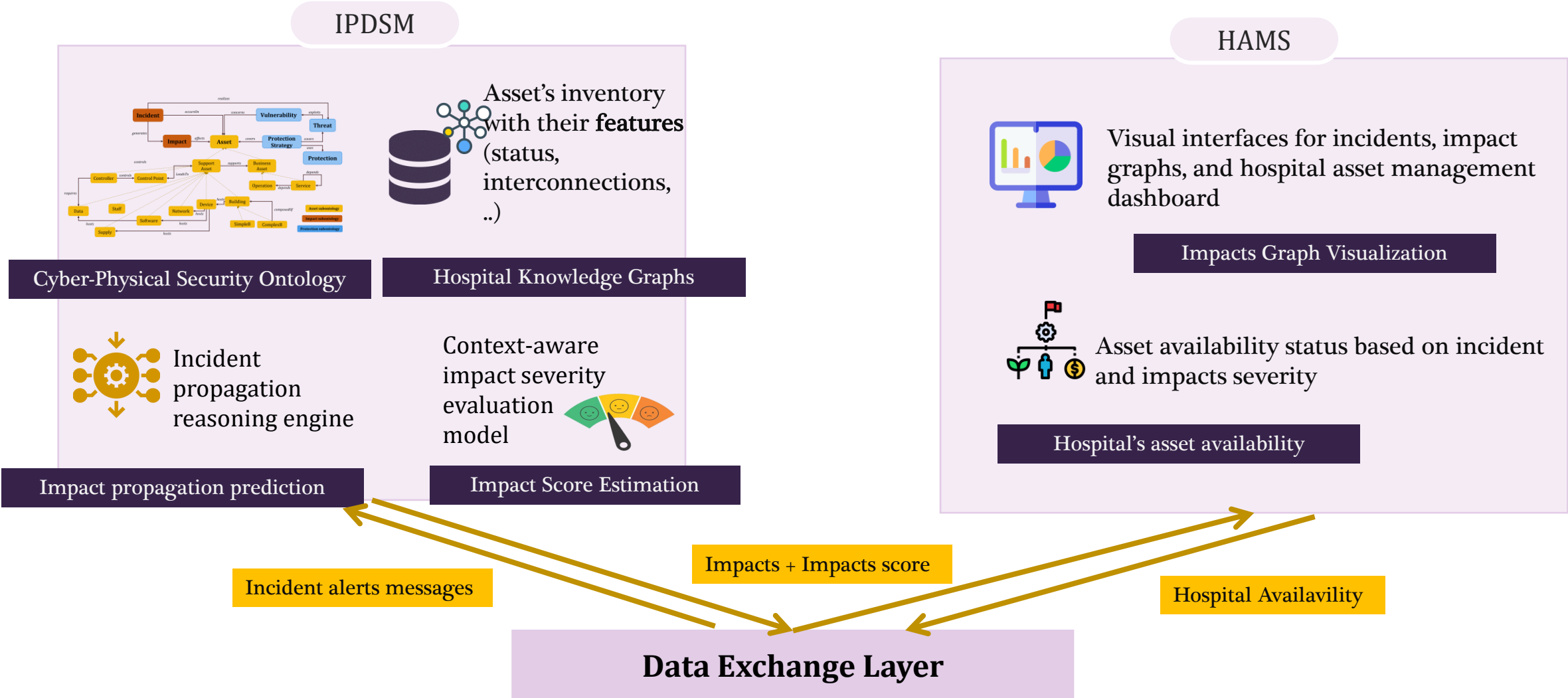


# Impact Propagation and Decision Support Module Hospital Availability Management System IPDMS-HAMS

 CNAM (CEDRIC-ISID)  
and LINKS Teams

# IPDMS and HAMS

IPDMS and HAMS are two modules among the SAFECRE global solution. All modules communicate through the Data Exchange Layer.



## Security attack Scenario

Attack purpose

Cyber-physical attack targeting the air-cooling system of the hospital



### Consequences:

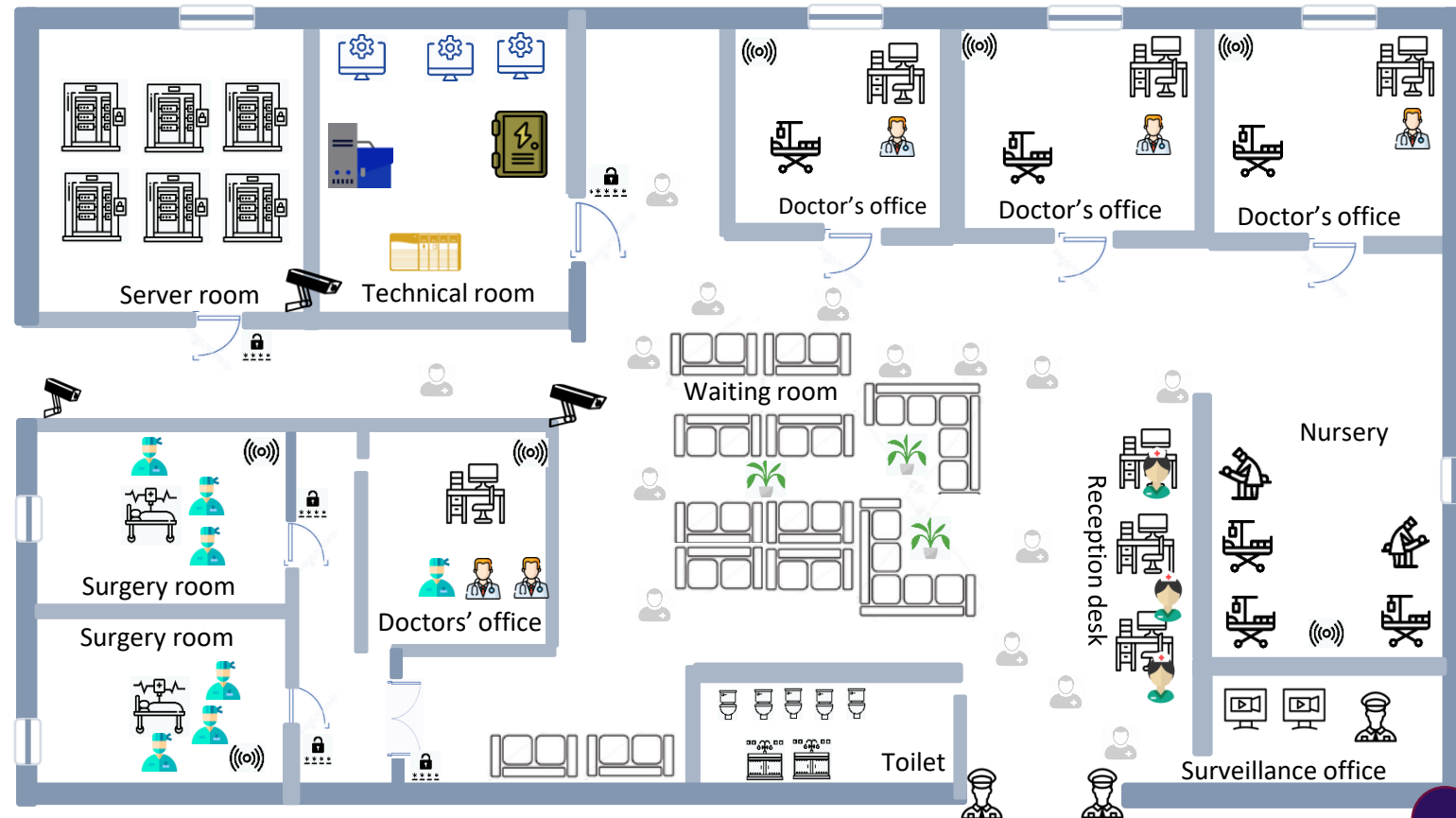
High temperature in surgery rooms

Data centers crash

Information system unavailability

Impact on emergency patients' health

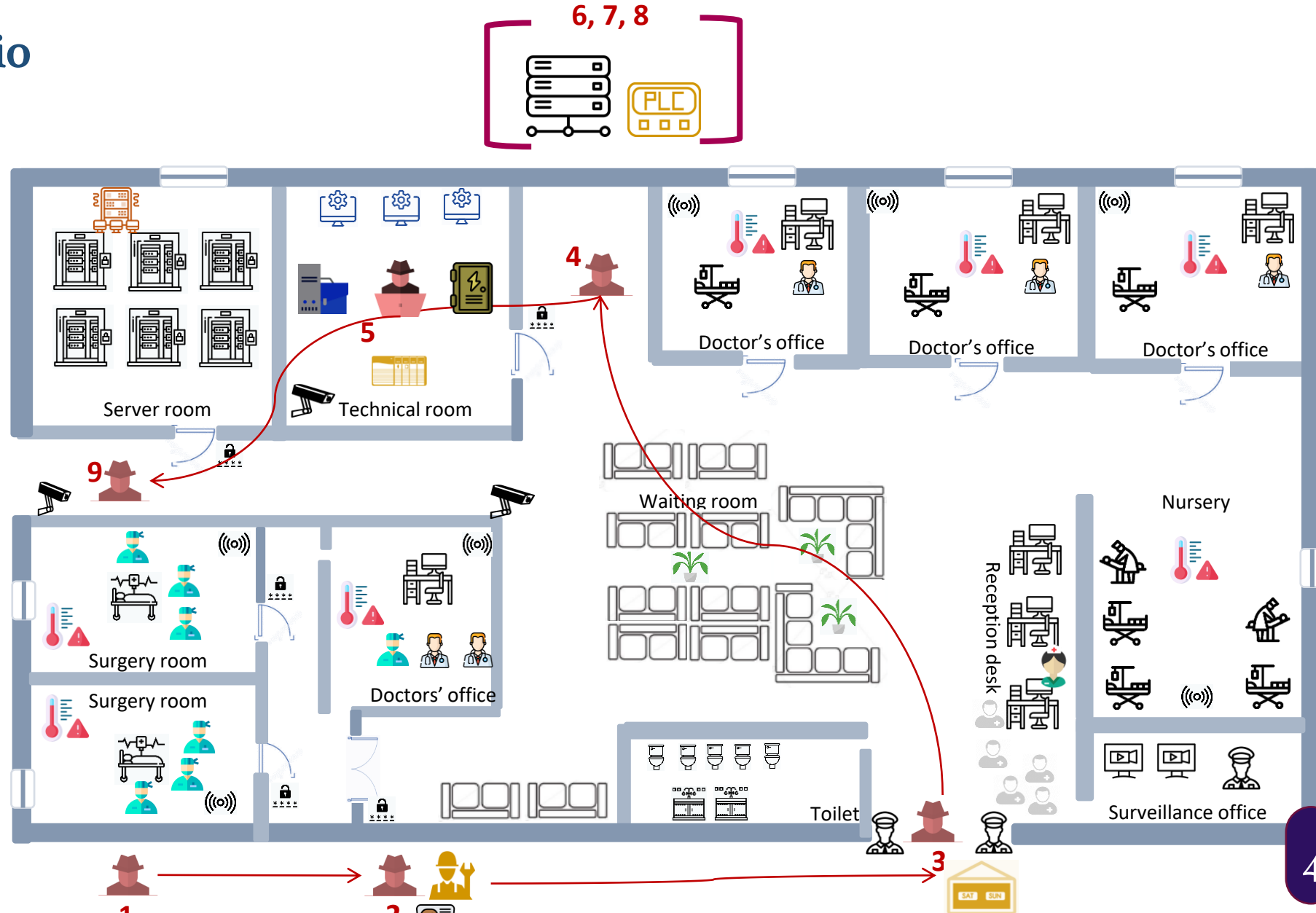
Damage to the reputation of the hospital



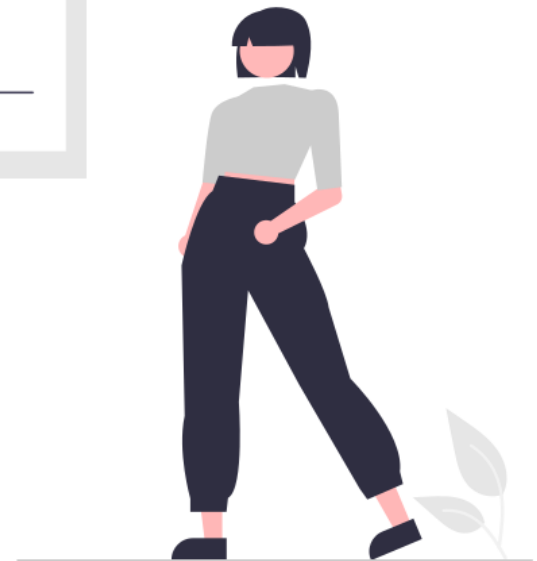
Physical architecture

## Security attack Scenario

- 1: Social engineering
- 2: Maintainer badge theft
- 3: Access the hospital outside opening hours
- 4: Access the technical room using the attacker badge
- 5: Attacker laptop connection to the network, execute a virus
- 6: Network scan, PLC identification
- 7: Increasing PLC temperature setpoints
- 8: Network denial of service



[Link to Demonstration](#)



**SAFE CARE**

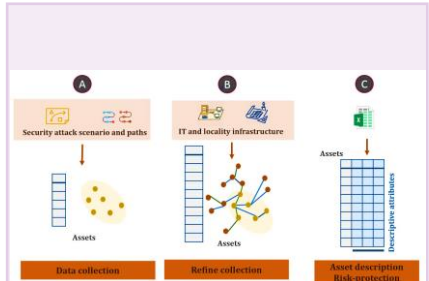
*Integrated cyber-physical security for health services*

le cnam

FONDAZIONE  
**links**  
PASSION FOR INNOVATION

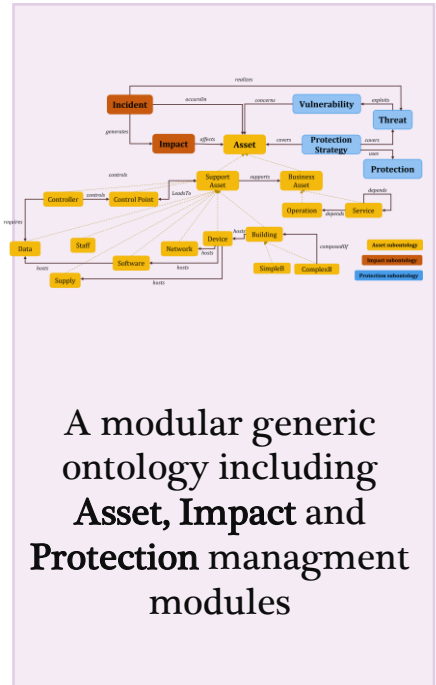
**Thank you**

# CNAM Contributions



Unified knowledge acquisition methodology to capture cyber physical security systems' data and business processes

Knowledge Acquisition Methodology



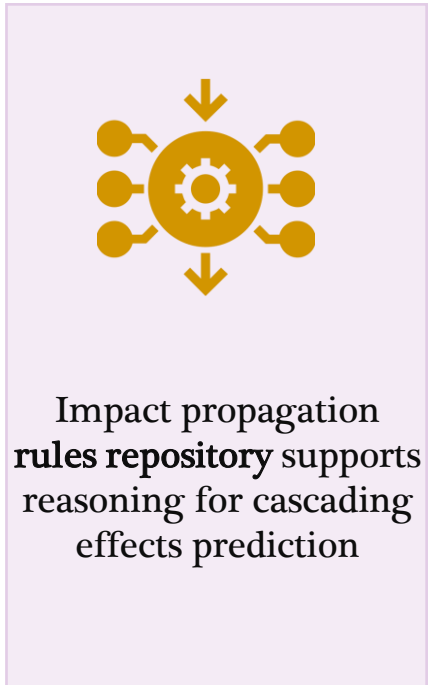
A modular generic ontology including **Asset, Impact and Protection** management modules

Cyber Physical Security Ontology



The knowledge graph contains asset's inventory with their **characteristics** (status, interconnections, ..) within a given hospital. for assets management

Hospital Knowledge Graph



Impact propagation **rules repository** supports reasoning for cascading effects prediction

Impact Propagation Prediction



A **context-aware** impact severity evaluation model.

Impact Score Estimation