



**I FIPBSF**

I Fórum de Internacionalização  
Paraíba sem Fronteiras

Paraíba - Alemanha



SECRETARIA DE ESTADO  
DA CIÊNCIA, TECNOLOGIA, INOVAÇÃO  
E ENSINO SUPERIOR



GOVERNO  
DA PARAÍBA

# Digital Innovations in actions by the Government of Paraíba

Raoni Kulesza

Carlos Eduardo Batista

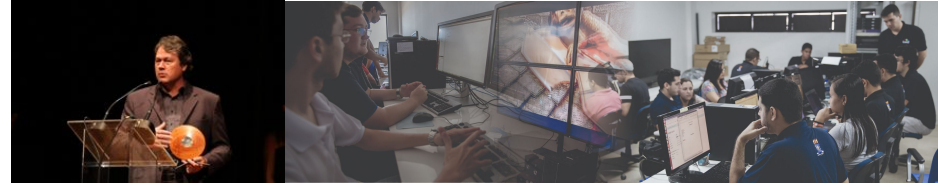
Research and Extension **Center for Digital Innovation** Network  
(Digital Video Applications Laboratory - **LAVID**)

May, 2024



# Presentation

# History



- Digital Video Applications Laboratory - **LAViD (2003)**, continuation of NatalNet (1997), both created by prof. **Guido Lemos** (UFPB and PUC-Rio)
- UFPB Research and Extension Center (2011) - NPE-LAVID
- **25 Researchers** and around **150 students** from the areas of Computer Science, Computer Engineering, Communication, Pedagogy and Anthropology
- Research and Extension Center for **Digital Innovation Network** (2019)



# LAVID - Main Staff

- Carlos Eduardo Batista
- Danielle Rousy Dias da Silva (LUMO)
- Derzu Omaia
- Guido Lemos
- Lincoln David
- Manuella Aschoff
- Marcelo Iury
- Rafael Magalhães (ARIA)
- Raoni Kulesza
- Rostand Costa
- Richelieu Costa
- Thais Gaudencio (ARIA)
- Tiago Maritan Yuri Malheiros (ARIA)
- Yuska Paola (ARIA)
- Valdecir Becker (LIM)

# Mission

Digital Technology for Social Development



# LAVID - Areas

- **Platforms (system software)**: middleware for embedded systems, secure distribution and storage systems (multi-point, global, UHD, blockchain), IoT and Big Data
- **Applications (end user)**: Authoring tools and multimedia applications for multiple platforms (Web, Mobile, games, Digital TV, 3D and Mixed Realistic)

# Awards



Serviços de  
VoD, Live e  
RITU da RNP



1ª Solução 4K do  
Mundo  
Baseada em SW



1º Multiplexador  
e Playout SBTVD  
2007



Middleware do SBTVD  
(Adotado em 17 países  
- 500M)



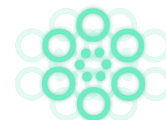
Suíte Vlibras  
Vencedor 2016/2018  
[Todos@Web/NIC.BR](http://Todos@Web/NIC.BR)  
LATAM Smart City



Brasil 4D  
Vencedor 2014  
FRIDA/LACNIC



V4H - Video for Heath  
Registro, Assinatura e Preservação  
de consultas médicas  
com blockchain - 2019



1.a solução de  
diploma digital com  
blockchain 2019  
UFPB



# Awards

#ZeroCon24 #ZeroBarriers



Federal University of Paraíba

VLBRAS SUITE: FREE SIGN  
LANGUAGE TRANSLATION  
APPLICATION IN PORTUGUESE



**vlibrasoficial** We are very proud to announce this news! VLibras has been internationally recognized and will be awarded through Project Zero 2024, an event that will take place at the UN Headquarters in Vienna!!

Project Zero promotes the sharing of solutions that improve everyday life and the legal rights of all persons with disabilities in the areas of Inclusive Education and Information Technology.

We competed with 523 proposals from 97 different countries, and we were one of the selected 77 projects and we are very happy for this recognition.



# Highlighted results

- Main success stories of public-private partnerships:
  - **Mopa** exported more than **30 million** licenses to **China**
  - **Vlibras** is referenced by over **120K** websites and is featured on all pages of the federal government, Senate, Chamber, and various companies.
  - **Assista** is a licensed accessibility solution by **Dolby (USA)**, installed in several cinemas across Brazil.
  - A service offered by **Ledger/RNP**, has been adopted by **100** Federal Higher Education Institutions, **195K diplomas** signed
  - **SEFAZ-PB**: A data integration platform that processes up to **1.2M** DFe emissions and **2.2M** vehicles plates records daily.
  - **SEECT-PB**: A digital pre-registration system with **6.7M** page views in 2023.

# Highlighted results

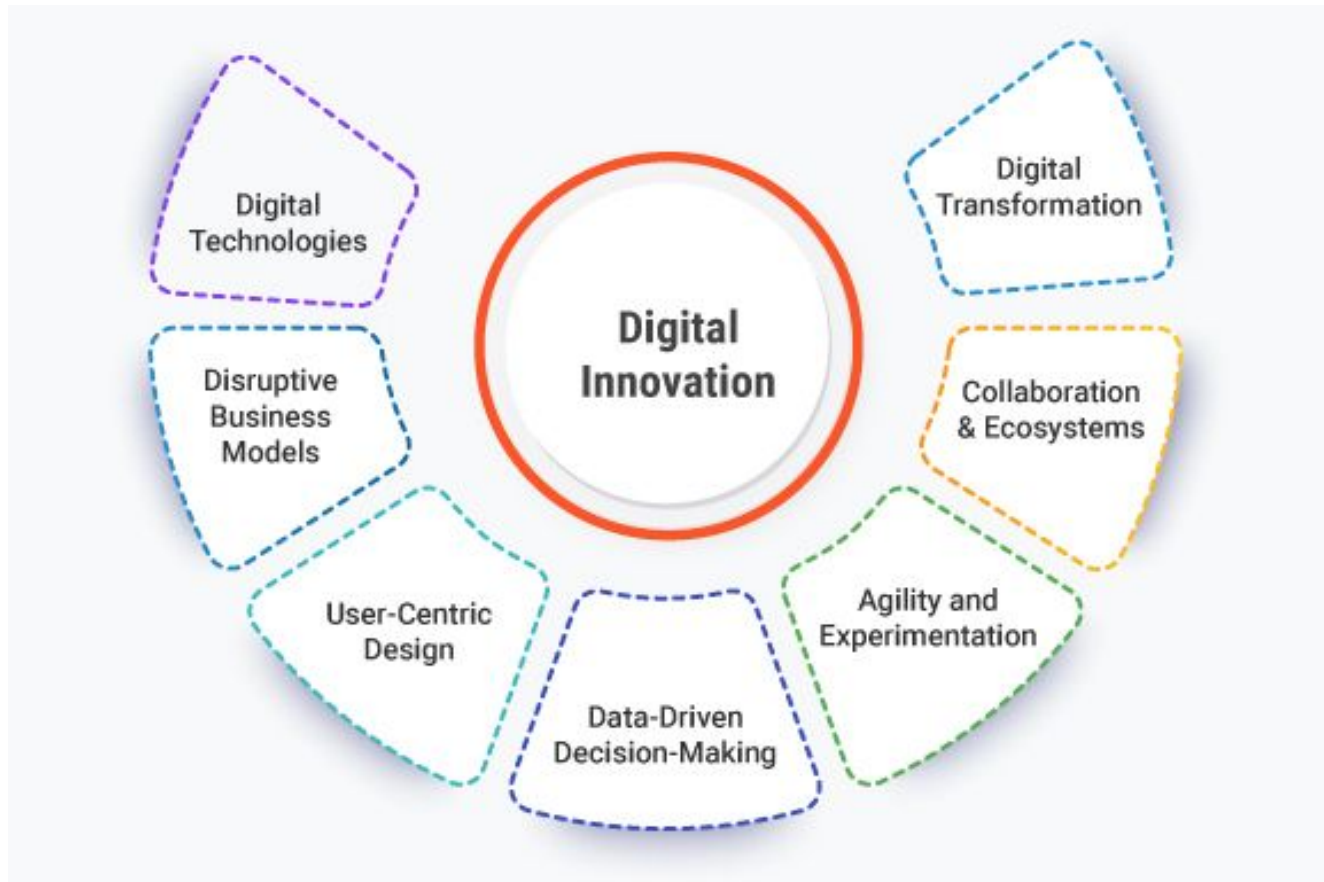
- **12 Patentes e 12 start ups** (with clients/offices in Taiwan, China, Argentina, Chile, EUA, Portugal, Espanha and México)
  - **Dynavideo**
  - **Mopa**
  - **Yupi**
  - **Fuze**
  - **Overmedia/Workverse**
  - **Assista**
  - **Ledger**
  - **Wisecare**
  - **RoboEduc**
  - **Netfans**
  - **Void**
  - **Media4All**



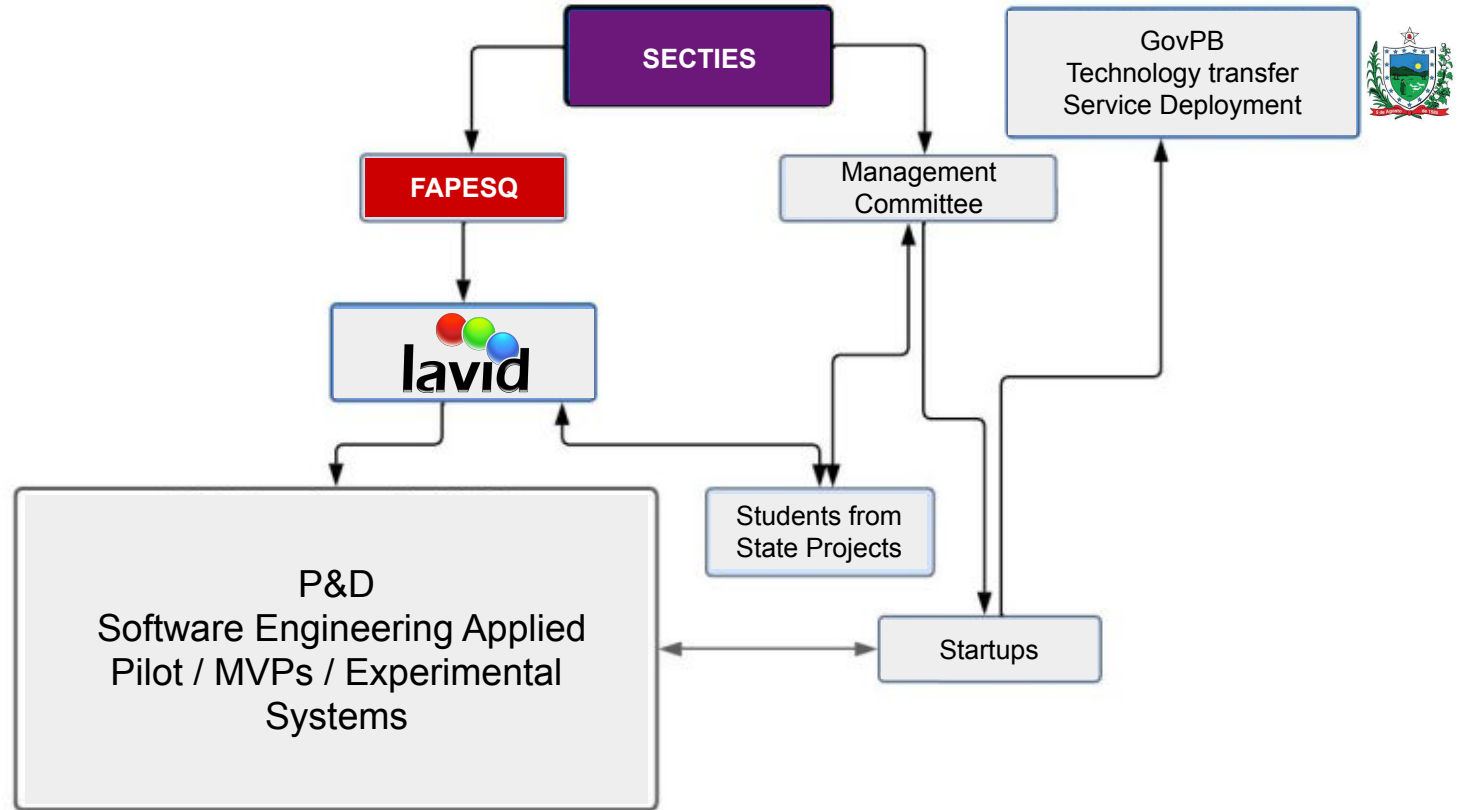
# Main Projects

## SECTIES / GOV-PB

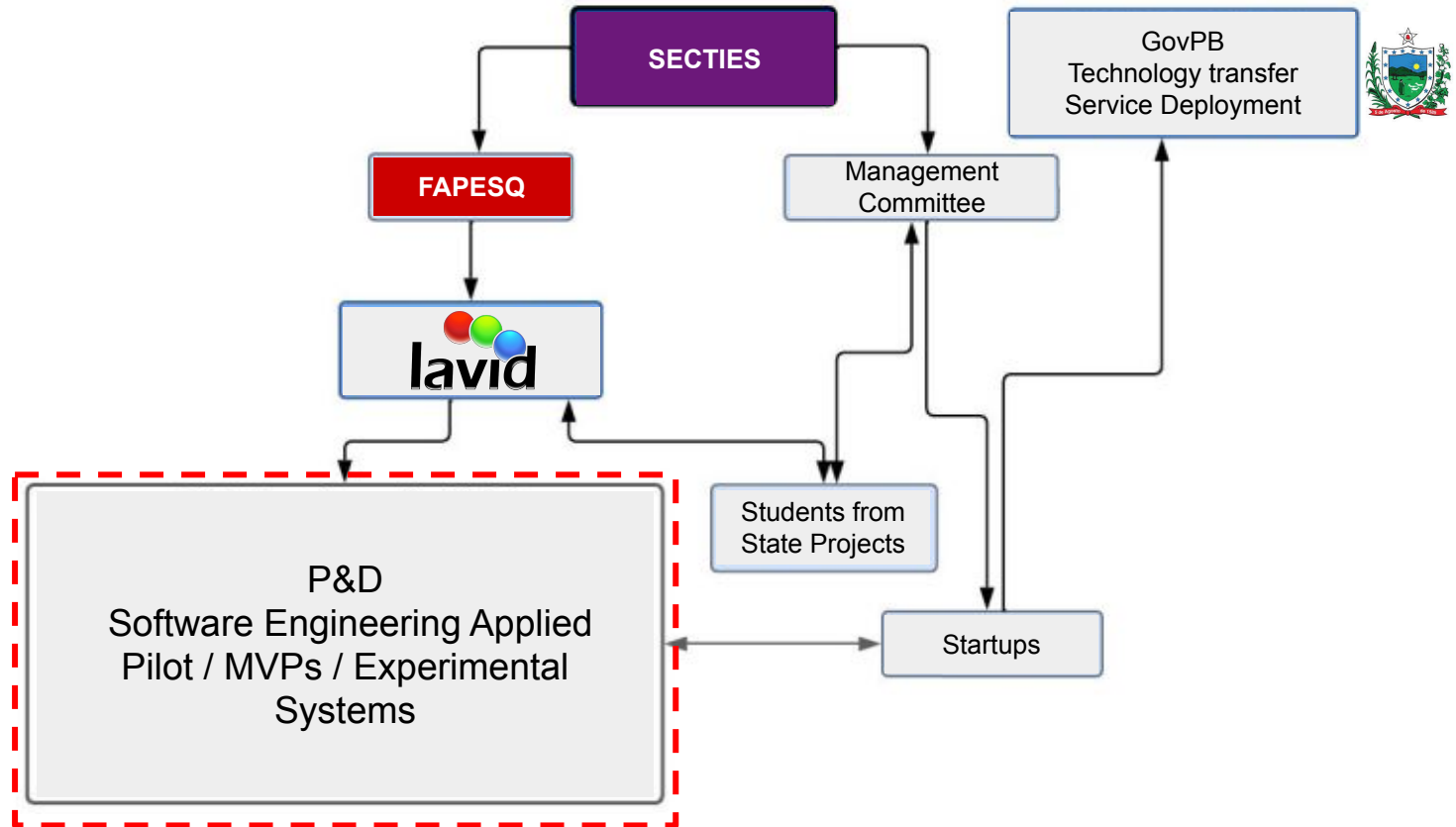
# Scope



# Ecosystem

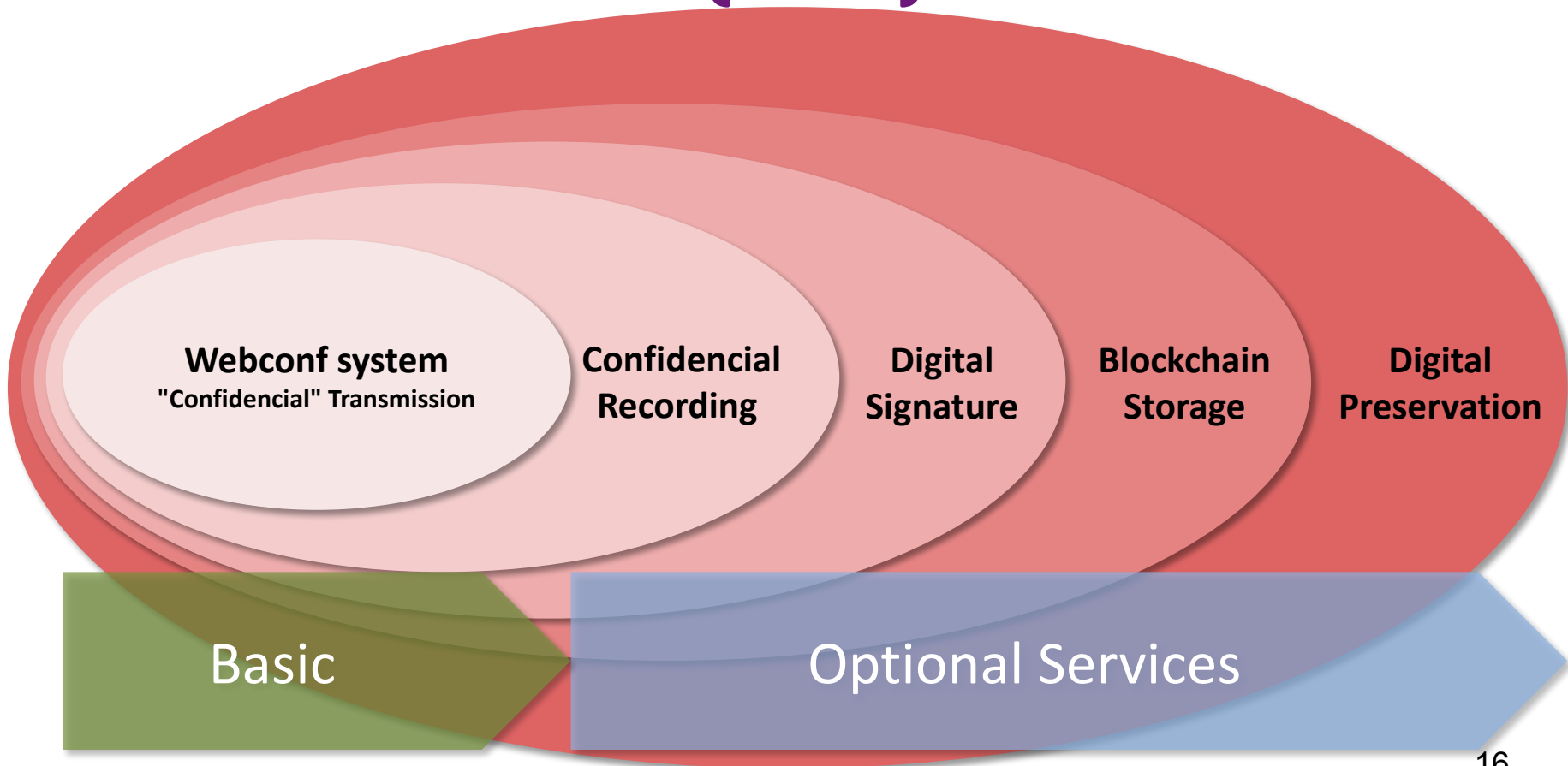


# Ecosystem



 V4H

# Video for Health (V4H)





# V4H

**User-centric Design**  
Accessibility and  
Adapted to Healthcare User  
Journey

Basic

Optional Services

# V4H - P&D

ACM DIGITAL LIBRARY

IMX ▾

DEMONSTRATION



## Video for Health (V4H) Platform. A Secure Video Suite Platform for Online Care, Teleconsultation and Tele-orientation

**Authors:** [Guido Lemos de Souza Filho](#), [Cicero Inacio da Silva](#),

[Denio Mariz Timoteo de Souza](#), [Giuliano Maia Lins de Castro](#), [+ 3](#) [Authors Info & Claim](#)

IMX '22: Proceedings of the 2022 ACM International Conference on Interactive Media Experiences

• June 2022 • Pages 233–236 • <https://doi.org/10.1145/3505284.3532815>

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WEBMEDIA ▾

RESEARCH-ARTICLE



## A Proposal for an Accessible Videoconferencing Interface for People with Hearing Impairments

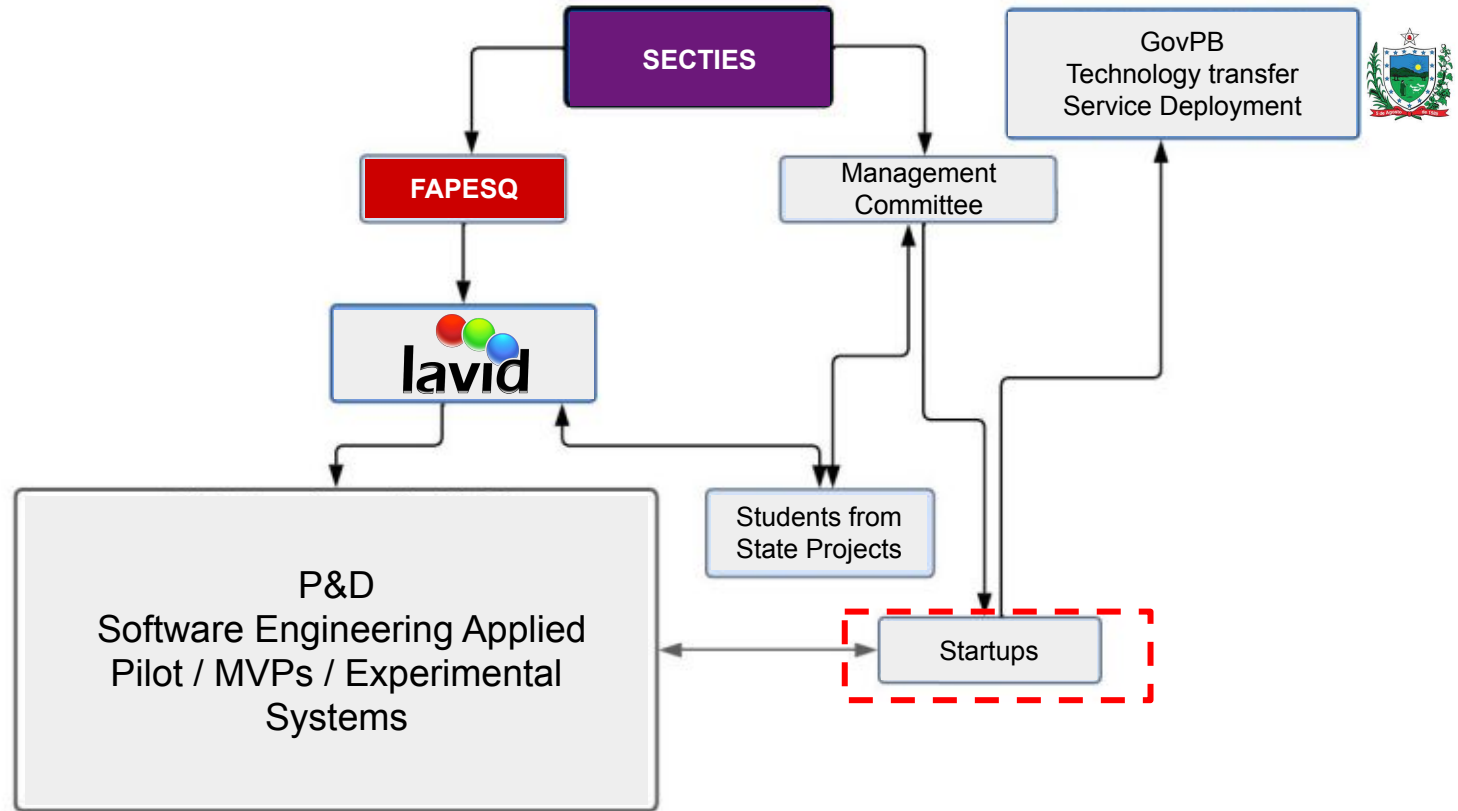
**Authors:** [Matheus Lima](#), [Guido Lemos](#), [Raoni Kulesza](#) [Authors Info & Claims](#)

WebMedia '21: Proceedings of the Brazilian Symposium on Multimedia and the Web

• November 2021 • Pages 29–36 • <https://doi.org/10.1145/3470482.3479614>

**Published:** 05 November 2021 [Publication History](#)

# Ecosystem



# V4H - Wisecare



[Home](#)

[About](#)

[Our products](#) ▾

[Features](#)


[Locations](#)

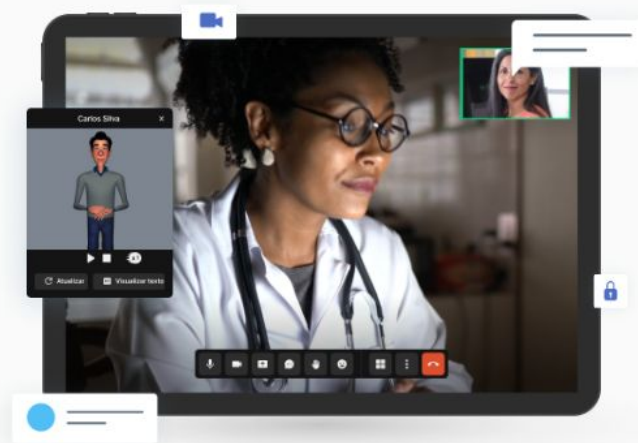
[Contact](#)

EN ▾

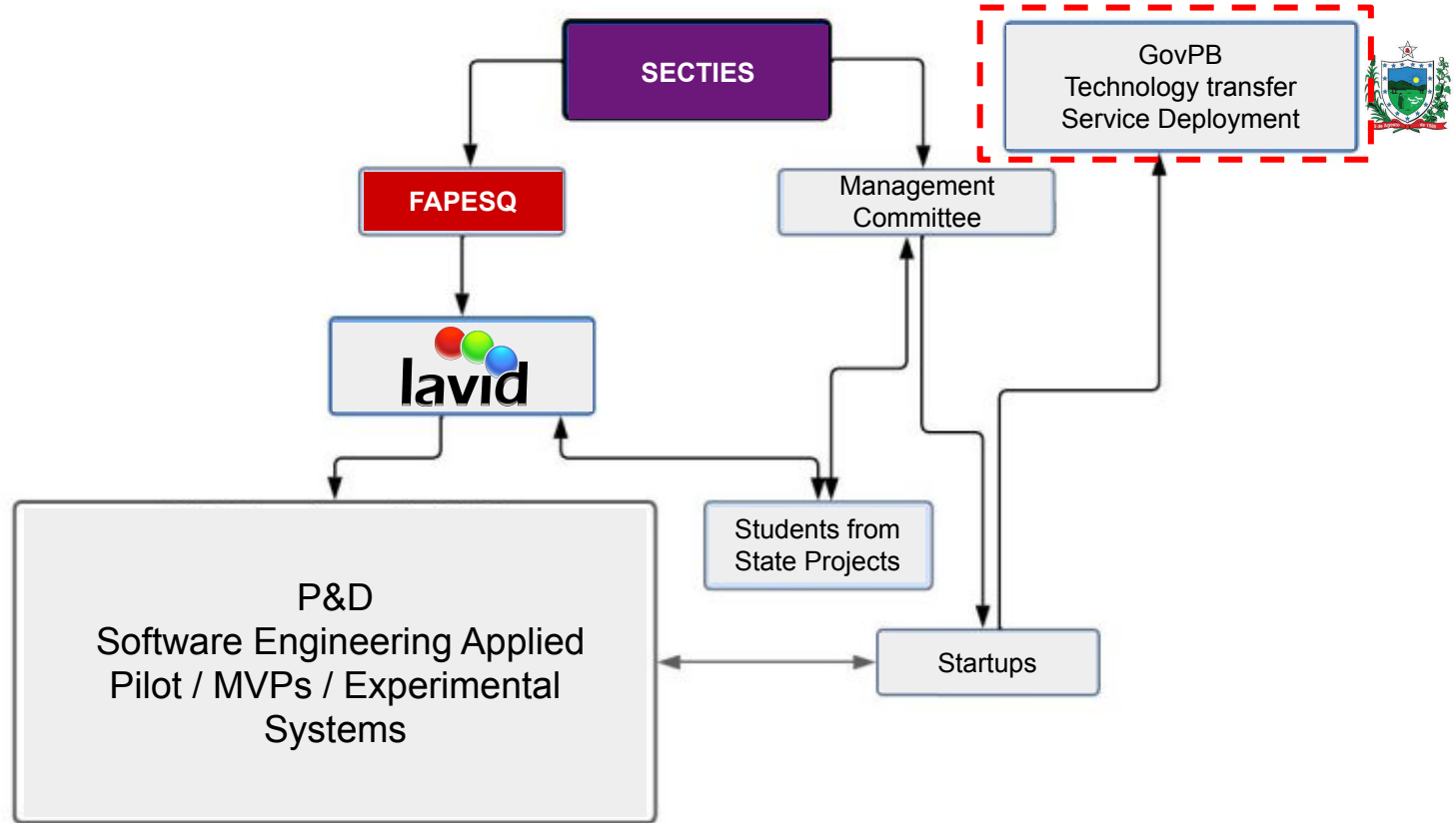
## Video platforms for online collaboration

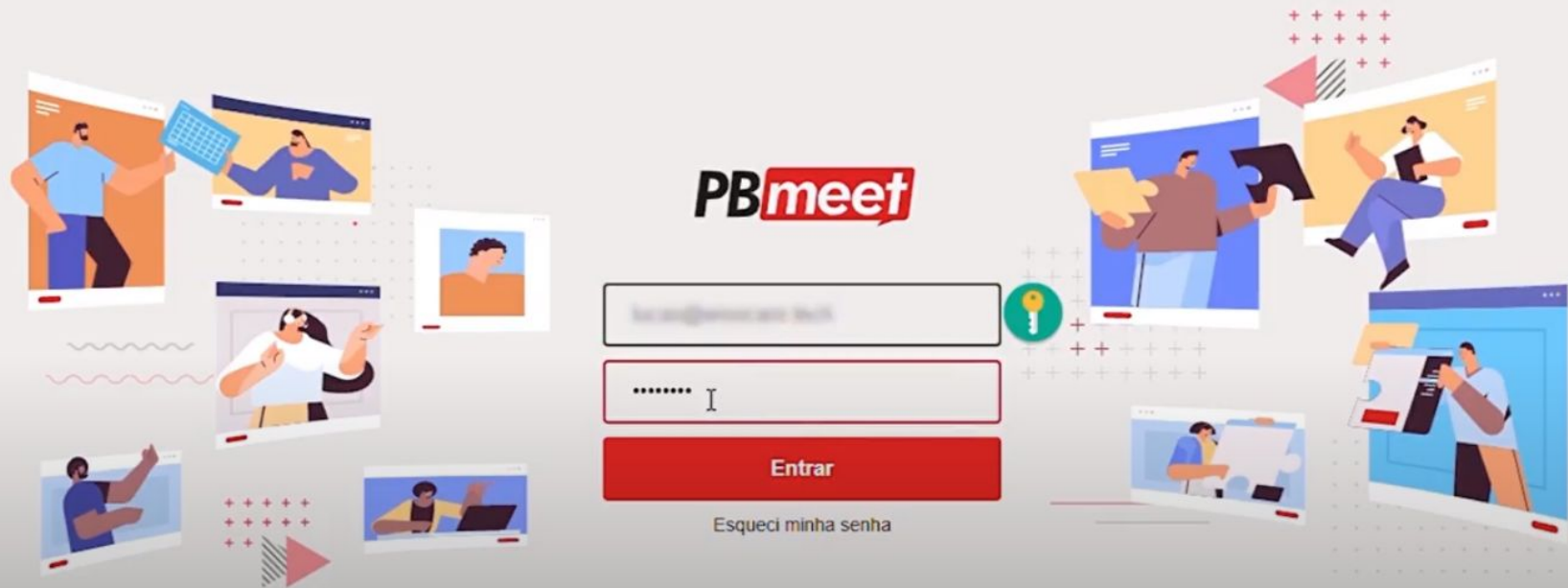
Corporate solutions for remote patient visits and video collaboration with the best cost-benefit on the market.

 [Contact sales](#)



# Ecosystem





Insira seu e-mail e senha nos campos,

# Sistema completo de telemedicina

Agendamentos, atendimentos online com video seguro, prescrições, atestados e outros documentos clínicos assinadas digitalmente e **acessibilidade embutida.**

← → ↻ 🏠 saudemeet.pb.gov.br

SECRETARIA DE ESTADO DA SAÚDE GOVERNO DA PARAÍBA

**SAÚDEMEET**

### Fazer Login

E-mail

Senha

Lembrar-me [Esqueceu sua senha?](#)

Versão 3.50.0R  
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Seja bem-vindo ao **Saúde Meet**

O Saúde Meet e-SUS é um sistema completo para atendimentos em saúde digital. Ele foi desenvolvido pela CODATA, em parceria com a UFPB e a Rede Nacional de Ensino e Pesquisa (RNP).

Consulte também os [Termos de Serviço](#) e [Políticas de Privacidade](#)



# Data Integration Platform



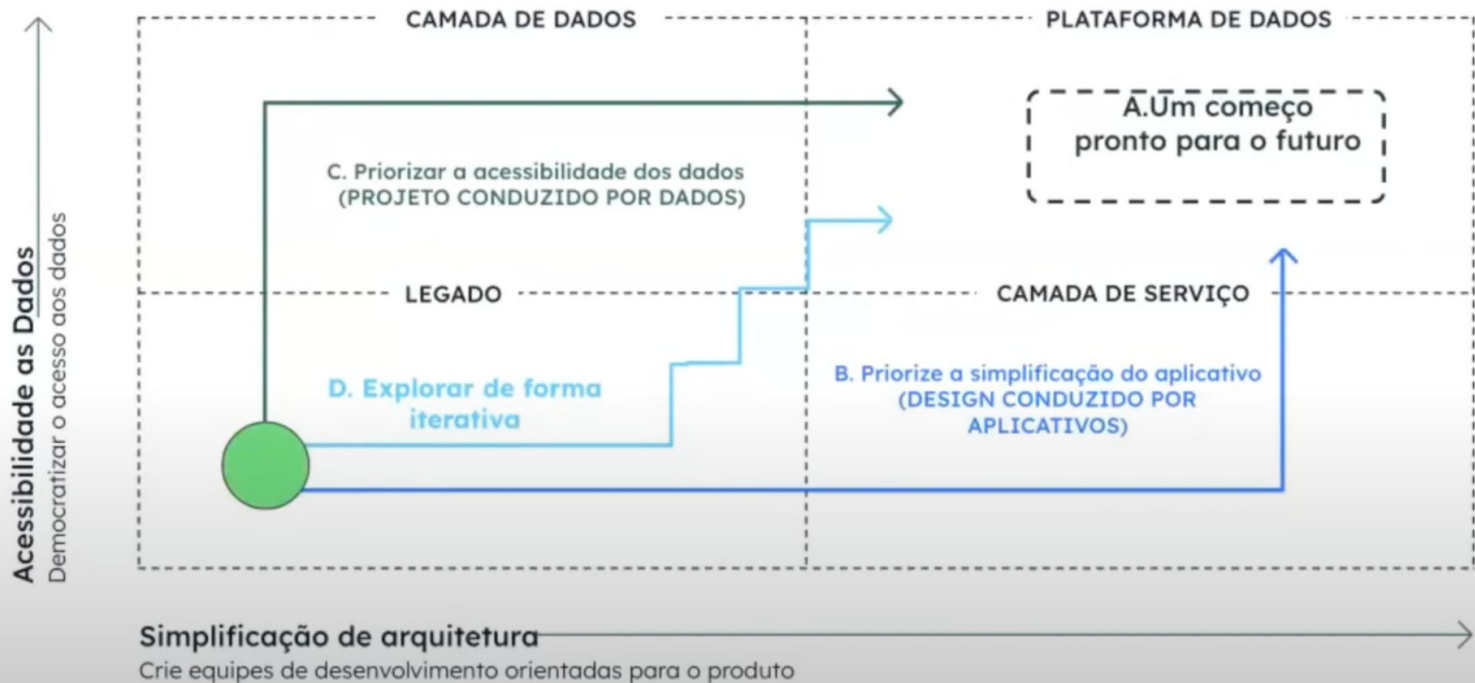
# Methodology

*The role of Software Architecture*



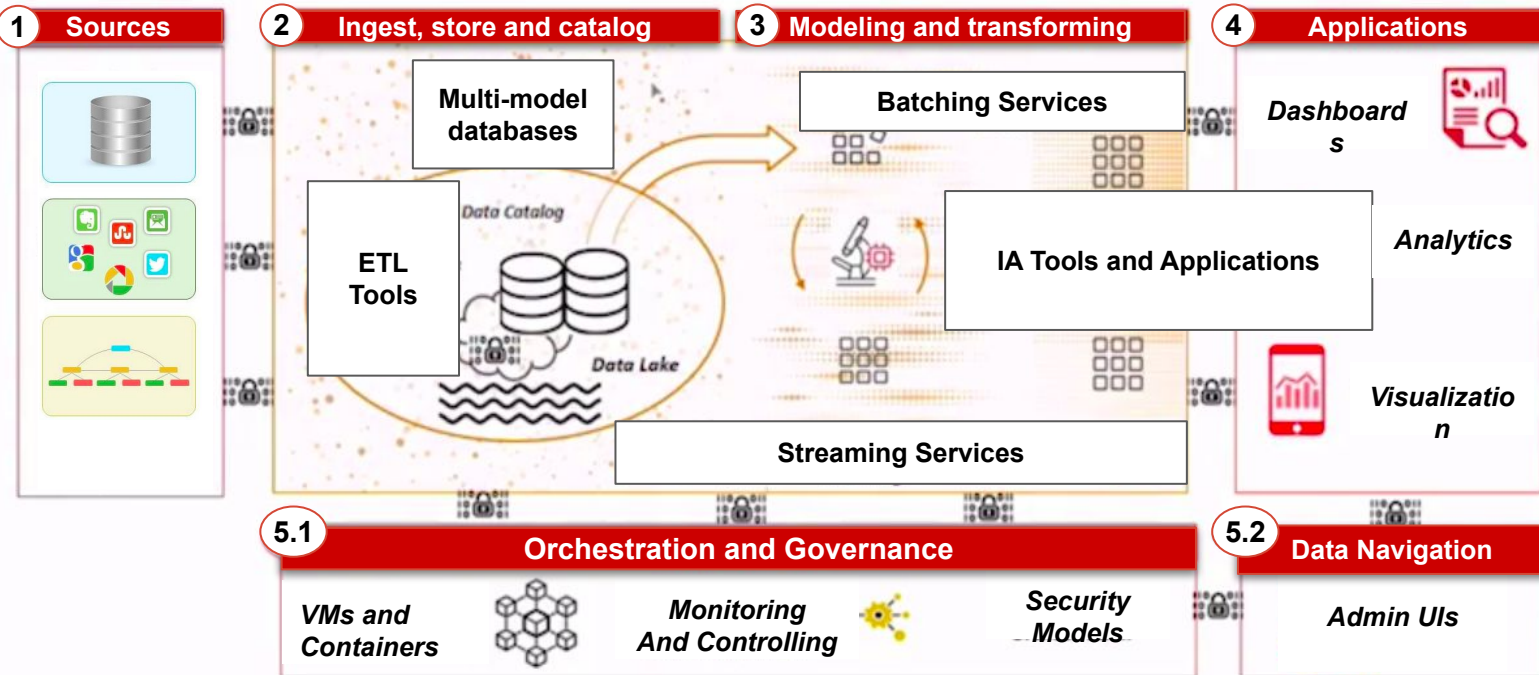
# P&D - State of the art

## Inovar enquanto moderniza



# P&D - Reference Architecture

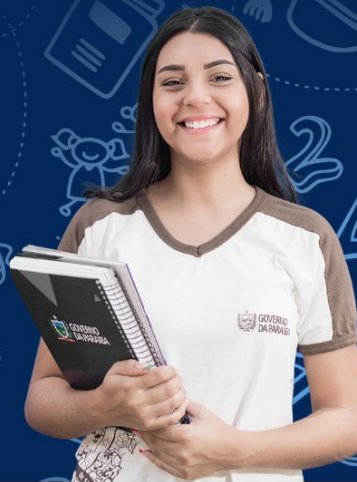
Reference: Kulesza R. et. al. (2020) **Evolution of Web Systems Architectures: A Roadmap**. In: Roesler V., Barrère E., Willrich R. (eds) Special Topics in Multimedia, IoT and Web Technologies. Springer, Cham. [https://doi.org/10.1007/978-3-030-35102-1\\_1](https://doi.org/10.1007/978-3-030-35102-1_1)



# Bem-vindo(a) ao e-Saber!

Clique no botão abaixo para acessar o sistema de matrículas do Governo do Estado da Paraíba.

[Realizar matrícula do estudante >](#)



## Dúvidas frequentes

Posso realizar a matrícula diretamente na secretaria da escola? ▾

Quem já estuda na rede estadual precisa renovar a matrícula? ▾

Quem vai mudar de escola, deve renovar ou fazer uma nova matrícula? ▾



Atenção: o prazo de renovação da matrícula dos veteranos vai até o dia 07/01/2022



1ª Etapa

Cadastro escolar

Atualizar



2ª Etapa

Pré-matrícula

Iniciar





3ª Etapa


Acompanhamento

Visualizar

# SEFAZ - CACTO

 SISTEMA CACTO

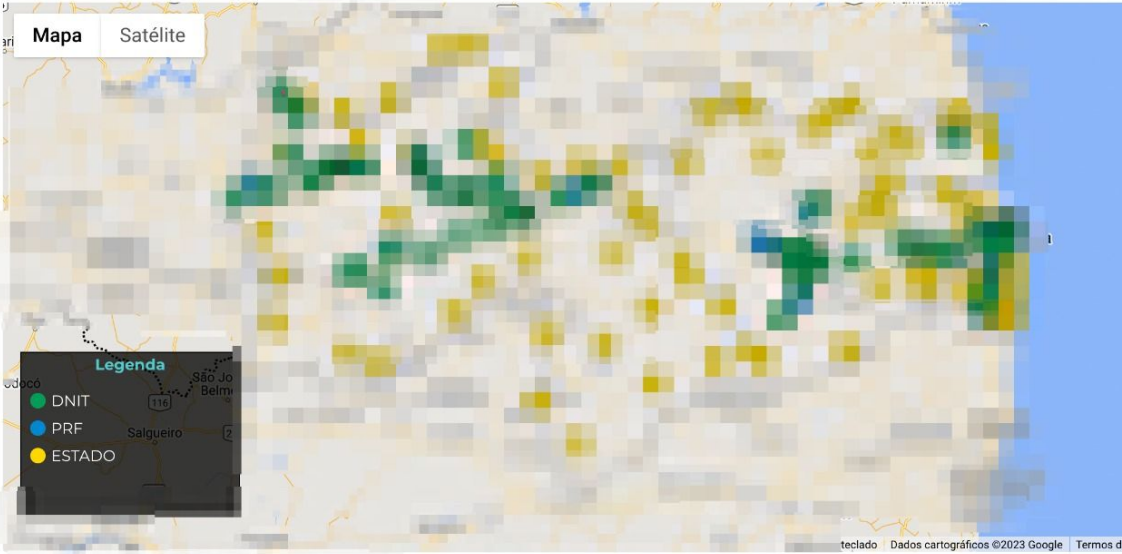
Gerenciar Câmeras 



**CADASTRAR NOVA CÂMERA** | **GERENCIAMENTO DE CÂMERAS**

Selecione as câmeras para exclusão


Mapa | Satélite



**Legenda**

- DNIT
- PRF
- ESTADO

teclado | Dados cartográficos ©2023 Google | Termos d

**SELECIONE** ▼ Digite o filtro 

NOME	DESCRIÇÃO	MUNICÍPIO	COORDENADAS	CATEGORIA
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# ParTec - Horizontes de Inovação



PARQUE  
TECNOLÓGICO  
HORIZONTES  
DE INOVAÇÃO



Incubadora admin  
Administrador

🏠 Início

## GESTÃO

🗉 Startups

👤 Usuários

📄 Editais

## ACOMPANHAMENTO

✍️ Inscrições

📅 Eventos

📁 Documentos

💰 Prestação de Contas

## Horizontes de Inovação

Transformando conhecimento em produtos e  
serviços inovadores para a sociedade



### Gerenciar Startups

Cadastre, edite ou exclua Startups e autorize que elas passem de uma etapa para outra.



### Gerenciar Usuários

Faça o pré-cadastro de novos integrantes do programa, edite permissões, e exclua ou suspenda usuários.



### Editais de Financiamento

Cadastre editais e suas etapas associadas e consulte, edite ou exclua as informações inseridas no sistema.



### Avaliar Inscrições

Faça a avaliação das inscrições nos Editais de Financiamento e cadastre justificativas para o deferimento ou indeferimento.



### Agendar Eventos

Organize reuniões de acompanhamento ou mentorias e cadastre lembretes para entrega de documentos.



### Gerenciar Documentos

Consulte e insira documentos diversos de entrega e para uso interno das startups ou mentores.



# SEPLAG



GOVERNO  
DA PARAÍBA



Início



Ações Municipais



Dashboard



Prédios Públicos



Ajuda



Configurações

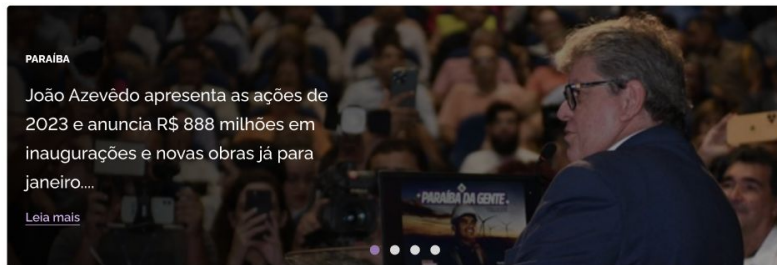


Nome do  
Funcionário



## Seja Bem-vindo ao Portal

Uma nova era da Transparência e Eficiência Governamental



### Acesse Informações Sobre Seu Estado

Escolha uma das opções abaixo



AÇÕES  
GOVERNAMENTAIS



AÇÕES  
MUNICIPAIS



INVESTIMENTOS POR  
ÁREA TEMÁTICA



PRÉDIOS  
PÚBLICOS




DASHBOARD



LOGIN\*



# TCE-PB - GeoPB

 **GeoPB**  
Versão 2022.1

**Painel de controle**

NAVEGAÇÃO

- [Início](#)

ACESSO PÚBLICO


- [Mapa de Obras](#)
- [Consulta de Obras](#)
- [Painel de Alertas](#)

JURISDICIONADO

- [Cadastrar Obras](#)
- [Alterar Informações](#)
- [Acompanhamento](#)
- [Relacionar Medições](#)












SUPOORTE


- [Apresentações](#)
- [Documentos](#)
- [Legislação](#)
- [Perguntas Frequentes](#)

 **Username**  
User role


## Bem-vindo ao GeoPB

Abaixo estão os atalhos para as principais operações do sistema

 <h3>Mapa de Obras</h3> <p>Visualize dados de obras públicas em um mapa interativo</p>	 <h3>Consulta de Obras</h3> <p>Acesse todas as informações cadastradas sobre uma obra</p>	 <h3>Painel de Alertas</h3> <p>Acompanhe todos os problemas relacionados a uma obra</p>	 <h3>Consultar preços</h3> <p>Pesquise por composições, insumos e preços de referência</p>
 <h3>Cadastrar Obras</h3> <p>Insira novas obras no sistema GeoPB</p>	 <h3>Alterar informações</h3> <p>Modifique dados cadastrais ou solicite a exclusão de uma obra</p>	 <h3>Acompanhamento</h3> <p>Informe condições, entregue obras e cadastre medições</p>	 <h3>Relacionar medições</h3> <p>Associe notas de empenho às medições cadastradas</p>
 <h3>Documentos</h3> <p>Consulte documentos sobre obras e operações do sistema</p>	 <h3>Legislação</h3> <p>Veja resoluções e portarias relevantes para o uso do GeoPB</p>	 <h3>Perguntas Frequentes</h3> <p>Tem alguma dúvida sobre o sistema? Consulte nosso FAQ</p>	

 **Nome do Usuário**  
User Role

[Meu perfil](#) [Sair](#)



# TV 3.0 & Accessibility

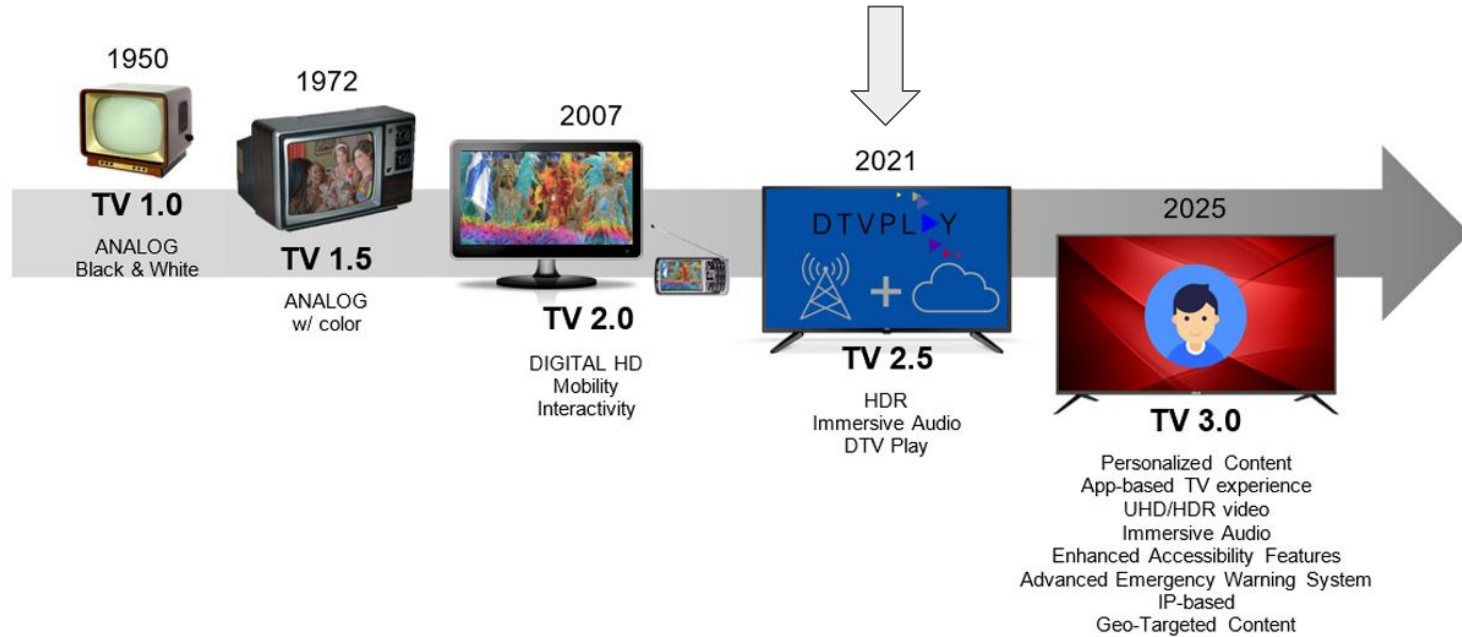
# TV 3.0

# LAViD & Digital TV in Brazil

- Participation in the Brazilian Digital TV System Project with middleware proposal (Flex-TV/Ginga) with PUC-Rio (2005-2006)
- Start of Digital TV broadcasts in SP in partnership with Linear (2007)
- Inclusion of the Ginga middleware (Java and NCL-Lua) in the SBTVD and publication as ITU standards (2008) - Ginga is now adopted by 17 countries
- Representation in the Council of the SBTVD Forum and coordination of working groups (Ginga Standards, Libras and Test Suites - Current)
- Coordination of R&D projects related to Digital TV & Ginga



# Road to TV 3.0

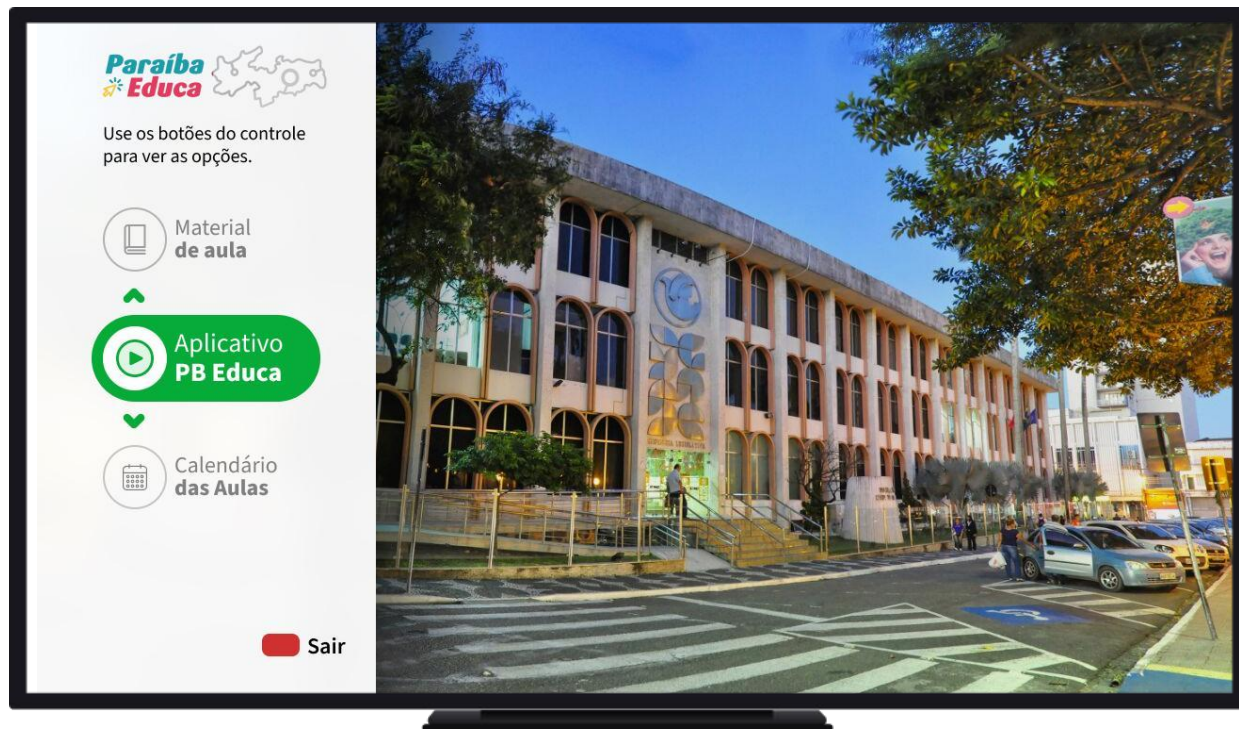


# TV 2.5 (today)

- Development of a new receiver profile for the middleware Ginga (receiver profile D, “DTV Play”)
  - On-demand video
  - Synchronized companion device
  - Audiovisual enhancement over the Internet
  - Targeted content
  - Introduction of three new optional immersive audio codecs (MPEG-H Audio, E-AC-3 JOC, and AC-4)



# TV 2.5 - Paraíba Educa



# TV 3.0 project

- Enhanced connectivity, the union of TV as we know it with elements of streaming and mobile devices.
- The integration of these devices and the ability to personalize the television experience through artificial intelligence, algorithms, and applications.
- A broader range of features and functionalities are now available for the interactive applications running on TV.
- Evolution of image and immersive audio.
- Improved Accessibility.





## TV 3.0

- Collaborative Effort: The project involves the participation of various universities, working in thematic groups, each focusing on a specific aspect of the project.
- The main objective of these groups is the development, testing and standardization of the necessary technologies.
- LAViD plays a significant role in the development of the interactive applications engine and accessibility technologies.



Rio de Janeiro / RJ  
Juiz de Fora / MG  
São Luis / MA  
João Pessoa / PB  
Niterói / RJ

  
Federal Center for Technological Education of Rio de Janeiro  
(CEFET/RJ, Centro Federal de Educação Tecnológica do Rio de Janeiro)

  
Federal University of Juiz de Fora  
(UFJF, Universidade Federal de Juiz de Fora)

  
Federal University of Maranhão  
(UFMA, Universidade Federal do Maranhão)

  
Federal University of Paraíba  
(UFPA, Universidade Federal da Paraíba)

  
Universidade Federal Fluminense  
Fluminense Federal University  
(UFF, Universidade Federal Fluminense)

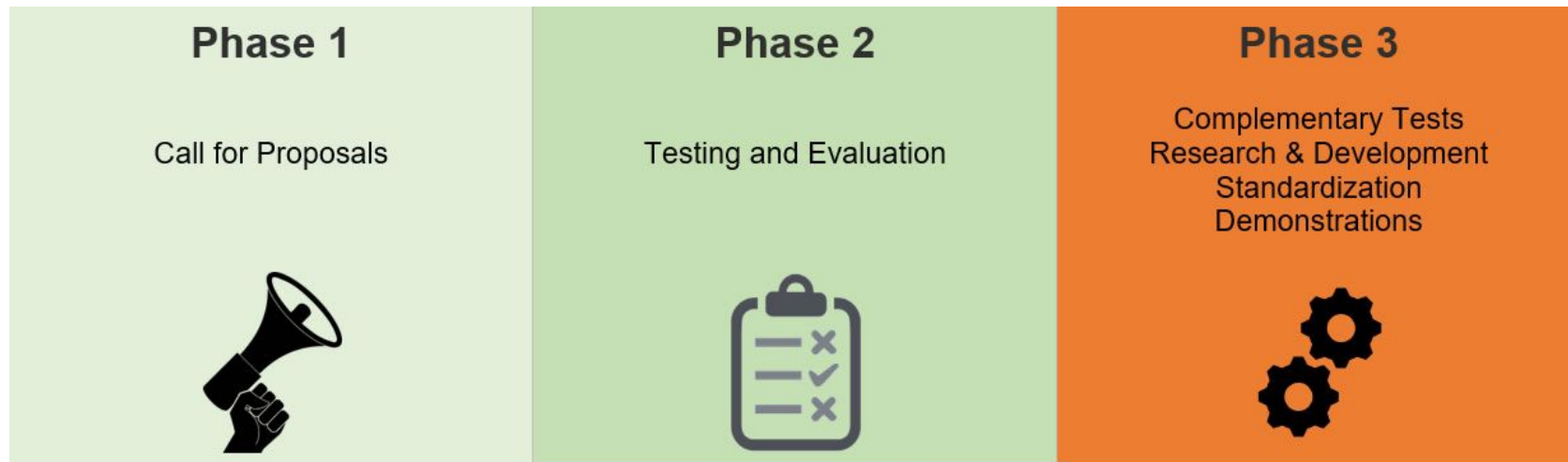
  
Pontifical Catholic University of Rio de Janeiro  
(PUC-Rio, Pontifícia Universidade Católica do Rio de Janeiro)

Coordination:



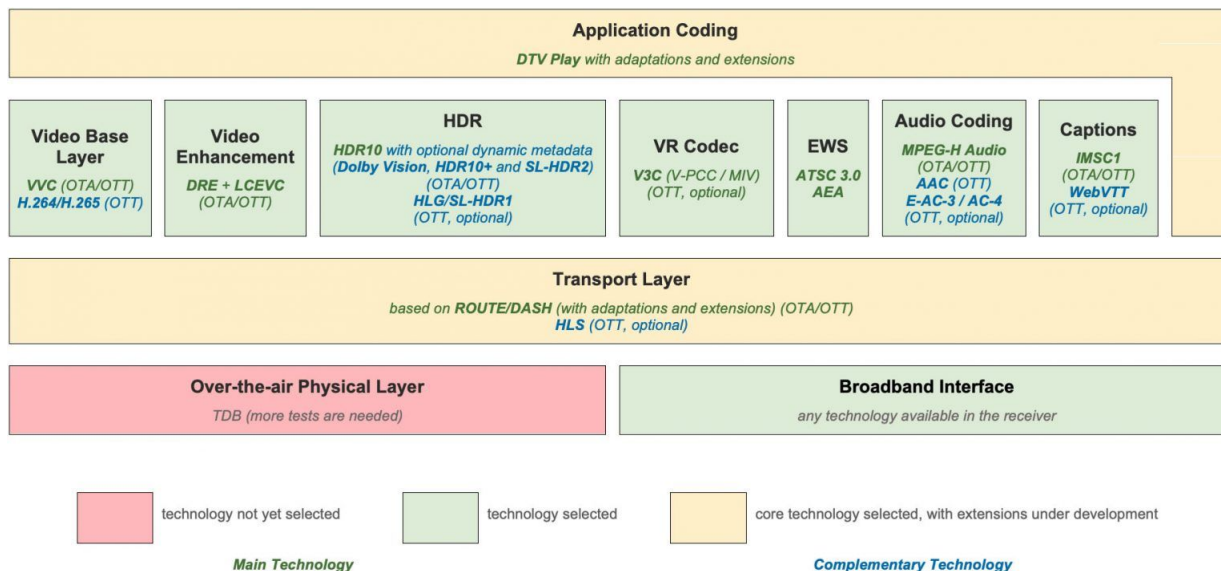
Prof. Marcelo Moreno

# TV 3.0 project



# TV 3.0 project

- Phase 2 - Testing and Evaluation



# TV 3.0 project

- **Phase 3 - Complementary tests, R&D, Standardization & demos**
- Conduct comprehensive tests for physical layer technologies
- Develop necessary modifications and additions to the ROUTE/DASH transport layer specification, along with a reference mux/demux implementation.
- Perform a subjective quality assessment of TV 3.0 video coding technologies (VVC and LCEVC) to determine required bitrate



# TV 3.0 project

- **Phase 3 - Complementary tests, R&D, Standardization & demos**
- Develop adaptations and extensions to DTV Play for TV 3.0 Application Coding
- Finalize technical standards, operational guidelines, and conformance testing for TV 3.0.
- Develop end-to-end system demonstrations.
- 90 researchers from nine Brazilian Universities.





# Accessibility

# VLibras

- VLibras is a collaborative platform with over 21,000 registered signs in Brazilian Sign Language (LIBRAS).
- VLibras is a set of free and open-source tools that translate digital content (text, audio, and video) from Portuguese to LIBRAS, making computers, mobile devices, and web platforms more accessible to deaf people.
- The operation of VLibras is powered by artificial intelligence, performing 100,000 translations per day across at least 120,000 websites



# VLibras

- VLibras was one of the winners of the international Zero Project 2024.
- The tool translates audio, video, and text from Portuguese to Brazilian Sign Language (LIBRAS) and already benefits about 10 million Brazilians with different levels of deafness.
- The platform allows users to suggest improvements to translations or animations, and even add a new sign to the library





# Accessibility as Service

vlibras.gov.br



## +120 mil

Traduções automáticas realizadas todos os dias



**Prêmio Acessibilidade na Web 2016**

1º lugar na categoria Tecnologia Assistiva da premiação Nacional do CGI.br e NIC.br

## 95 mil

frases treinadas por uma Inteligência artificial para melhorar a tradução



**LATAM Smart City Award 2018**

Ganhador na categoria Sociedade Equitativa e Colaborativa

## +21 mil

Sinais cadastrados em nossa biblioteca e ela não para de crescer.

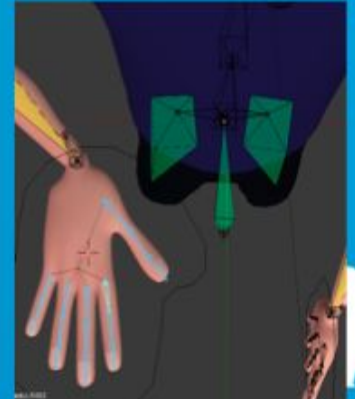
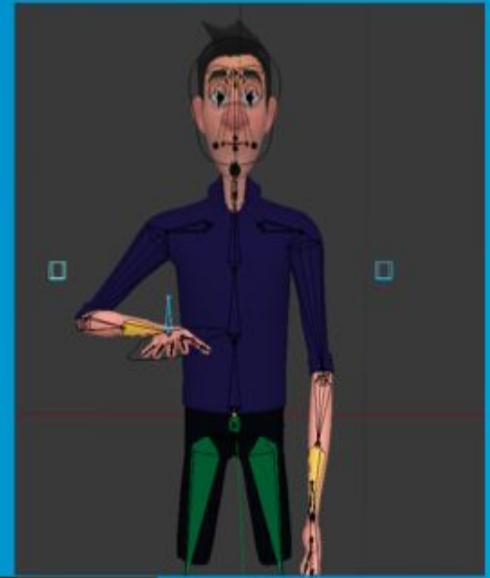


**Tecnologia Social BB 2019**

Certificação de tecnologia social pela Fundação Banco do Brasil



# Avatar 3D



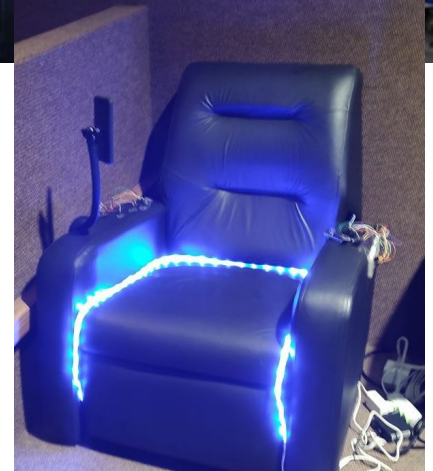
# Cine Modelo

- The context is set by the Normative Instruction No. 128/2016 from ANCINE and the Brazilian Inclusion Law (Law No. 13.164/2015).
- Introduces an innovative model of Accessible Cinema in the country, capable of providing deaf and blind people with a richer and more immersive sensory experience.
- Tests are being conducted @ Cine Banguê.

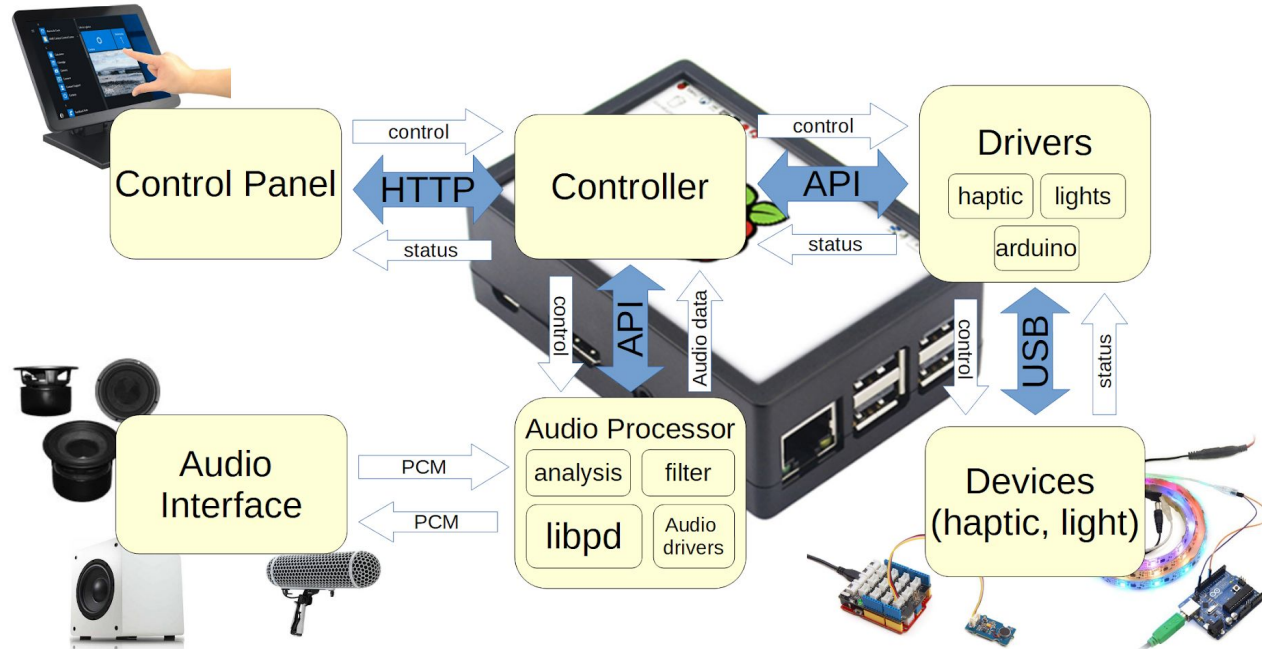


# Cine Modelo

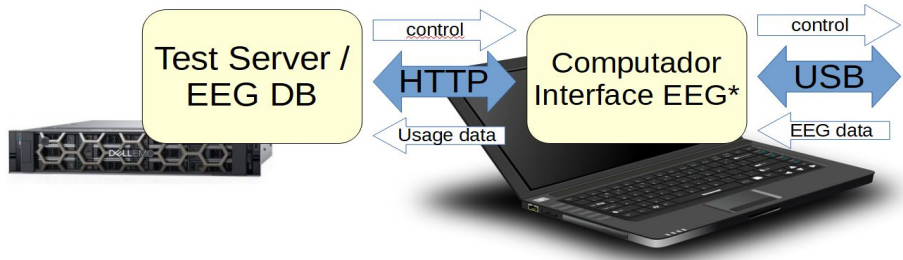
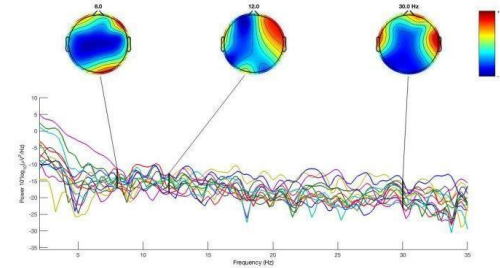
- The development of multi-sensory chairs equipped with features to provide a new form of sound perception for deaf people.
- Devices attached to the chair enable the representation of sound effects and musical elements such as arrangement, rhythm, and melody through senses other than hearing.
- The tests are conducted using innovative methods that include the use of EEG (Electroencephalogram) interfaces.



# Cine Modelo



# Cine Modelo



\*OpenVibe, BrainWave, Emotiv e OpenBCI



# Thank You

[contato@lavid.ufpb.br](mailto:contato@lavid.ufpb.br)

