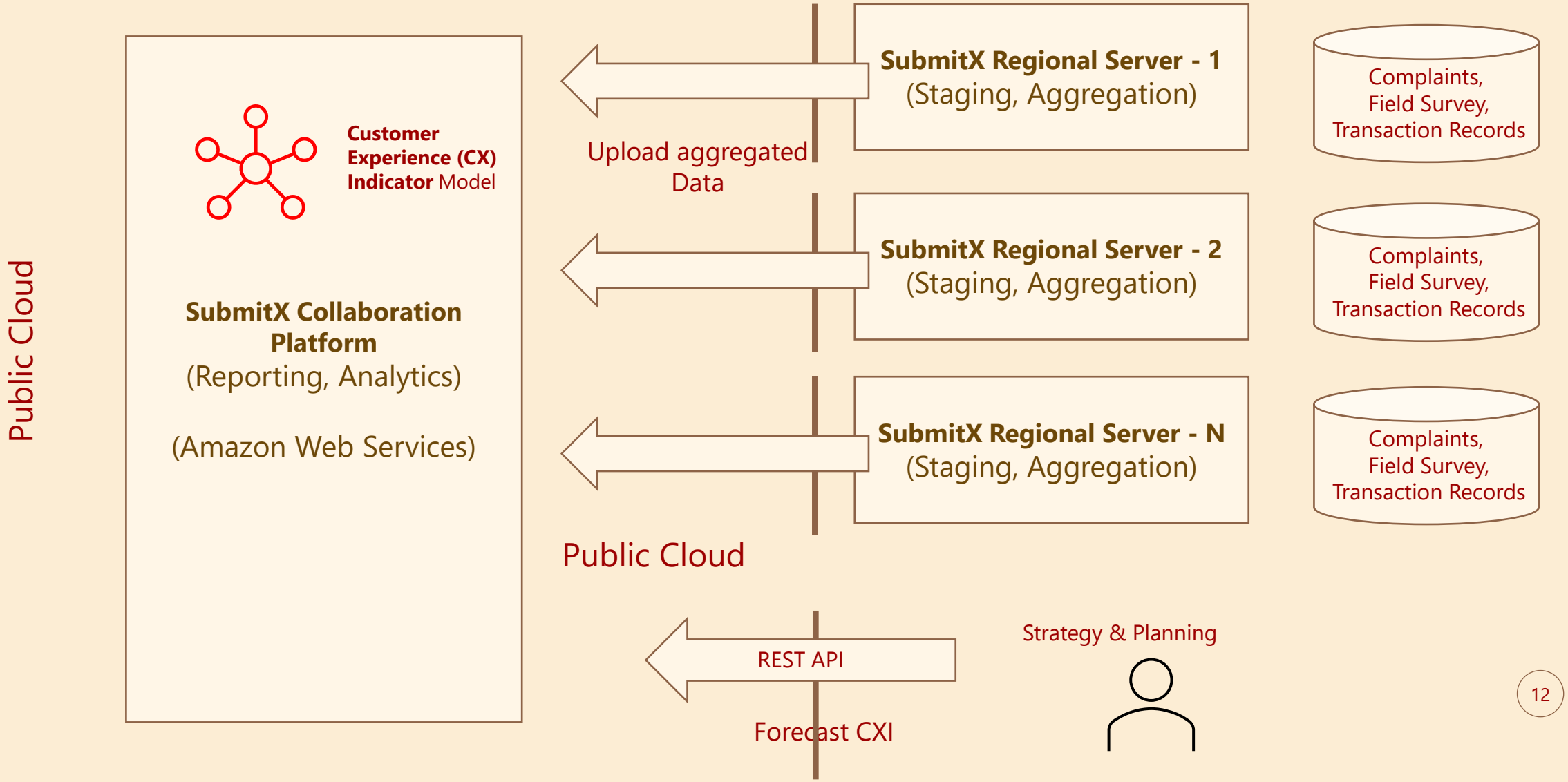
Technology : Spring Boot, Tomcat, Hibernate,
Proprietary Jantric-Brain container written in Java

How can we partner? (Banking)

Net Interest Margin – Data aggregation & Prediction

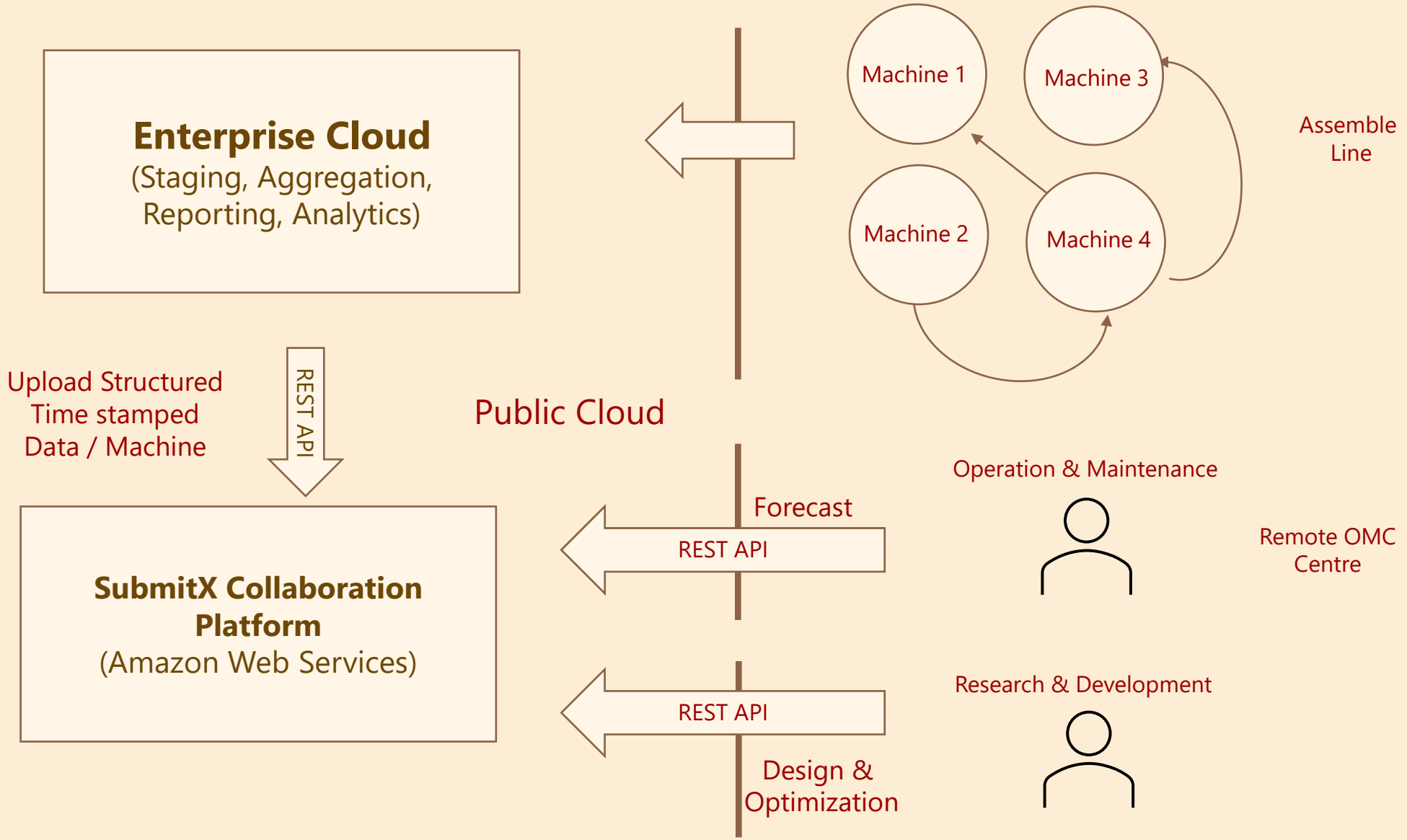


How can we partner? (Banking/Telecom/ Customer Service Industry)
Prediction and Root Cause of CX Indicator



How can we partner? (Manufacturing)

Near real time Time-Series forecasting



How we can partner? (Manufacturing)
Industrial Quality Control through robotic vision

Enterprise Cloud
(Staging, Aggregation, Reporting, Analytics)

Quality Control

Upload tagged images of industrial products

REST API

Public Cloud

Image Classification on device

SubmitX Collaboration Platform
(Amazon Web Services)

Download Brain file

SubmitX Brain + Brain File
(System on Chip)

REST API

Research & Development

Design & Optimization

Data Science Solution Acceleration Service

Consulting + Implementation

Team & Project Duration

8 – 12 weeks

Lead Consultant + Customer Solution Manager +

Technical Solution Manager +

Data Scientist

(all with advanced degrees and between 5 – 12 years of work experience)

Activities

1. Gathering business requirement and agreeing on success criterion.
2. Stakeholder Management(interface with Operations, CXX, Product Management , Sales & Marketing, Loyalty & Retention)
3. As-Is evaluation and presentation to management. Improvement of Internal tools & processes
4. Mathematical formulation of domain specific features (F2F meetings with domain experts
5. Data Readiness for project (Stakeholder management with IT, Security, RACI matrix agreement)
6. Compute readiness for project(on-premise h/w availability or VM availability on public/private/hybrid cloud)
7. Data pipe creation for Data-At-Rest or Data-in-Motion(subscribe to existing streaming systems or deploy a new data streaming and aggregation system)
8. Preparing REST consumer adaptor and integrating with MIS, CRM, Mobile App ecosystem etc
9. Feature creation in implementation tool
10. End-2-End automation of repetitive tasks like model building, data preparation etc (or deploying JantricAutoML product)

Billing

Hourly Rate

+ Applicable Service Tax

THANK YOU!

Write to us

Email:
sales@celeriac.co.in