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**MAURO OLIVEIRA & ODORICO MONTEIRO**



FEDERAL INSTITUTE OF CEARÁ  
FEDERAL UNIVERSITY OF CEARÁ



**LAR-A : Laboratório de Redes de Computadores - Aracati**  
**RIPASS : Rede Interdisciplinar de Pesquisa e Avaliação em Sistemas de Saúde**



# **DIGA SAUDE**

## **A HOME CARE PROTOTYPE BASED ON THE DIGITAL TV BRAZILIAN MODEL FOR A HEALTH MANAGEMENT SYSTEM**

### **Mauro Oliveira**

*Federal Institute of Ceará (IFCE)  
Fortaleza, Brazil  
amauroboliveira@gmail.com*

### **Luiz Odorico A. Monteiro**

*Federal University of Ceará (UFC)  
Fortaleza, Brazil  
odorico0811@gmail.com*

### **Marcos Santos**

*State University of Ceará (UECE)  
Fortaleza, Brazil  
marcoseduardoss@gmail.com*

### **João Batista Frota**

*Federal Institute of Ceará (IFCE)  
Fortaleza, Brazil  
jbfrota2009@gmail.com*

### **César Olavo Moura**

*Federal Institute of Ceará (IFCE)  
Fortaleza, Brazil  
cesarolavo@ifce.edu.br*

### **Leonardo Gardini**

*State University of Ceará (UECE)  
Fortaleza, Brazil  
lgardini@gmail.com*

### **Paulo Roberto Freire Cunha**

*Federal University of Pernambuco  
(UFPE)  
Recife, Brazil  
prfc@cin.ufpe.br*

### **Carina Oliveira**

*Federal University of Ceará (UFC)  
Fortaleza, Brazil  
Carina@great.ufc.br*

A tropical landscape featuring a body of water, possibly a lagoon or bay, with numerous palm trees growing along the shoreline. The sky is clear and blue. The water is calm, reflecting the light. In the foreground, there are some green plants and a small patch of land.

# Outline

1. *DIGA Saúde*
2. *LARIISA Project*
3. *DIGA Saúde Prototype*
4. *The Brazilian Digital TV*
5. *Conclusion*

A photograph of a flooded landscape. In the foreground, there is a body of water with some green vegetation floating on it. In the middle ground, several palm trees stand in the water. In the background, there is a line of trees and a clear sky. The text "1. DIGA Saúde" is overlaid on the image.

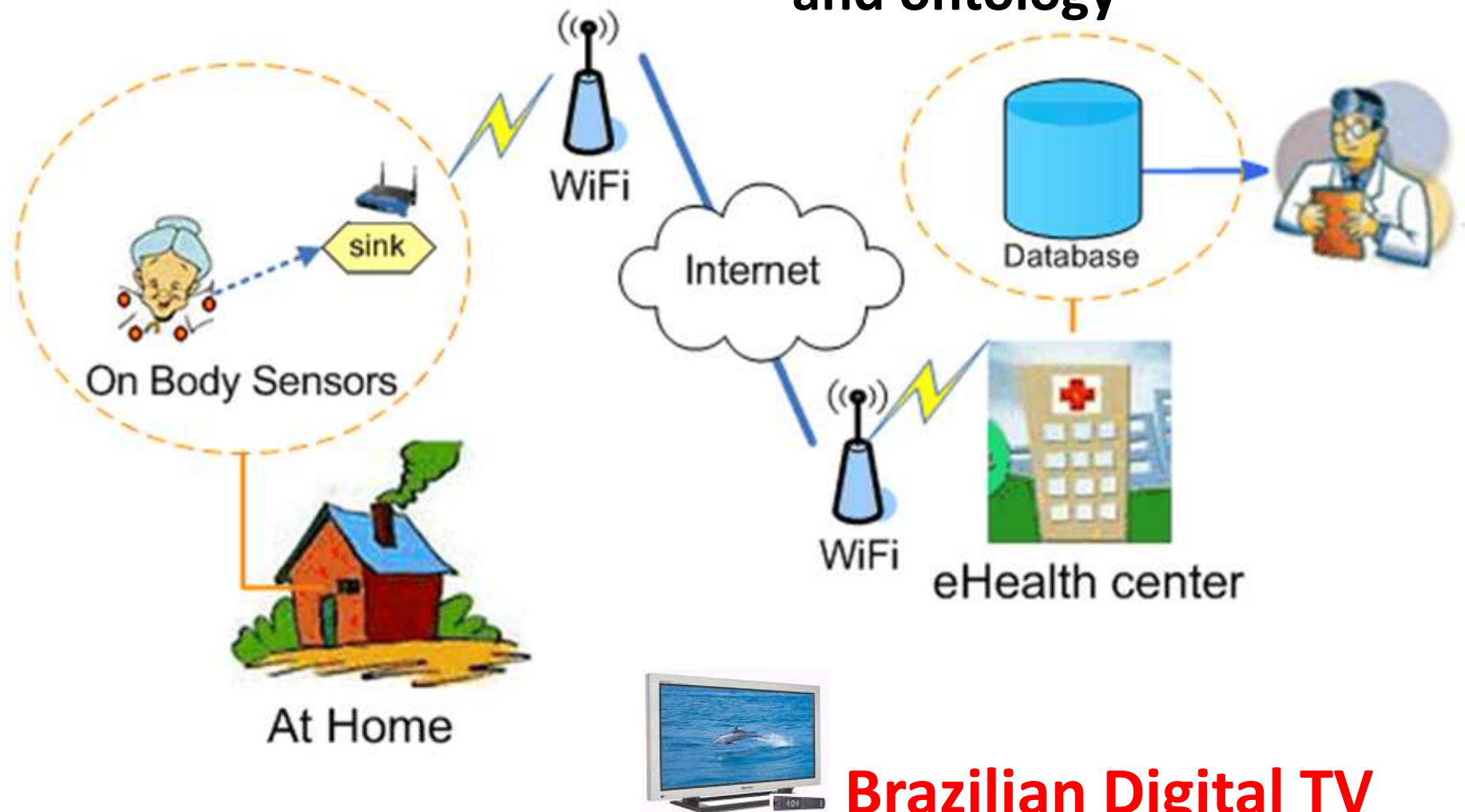
## ***1. DIGA Saúde***



Homecare,  
context-awareness

**DIGA Saúde**

and ontology



**Homecare is very expensive for developing countries !**



**DIGA Saúde is a low-cost system !**

A photograph showing a flooded area with several palm trees standing in the water. The water is a deep blue-grey color, and the sky is a clear, pale blue. In the foreground, there are some green, leafy plants. The text "2. LARIISA Project" is overlaid in the center of the image.

## ***2. LARIISA Project***

**LARIISA**, A Context-Aware Framework for Health Care Governance  
Decision-Making Systems: A model based on the Brazilian Digital TV

**Mauro Oliveira & Odorico Monteiro**





# GENESIS of the **LARIISA** Project

The objective of the LARIISA is to provide a software platform that allows the decision-making model for public health system.



# The **LARIISA** Environment - 2010

Decision Making in Knowledge Management

Decision Making in Systemic Normative

Decision Making in Clinical and Epidemiology

Decision Making in Share Management

Decision Making in Administration

**Decision:** Creating an Emergency for the clinical management of severe cases (ER-SC)

**Rule:** IF the patient had Dengue more than once  
AND lives in an area with high infestation rate  
AND has symptoms A,B and C,  
THEN you must consult the ER-SC about this case

**Results:** lower mortality due to a series of actions, in special the use of the rule above.

# Example of the **LARIISA** Environment - 2010

## 1) **LARIISA** Application

**Decision Making in Administration**

**Decision:** Creating an Emergency (ER) for the clinical management of severe cases (ER-SC)

**Administration Case**

IF-THEN RULE-BASED APPROACH

Decision Making Application

Context-aware Services

IF the patient had Dengue more than once  
AND lives in an area with high infestation indice  
AND has symptoms A,B and C,

THEN you must consult the ER-SC about this case

**Results:**

lower mortality due to a series of actions, in special the use of the rule above

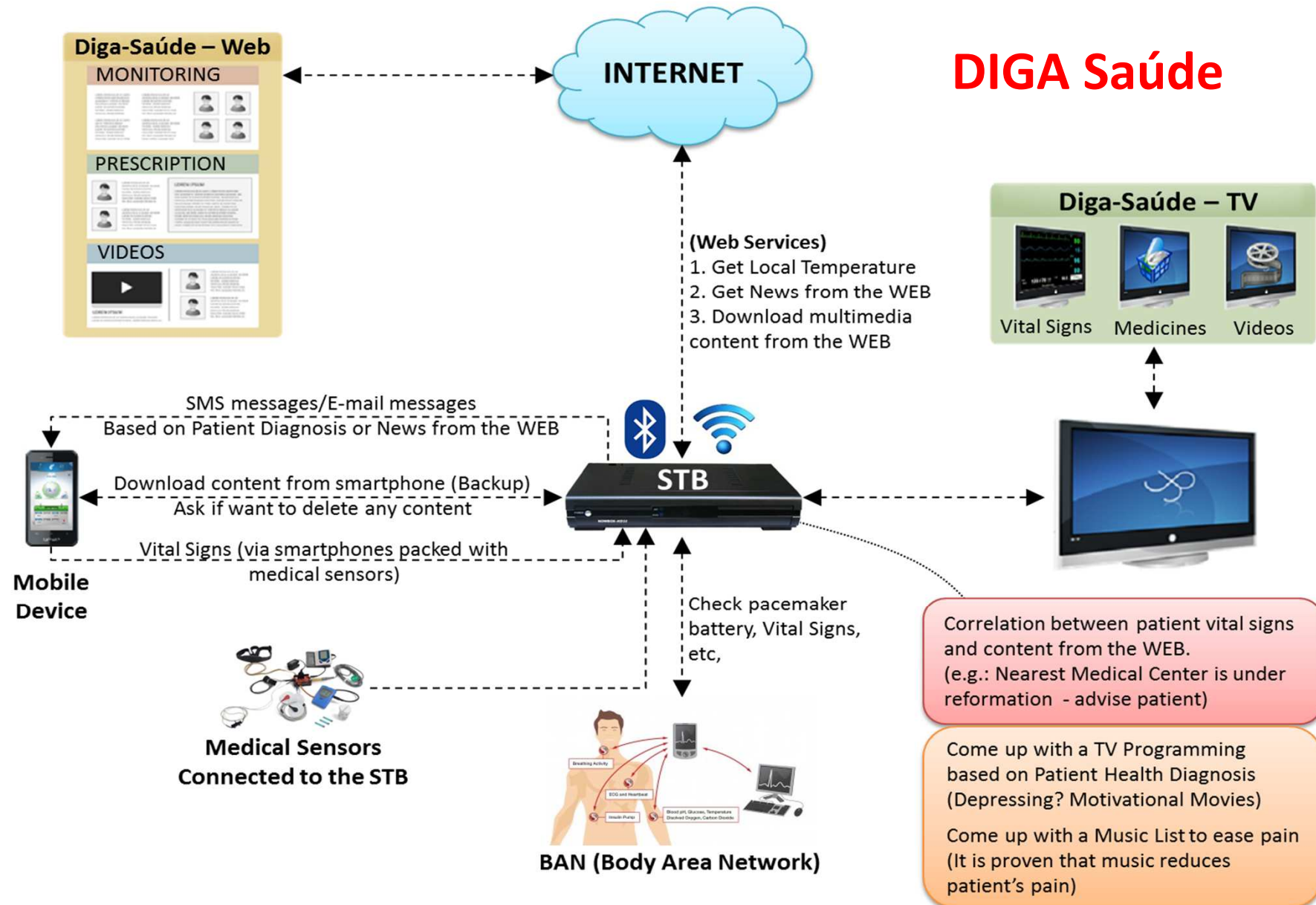
## 2) **LARIISA** Data Acquisition

Context Detection



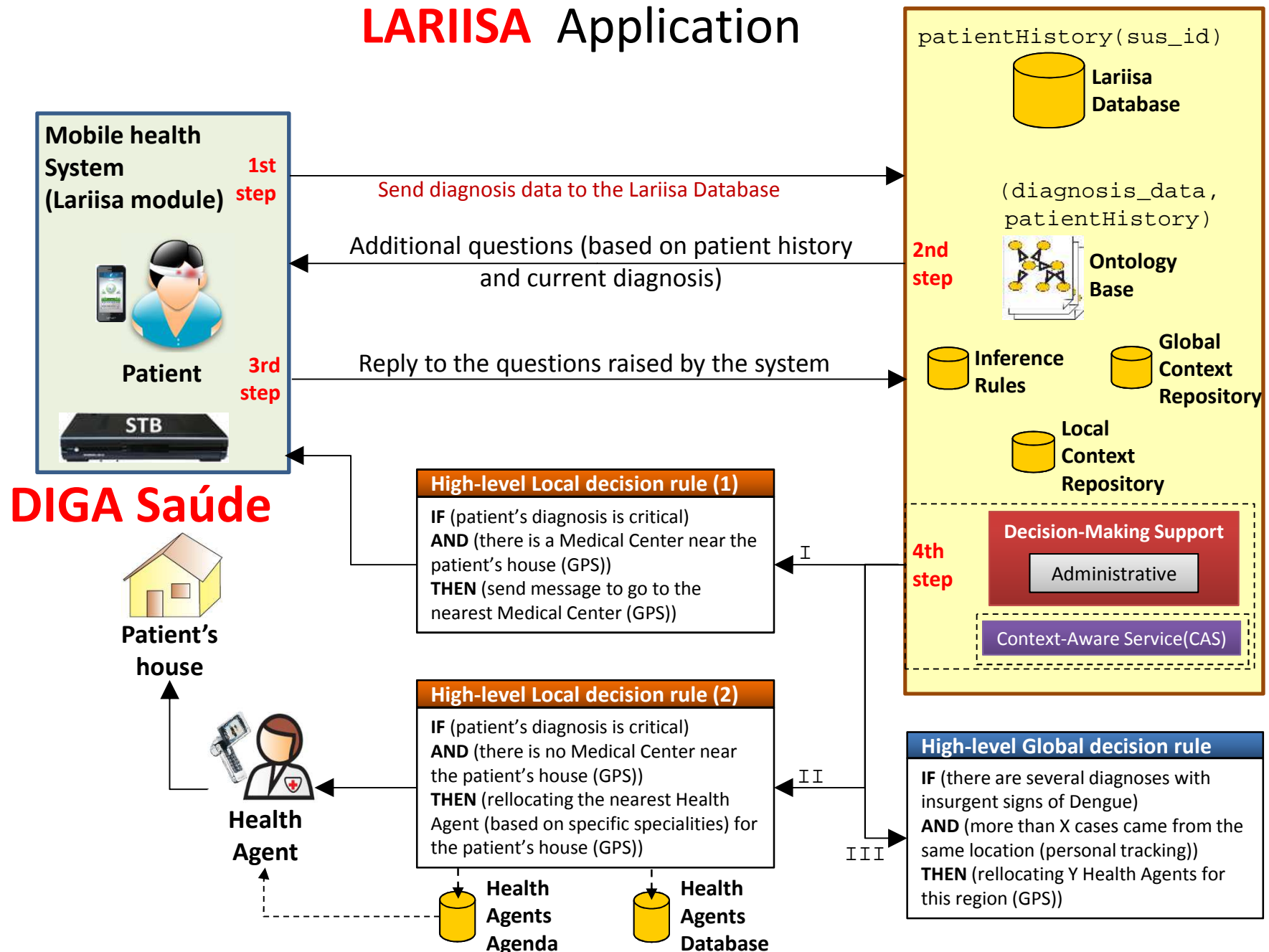
**DIGA Saúde**

# LARIISA Data Acquisition

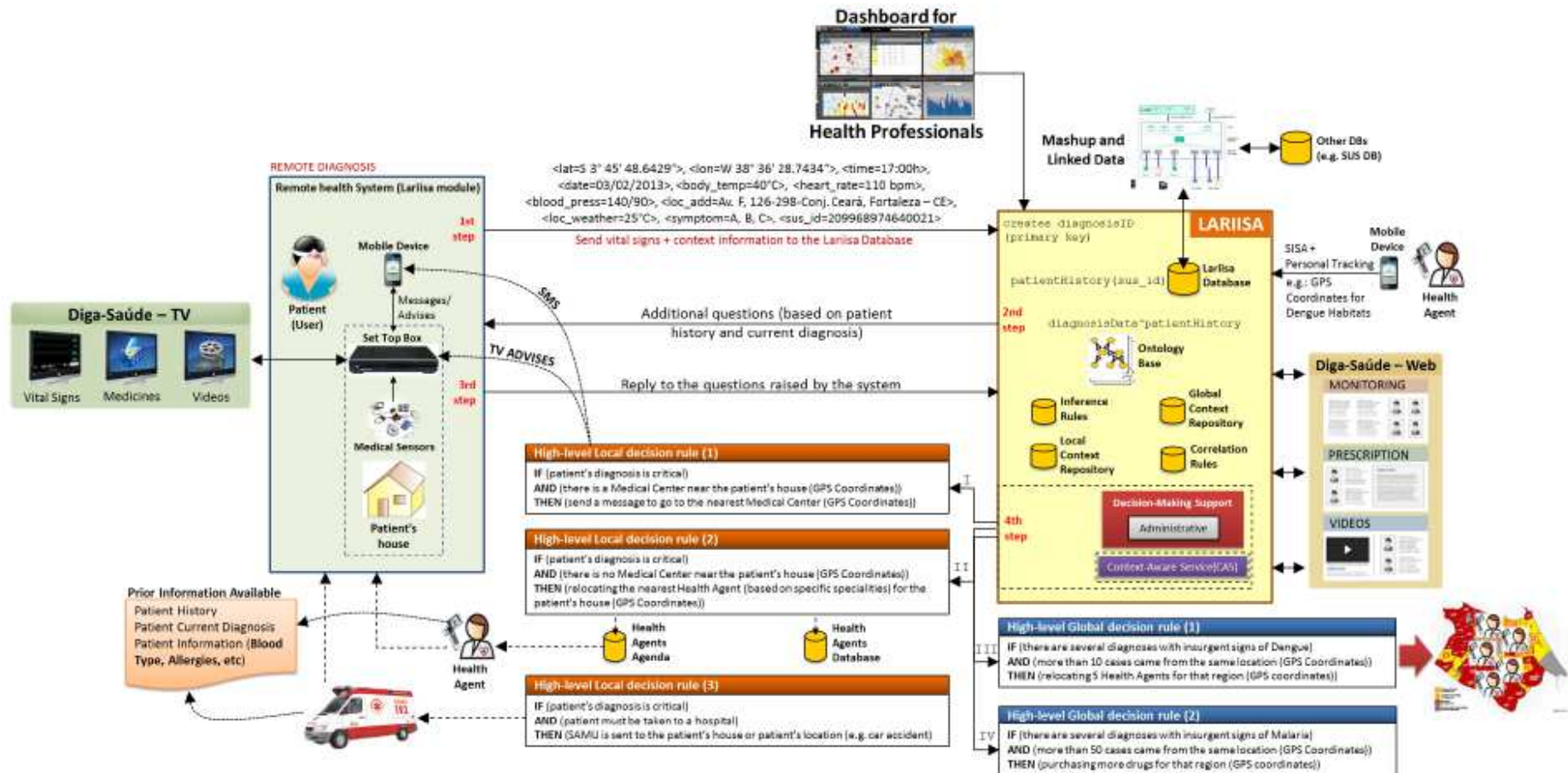




# LARIISA Application



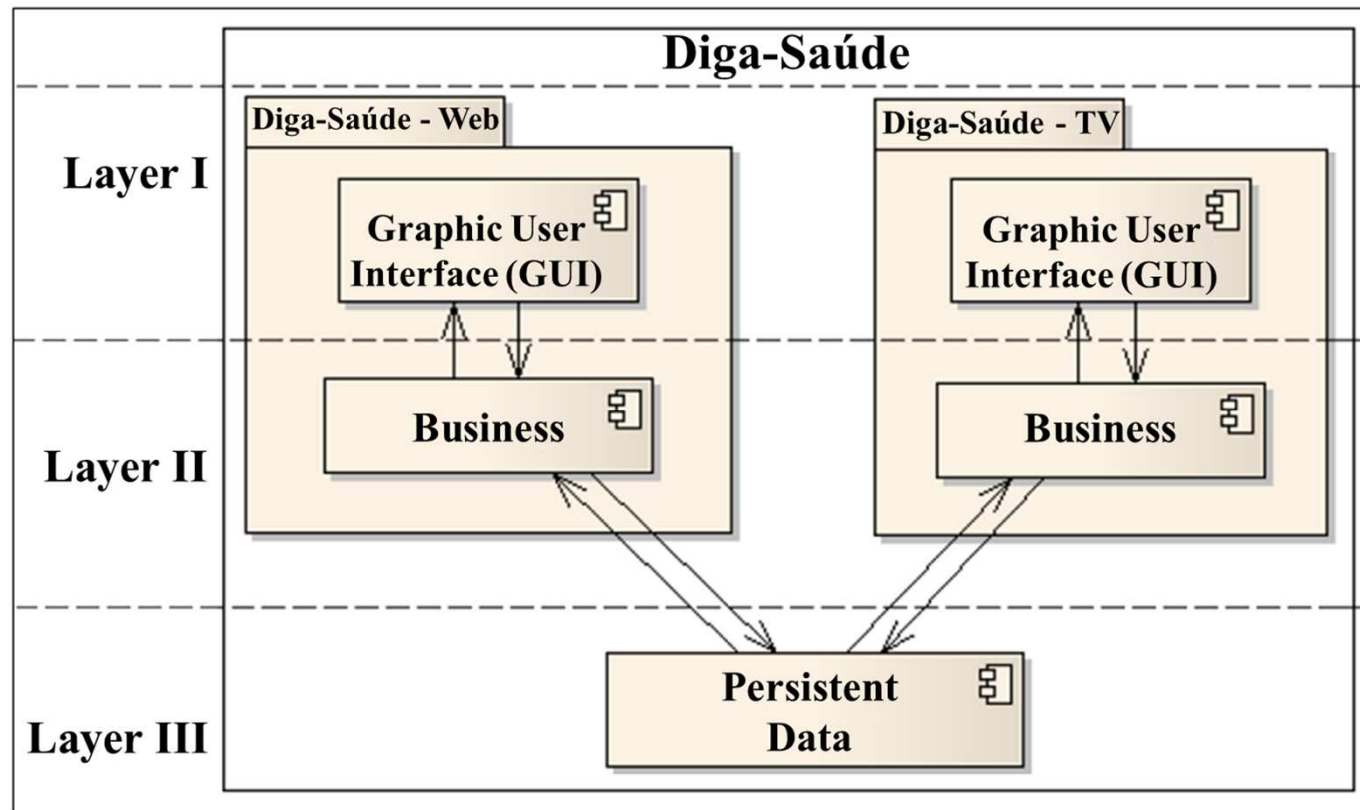
# LARIISA Environment - 2013



A photograph of a flooded landscape. In the foreground, there is a body of water with some green vegetation floating on it. In the middle ground, several palm trees stand in the water. In the background, there is a line of trees and a clear sky.

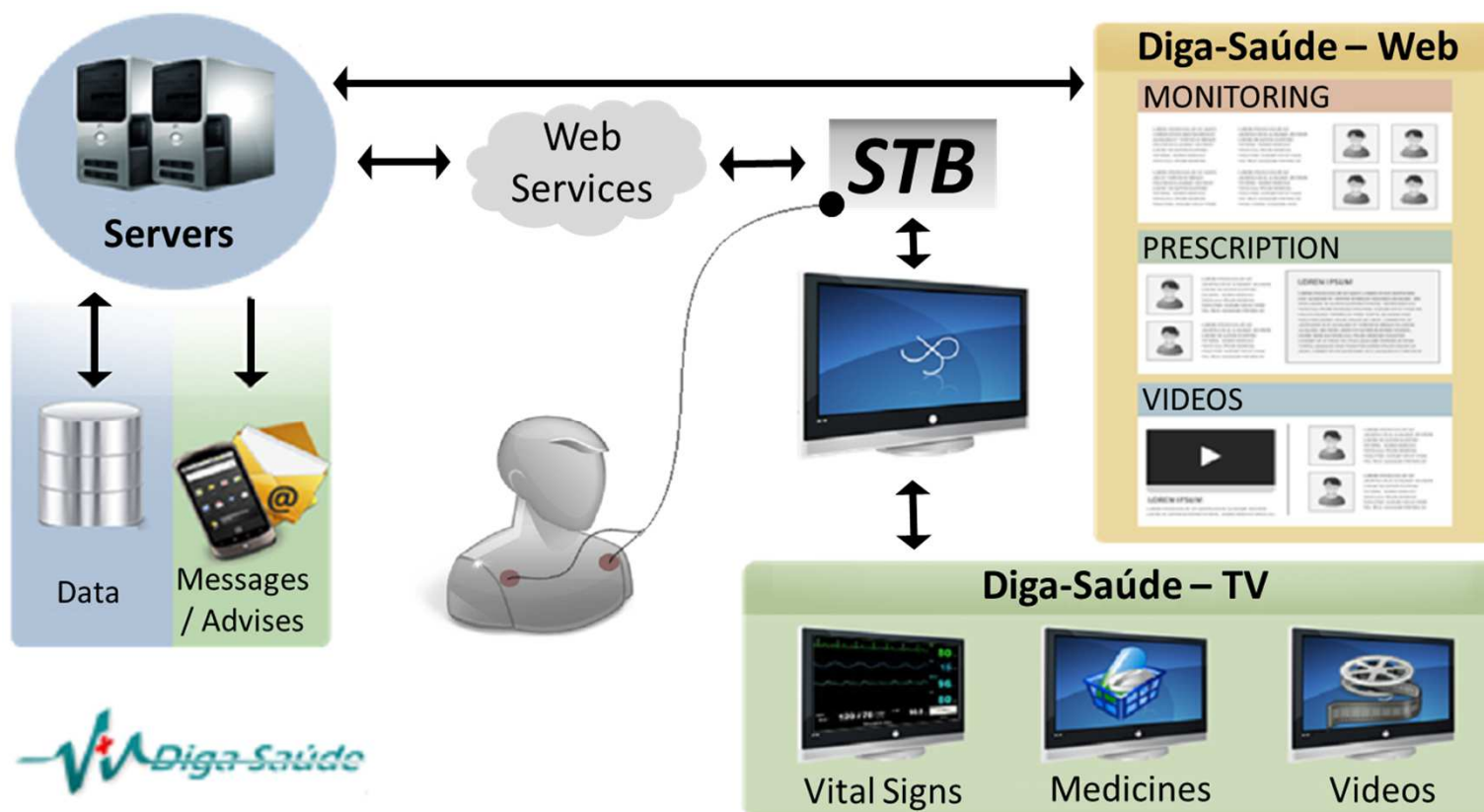
### ***3. DIGA Saúde Prototype***

# Diga-Saúde's architecture diagram





# Overview of Diga-Saúde



# Implementation Aspects of the Prototype



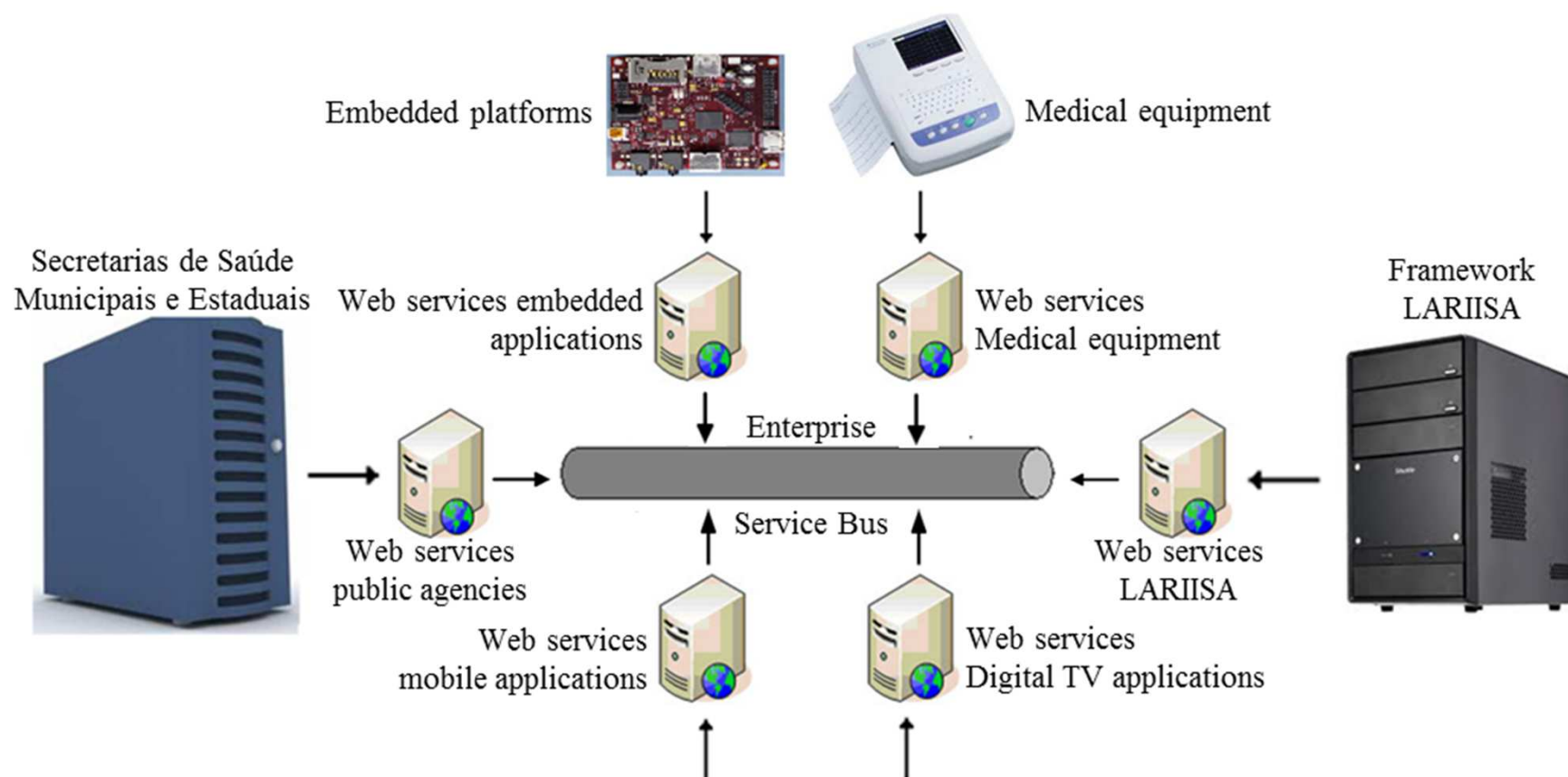
Sensors



Medicine list on a Digital TV application

## Why DIGA Saúde is a Low-cost system?

# Overview of Diga-Saúde

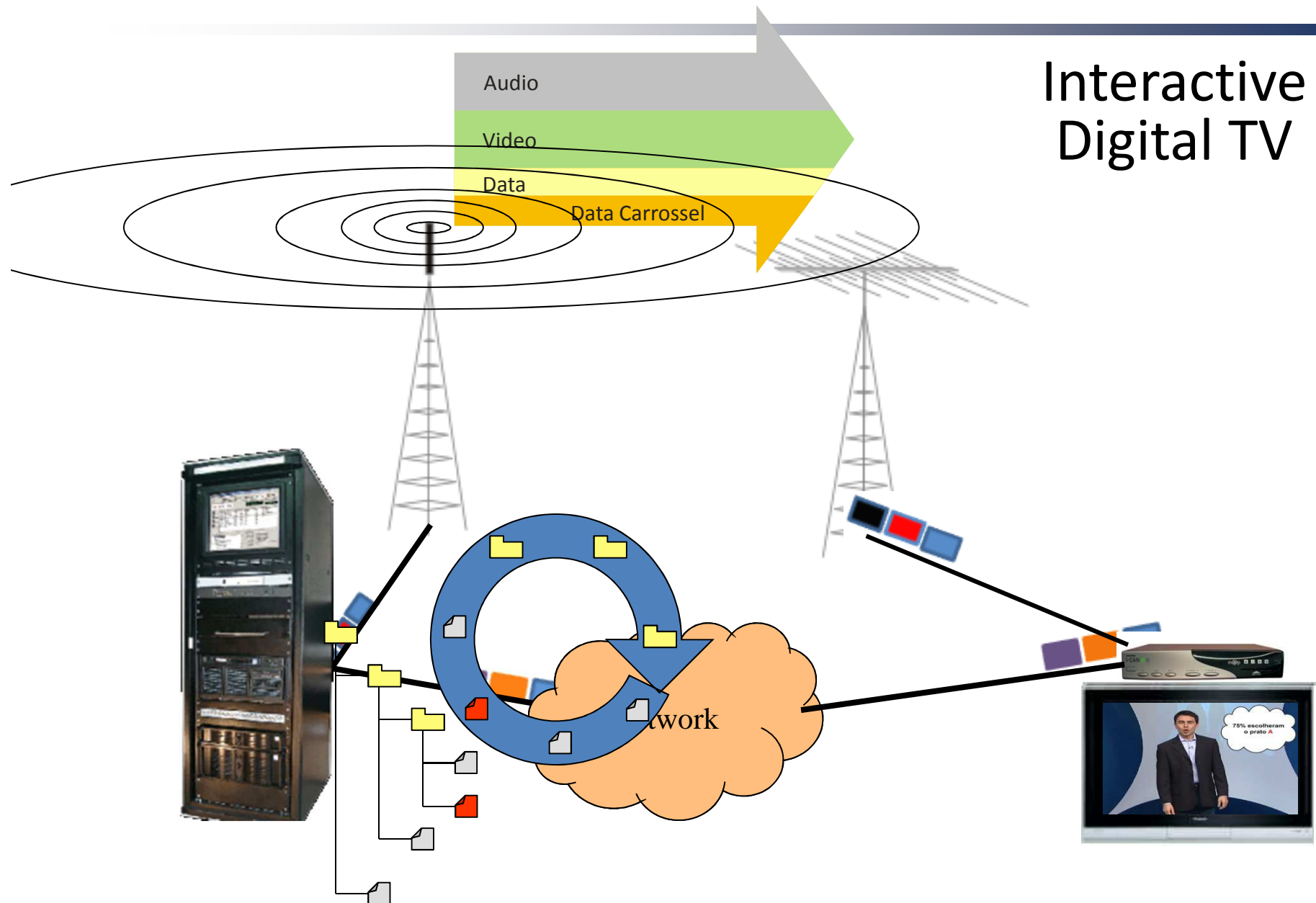


A photograph of a flooded landscape. In the foreground, there is a body of water with some green vegetation and debris floating in it. In the middle ground, several palm trees stand in the water, their trunks partially submerged. The background shows a line of trees and a clear sky. The text "4. The Brazilian Digital TV" is overlaid on the image in a white, italicized font.

#### *4. The Brazilian Digital TV*



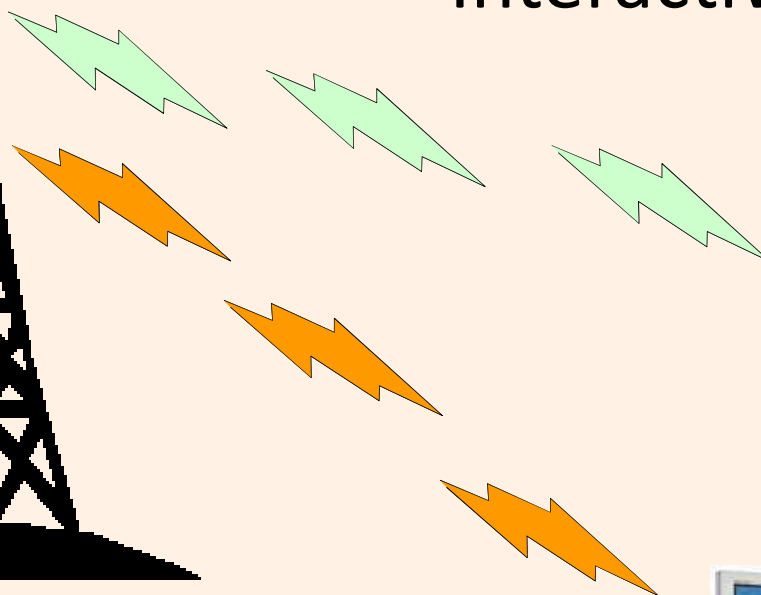
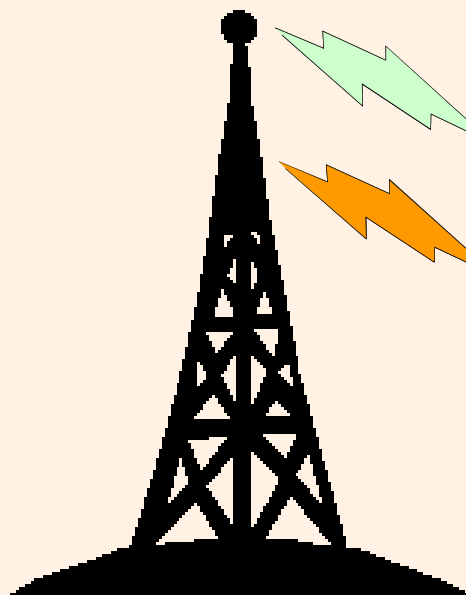
# *The Brazilian Digital TV*



# ***The Brazilian Digital TV***

Today

Interactive Digital TV

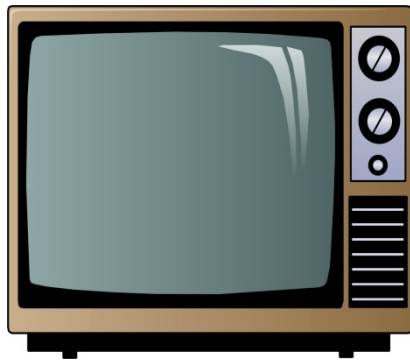
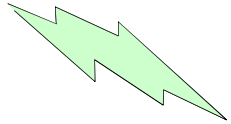


Digital

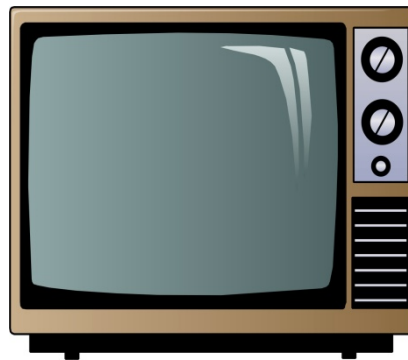
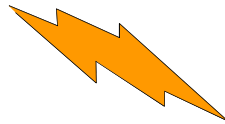


# ***The Brazilian Digital TV***

## Interactive Digital TV

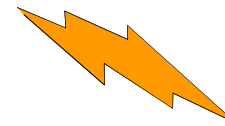


(Passive)



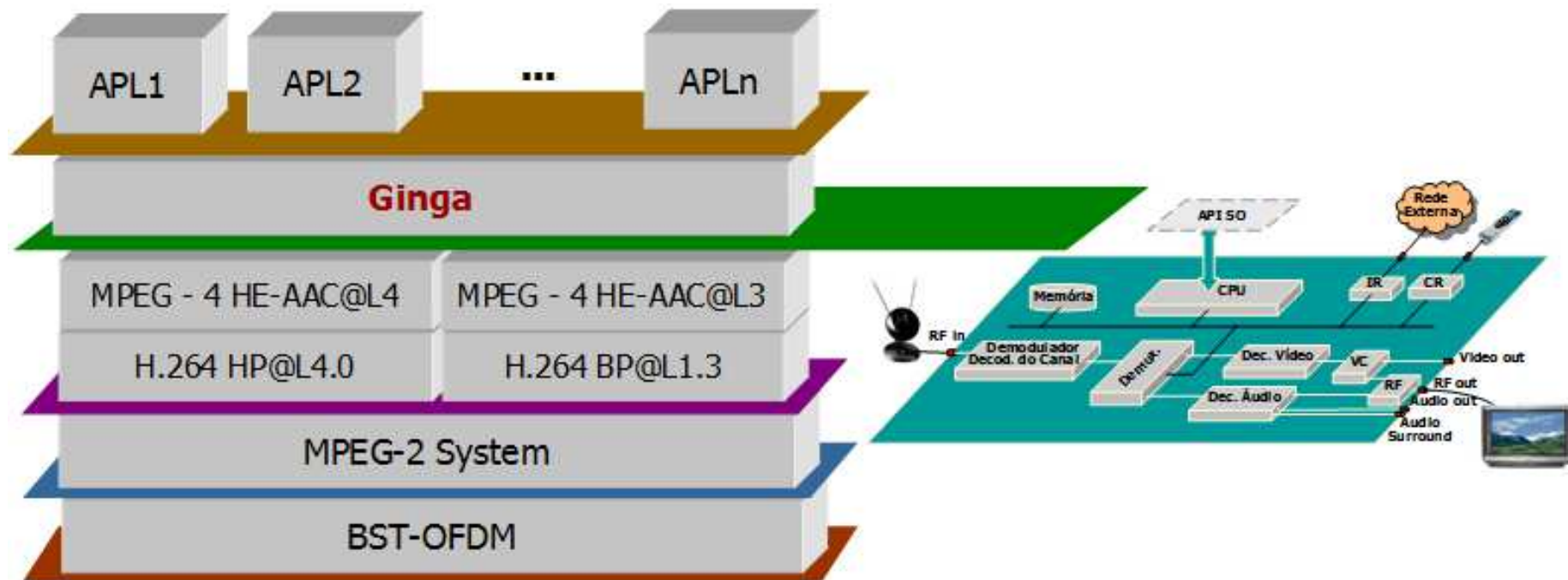
(Passive)

(Active)



(Active)

# Architecture of the Brazilian Digital TV



**GINGA**, a recommendation H.761 of the **International Telecommunications Union** (ITU-T).

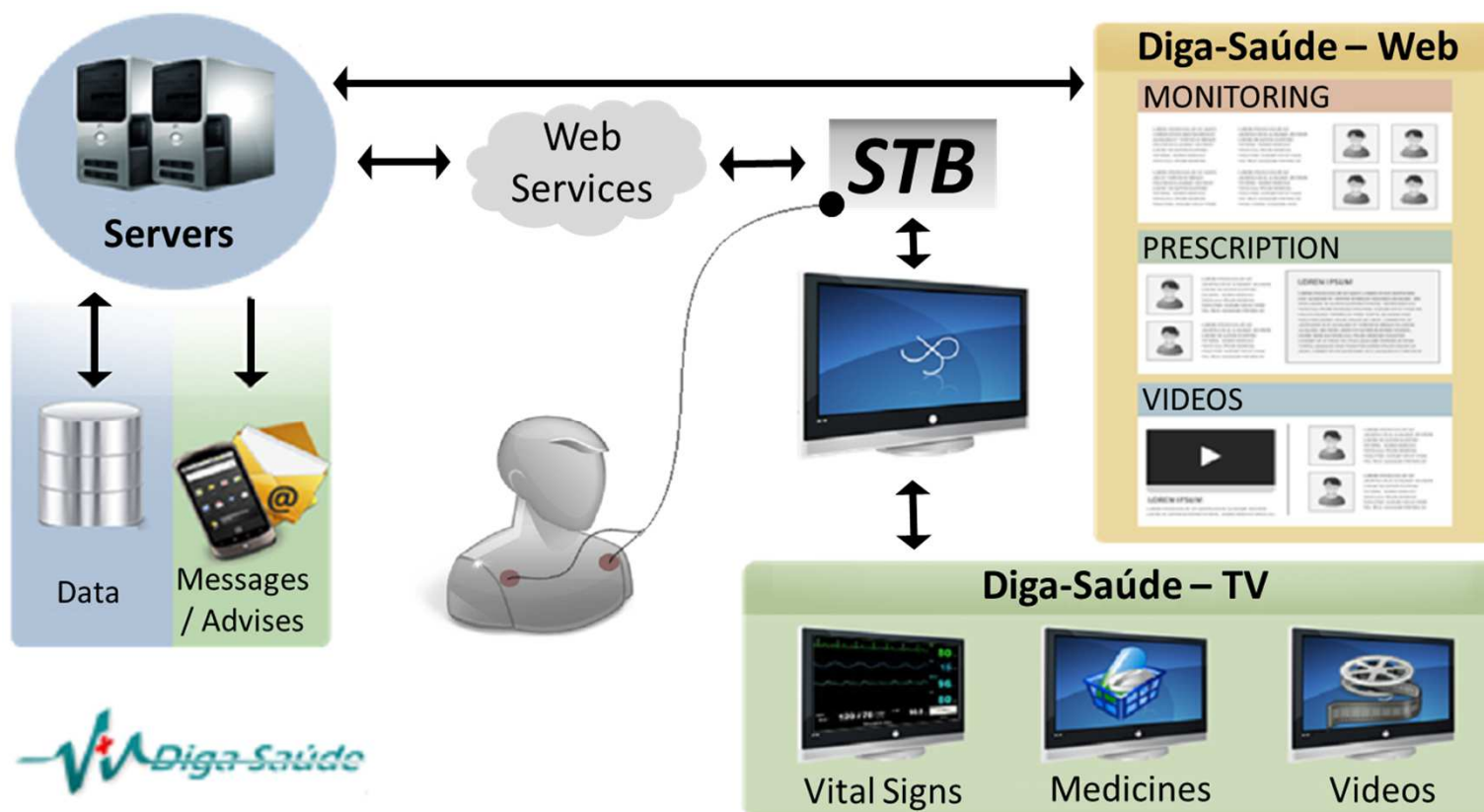
# ***The Brazilian Digital TV***

Coockle	97,7%
<u>Television</u>	<u>95,7%</u>
Refrigerator	86,7%
Mobile phone	61,2%
Telephone	54,0%
Microcomputador:	16,91%
<u>Internet access</u>	<u>18,08%</u>

**Don't forget that a set top box is  
a Jonh Von Neumann architecture  
It's a COMPUTER !**



# Overview of Diga-Saúde



A photograph of a flooded landscape, likely a coastal area, with numerous palm trees standing in shallow, blue water. The water reflects the sky and the trees. In the foreground, there are some green, leafy plants. The text "5. Conclusion" is overlaid in the lower right quadrant of the image.

## ***5. Conclusion***

# The LARIISA project will be applied to the **SUS**, The brazilian public health system

## ACADEMIC RESULTS

- 10 Master of Science
- 12 papers
- 03 research projects

## INOVATION ASPECTS

- A Proof of Concept of the LARIISA Applications is being implemented by the TI companies in Brazil
- The LARIISA Data Acquisition prototype is held by the COELCE (Electricity Company of Ceará State – Brazil)





**MUITO OBRIGADO**