NRG4CAST

ENERGY FORECASTING

EMENDER Workshop

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A system for the emergency management in energy network control rooms

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SEVENTH FRAMEWORK PROGRAMME

Overview

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- This paper presents the realization of a communication strategy for the operators of the energy network control room of Iren Group, to cope with some lacks and problems in their interactions.

- As the concrete result of this study, a mobile application for Android has been realized within the HoliDes Artemis EU-funded project.

Control rooms

- Control rooms are critical infrastructure that assure a constant monitoring of the working conditions of the energy network.

- They receive end users calls referring about malfunctions on the network and then dispatch the intervention requests to the proper technical team

Control rooms

- PROBLEMS
  - The present approach is time consuming for operators
  - The allocation of tasks is inefficient
  - Absence of any system able to automatically share, coordinate and collect the relevant information

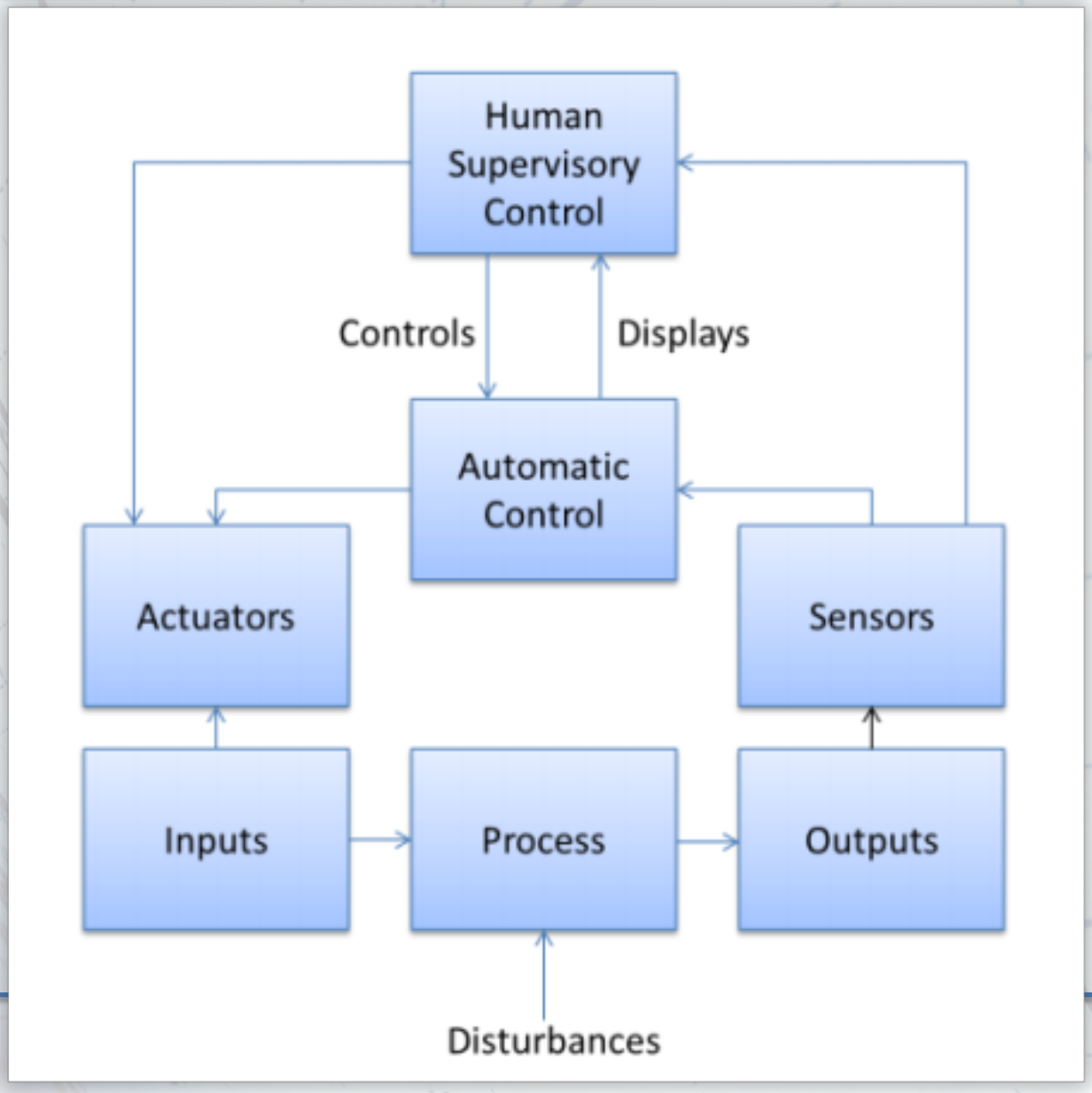
Control rooms

- To cover these lacks in the control room communication strategy, a so-called **AdCoS (Adaptive Cooperative HumanMachine System)** has been designed for
  - collecting and managing information to adapt the distribution of tasks according to a set of configurable criteria
  - providing available data to on field technicians
  - providing both the operators and the technicians on the field with historical records concerning the relevant infrastructure

The IREN AdCoS design

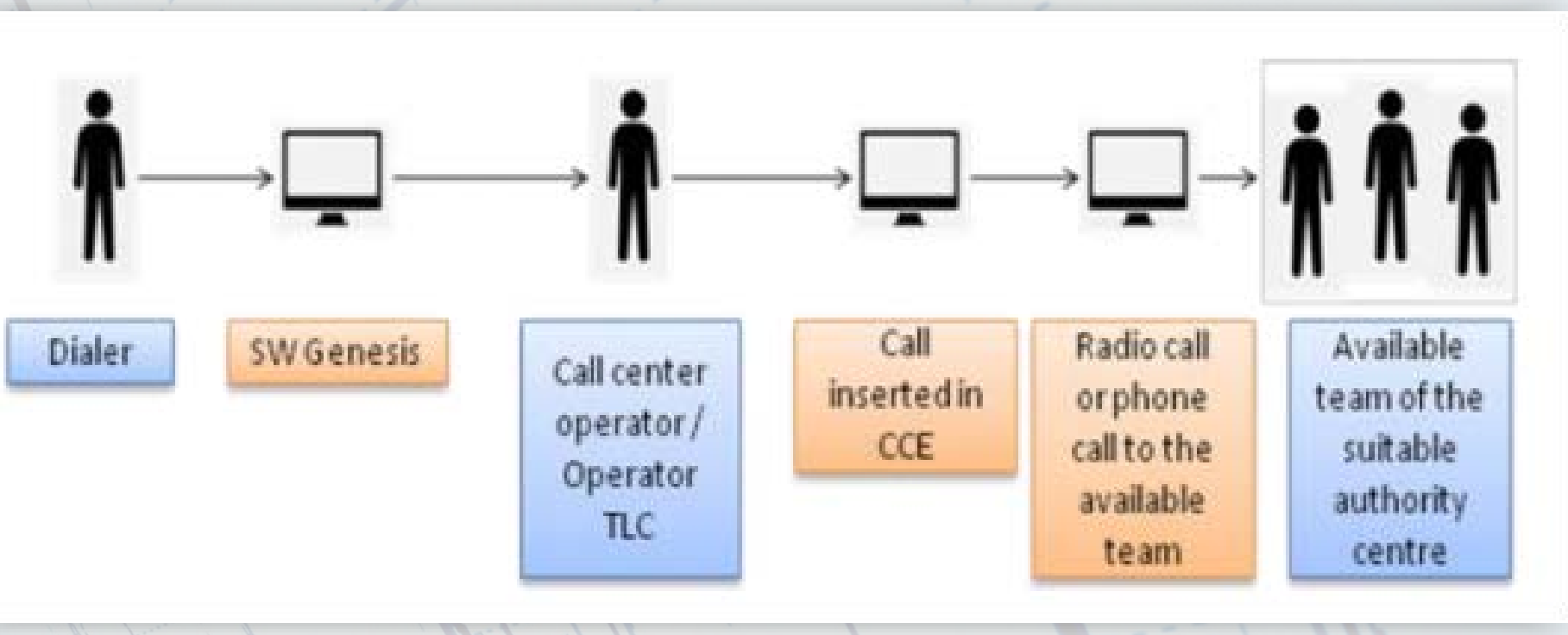
The AdCoS design refers to the control theory, where systems can be modelled as interrelated components that maintain the system's stability by feedback loops of information and control

The IREN AdCoS design



Basic control loop in the control rooms of modern process industries

The IREN AdCoS design



Environment of the Energy Network Control AdCoS

The IREN AdCoS design

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Source of information for monitoring

TECHNICIAN	*MALFUNCTION*
Shift rotation	Type (water, electricity, gas)
Night & holiday shift	Where
Working time	Historical data – malfunction lifecycle (first/second time)
Skills	Historical data – already applied solutions
Geographic area assigned for intervention	
Currently engaged (where, up to when)	

Factors making monitoring difficult for control room operators

TECHNICIAN	*MALFUNCTION*
Verify availability in terms of shift and working time	To verify if it occurred in the past and which solutions where applied by whom.
To be aware of requested skills	
To be aware of the current commitment	

The IREN AdCoS structure

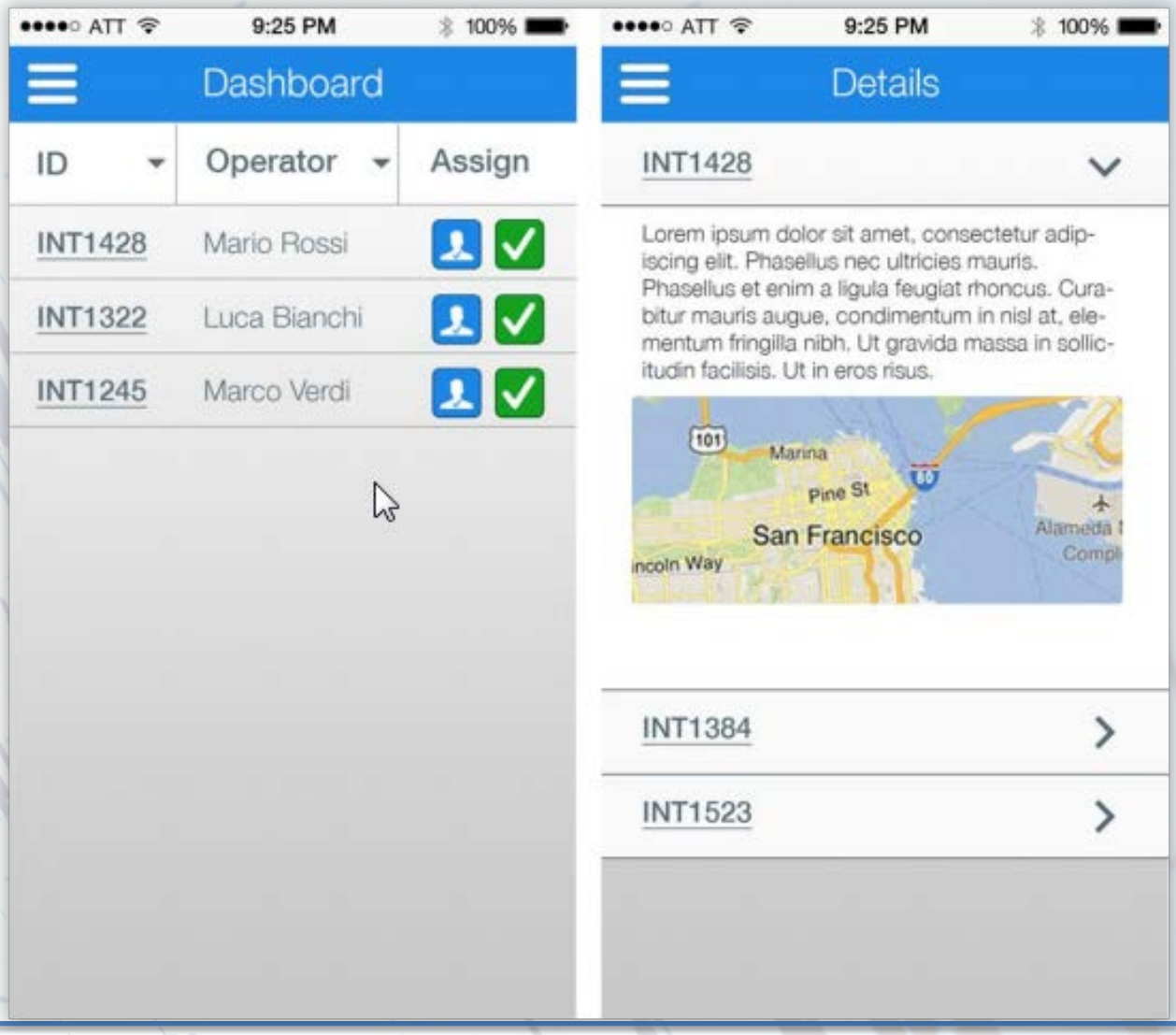
- an **Entity-Relationship Data Base** to organize and store historical data about malfunctions and data about shift and skills of technicians;

- an **Android application** that ease the communication between the Control Room operators and the technicians on field;

- a **rule-based Engine** that automatically assign the best suitable technician, according to his time availability, current geographic position and skills, to the incoming malfunction.

The IREN AdCoS HMI

User Interfaces of the AdCoS App designed for the control room operator (on the left) and for the technician on field (on the right)



Thank you for your attention!