

Tubewell Pump Automation

IoT based Solution



Challenges

- Tube well On/Off operation
 - Operator dependent
 - Power supply unavailability
- Multiple tube wells scattered over a large area, it is very difficult to locate and rectify any faults/problems that might occur at a particular tube well.
- Financial burden because operation and maintenance of tube well pumps has been outsourced to contractors. Due to lack of manpower and resources.
- No protection against short circuit, overload, underload, stalling and phase failure.

Challenges

- High repair and maintenance cost .
- No collection of data (Flow, Level Pressure, Event, Alarm).
- No facility for data processing of data at Tubewells/ Pumphouse
- Decision-making based on processed data and report generation absent.
- No integrated management due to absence of timely information and enabling.

Scope

- Acquiring important analog and digital parameters through field instruments:
 - Water flow
 - Level
 - Pressure
 - Current
 - Voltage
 - Power factor
 - Frequency of event
- Install RTU hardware
 - Transmission of data
 - GPRS communication,
 - Inbuilt memory for storage
 - Provision for On/Off.

Scope

- Integrate following functionalities
 - Monitor data
 - Archive data
 - Analyse the logged data
 - Generate control signals
 - Log event history
 - Generate alarms
 - Generate management reports
 - Display graphical presentation.
- Transfer of data from the site to head office.

Parameters monitored

- Flow
- Temperature
- Pressure
- Chlorine content
- Turbidity
- Water level

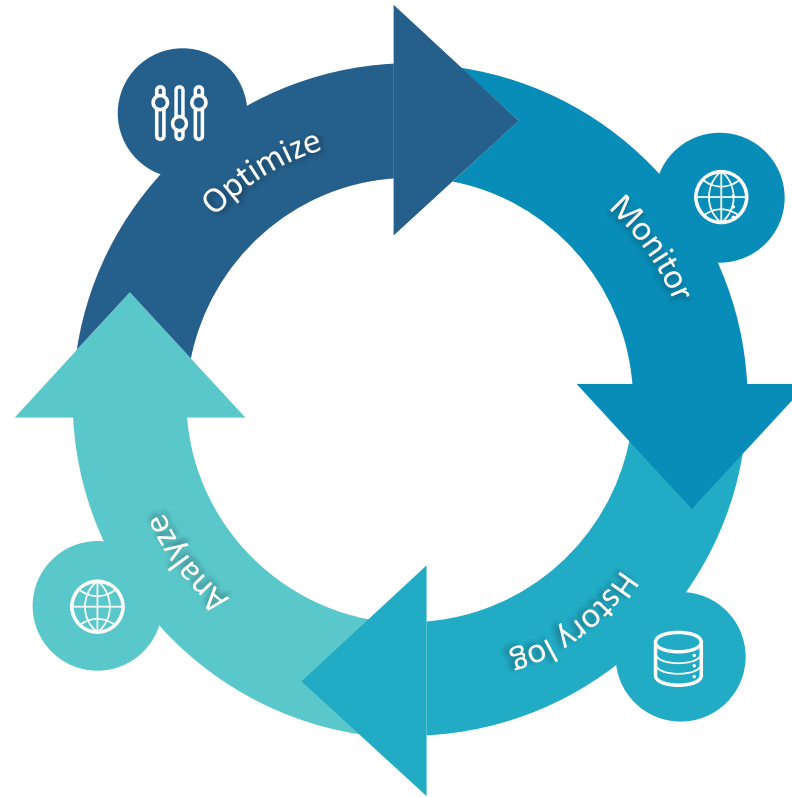
Additional parameters

- Pump status
- Sequential failure
- Overload failure
- Level switch
- Valve open/close

Energy monitoring signals

- Voltage of each phase
- Current in each phase
- Neutral Current
- PF (Power factor)
- kW each phase and total
- kVA each phase and total
- kVAR each phase and total
- Metering kWh cumulative
- Metering kVAh cumulative

Circle Diagram



Features

- Scheduled “On”/”Off” of the motor
- Tubewell field devices should be able to send data to the centralized Application hosted on web.
- Motor can be operated manually by pressing Start and Stop buttons on Starter Panel or automatically by IoT devices without any changeover switch.
- The proposed application system shall be hosted at a Central Data Centre and the system shall be web based.

Features

- The WPAS application software shall be controllable through a web browser via Internet. There should not be any requirement of paid client license on the User workstation.
- Pump operations for fixed hours despite power outage, as per defined schedule
- Operational hours reset on daily basis
- Provision to define group of pumps and define the reports on group basis like:
 - Cumulative kWh
 - Running hours, etc.

History and Reports

- Pump Failure History:
 - The system should be capable of keeping the history of pump failure data for the last 3 years.
 - History of replacement of different pumps with makes
- The system should have the facility to view reports for pumps stopped due to the following reasons :
 - Single phasing
 - Reverse phase sequence.
 - Unbalance in phase voltages
 - Overloading of pump motor

Report timelines and formats

- The software should provide tabular as well as graphical reports on following intervals:
 - 15 minutes
 - Hourly
 - Daily
 - Weekly
 - Monthly
 - Yearly
- Export reports in Excel format.
- Provision to define reports based quality of power supply :
 - Voltage imbalance
 - Current imbalance
 - Voltage fluctuations, etc.

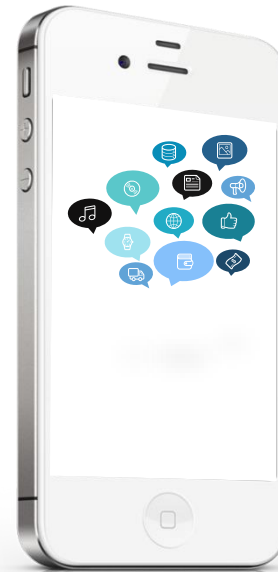
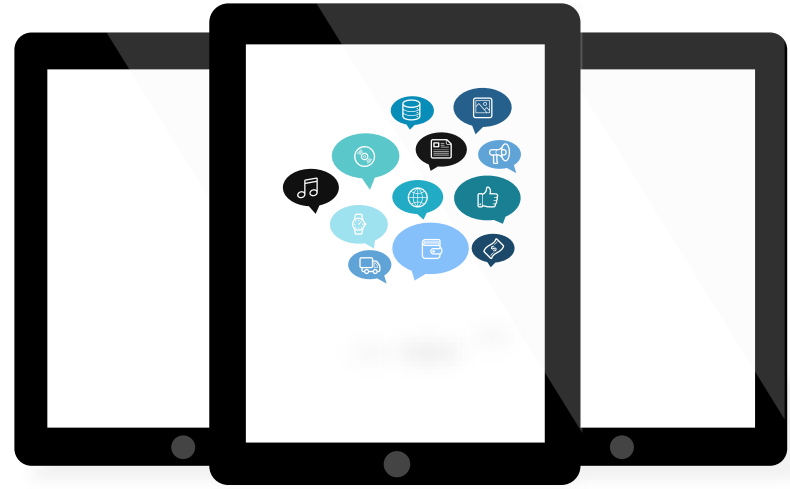
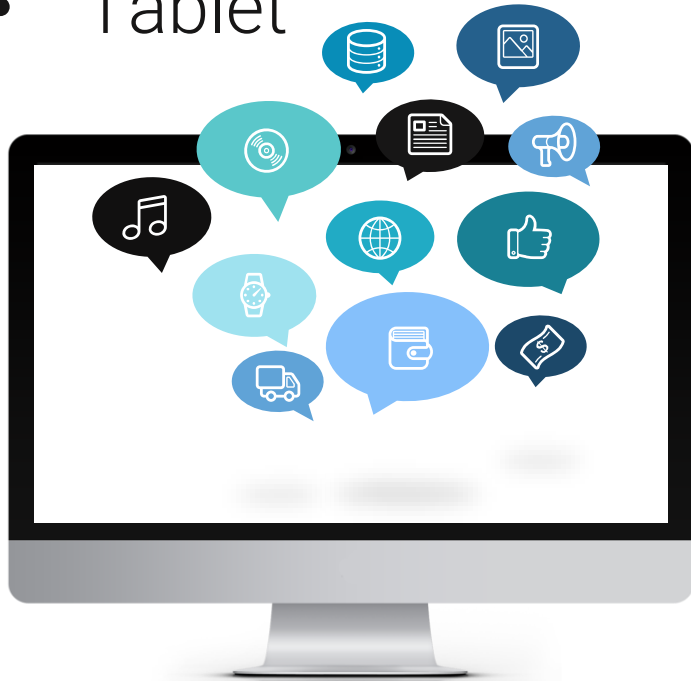
Features

- Display Alarms / Events in near real time
- Maintain history of Alarms / Events.
- Remotely send On/Off command to a pump/pumps.
- Prevent conflicting schedules
- Provision to define unlimited schedules
- Apply upto 8 schedules to IoT devices or to a group of devices..
- Define various rules for Alarms /Events reporting.
- The rule engine at Data Centre should work on real time basis with IoT devices at site.

IoT enabled

Be always in touch with your system

- Computer
- Mobile
- Tablet



Be future ready

Introduce Intelligence

Analyze and predict



Save power

Savings



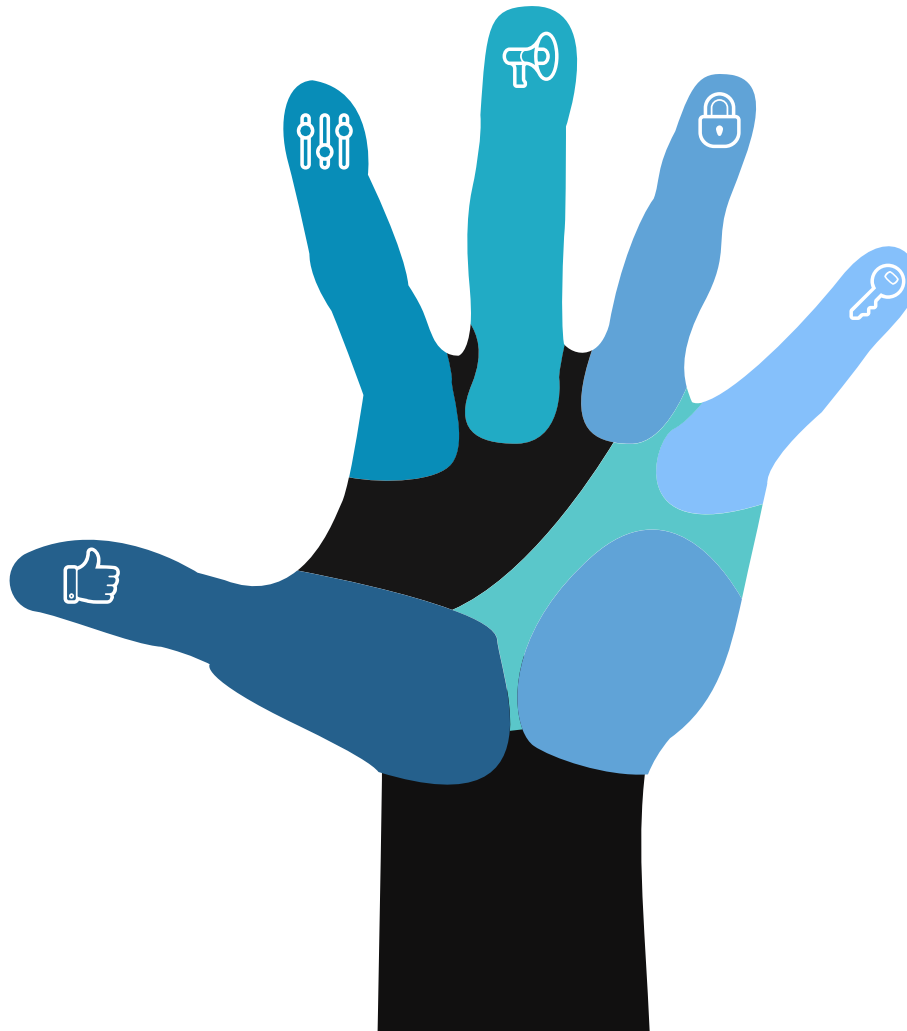
Focus

Key Performance Indicators



Alarms

Set threshold limits.



Repair and maintenance



Authorize data
Select the hierarchy

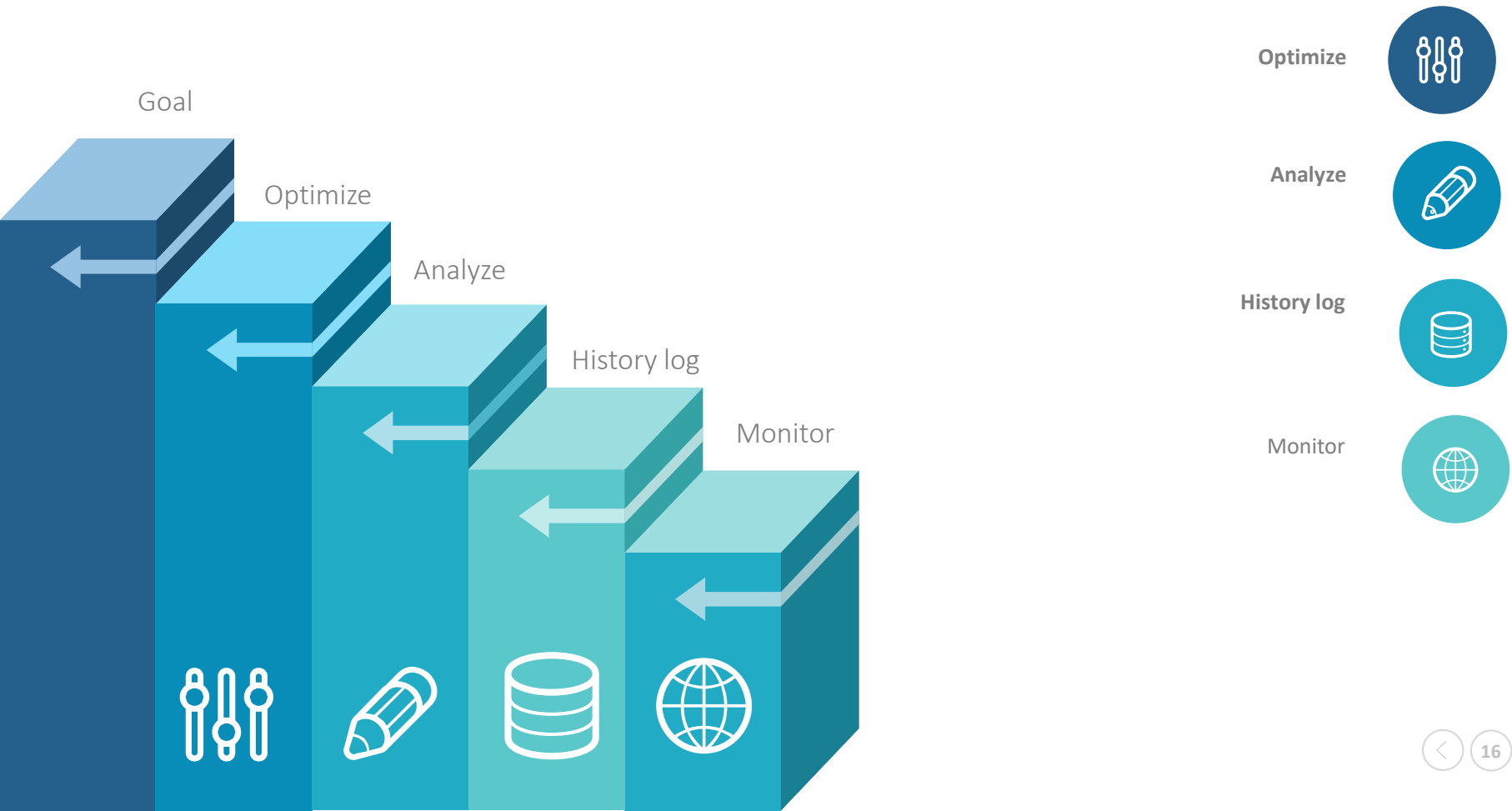


Streamline



Optimize usage

Introduce intelligence



Think about the Future

DigiReach

What do you think ?

- 👍 Optimize your solution
- 👍 Increase efficiency
- 👍 Smooth and streamlined operation
- 👍 Increase profits

