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Networking, Application & Services

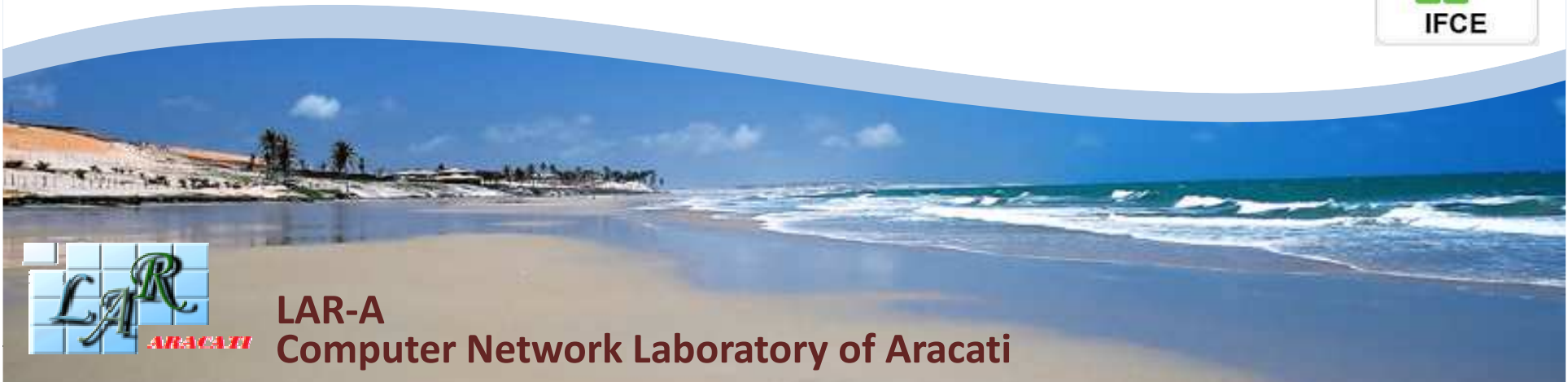


***Towards a Cost-Effective Homecare for  
a Caregiver Assistance System in Brazil***

**MAURO OLIVEIRA**



**LAR-A**  
**Computer Network Laboratory of Aracati**



# Team working on this project

## *Towards a Cost-Effective Homecare for a Caregiver Assistance System In Brazil*

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**coelce**

uma empresa **endesa brasil**



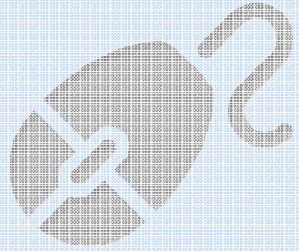
# Summary

- 1. Contextualization*
  - 2. Application Scenario*
  - 3. Brazilian Digital TV*
  - 4. LARIISA Project*
  - 5. Prototype*
- Conclusion*

A photograph showing 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 blue sky. The text "1. Contextualization" is overlaid on the image in white, bold, italicized font.

# ***1. Contextualization***

# CONTEXTUALIZATION



## Health System - *Information Era*

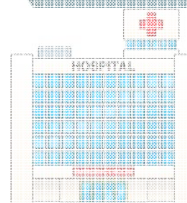
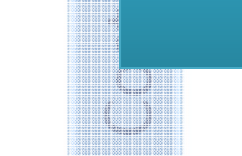
Based on Disease PREVENTION

Encouraged



Primary  
Health Care

# Decentralization of Public Health System



Hospital (specialists)

Discouraged

Fonte: K. Jennings, K. Miller, S. Materna (1997)

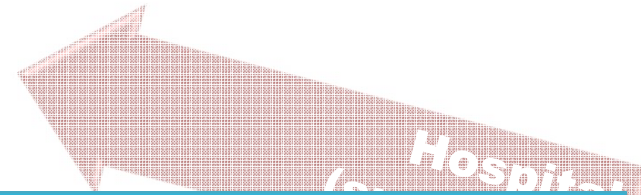


CONTEXTUALIZATION → PROBLEM

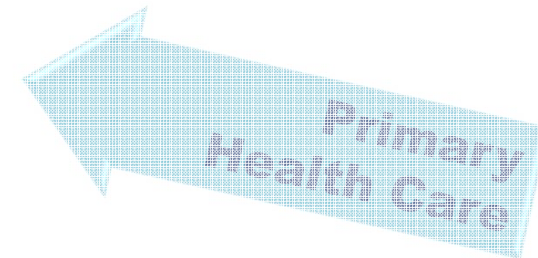


Manag

# Increasing Complexity of Health Management for Decision-making

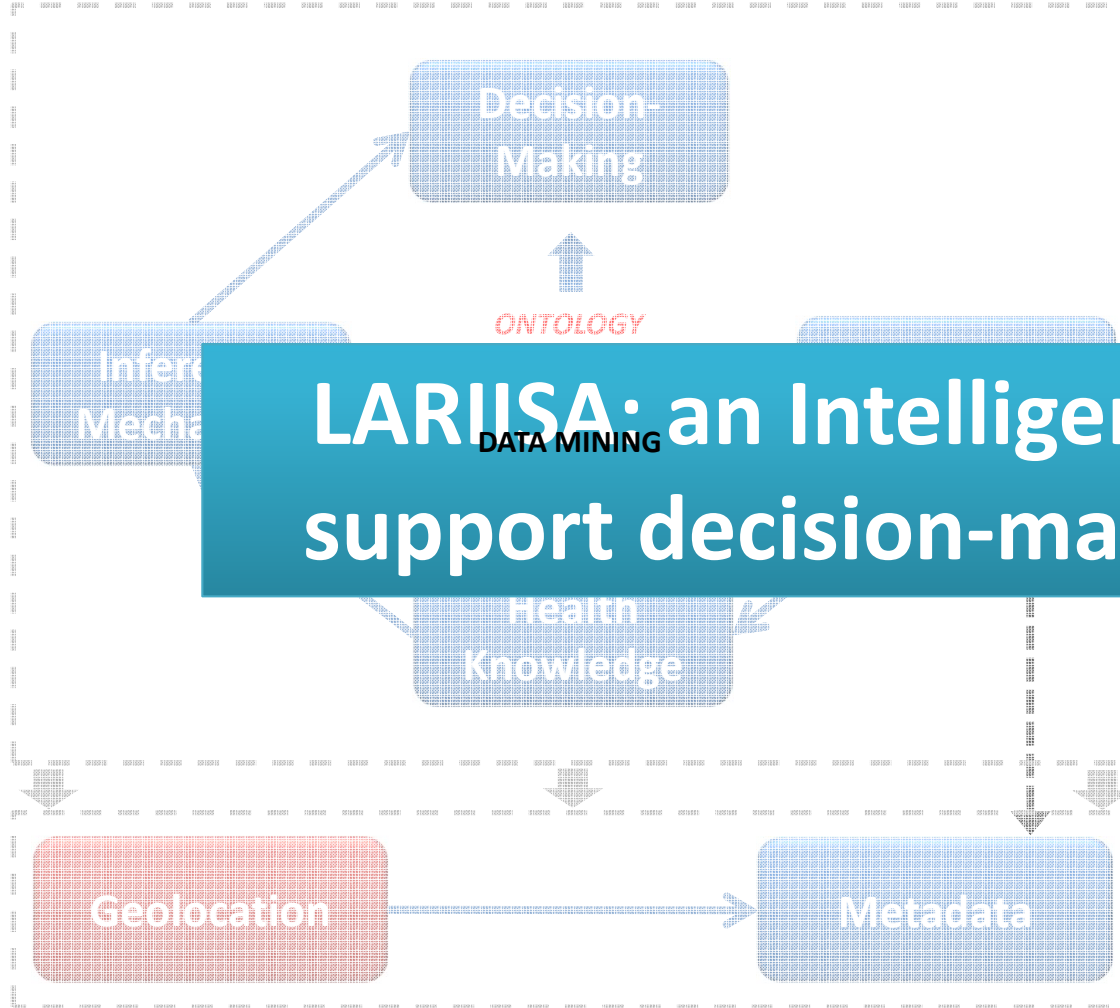


Data Acquisition

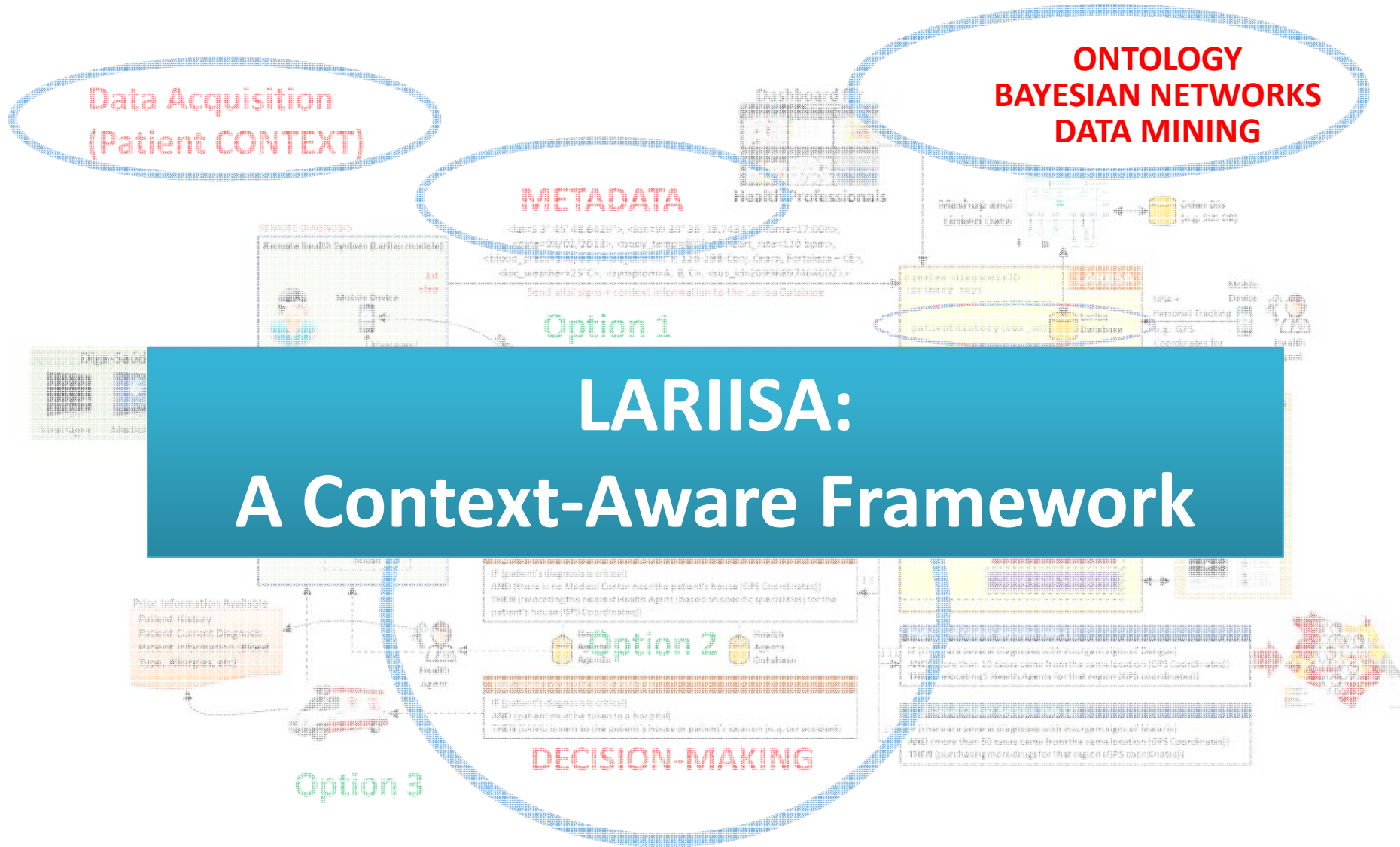


# CONTEXTUALIZATION → PROBLEM → SOLUTION

## CONTEXT-AWARE FRAMEWORK



# LARIISA's Scenario: a context-aware framework





A photograph showing 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 blue sky. The text "2. Application Scenario" is overlaid on the image in white, italicized font.

## *2. Application Scenario*

# Scenario for LARIISA Application

**CAREGIVER** - an unpaid or paid person who helps another individual with an impairment with his or her activities of daily living.

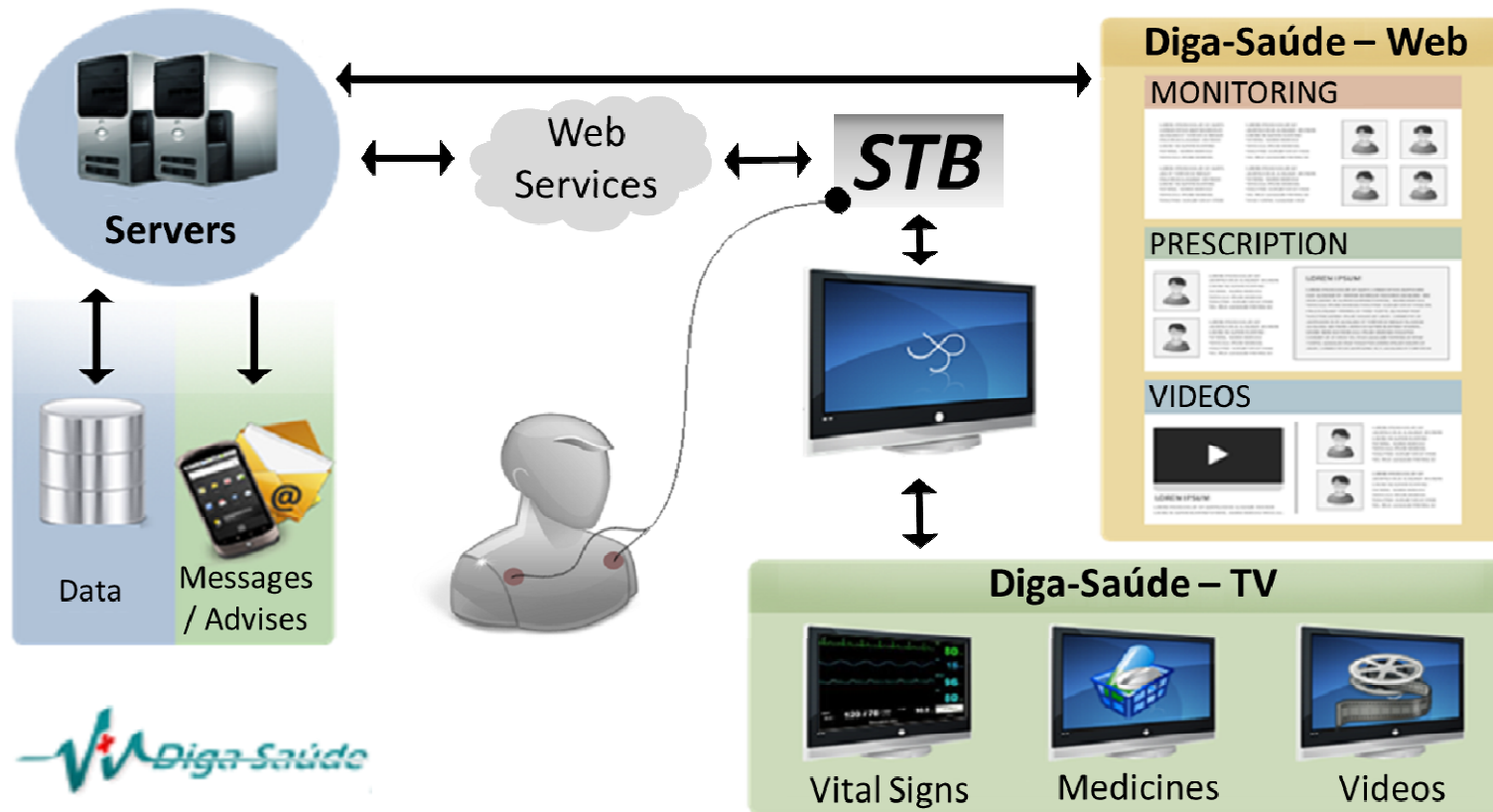


**LARIISA can help  
Specialized person**

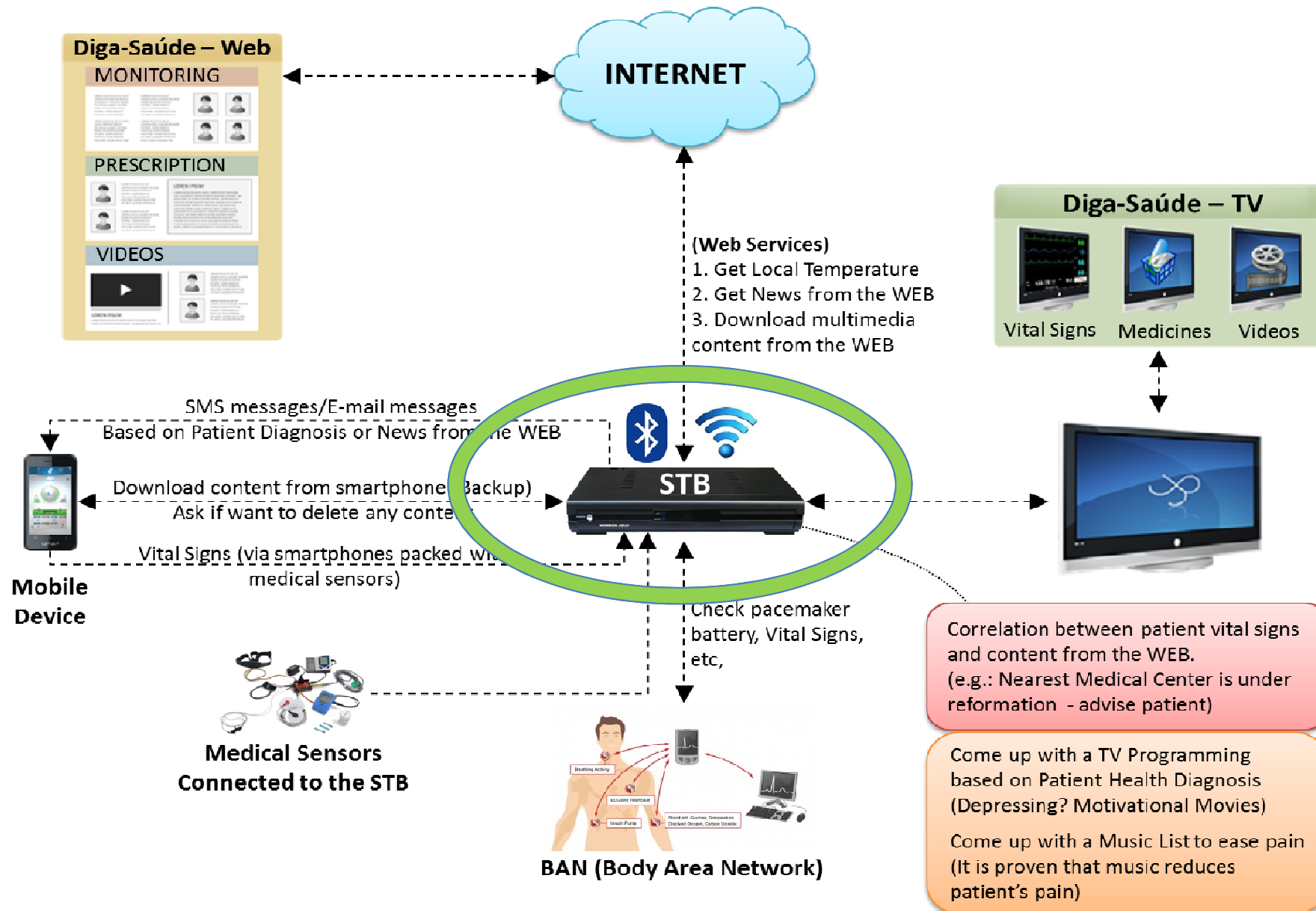


**Or NON specialized person**

# Data acquisition - CONTEXT



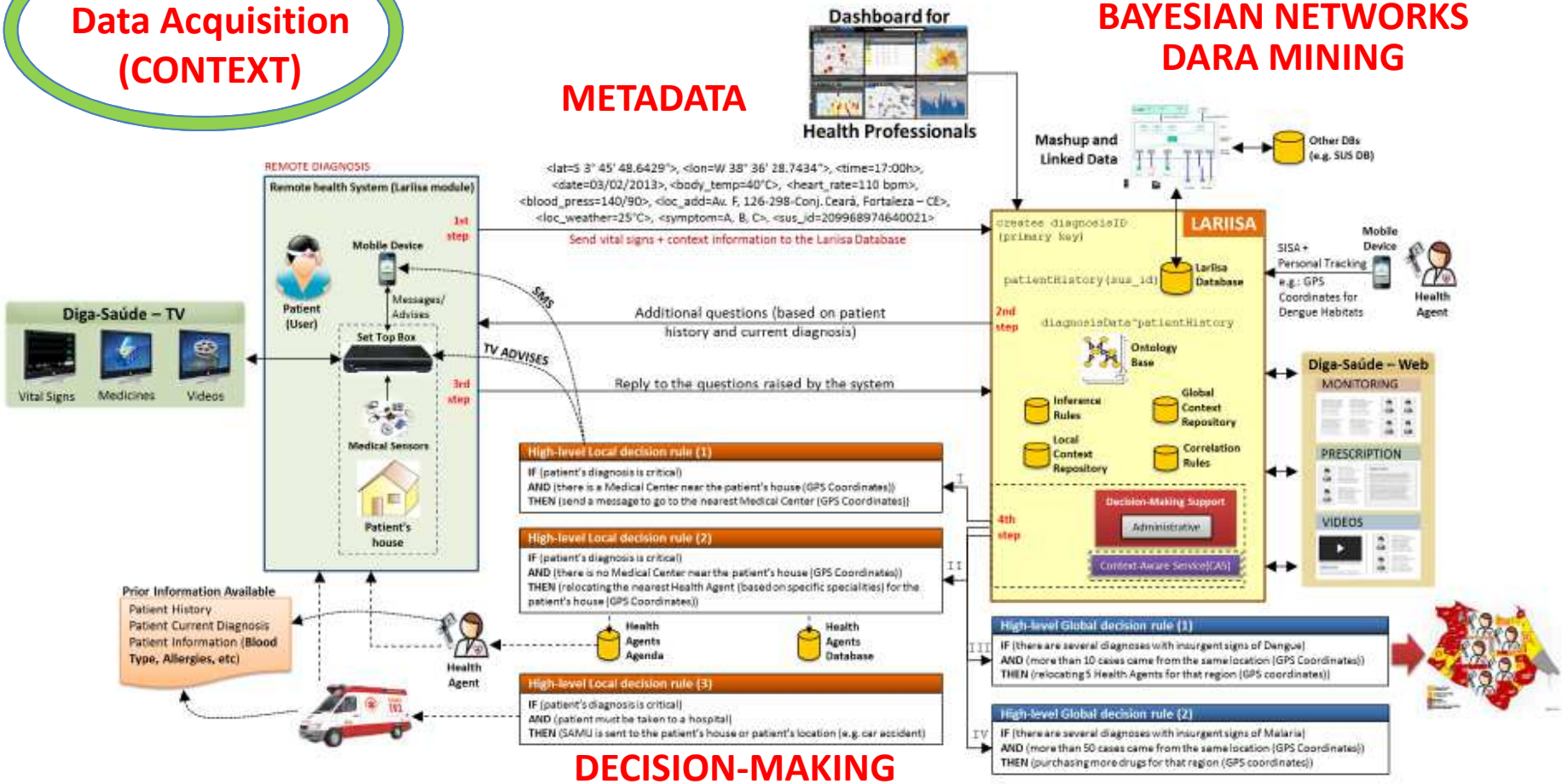
# LARIISA Data Acquisition



# LARIISA: Next Generation

**Data Acquisition  
(CONTEXT)**

**ONTOLOGY  
BAYESIAN NETWORKS  
DARA MINING**





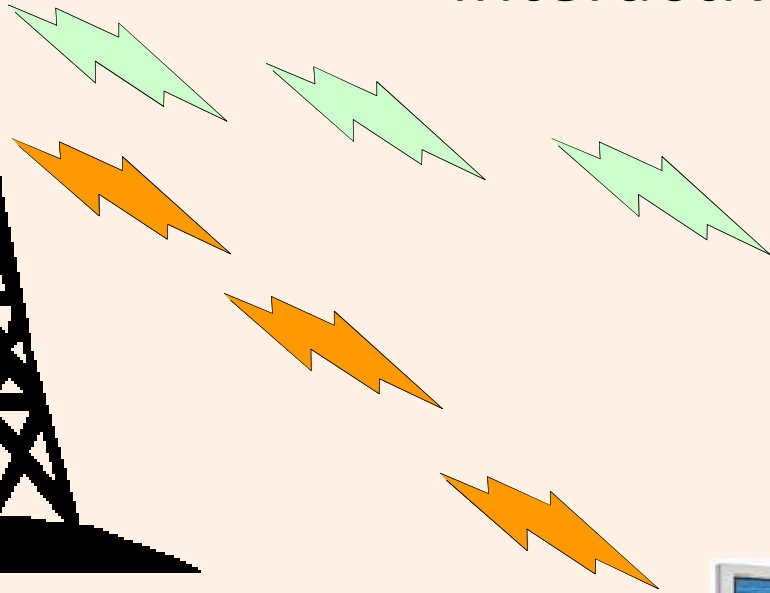
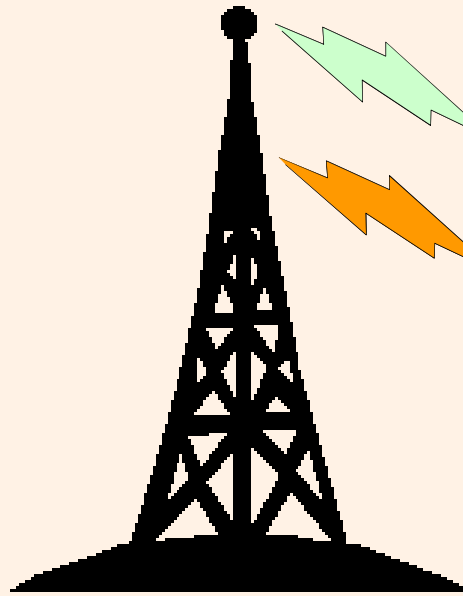
A photograph of a flooded landscape. In the foreground, there is a body of blue water with some green vegetation floating on the surface. In the middle ground, several tall palm trees stand in the water, their trunks partially submerged. The background shows a dense line of palm trees under a clear blue sky. The overall scene suggests a coastal or tropical area affected by flooding.

***3. The Brazilian Digital TV***

# The Brazilian Digital TV

Today

Interactive Digital TV

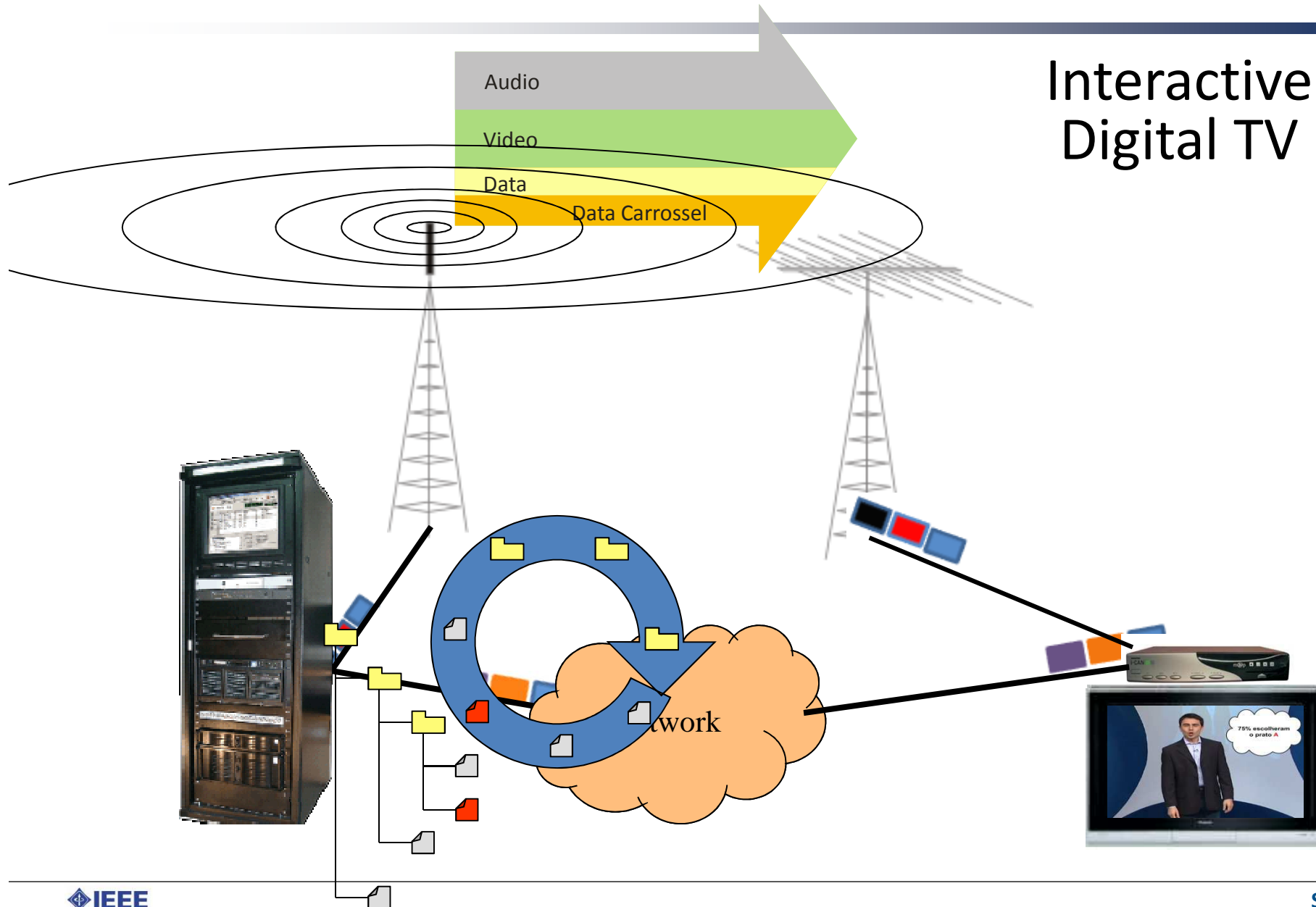


Digital



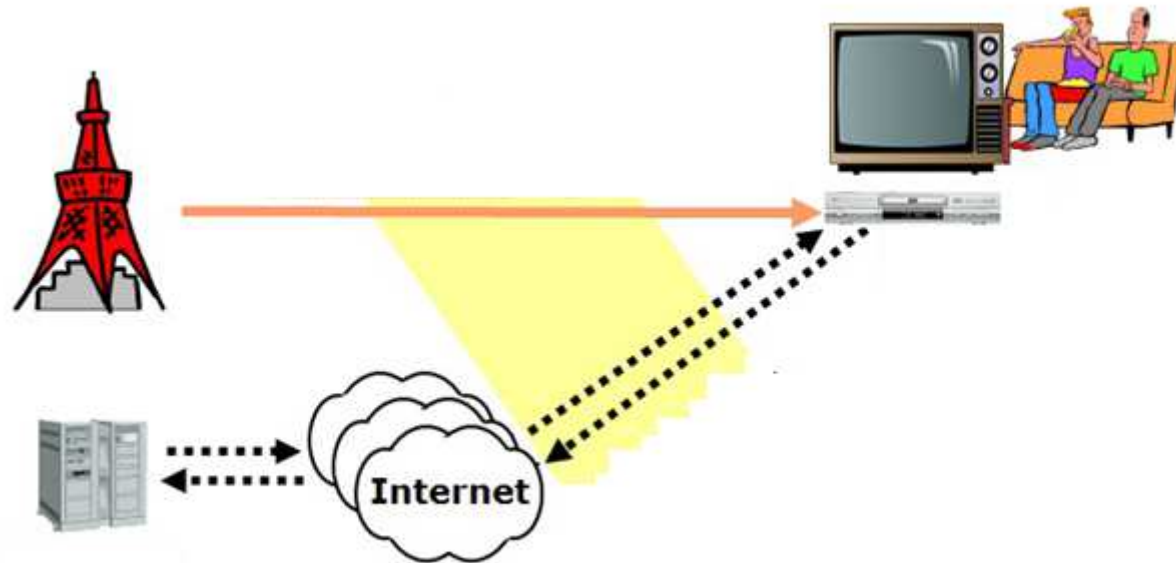
# 1. MOTIVATION

## Interactive Digital TV

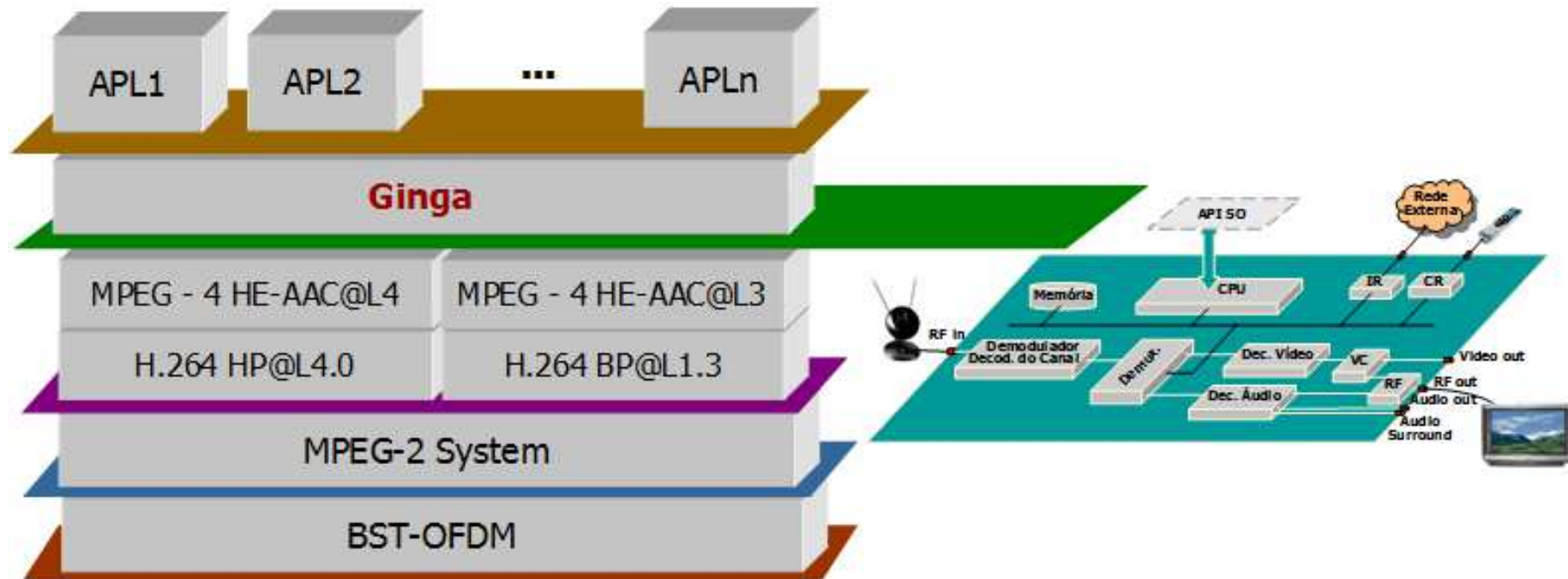


# *The Brazilian Digital TV*

## Interactive Digital TV



# Architecture of the Brazilian Digital TV



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



A photograph showing a flooded area with several palm trees standing in the water. The water is a deep blue color, and the sky is a clear, light blue. In the foreground, there is some green vegetation. The text "4. LARIISA Project" is overlaid on the image in white, bold, italicized font.

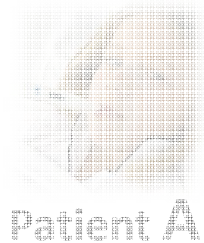
***4. LARIISA Project***

# LARIISA: a Context-Aware Framework

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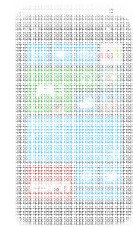
# LARIISA: a Context-Aware Framework



Information: **lat**=S 2° 22' 32.9483", **lon**=W 34° 33' 21.4657" on March 24th, 2013 at 3:00PM. **Body temperature**=37°C, **Heart rate**=90 bpm, **Blood pressure**=120/80. **Address**= Av. da Sé, n° 227, Conj. Palmeiras, Fortaleza – CE. **Local Temperature**=32°C. **Symptoms**=Chills, Diarrhea.



Information: **lat**=S 3° 45' 48.6429", **lon**=W 38° 36' 28.7434" on March 24th, 2013 at 3:00AM. **Address**= Av. C, 102-223 Conj. Ceará, Fortaleza – CE. **Local Temperature**=29°C. **Comment**= Dengue Habitat.



## Who is the patient? Are Data Structured?

### Dengue (Local Context)

The photo IMG001 was taken at **lat**=S 3° 45' 48.6532", **lon**=W 38° 36' 28.7332" on February 2nd, 2013 at 3:00AM. **Address**= Av. C, 102-223 Conj. Ceará, Fortaleza – CE. **Local Temperature**=29°C. **Comment**= Dengue Habitat.

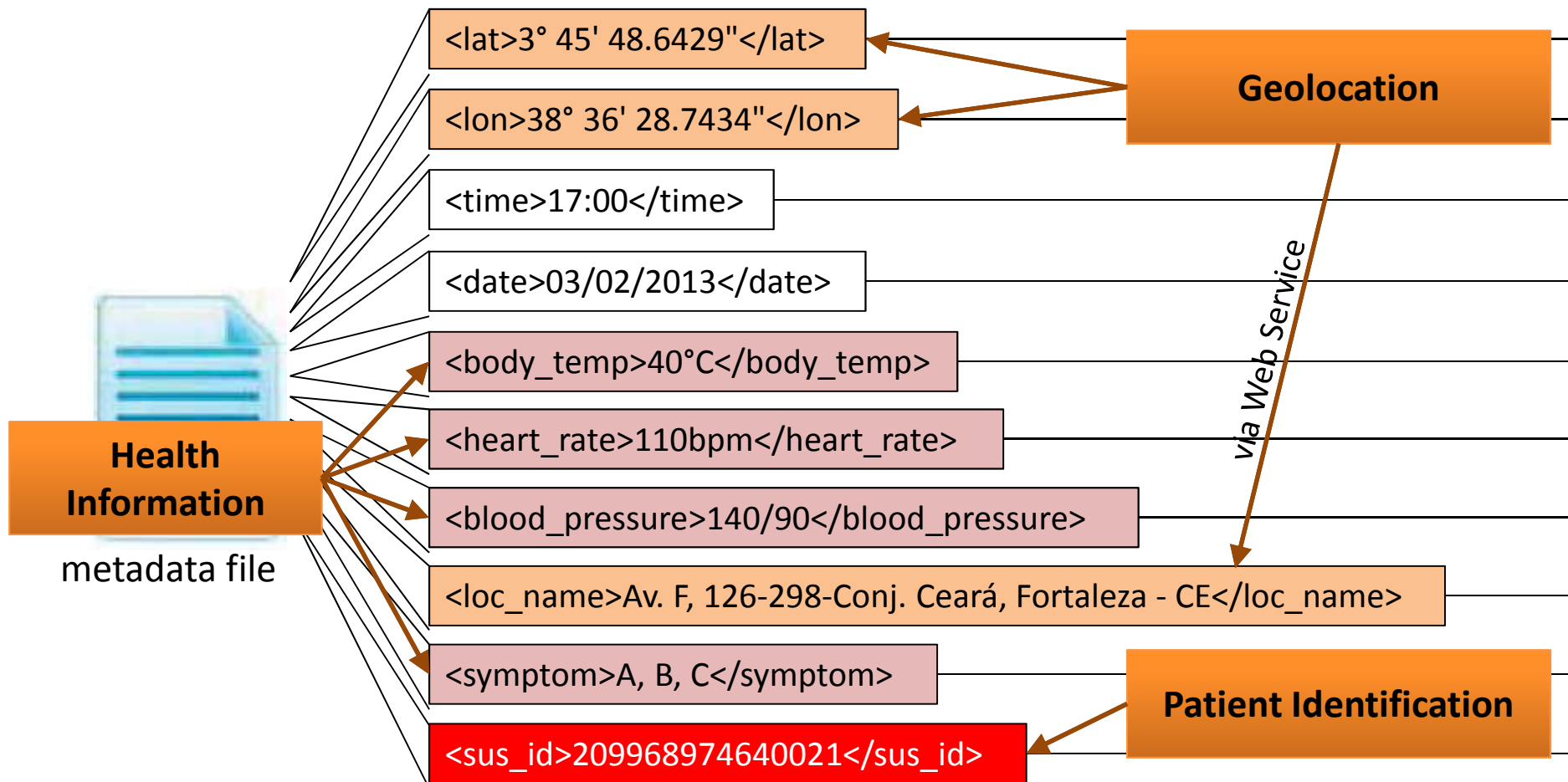


Health Agent

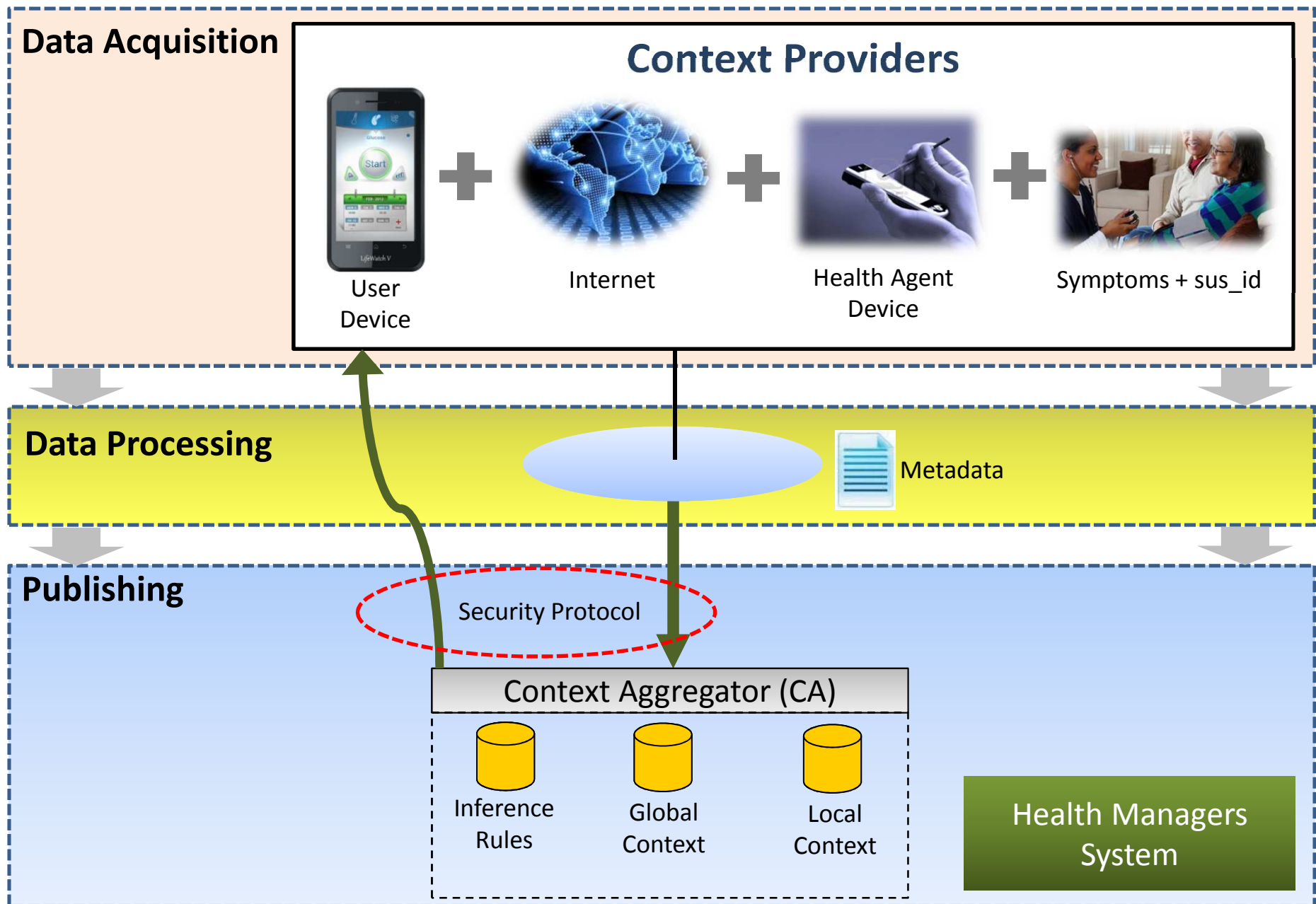
Relocating a health agent for the Patient B's house

# Building a metadata file

<lat=S 3° 45' 48.6429">, <lon=W 38° 36' 28.7434">, <time=17:00h>, <date=03/02/2013>, <body\_temp=40°C>, <heart\_rate=110 bpm>, <blood\_press=140/90>, <loc\_add=Av. F, 126-298-Conj. Ceará, Fortaleza – CE>, <loc\_weather=25°C>, <symptom=A, B, C>, <sus\_id=209968974640021>

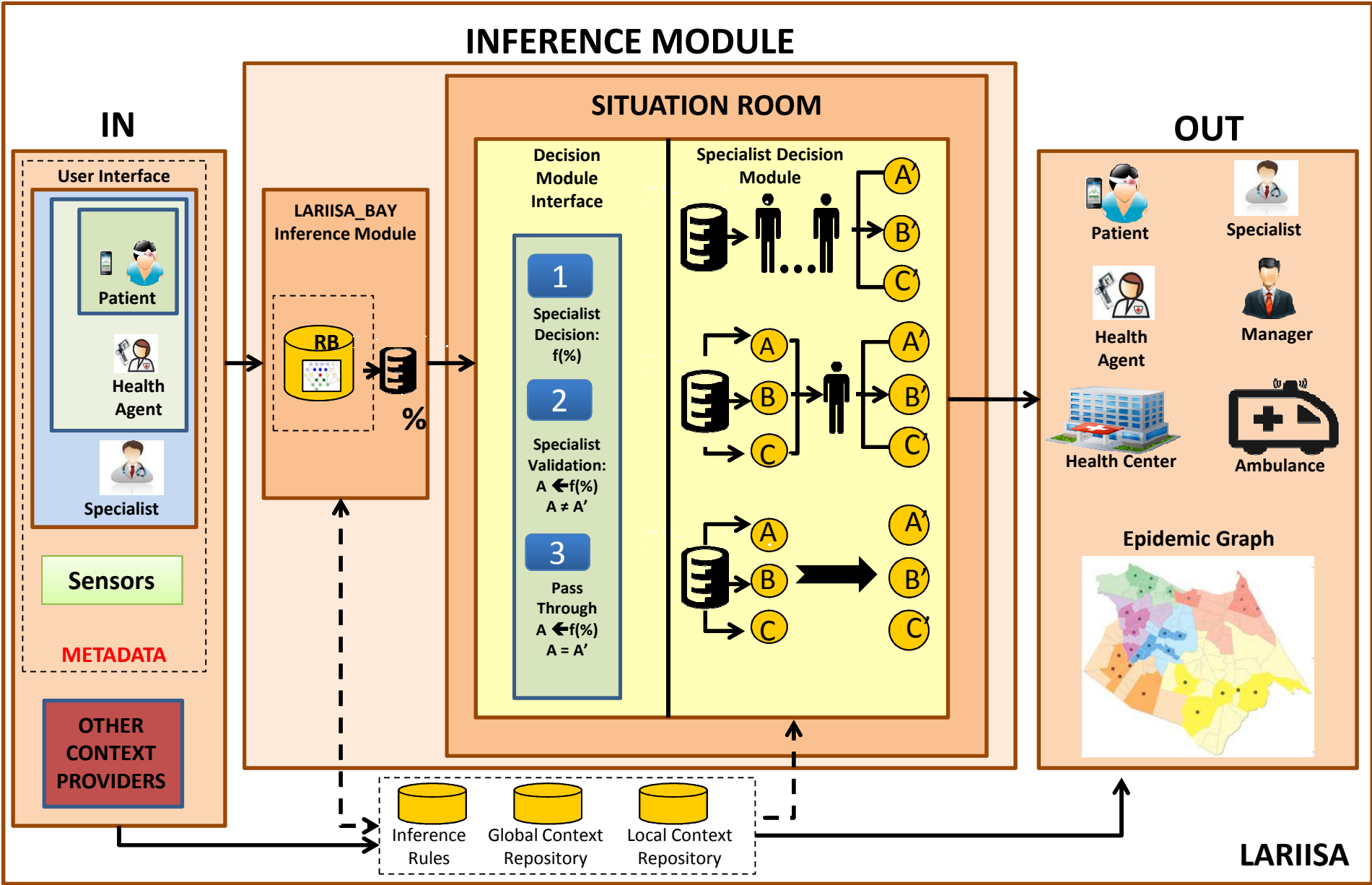


# LARIISA's Architecture: a context-aware framework





# LARIISA: Functional Diagram



A photograph showing a flooded area with several palm trees standing in the water. The water is a deep blue color, and the sky is a clear, light blue. In the foreground, there are some green plants and branches. The text "5. Prototype" is overlaid on the image in a white, bold, sans-serif font.

***5. Prototype***

# LARIISA's Prototype

Data Acquisition  
(Patient CONTEXT)

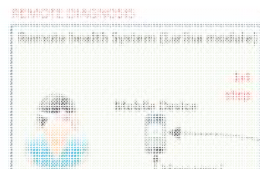
ONTOLOGY  
BAYESIAN NETWORKS

METADATA



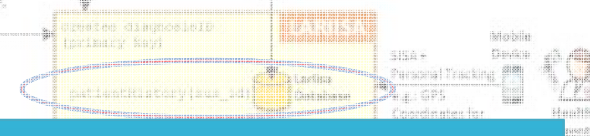
Mashup and  
Linked Data

Other DBs  
(e.g. GIS DB)



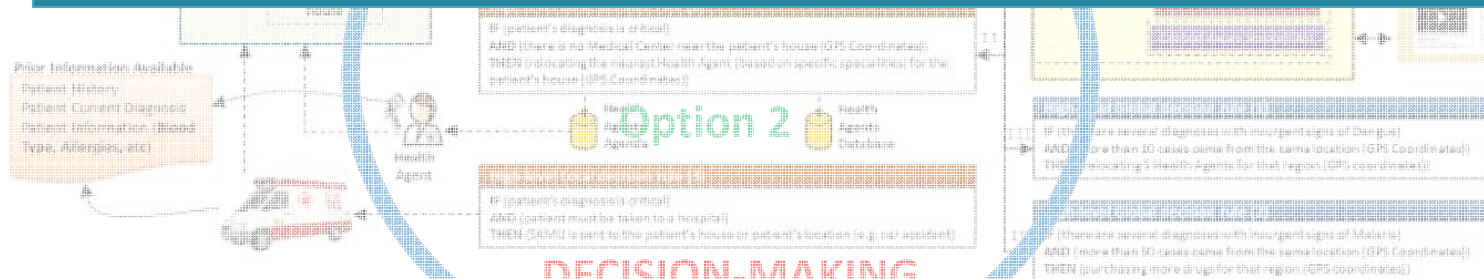
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<blood_press="140/90">, <loc_address="R. 126-200-Cont. Ceará, Fortaleza - CE">,  
<loc_weather="25°C", <symptoms="A, B, C">, <user_id="20000007060001">
```

Option 1

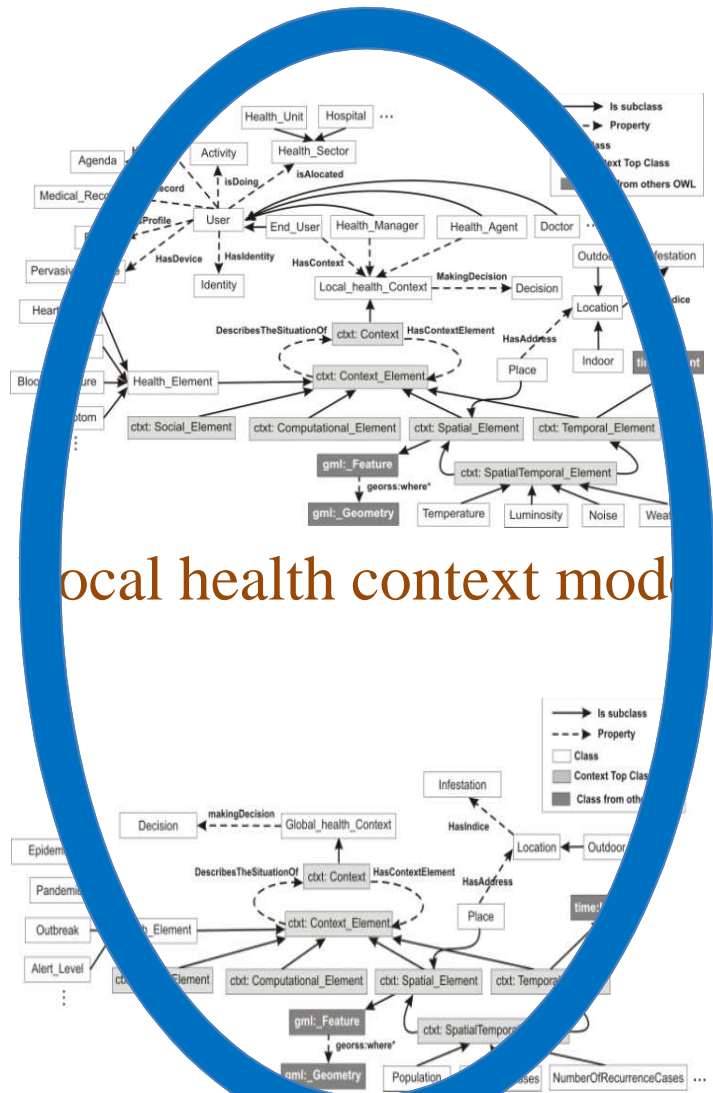


## LARIISA:

# A Context-Aware Framework

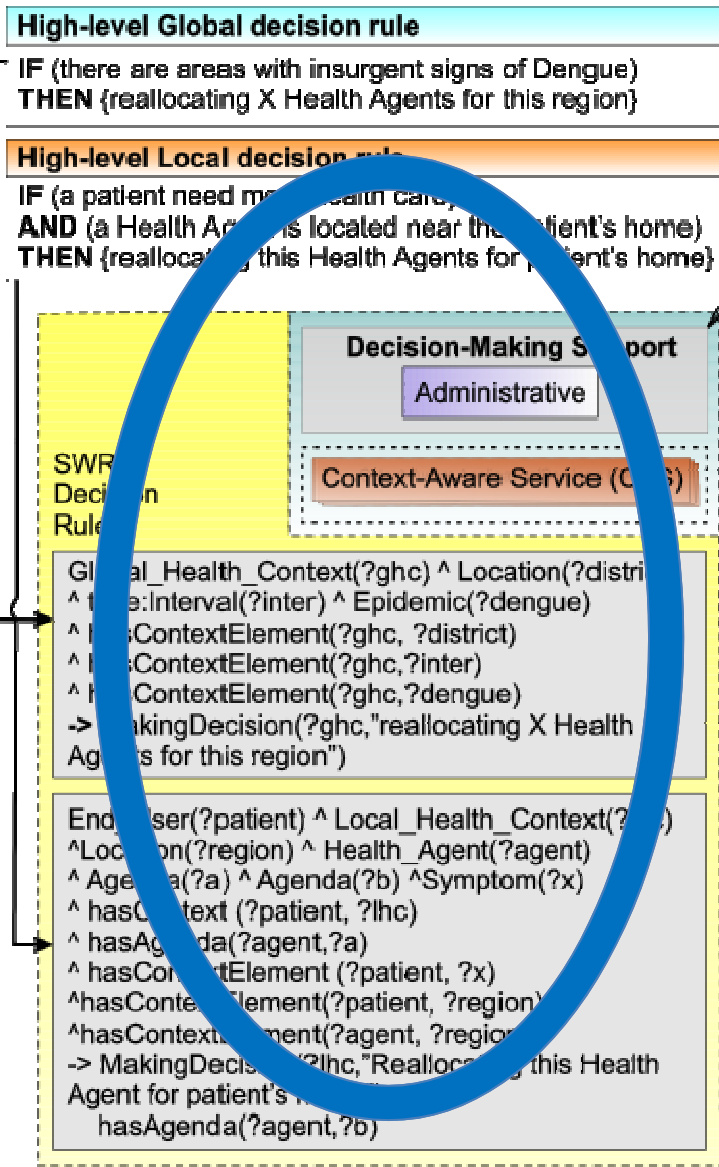


# Prototype: Dengue Fever Case Study

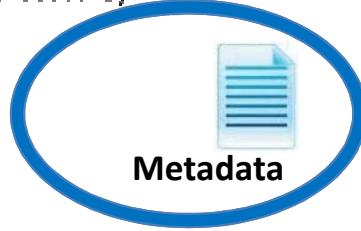
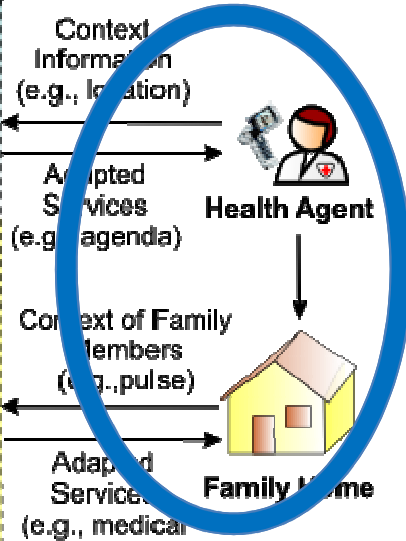


Local health context model

Global health context model

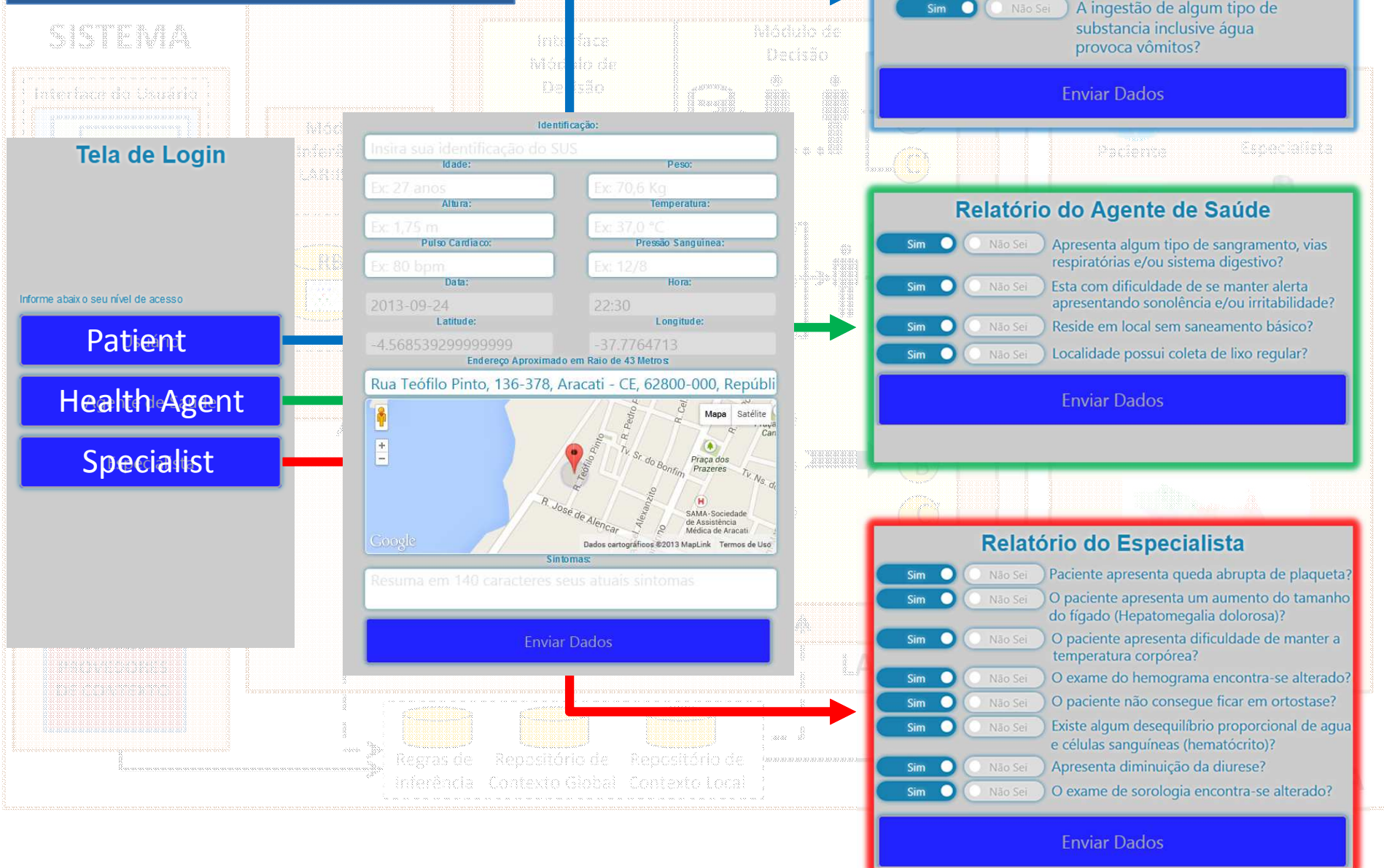


High-level decisions





# Screens of the proposed System





**Diga-Saude Prototype's Hardware**



A photograph showing a flooded area with several palm trees standing in the water. The water is a deep blue-grey color. In the foreground, there are some green, leafy plants. The sky is a clear, light blue. The word "Conclusion" is written in white, italicized font across the middle of the image.

*Conclusion*

# Sponsors

LARIISA project is being sponsored since 2004 by  
the **Science and Technology Ministry of Brazil** and others  
**Brazilian Research Agencies**

It will be applied to the brazilian public health system

**Diga Saude (FUNCAP)**

**SISA (FIOCRUZ)**

**LARIISA (IFCE)**

**GISSA (FINEP)**

**Next Saude (DATASUS / Min Saúde)**



Thank You!

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