

Internet Governance Forum- 2020

# Move on the Web

for Brumadinho

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# Brumadinho Dam Disaster

- The tragedy
- Aftermath
  - Victims
  - Environment
  - Economic impact



# What to do?

How  
technology can  
help?

What  
technologies  
can address  
real problems  
of real people?

Can the Web  
technology  
help people to  
move on?

**Move on the Web for Brumadinho**

# Partnerships

• MCTIC • UFMG • SOFTEX • SEDE-MG •

# Meeting with the community

## Need identification

- August, 2019
- Moderated meeting to collect the needs of local community and other affected people

QUAIS AÇÕES DEVEMOS REALIZAR PARA ALCANÇAR ESSES RESULTADOS?

REDE MULHERES ENCONTRAR O FEMININO CI TROCAS CULTURAS IDENTIDADES LOCAIS PRESENCIAL POTENTE MANUTENÇÃO CONEXÃO CI/ TECNOLOGIA

PLATAFORMA SOCIOAMBIENTAL NEGÓCIOS SOCIAIS FILTRO / GESTÃO JOVENS PRONTO TALEI! FORMAÇÃO COMUNICAÇÃO

PLATAFORMA ENIGMAS MILB INSENSIBILIZAÇÃO CONTAMINAÇÃO

Controle Social Ação - Cursos para uso da lei de Acesso à Informação

Controle Social Ação - Cartilha e Lei de Acesso à Informação

Aplicativo Cidadão

Controle Social Ação = Advocacy

Controle Social Ação - Cursos para uso da lei de Acesso à Informação

Ações - whatsapp e app existente

Ações - Curso de Sala Multica

Ações - Jornadas de sensibilização

Ações = EAD Capacitação Profissional

(A) CIDADANIA, GÊNERO E MONITORAR APLICATIVOS E AÍSO CIDADANIA

(A2) FORTALECER E MANUTER AÇÕES TECNOLÓGICAS PARA PESQUISA AGRICOLA

(A3) FORMAR O APLICATIVO O TAMBÉM

(A4) CEAR EXPERIÊNCIAS INICIATIVAS (AMBOS SÓCIBOS ALÉM DO SUSTENT)

# Program goals

Overall goal

Mitigate economic/social  
problems of Brumadinho

# Program goals

## Specific goals

Promote entrepreneurship among college students

Stimulate students to undertake technological projects using web technologies: Progressive Web Apps (PWA) and Internet of Things (IoT)



# Program themes

01

Social networks

- a. Projects that foster local women's social networks
- b. Projects that address environmental monitoring by community

02

Sustainable economic and environmental matrices

- a. Projects that improve the management of water resources
- b. Projects that connect consumer and producer

# Project proposal review process

**26** project proposals  
submitted

**10** reviewers

Final reviewer  
meeting

**5** projects accepted

# Brumadinho Open Data Lake & Analytics

Federal University of  
Minas Gerais (UFMG)

## Problems:

- Lack of tools to gather and analyze real data
- Existing data is spread out in silos (IBGE, Open Data Portal)
- Evidence-based policy-making is undermined

# Brumadinho Open Data Lake & Analytics

Federal University of  
Minas Gerais (UFMG)

## Goals:

- Create a technological framework to collect data from different sources
- Centralize the analysis of scattered data
- Subsidize evidence-based policy-making
- Strengthen environmental monitoring

# Brumadinho Open Data Lake & Analytics

Federal University of  
Minas Gerais (UFMG)

## Proposed solution:

- Based on LEMONADE1 (Live Exploration and Mining Of a Non-trivial Amount of Data Everywhere)
- Allows the implementation, experimentation, tests, and data processing application deployment
- Machine learning
- High-performance, scalable technologies (Ophidia and Spark)
- Microservices

1 <https://www.lemonade.org.br/index-en.html>

# Brumadinho Coin - an Environmental Coin of Solidarity

Federal Fluminense  
University (UFF)

## Problems:

- Mitigate economic impact for locals
- Promote the local environmental preservation: forests, watersheds

# Brumadinho Coin - an Environmental Coin of Solidarity

Federal Fluminense  
University (UFF)

## Goals:

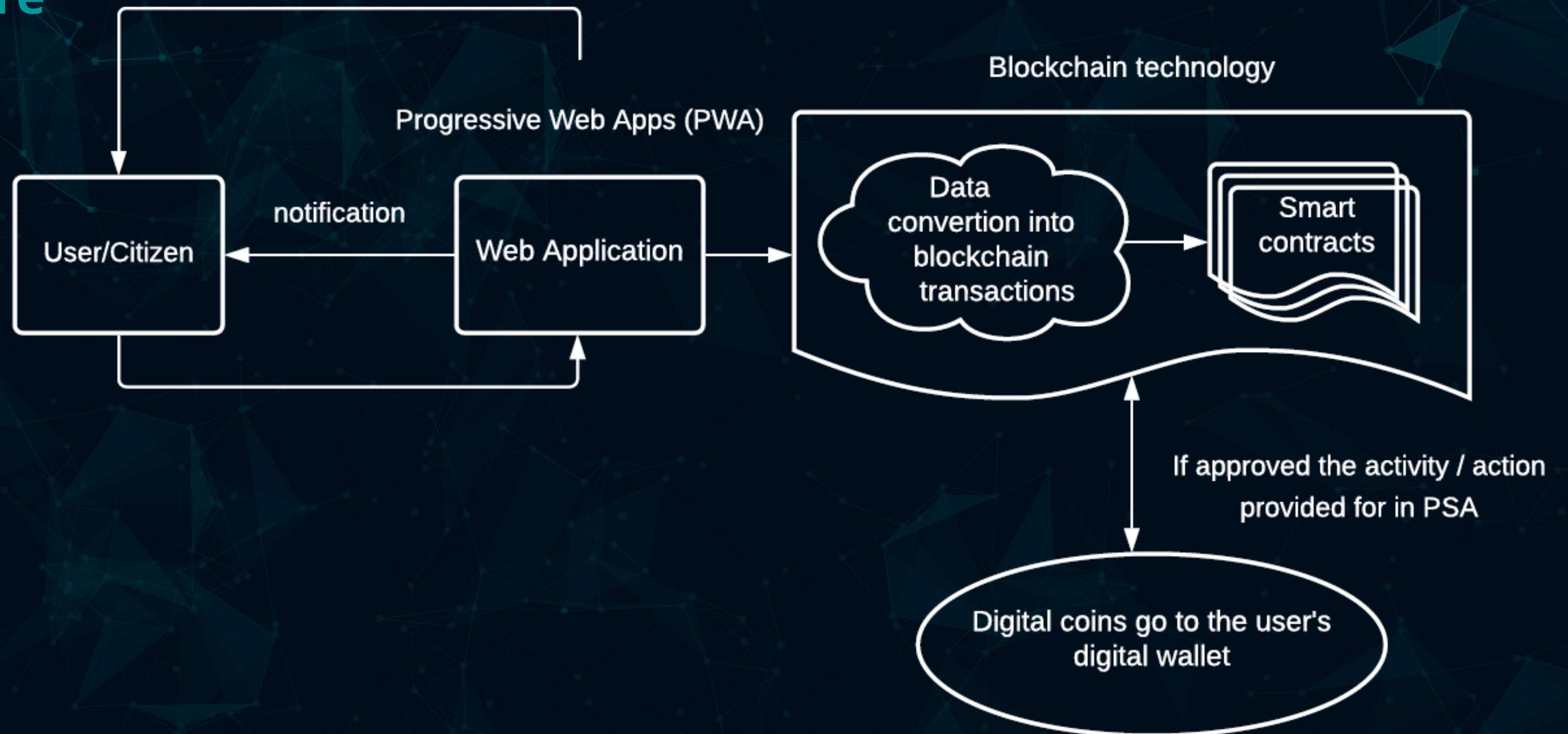
Virtual currency ecosystem (Bcoin) for  
the payment of environmental services

- Blockchain (BrumadinhoChain)
- Web platform
- Smart contract

# BrumadinhoCoin - A Solidarity Environmental Coin

Federal Fluminense University (UFF)

## Architecture





# SuperAção - Platform for Collective Funding of Innovative Projects for Women in Brumadinho

Federal Institute of Education,  
Science, and Technology of  
Southeast of Minas Gerais

## Problems:

- Families dependence on women's labor force
- Women's ideas are not leveraged or presented to others
- Lost female talents

# SuperAção - Platform for Collective Funding of Innovative Projects for Women in Brumadinho

Federal Institute of Education,  
Science, and Technology of  
Southeast of Minas Gerais

## Goals:

- Collect innovative women project ideas
- Create a crowdfunding platform
- Promote strategic partnerships for the project creation, execution, and management
- Provide information on real-time
- Provide information on project execution and on financial goals to all stakeholders

# SuperAção - Platform for Collective Funding of Innovative Projects for Women in Brumadinho

Federal Institute of Education,  
Science, and Technology of  
Southeast of Minas Gerais

## Workflow:

- Fast and simple subscription

# SuperAção - Platform for Collective Funding of Innovative Projects for Women in Brumadinho

Federal Institute of Education,  
Science, and Technology of  
Southeast of Minas Gerais

## Technology stack:

- Frontend
  - PWA
- Backend
  - Safe, excellent performance,  
highly customizable

# Brumadinho Alert - A Technological Solution for Reporting Environmental Violations

Federal Technological  
University of Paraná (UTFPR)

## Problem:

Existing channels (SEMAD) for reporting environmental violations are ineffective.

- In person
- Online forms
- Phone
- Printed forms
- Email

# Brumadinho Alert - A Technological Solution for Reporting Environmental Violations

Federal Technological  
University of Paraná (UTFPR)

## Problem (2):

Existing apps for reporting  
environmental violations (5 in Google  
Play):

- Poor usability
- Inexistent tracking of violation report
- Region-specific

# Brumadinho Alert - A Technological Solution for Reporting Environmental Violations

Federal Technological  
University of Paraná (UTFPR)

## Goals:

- Make the process for reporting environmental violations easier, more agile, more transparent
- Strengthen environmental surveillance
- Reward the population for reporting environmental violations

# Brumadinho Alert - A Technological Solution for Reporting Environmental Violations

Federal Technological University of Paraná (UTFPR)





# Real-time Monitoring System of Water Quality of a River

Federal Institute of Education,  
Science, and Technology of  
Pernambuco (IFPe)

## Problem:

- Contaminated water of Paraopeba river (mercury and lead)
- 2.3 million affected people
- Inhabitants are not aware of river's water quality
- TDS Turbidity

# Real-time Monitoring System of Water Quality of a River

Federal Institute of Education,  
Science, and Technology of  
Pernambuco (IFPe)

## Goal:

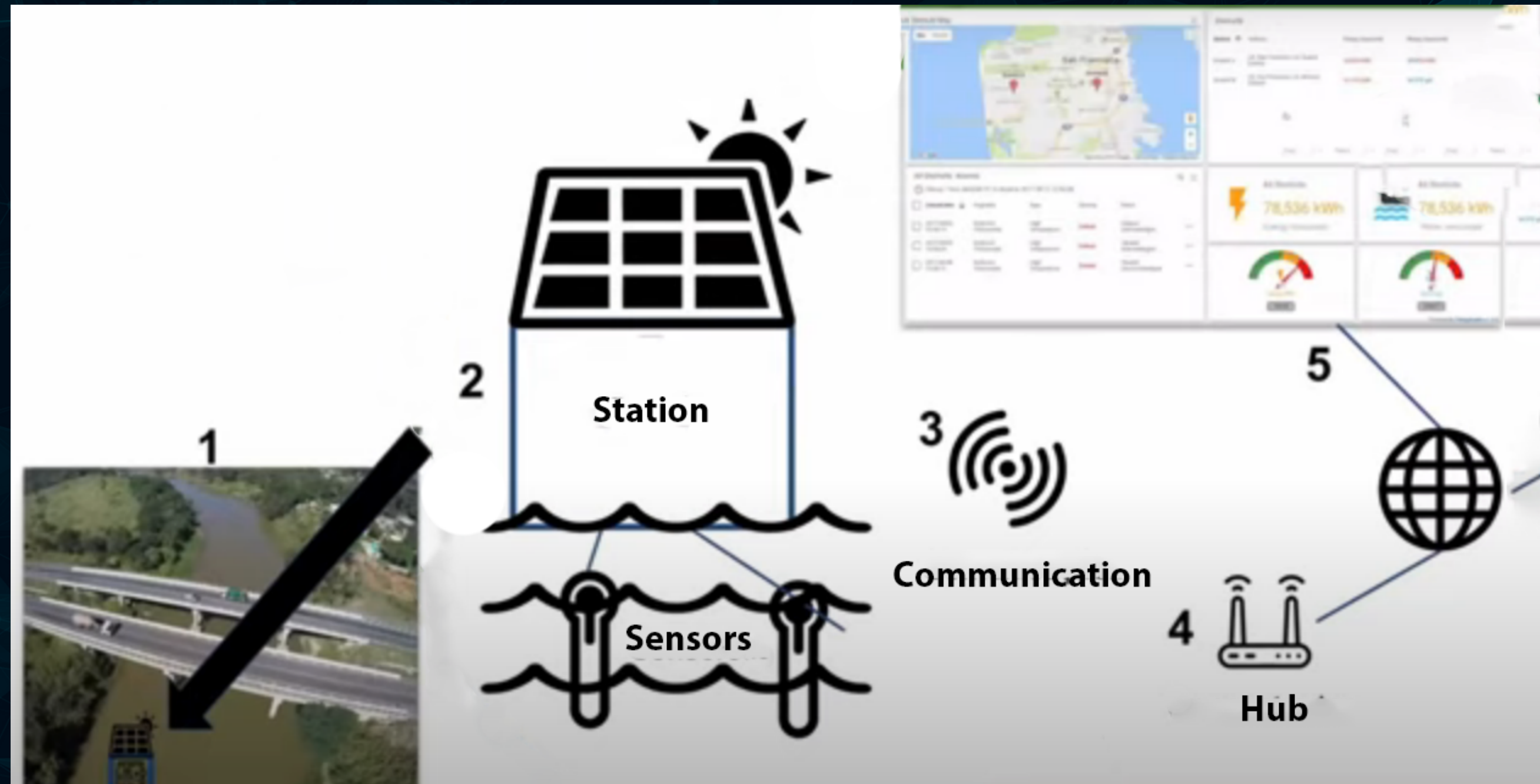
- A low-cost auto-sustainable water quality monitoring system
  - Existing solutions (CETESB/SP) => approx. US\$ 100,000

Estimated cost of solution => approx.  
US\$ 300/station

# Real-time Monitoring System of Water Quality of a River

Federal Institute of Education, Science, and Technology of Pernambuco (IFPe)

## Architecture:



# Real-time Monitoring System of Water Quality of a River

Federal Institute of Education,  
Science, and Technology of  
Pernambuco (IFPe)

## Proposed Solution:

### Water Quality Monitoring Station

- Sensors => Arduino/ESP (IoT)
- Actuators

### Web Application

- Django framework

The background is a dark teal color with a complex network of light teal lines and dots, resembling a molecular or data network structure. The lines connect various points, some of which are highlighted with larger dots or clusters. The overall effect is a sense of interconnectedness and digital complexity.

# Questions?

[ceweb.br](http://ceweb.br) [nic.br](http://nic.br) [cgi.br](http://cgi.br)

# Internet Governance Forum- 2020

**Thank you**

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