Introducing DR to your platform
based on EV CPO case study

codibly | Create. Impact. Innovate.

Introduction

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Agenda

Introduction / About Codibly

Problem statement

Exploring possibilities

Designing for the success based on Case Study

Key takeaways

Q&A

About Codibly

SOLUTIONS

How can we help

Operations and Management Systems

Energy Efficiency

Connectivity Solutions

Battery Management

Demand Side Management

Start intelligent energy management for demand response, smart grid, micro-grid, STOR, capacity market, peak shaving, load balancing, or electric vehicle charging.

Data Analysis/Forecasting Platforms

Benchmarking and Optimization

Solution Accelerators

Extensive experience in software engineering for EV industry

We develop advanced software tailored to EV companies' business needs

V2G Systems	Smart charging	Energy management systems	Connectivity (OCPP, OCPI, OICP, and more)	Electric Vehicles Fleet Management Centers	Charging stations menegment systems	Demand repsonse systems	VPPs

Software engineering powered with EV know-how

Whether you are looking for end-to-end cooperation or an experienced remote team of software engineers with EV expertise - we are here to help you out.

Software team augmentation

Scalable team of experts with EV know-how, experience and skills

MVP

Ready-to-use app in three months

End-to-end projects

Software that serves the cross-functional business needs

PoC

Ready-to-use in two months

Product design

Reliable UX team will design a product that stands out on the market

Why Codibly is the right choice for DR and EV Industry?

- **We have a in-depth understanding of EV ecosystem technologies & excellence in it** - We delivered tens of projects within electromobility ecosystem and gained practical knowledge, this includes different areas and actors of the EV ecosystem which gives us the unique understanding form different angles (end-users, CPO, CP manufacturers and many more). It's what we do, love, and constantly improve ourselves in; educating employees from day one, running EV and Renewable academies, knowledge sharing, and retaining talent.

- **We have tools and know-how that will accelerate the project delivery -** during our journey with electromobility, we also created several reusable building blocks that help accelerate project delivery, we understand time-to-market is key in this rapidly evolving and competitive environment.

- **"We speak the same EV language"** - To ensure EV knowledge sharing, we have established an internal "Energy Academy" course that our employees need to participate in. Thanks to that, Codibly provides teams of experienced programmers with EV technology experts and delivery process-oriented skills. This technical expertise can help us build software solutions that integrate with complex electromobility systems, such as charging infrastructure, battery management systems, and vehicle-to-grid systems.

- **Innovation** - Codibly is committed to innovation and staying up-to-date with the latest trends and technologies in the software development space. This mindset can help us bring fresh ideas and perspectives to a project in the electromobility space, and help the client stay ahead of the curve in this rapidly evolving industry. Our R&D Team develops custom accelerators to integrate via OpenADR, IEEE 2030.5 protocol, OCPP 2.0 and many more…

- **Focus on quality** - Codibly strongly emphasizes software quality and testing. We follow industry-standard testing practices and use tools like automated testing to ensure the software solutions are reliable, secure, and scalable. Additionally, we've built an internal Testing Lab supporting direct charger testing from different manufacturers.

Our Clients include: HUBJECT   enbala YOUR GRID. IN BALANCE.   kiwipower   true a Landis+Gyr company   SIEMENS energy   IoTecha

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Why should we bother?

- ✓ **Grid stability**

- ✓ **Cost savings for consumers and utilities**

- ✓ **Potential profits from incentives**

- ✓ **Future proofing for upcoming regulations**

- ✓ **Greater competitiveness of products**

Getting exact
DR program types

✓ **Incentive-based**

- Direct Load Control
- Emergency Demand Response
- Interruptible / Curtailable load
- Capacity Bidding

✓ **Price-based**

- Critical Peak Pricing
- Real-Time Pricing
- Time of Use
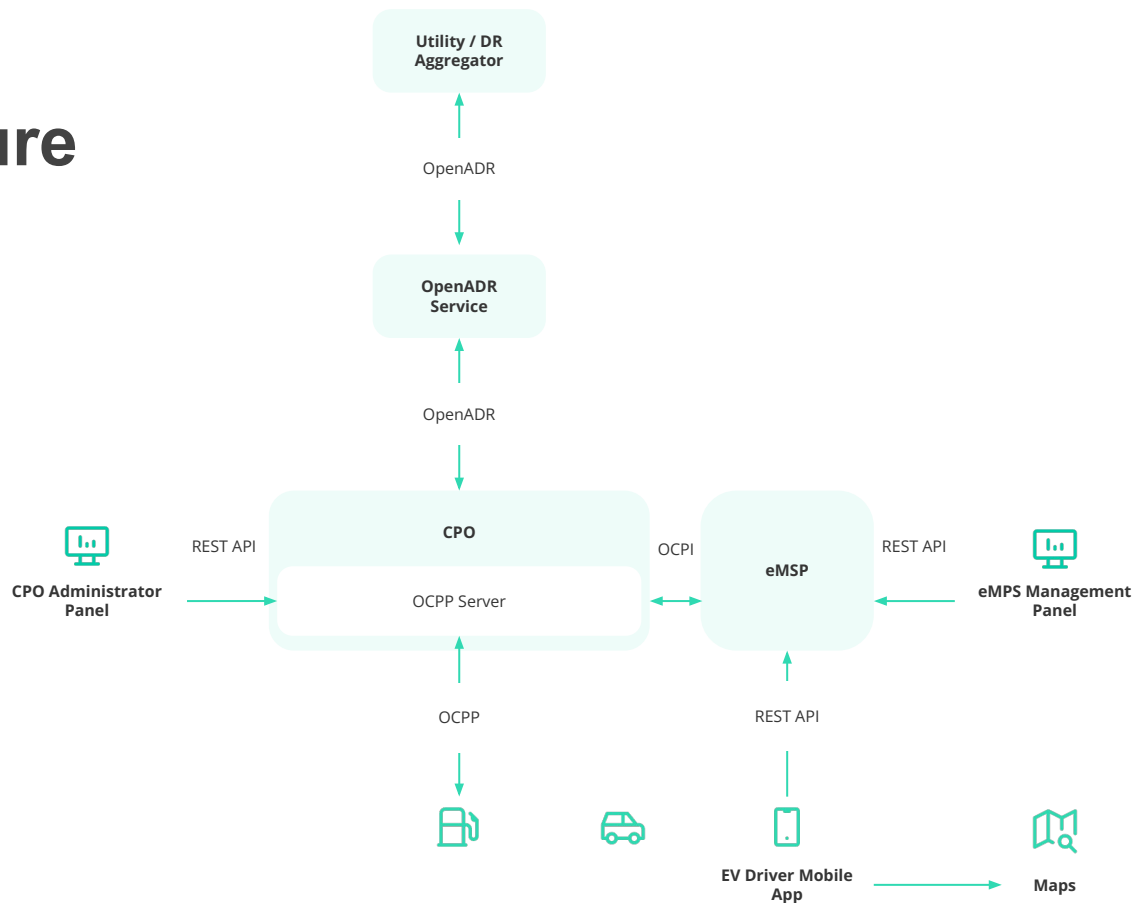- Peak Time Rebates

Key Features

- ✓ **Event**

- ✓ **Opt**

- ✓ **Report**

- ✓ **Register party**

- ✓ **Security**

Overall architecture

CPO (Charging Point Operator) - responsible for the management, operation, and maintenance of charging infrastructure. They install and operate charging stations and provide the necessary services to enable EV drivers to charge their vehicles. CPOs may partner with various stakeholders, such as property owners, utilities, and eMobility service providers, to expand the charging network.

eMSP (eMobility Service Provider) - provides a range of services to EV drivers, including access to charging infrastructure, payment processing, and charging data management. They may also offer value-added services, such as route planning, charging station reservations, and loyalty programs. eMSPs work with CPOs to provide seamless access to charging infrastructure across different networks.

Utility / DR Aggregator

OpenADR

OpenADR Service

OpenADR

CPO

REST API

OCPI

OCPP Server

CPO Administrator Panel

eMSP

REST API

eMPS Management Panel

OCPP

REST API
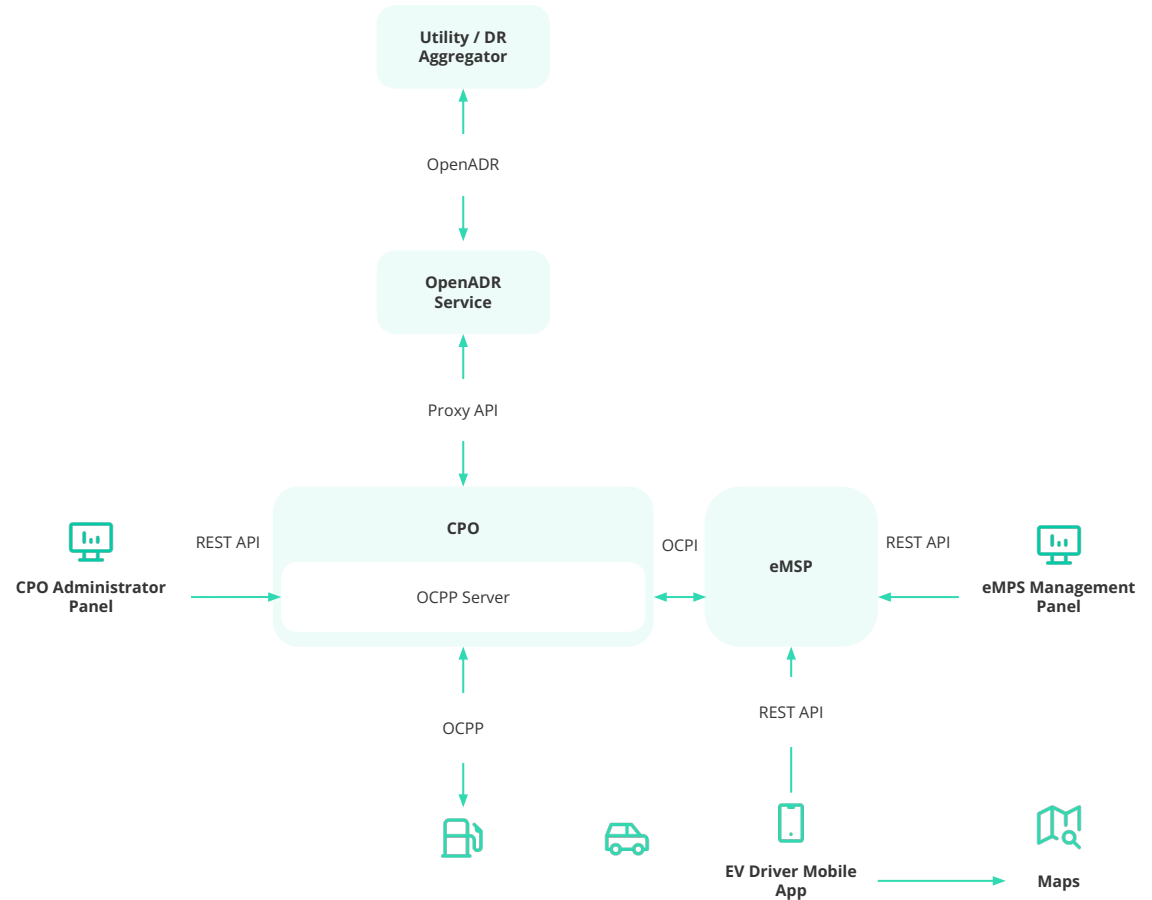
EV Driver Mobile App

Maps

Data retention

Choosing right place to store data may not be obvious decision. **Depending on the storage placement we may increase infrastructure cost although we may gain faster response time** and we will relive rest of the system

Most of the time, for data retention we choose from:

- Device Level - Low need for data synchronisation but at cost of the poorest performance
- EMS/CPO - Usually already has data stored but additional calculations and traffic may affect other parts of the system
- Protocol Adapter - Best performance but synchronisation mechanisms must be in place

Utility / DR Aggregator

OpenADR

OpenADR Service

Proxy API

CPO Administrator Panel — REST API — CPO

OCPP Server

OCPI — eMSP — REST API — eMPS Management Panel

OCPP

REST API

EV Driver Mobile App

Maps

SLA

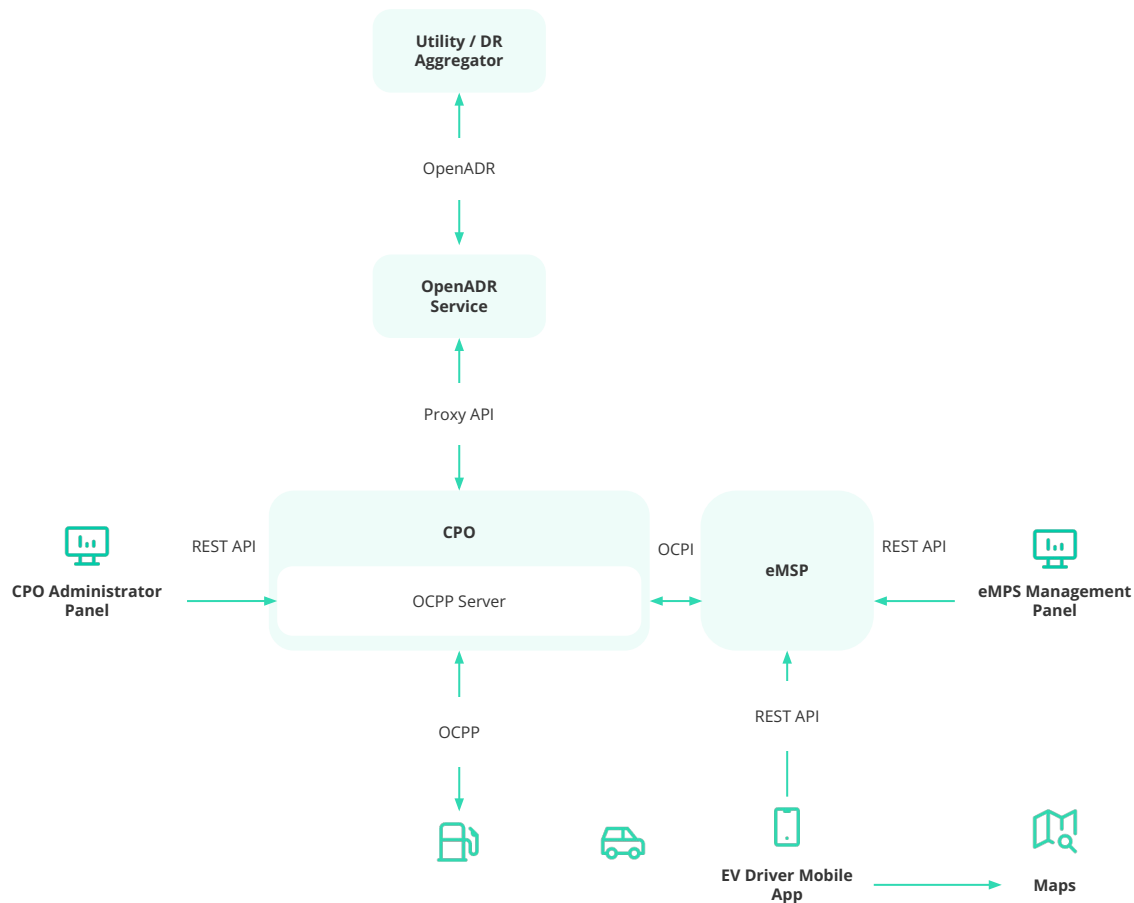**Downtime of one service may affect the others if it's not taken into account in architecture** during process of program choosing we may endanger our company on penalties

For system deployed as chain of tightly connected component SLA is calculated as multiplication of availability of each individual components

Let's assume that in our example only two services are necessary CPO and OpenADR. To make calculation easier we also assume that they are tightly connected and their availability is both 99.5%

Resulting availability of our solution would be

99.5 * 99.5 = 99,0 %

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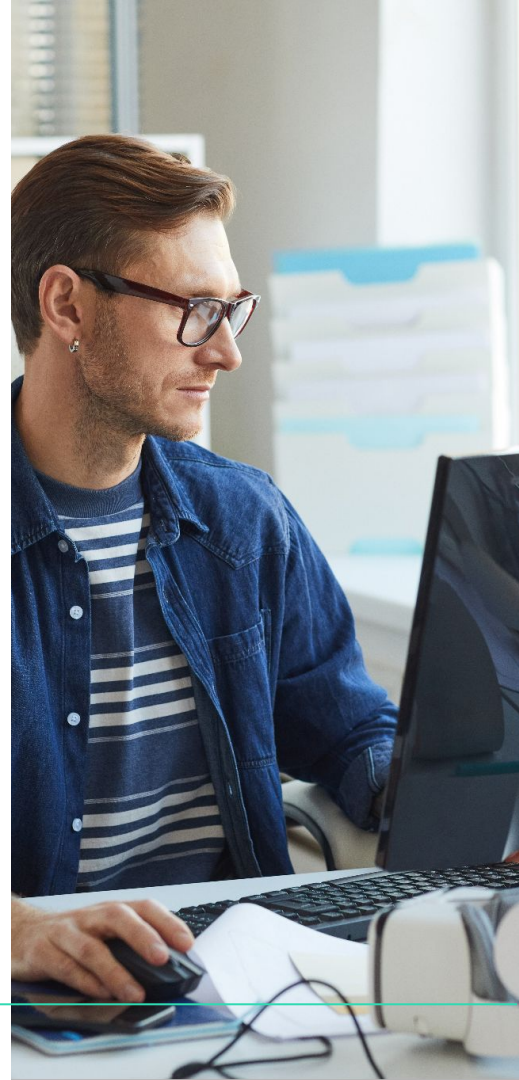
OCPP

REST API

EV Driver Mobile App

Maps

Key learning points for your consideration

Here are some good practices we've learned based on our experience delivering projects for our clients.
They are all practical, actionable, and in our experience, the hallmarks of a successful implementation.

- **Choose DR program carefully -** OpenADR can be a perfect solution for introducing demand response opportunities to your business and users but there are many options and choosing subset of DR program may speed up a implementation

- **Take future into account** - spending few days on careful planning and explorations of opportunity may save monts of custom development later in the long run.

- **Don't forget the rest of the system** - demand response is just one pice of the puzzle if not implemented correctly it may affect rest of the platform therefore design must take into account that SLA of modules may multiply and place where data will stored also may affect maintenance cost and performance

Q&A

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