

Team Port of Switzerland



Samuel



Simon



Syarif



Tobias



Universität Basel

Blockchain Challenge

12. Dezember 2019

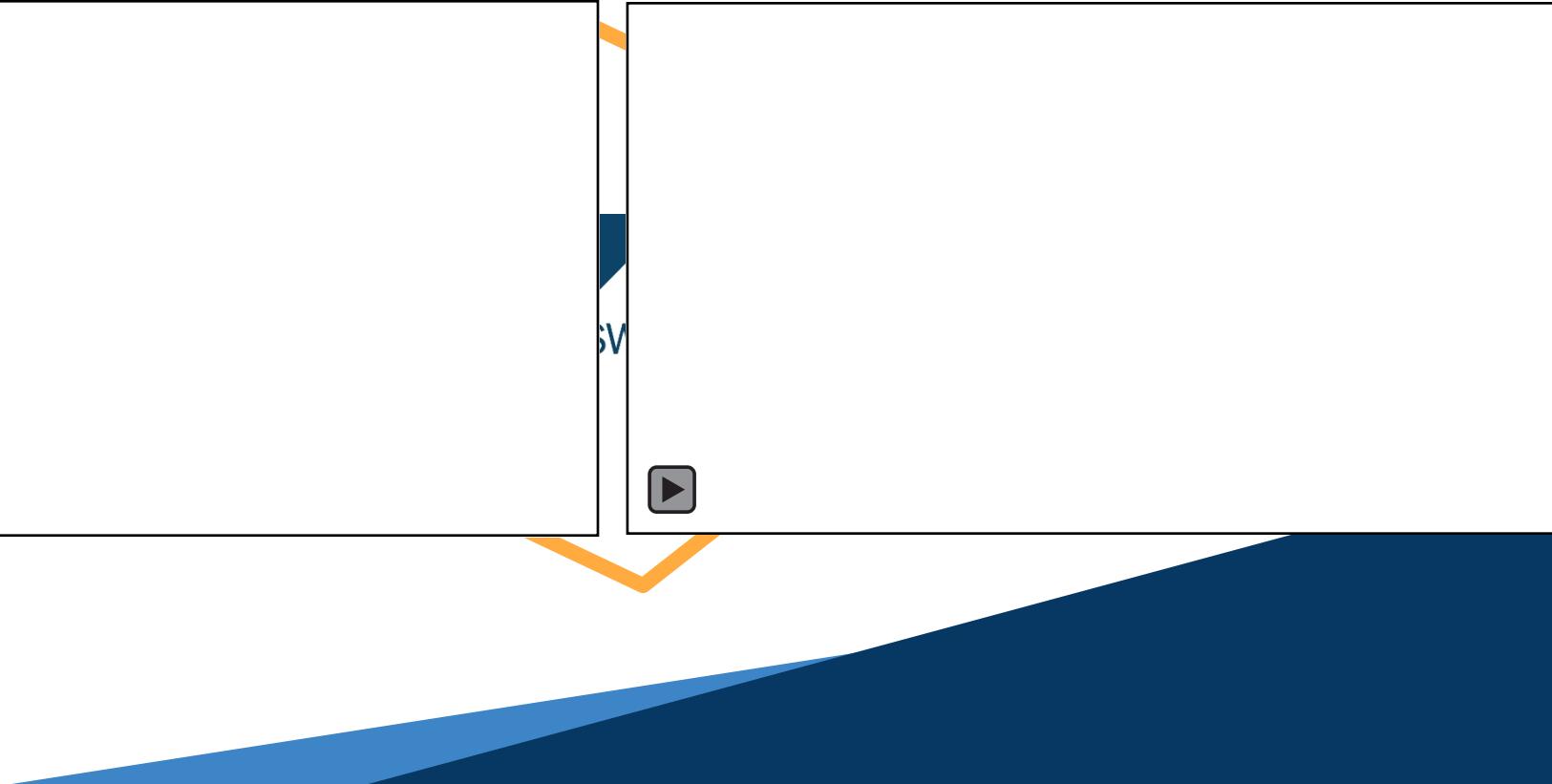














Vermieter

Schiffahrtspolizei

Schiffahrtspolizei

Schiffahrtspolizei



PORT OF
SWITZERLAND





A wide-angle photograph of a European city along a river. In the foreground, a large white cruise ship is docked at a pier. Behind it, a multi-arched stone bridge spans the river. The background features a dense cluster of buildings, including several church towers with spires, under a bright blue sky with scattered white clouds.

01

die Probleme



Reservation



Verbrauch



Rechnung



Verbrauch





AIS

Automatic Identification System



RPIS



Rhein Ports Information System

The screenshot shows the RPIS interface with the following sections:

- Schiffsanläufe (Ship Arrivals):** A table listing ship arrivals with columns for Callid Schiff, ETA, Status, and actions. Recent arrivals include:
 - CAMARO V: 12-10-2019 09:00, Verpaster Anfrage
 - CAMARO II: 12-10-2019 11:30, Neu
 - LIBELLE: 11-10-2019 07:00, Verpaster Anfrage
 - MICHAELANGELO: 11-10-2019 07:00, Verpaster Anfrage
 - STATENDAM: 11-10-2019 19:00, freigegeben
 - STATENDAM: 11-10-2019 05:00, freigegeben
 - CAMARO V: 11-10-2019 23:00, Abgesagt
 - ALSACE: 11-10-2019 21:00, freigegeben
 - ALSACE: 11-10-2019 14:00, InDurchführung
 - ALORBA: 12-10-2019 10:30, Neu
 - ALORBA: 12-10-2019 07:30, Neu
 - STBLS: 11-10-2019 11:00, Neu
- Zuletzt erhaltene ATA's für CAMARO V:** A map of the Basel area showing recent Automatic Terminal Arrivals (ATAs) for the vessel CAMARO V.



02

die Lösungen



Warum Blockchain?

Wiederverwertung

Integrität der Daten
& Datenbank

Zahlungsflüsse
Mikrotransferierung

1.Reservation

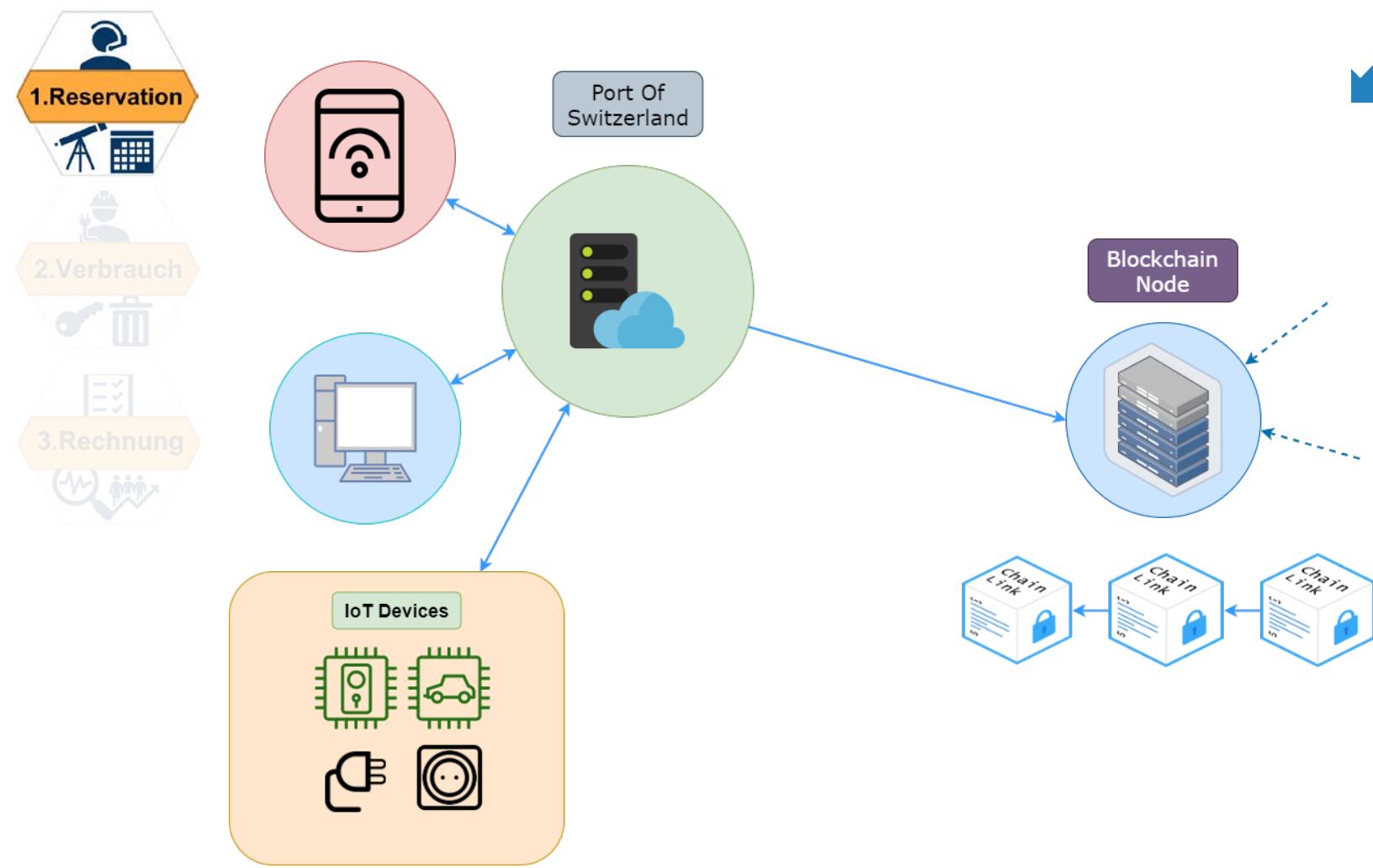


2.Verbrauch



3.Rechnung







1.Reservation



2.Verbrauch



3.Rechnung

RPIS

Planung & Durchführung

Schiffsanläufe

Call id Schiff	ETA Status
18046 CAMARO V	12-10-2019 09:00 Verspätete Anfrage
18023 CAMARO II	12-10-2019 11:30 Neu
18021 LIBELLE	11-10-2019 07:00 Verspätete Anfrage
18020 MICHAELANGELO	11-10-2019 07:00 Verspätete Anfrage
18019 STATENDAM	11-10-2019 19:00 Freigegeben
18018 STATENDAM	11-10-2019 05:00 Freigegeben
18017 CAMARO V	11-10-2019 23:00 Abgesagt
18015 ALSACE	11-10-2019 21:00 Freigegeben
18014 ALSACE	11-10-2019 14:00 In Durchführung
18013 ALORBA	12-10-2019 10:30 Neu
18012 ALORBA	12-10-2019 07:30 Neu
18011 	11-10-2019 11:00

Reihe 1-23 / 23

Benachrichtigungen Dashboard Jelena Dobric Anwendungsverwalter (extern) Neu laden X

Zuletzt erhaltene ATA's für CAMARO V



The source for all AIS data displayed or used in RPIS is provided by Vesseltracker.com GmbH.

Passagen

Passagen	ATA	Quelle
Contargo Terminal Basel (ATD)	10-10 14:45	BRP
Swissterminal Birsfelden (ATD)	10-10 10:23	BRP
STBSL (ATD)	10-10 09:55	BRP
Swissterminal Birsfelden	10-10 08:21	BRP
Birsfelden (IN)	10-10 07:53	AIS
Birsfelden Schleuse (OUT)	10-10 07:44	AIS
Birsfelden Schleuse (IN)	10-10 07:17	AIS
STBSL	10-10 07:05	BRP

Anläufe

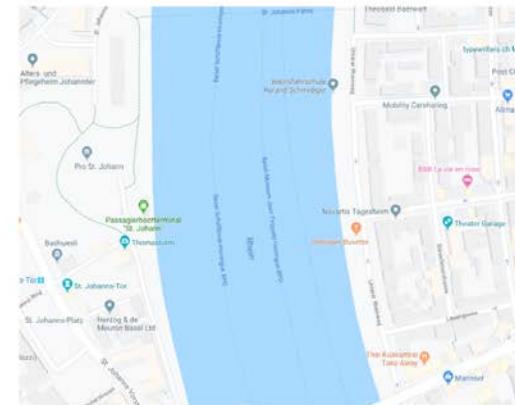
Anläufe	Standorte	RTA	ETA	Quelle
BIRSTERMINAL AG		11-10 06:00		BTSPR



1.Reservation



Reservation

**Shipname****Theodore 2****Port of Destination****Basel****Terminal****1****Date****23.12 - 25.12.19****Time****10:45 - 09:30****Send**

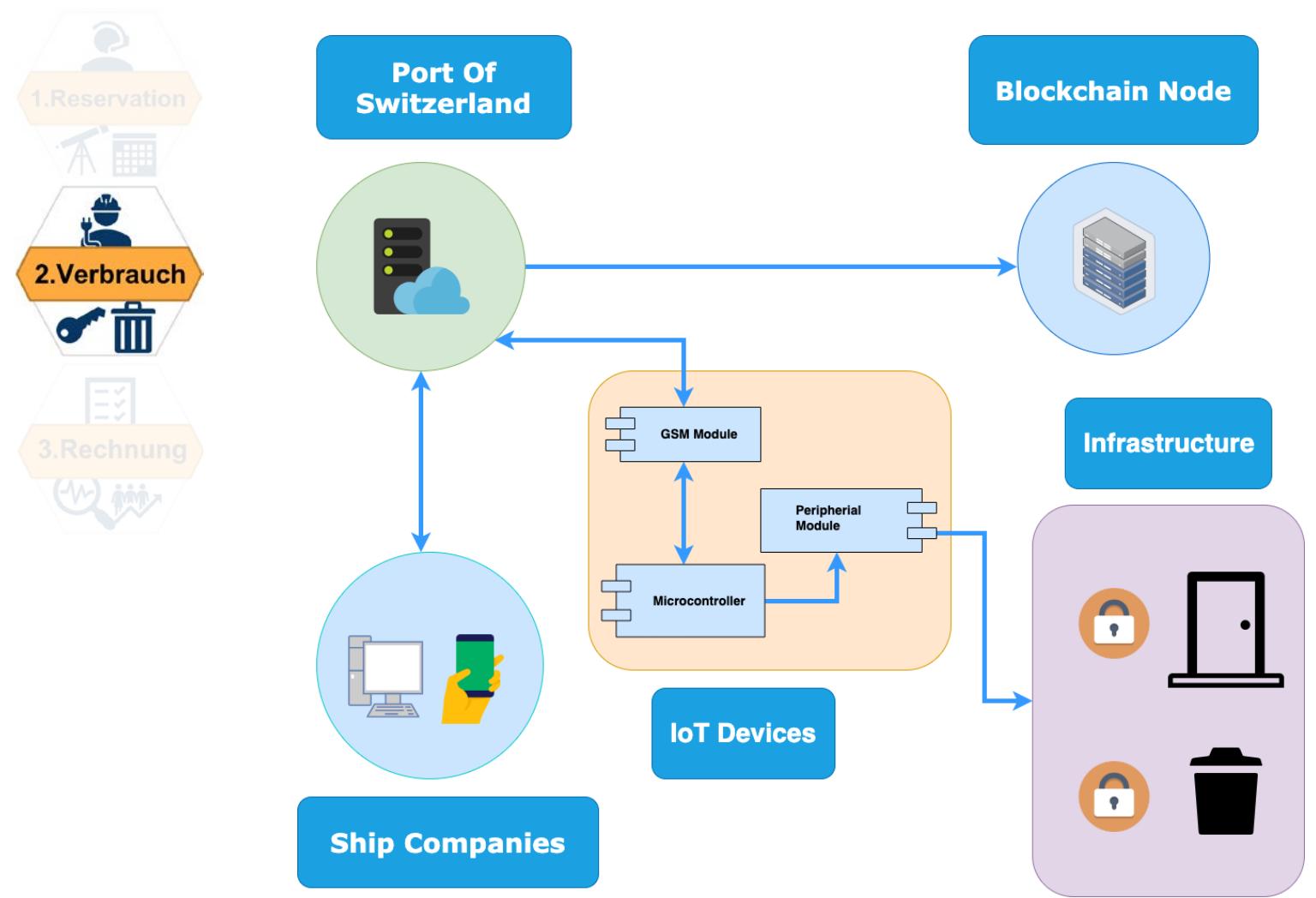


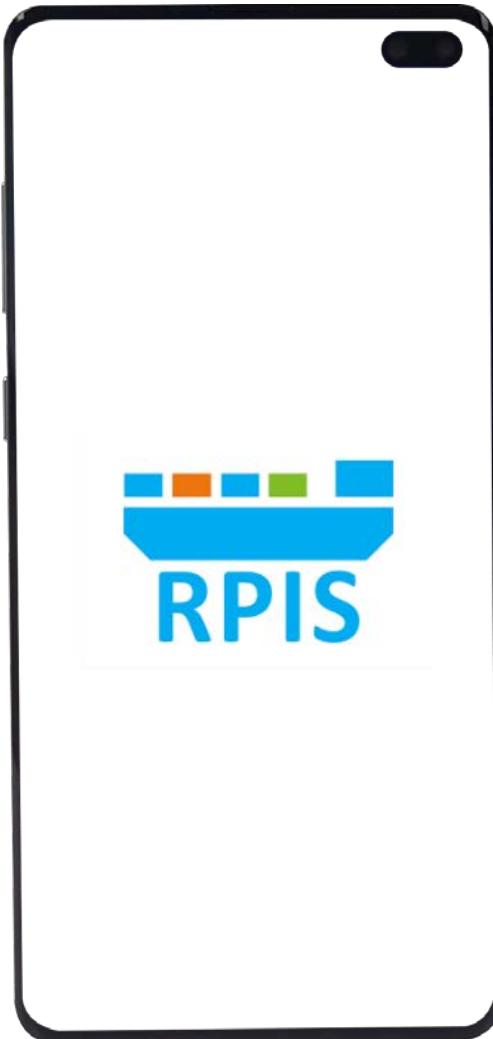


**Steckdose
Start/ Stopp**

**PoS eigener
Zähler**

**PoS eigener
Display**







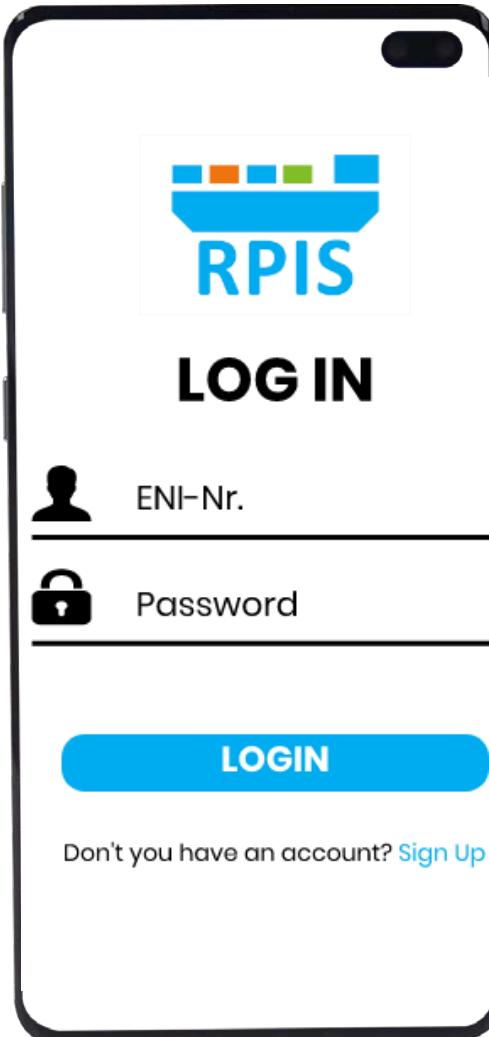
1.Reservation



2.Verbrauch



3.Rechnung

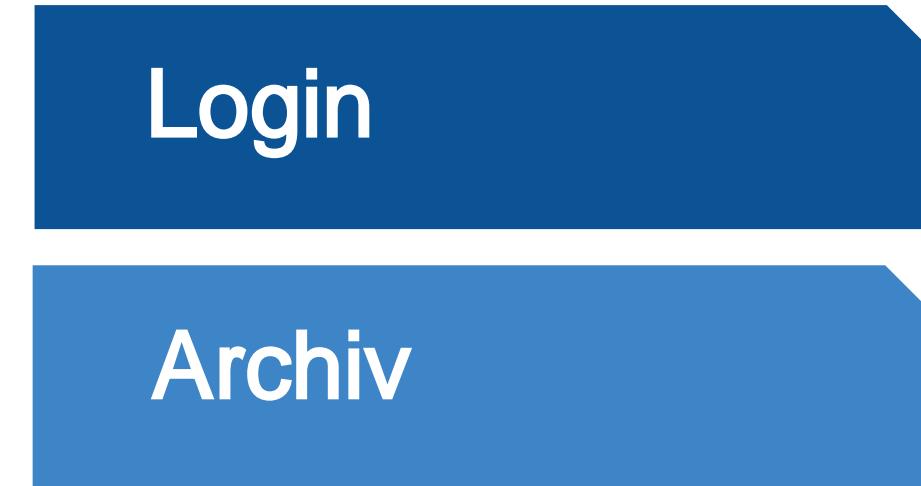
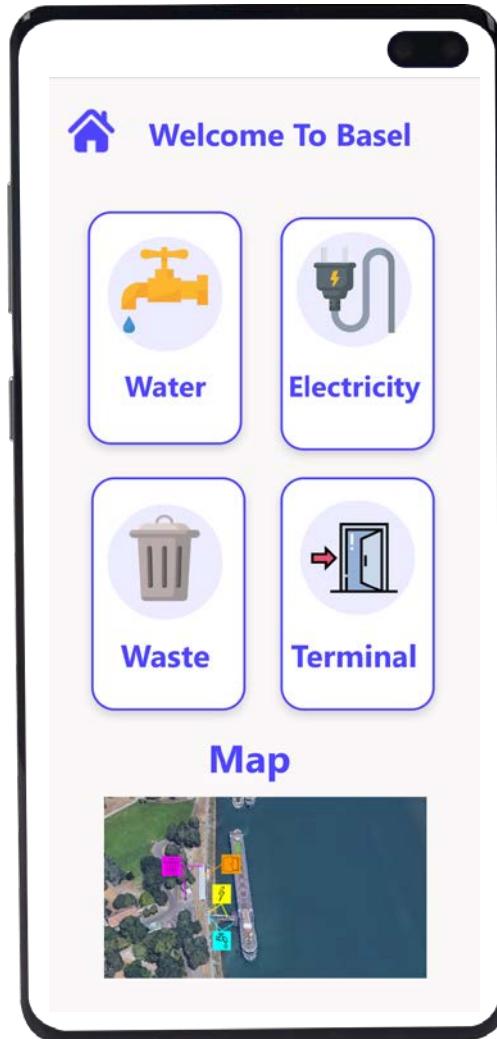


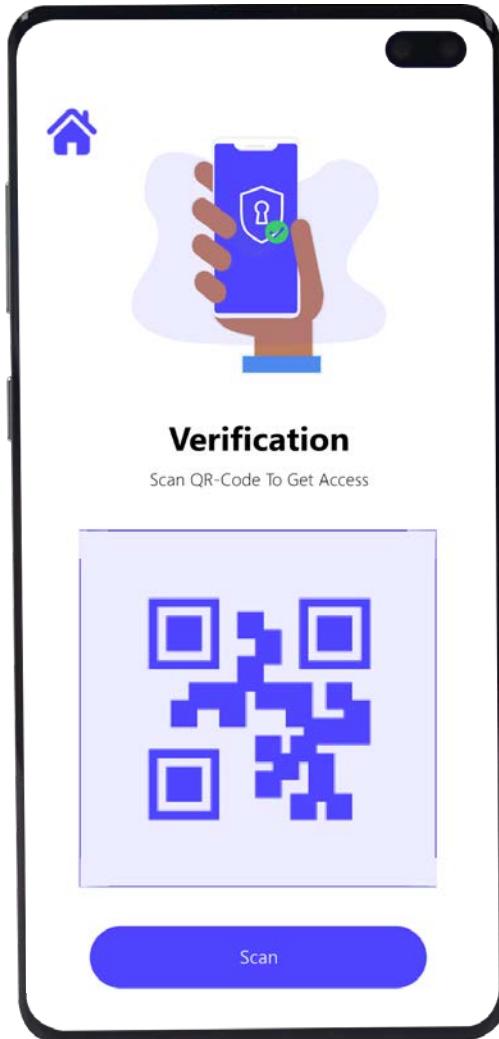
Login



Login

Archiv





Login

Archiv

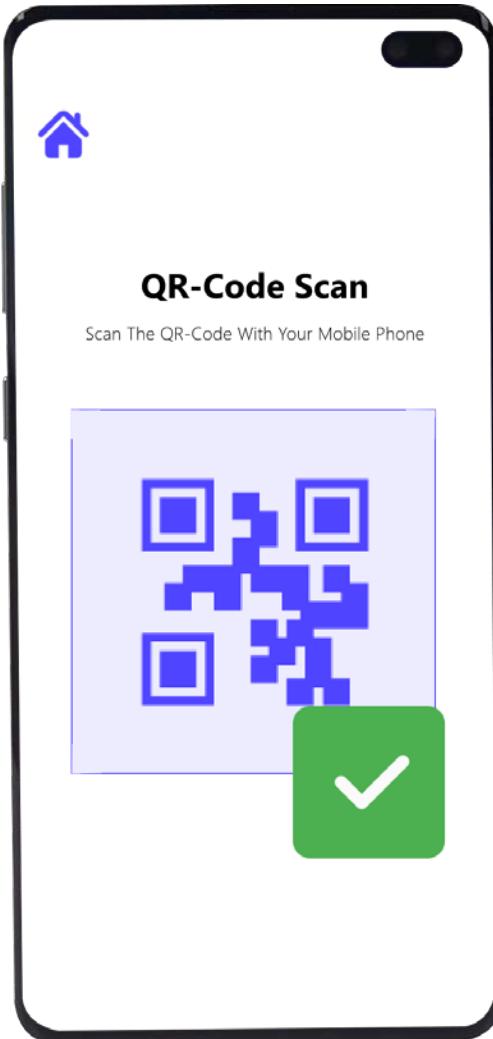
Zutritt



Login

Archiv

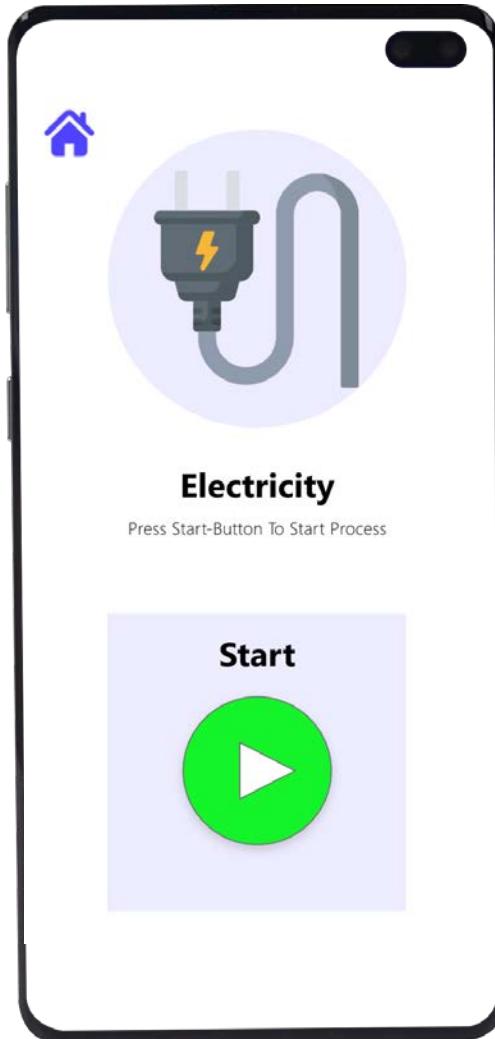
Zutritt



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Archiv

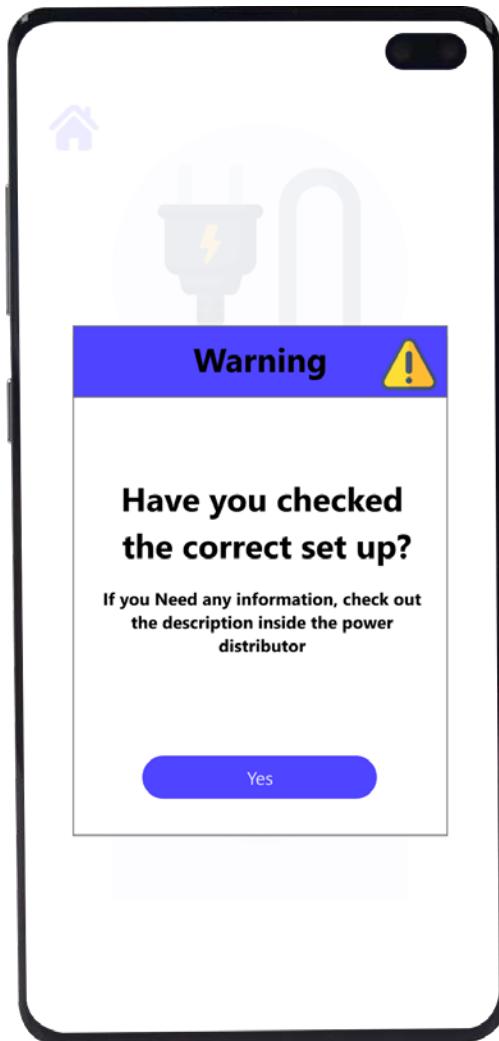
Zutritt



Login

Archiv

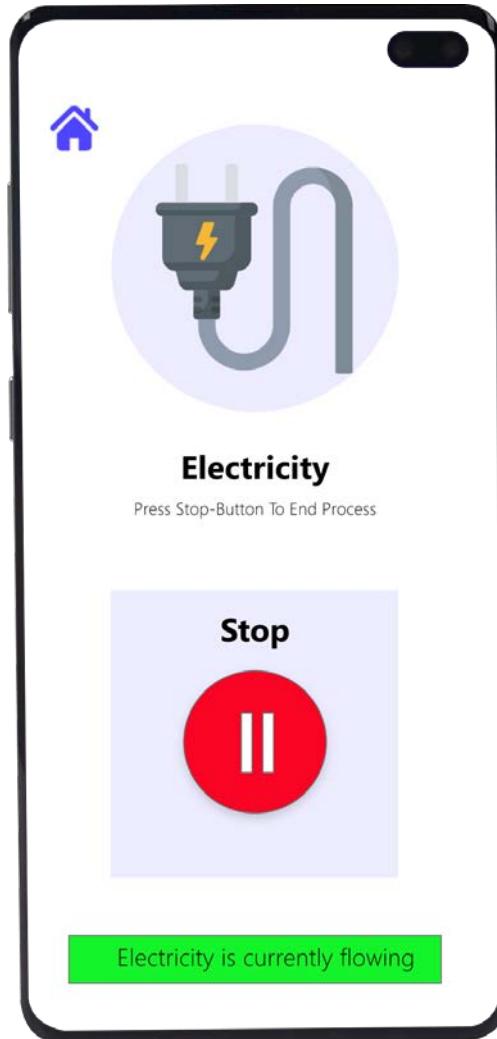
Zutritt



Login

Archiv

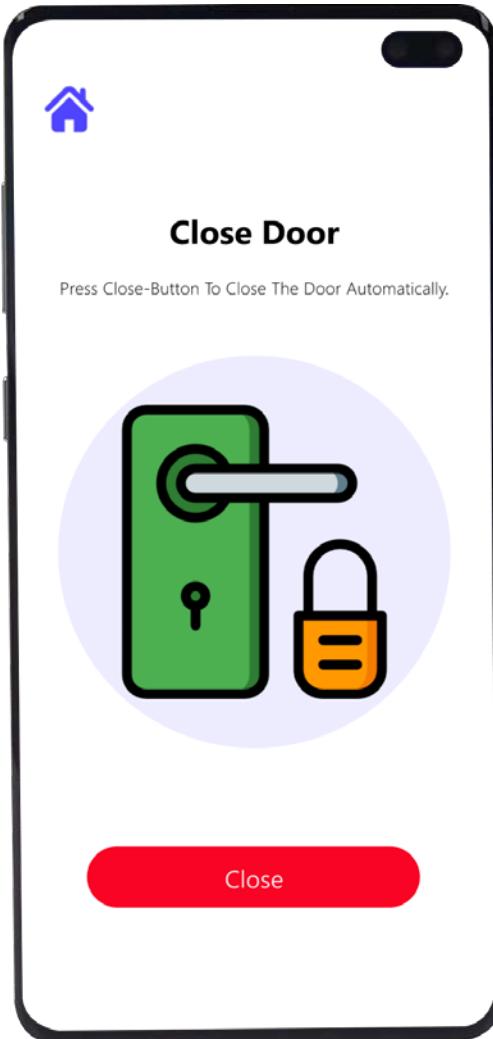
Zutritt



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Abrechnung









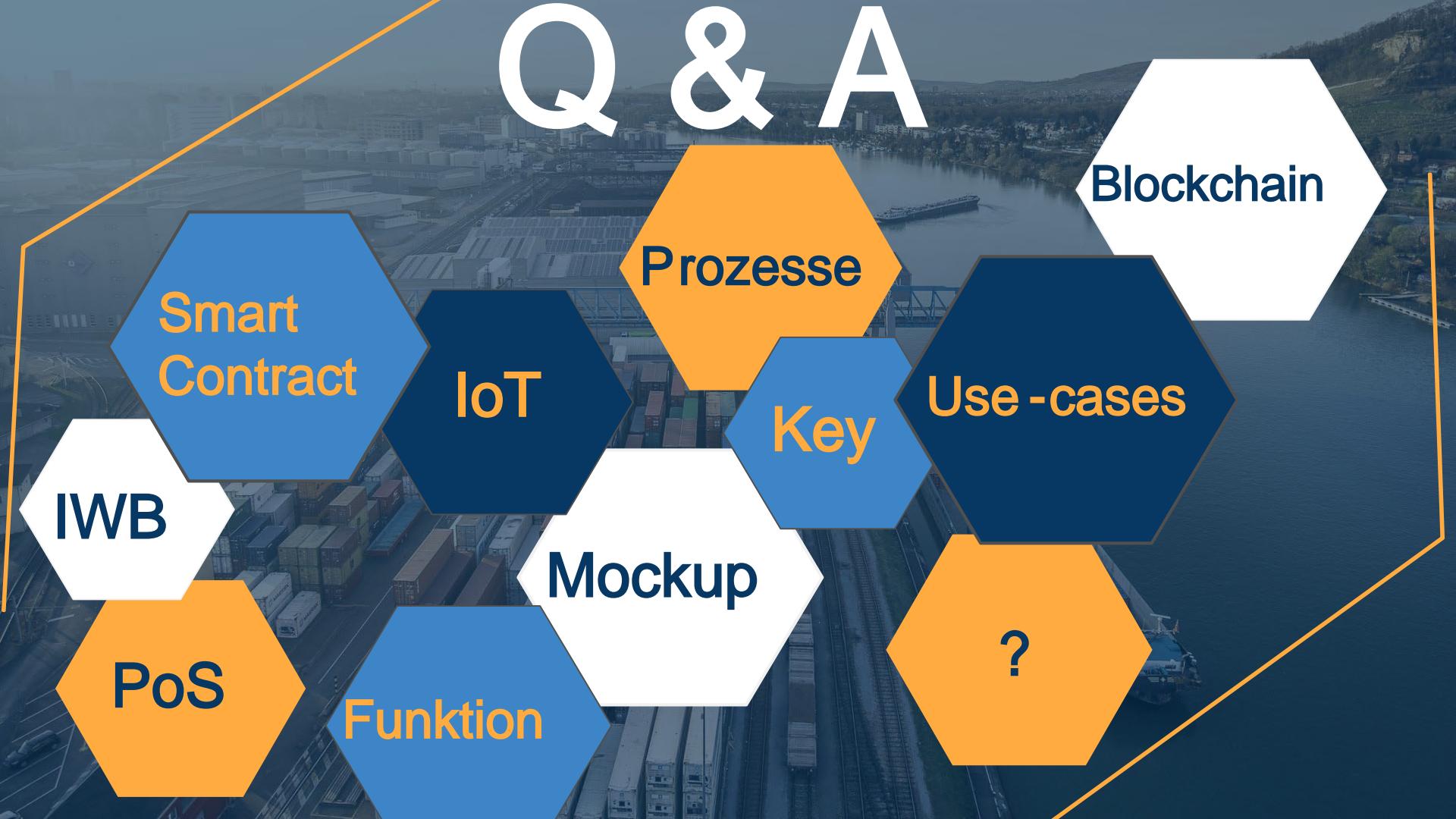




An aerial photograph of a port terminal. In the foreground, numerous shipping containers are stacked in organized rows. A large cargo ship is docked on the right, with several shipping containers already loaded onto its deck. A blue rail-mounted gantry crane (RMG) is positioned above the containers, extending from the left side of the frame towards the center. In the background, a river flows through the city, with buildings and hills visible under a clear sky.

Weitere Informationen

Q & A



IWB

PoS

Smart
Contract

IoT

Funktion

Prozesse

Key

Use -cases

?

Blockchain

An aerial photograph of a port terminal. In the foreground, numerous shipping containers in various colors are stacked in rows. A large cargo ship is docked at a terminal with the name "RIBS TERMINAL" visible. An industrial building with a flat roof is on the left. In the background, a river flows through a valley with hills and buildings under a clear sky.

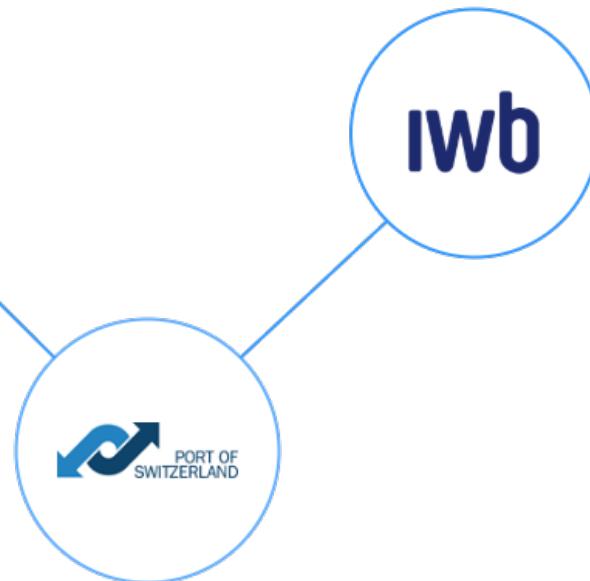
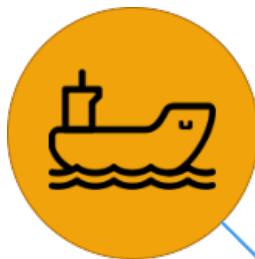
Schritt für Schritt,
Block an Block,
Port für Port,
Blockchain bildet Brücken

02

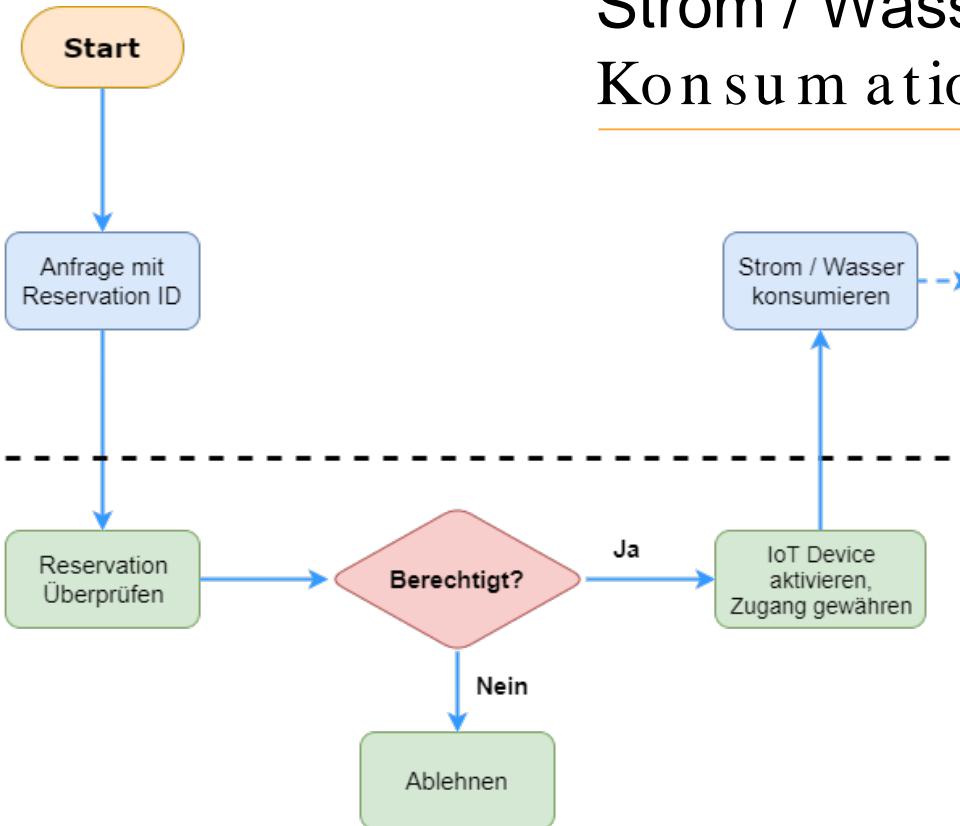
Mockup Smart Contract



Smart
Contract



Strom / Wasser Konsumation



Smart
Contract

```
// Create a reservation
function createReservation(
    address _shipOwnerAddress, address _shipAddress, uint _eni_nr, string calldata _terminalid, uint _begin, uint _end) external{
    if(msg.sender != _shipOwnerAddress){
        revert("Reservation can only be made by the ship owner");
    }
    uint id = currentid[_shipAddress]++;
    currentid[_shipAddress] == id;

    if(_begin < now){
        revert("Reservation is in the past");
    }
    reservations[_shipAddress][id] = Reservation({
        reservationid: id, shipOwnerAddress: _shipOwnerAddress, shipAddress: _shipAddress, eni_nr: _eni_nr, terminalid: _terminalid, begin: _begin, end: _end, isAktiv: true,
        checkedIn: false, checkedInTime: 0, checkedOut: false, checkedOutTime: 0, isValid: true
    });
}
```

```
// Check if a ship hast a reservation NOW
function hasReservationNow(address shipAddress, uint reservationid) private view returns (bool){
    Reservation storage reservation = reservations[shipAddress][reservationid];
    if(!reservation.isValid){
        return false;
    }

    if(reservation.begin > now || reservation.end < now){
        return false;
    }
    return true;
}
```

```
function startConsumeResource(uint resourceId, address shipAddress, uint reservationId) external returns(bool){  
    Reservation storage reservation = reservations[shipAddress][reservationId];  
    if(!(reservation.isValid && hasAReservationNow(shipAddress, reservationId) && isCheckedIn(shipAddress, reservationId))){  
        revert("Precondition for using a resource is not met");  
    }  
    Resource storage resource = resources[resourceId];  
    if(!(resource.status == ResourceStatus.FREE)){  
        revert("Resource is not available");  
    }  
    resource.status = ResourceStatus.INUSE;  
    return true;  
}  
  
function stopConsumeResource(uint resourceId, address shipAddress, uint reservationId) external returns (bool){  
    Reservation storage reservation = reservations[shipAddress][reservationId];  
    if(!(reservation.isValid && hasAReservationNow(shipAddress, reservationId) && isCheckedIn(shipAddress, reservationId))){  
        revert("Precondition for using a resource is not met");  
    }  
    Resource storage resource = resources[resourceId];  
    if(!(resource.status == ResourceStatus.INUSE)){  
        revert("Resource is not in-use");  
    }  
    resource.status = ResourceStatus.FREE;  
    resource.lastUser = shipAddress;  
    int totalCost;  
    if (resource.resourceType == ResourceType.NUMERIC){  
        totalCost = resource.currentState - resource.lastState;  
        ShipOwnerAccount account = mainContract.getShipOwnerAccount(reservation.shipOwnerAddress);  
        account.addShipBalance(totalCost);  
    }  
    return true;  
}
```

04

IoT



Sometimes, reviewing concepts is a good idea



MERCURY

Mercury is the closest planet to the Sun and is only a bit larger than our Moon



SATURN

Yes, this is the ringed one. It's composed mostly of hydrogen and helium



MARS

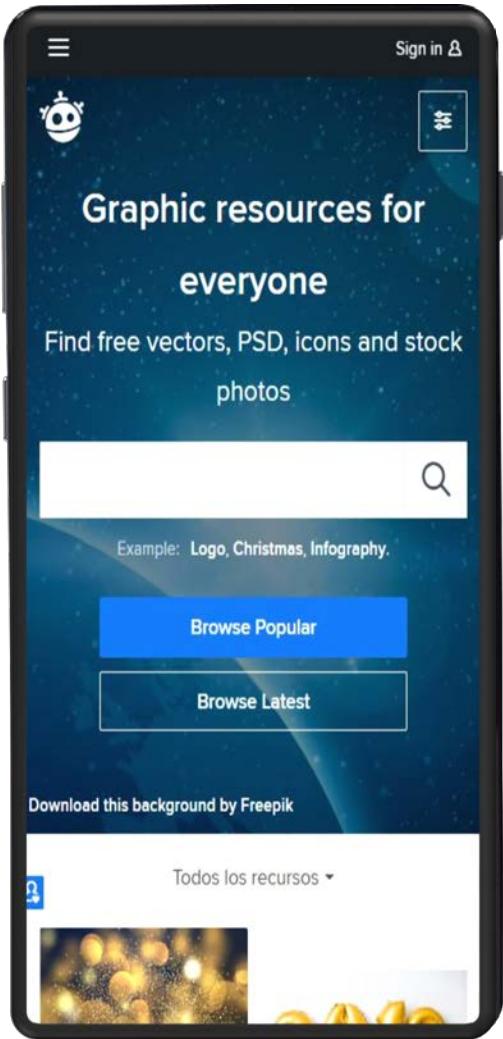
Despite being red, Mars is a cold place, not hot. The planet is full of iron oxide dust



VENUS

Venus has a beautiful name and is the second planet from the Sun

Mockup



Mockup

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MERCURY



Mercury is the closest planet to the Sun and is only a bit larger than our Moon

SATURN



Yes, this is the ringed one. It's a gas giant, composed mostly of hydrogen and helium

MARS



Despite being red, Mars is a cold place, not hot. The planet is full of iron oxide dust

JUPITER



It's the biggest planet in our Solar System and also the fourth-brightest object in the sky

Blockchain

