Smartricity App

Midterm Presentation

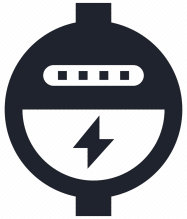
Group O
26.2.2025

Stakeholders & our value proposition

Consumers

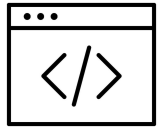
Property owners & housing companies

Smart electricity device providers

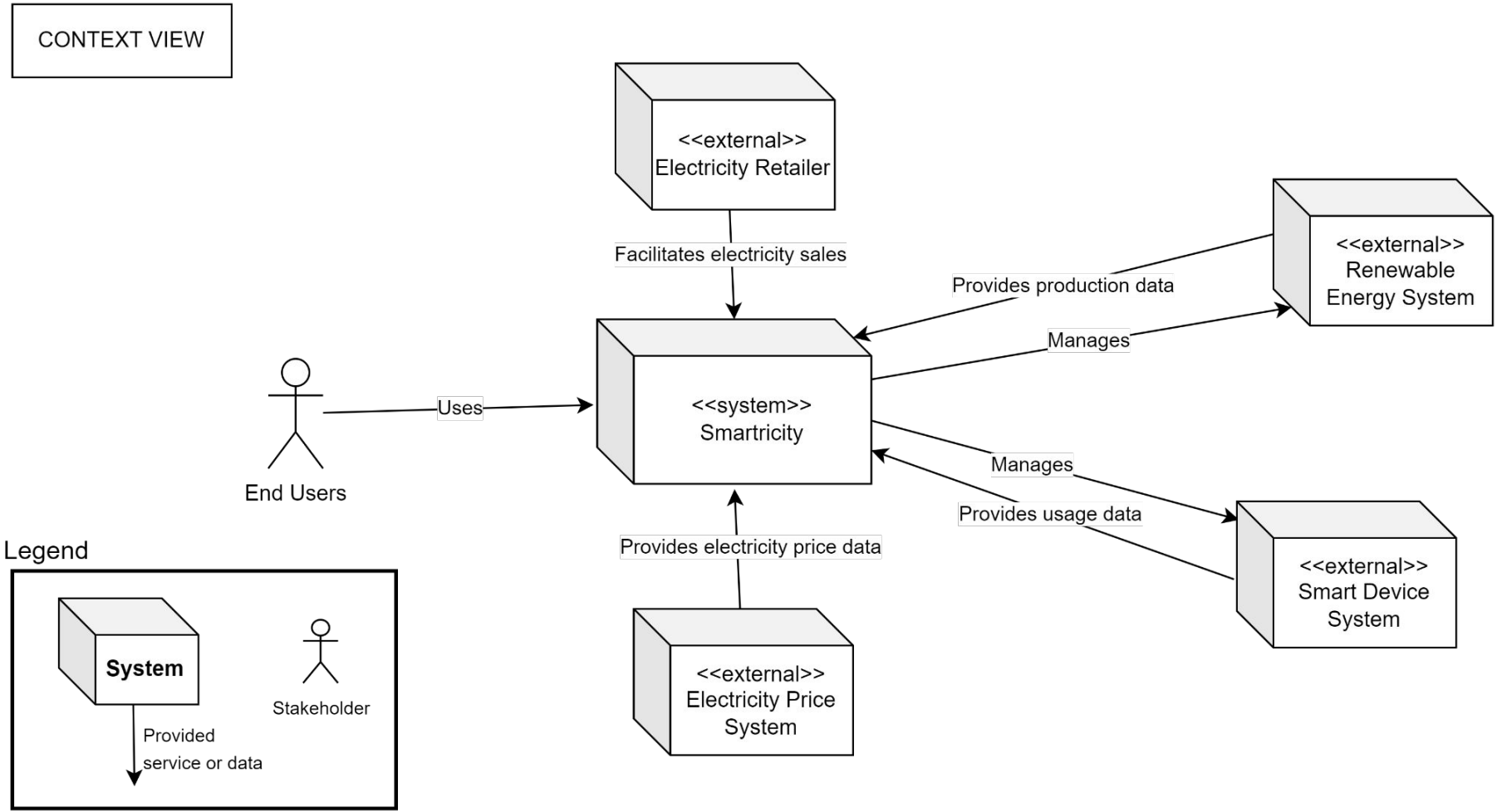


Smart appliance manufacturers

Developers



A cloud-powered web solution to integrate, aggregate and manage a home's smart devices, both by users and automatically through AI.


CONTEXT VIEW
<<external>>
Electricity Retailer
Facilitates electricity sales
<<external>>
Renewable
Energy System
Provides production data
Manages
Uses
End Users
<<system>>
Smartricity
Manages
Provides usage data
<<external>>
Smart Device
System
Provides electricity price data
<<external>>
Electricity Price
System
Legend
System
Stakeholder
Provided
service or data

NFASR-1
Ensure continuous operation and minimize downtime and store data in case of failure.

NFASR-2
Store user' data securely and prevent unauthorized parties from accessing or controlling it.

NFASR-3
Scale up services when the number of users increases.

NFASR-4
Ensure accurate data and proper execution of automation

FASR-2
Store electricity usage time series data

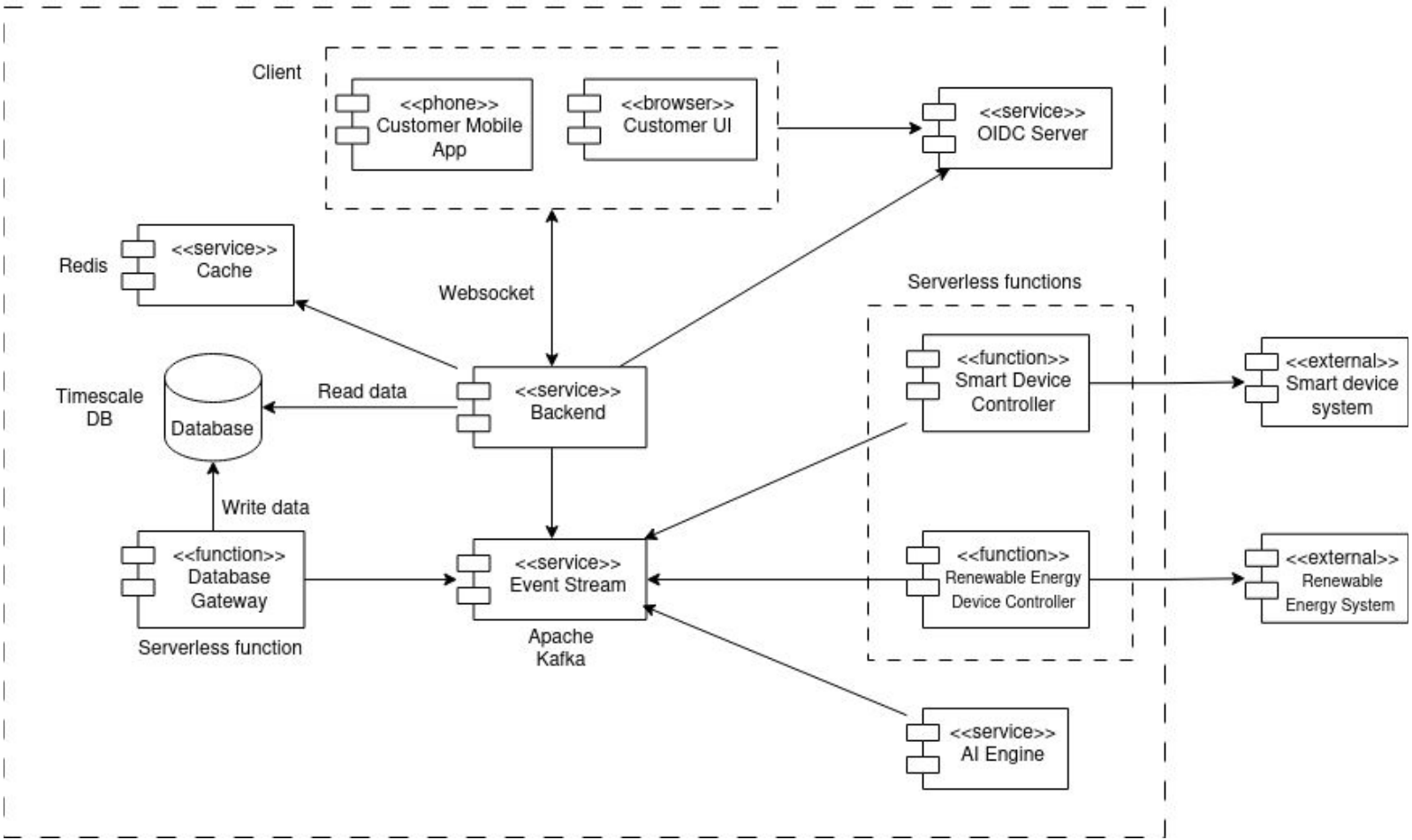
FASR-1
Integrate smart home and electricity production devices

FASR-3
Display real-time electricity usage data

FASR-5
Automatically balance energy production, storage and selling

FASR-4
Use AI to analyze and optimise energy usage

FUNCTIONAL VIEW



Key design decisions and assumptions

Key design decisions & principles shaping our architecture

- Event-based design
- Service-oriented architecture
- Horizontal scalability

Assumptions

- We are able to connect to different kinds of smart devices and can get data from them
- There is no need for synchronous communication between the individual services

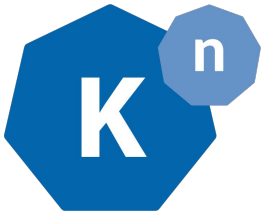
Functional Elements added based on identified ASRs

Event Stream (Apache Kafka)

- A distributed event streaming platform, allowing different services to produce and consume events.
- NFASR-1: Ensure continuous operation and minimize downtime and store data in case of failure.

Serverless functions (Knative)

- A Kubernetes-based platform that enables serverless computing.
- NFASR-3: Scale up services when the number of users increases.



OIDC (OpenID Connect) Server (Keycloak)

- An identity provider which authenticates users and issues ID tokens to client applications.
- NFASR-2: Store user' data securely and prevent unauthorized parties from accessing or controlling it.