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NICA MPD

FUNCTIONALITY of Automation systems in Experimental facilities

Baldin Nikita,
Dubna, March 2024

AUTOMATION – MAIN IDEA

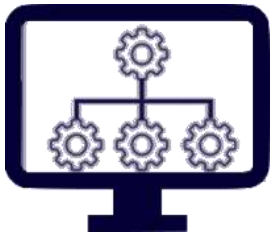
OPERATION DATA

CONTROL ROOM

CONTROL & ADJUSMENT

SURFACE FUCTIONALITY OF SYSTEMS

DISPLAY COMPREHENSIVE INFORMATION



ALARM, ERROR WARN EVENT NOTIFY

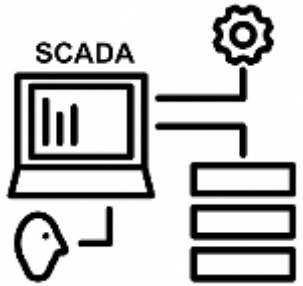
CONTROL FUNCTION AND ADJUSMENT

ORIENT OPERATOR IN EMERGENCY SITUATIONS

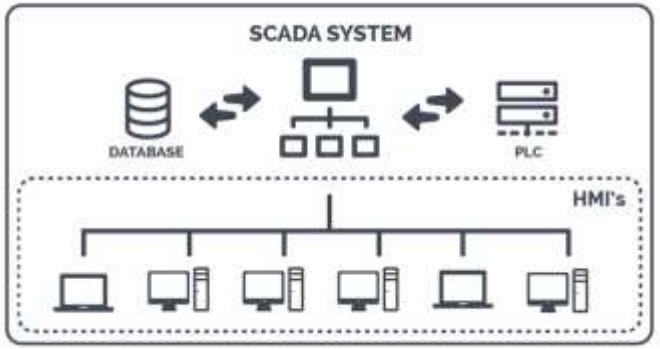
ARCHIVE DATA AND LOG OPERATOR ACTIONS

GENERATE REPORTS

SCADA Abbreviation



SCADA



Supervisory, control and **data acquisition**

Supervisory

Control

Data Acquisition

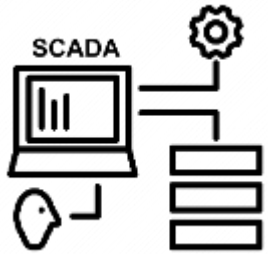
Experimental physics terminology

"Data Acquisition, Control and Trigger"

"High-Level Trigger, Data Acquisition and Controls"

Trigger + **Data Acquisition** + **Controls**

Main functionality SCADA



Supervisory Control And **Data Acquisition**

data collection and processing	automatic and operational control
process visualization	Saving and displaying historical data
Integration capabilities	Information security

SCADA is Developing and Runtime

Developing studio

- Multi-user
- framework, dlls, add-on
- Availability of export/import
- Object hierarchy and typing
- Support for the standard IEC-61131
- Ability to load changes into the project without stopping Runtime

Runtime environment

- Overlapping automation levels
- Platform, cross-platform
- Failure Resistance (SIL0-3)
- Backup and redundancy functions
- Supported protocols, DB
- Delimitation of access rights

DCS qualitative indicators

Qualitative indicators:

- Monitoring all subsystems
  All in one application
- Alarm table & tips
  All in one application
- Automations algorithms
- Control function
- Archive & logging

WinCC OA choice of CERN

CERN's choice in the LHC project: WinCC Open Architecture SIEMENS

CERN pays a hefty licensing fee every year

CERN management considers switching to TANGO

It would take too much resources (manpower, timescale)

*longer that lifetime of LHC

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Thank you !!!