PRESENTATION OF A MODERN, SCALABLE AND EXTENDABLE MINE CONTROL STATION FOR SMALL AND MEDIUM ENTERPRISES

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Outline

1. Current problems in mining
2. Requirements on modern Mine Control Stations
3. MoSC - Modern SCADA System
4. Summary
1 Current problems in mining

Challenges

- Decreasing ore grades
- More complex mineralization
- Increasing depths
- Narrow veins
- Irregular deposit shapes
- Increasing costs
- Fluctuating raw material prices
Consequences and Solution Approaches

Consequences

• Increasing costs
• Fluctuating raw material prices

Solution Approaches

• Economy of Scales
• Automation
• Efficiency enhancement
Benefits of data acquisition and evaluation

- Faster decision making
- Faster reaction on events

Due to:
- Monitoring of actual value and target value
- Guarantee secure conditions
- Process visualization
- Higher automation grade
- Maximization of effectiveness

https://gblogs.cisco.com
2 Requirements on modern Mine Control Stations

Optimization of planning processes

- reserve modelling - proved mineral reserve
- mine planning (total mine, Field, sub-field)
- mine planning ((panel, face, i.e. direction, Inclination of Stope/drift, ...)
- real time sampling during processing
- extraction
detection of machine health replacement before failure
- real time sampling during processing
- haulage
detection of machine health replacement before failure
- real time sampling during processing
- processing
detection of machine health replacement before failure
- market
market analysis

- days to weeks
- hours to days
- minutes to hours
- seconds to minutes
Requirements

- Small scale, modular and extendable MCS
- Plug and produce
- Access from everywhere
- Easy to use
- Machine readable communication
- Multivendor-capability
- Decentralized data evaluation to reduce data transfer
MoSC - Modern SCADA System

Structure

Firebird

MoSc Server

Optica UA

Process Data

Frontend via Webbrowser
Technologies

• Backend developed with .NET Core (Lean Framework and platform independent)
• Data storage on Firebird DB (Open source and industry proven)
• Web based frontend using Angular and WebGL (flexible and easily extendable/works on desktop PCs, mobile devices)
• Interfaces to process data with OPC UA (platform independent and standardized data access)
• Extendable via plugin system (to extend basic functionality and add additional process data interfaces)
3 MoSC - Modern SCADA System
### Werte des aktuellen Versuchs

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3 MoSC - Modern SCADA System
Summary

- Trend to digitize and automate mines strides ahead
- No scalable and modular MCS on the market
- MoSC gives the opportunity for an
  - Easy utilization
  - Machine to Machine communication
  - Multivendor-capability

Mine Control Station
Thank you for your attention and Glück Auf!