Smart Mosque

Implementation Ideas
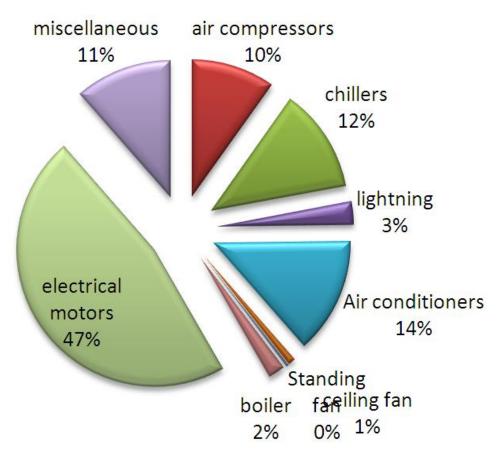
By: Smart-Group UAE

What is Smart Mosque?

- The Smart Mosque is the Mosque that Helps to give maximum level of comfort, peace, quietness with high level of Ambiance for the visitor(temperature, Lights, Smell and Audio levels) according to different **Prayer Time and season** while in parallel is Targeting to eliminate wastage in energy and water resources.

- Smart Mosque also Targets convenience in Communication and elimination of mistakes or discomfort.

Main Mosque Problems Today

- Electrical Bills (Wasted)
- Water Bills (Wasted)
- Maintenance Bills
- Iqama Delay (Confusion)

Pie chart:
- miscellaneous 11%
- air compressors 10%
- chillers 12%
- lightning 3%
- Air conditioners 14%
- ceiling fan 1%
- Standing fan 0%
- boiler 2%
- electrical motors 47%

What Problems can Smart Mosque Solve?

- (A) Air conditioning and HVAC Problems
  - Energy Wastage (Electric Bills Cost)
  - Maintenance Issues (Maintenance Bills and <u>Downtime</u> or Noise Inconvenience)
  - Clogged Filters cause HVAC unit to overwork and thus consume More Energy and More wear and Tear due to (over working).
  - Different Prayer and Different Qty of Persons Require Different Air Handling treatment.

Solution:
- Calculate Time Needed according to Season and Prayer Type
- Save Energy Direct after Prayer is Over
- Alert for protective Maintenance

Components:
- HVAC Modules
- Weather Station and Temperature Sensors
- Filter Deferential Sensors
- Manual Override Modules (Protected)
- Logic Timers and controls
- People Counters and Sensors
- SMS GPRS Module/ RSIP to central office

G4

What Problems can Smart Mosque Solve?

- **(B) Wasted Energy on** Lighting Problems
  - Energy Wastage (Electric Bills Cost)
  - Maintenance Issues (Maintenance Bills and Replacement Cost and Inconvenience)
  - Heat Generated from Lights Require More Air conditioning to compensate for that

Solution:
- Calculate Time Needed according to Season and Prayer Type
- Save Energy Direct after Prayer is Over
- Alert for protective Maintenance

Components:
- Relays and Dimmers
- CT Sensors for Bulb maintenance
- Manual Override Modules (Protected)
- Logic Timers and controls
- People Counters and Sensors
- SMS GPRS Module/ RSIP to central office

G4

What Problems can Smart Mosque Solve?

- (C) Wasted Water and Resources Abuse
- Leakage Wastage (High Water Bills Cost)
  - Using of Mosque Free Water for Other (Car Wash+)
  - Leaking water creates Disposal Problem, Stains, and Bacterial Environment

Solution:
- Shut off Valves after Isha until Fajr
- Open Valves for few Minutes before Prayer time up to Prayer Finish only
- Alert for protective Maintenance

Components:
- Solenoid Valves
- Water Tank Level Sensors
- Pumps Control Modules
- Manual Override Modules (Protected)
- Logic Timers and controls
- People Counters and Sensors
- SMS GPRS Module/ RSIP to central office

G4

What Problems can Smart Mosque Solve?

- (D) Confusion about Prayer Iqamah Time
  - Imam Comes Late Sometimes
  - We Need to alert That Iqama Time reached in simple and convenient way

Solution:
- Light up Mihrab Lights once Iqama Time is Reached

Components:
- LED Strip or Other Light
- LED Driver or Relay
- Manual Override Modules (Protected)
- Logic Timers and controls
- People Counters and Sensors
- SMS GPRS Module/ RSIP to central office

What Problems can Smart Mosque Solve?

- (E) Call for Prayer Announcement
  - Accurate Salat Call Times
  - Convenient Sound Level and Quality
  - Clear and Unified Nation Wide image

Solution:
- **Automated Pre-Recorded Prayer Call Announcement**
- **UPS**

Components:
- **Zone Audio**
- **SD Card with Pre-recorded Athans**
- **Manual Override Modules (Protected)**
- **Logic Timers and controls**
- **People Counters and Sensors**
- **SMS GPRS Module/ RSIP to central office**

What Problems can Smart Mosque Solve?

- **(F)** Transmission of Prayer and lessons to Ladies Section Problems and Large Mosque Screens
  - Qira'aa Issues
  - Sujood Issues
  - Lessons, lectures, debates Q&A

Solution:

- Projectors and Screens transmitting Cameras over Men section activity
- Discrete flashing Requester Button
- Microphone for Discrete Questions from Ladies section to Shiekh Headset

Components:

- Large Screens / Projectors
- CCTV Cameras
- Ladies Mic Jack to Sheikh Headset
- Flasher Alerter when Question is pending
- Relays and Media Controls for Energy Saving
- Logic Timers and controls
- People Counters and Sensors
- SMS GPRS Module/ RSIP to central office

What Problems can Smart Mosque Solve?

- (G) Disabling of Mobile phones during Prayers Problem
  - Some people Receive Text
  - Some People receive Calls
  - Other Mobile Messaging

Solution:
- **Create Mobile free Environment**
- **Activate during Salah**

Components:
- **Mobile Jammers**
- **Relays for Controls & Energy Saving**
- **Logic Timers and controls**
- **People Counters and Sensors**
- **SMS GPRS Module/ RSIP to central office**

G4

What Problems can Smart Mosque Solve?

- (H) Easy Maintenance Request Difficulty
  - Simple
  - Fast
  - Convenient

Solution:
- Create mobile APP
- Give Mosque 2D Bar Code ID
- Create Central Request Management Center

Components:
- Mobile APP
- Central Server For Request Handling
- 2D Mosque Barcode ID

G4

What Ideas can Smart Mosque Add?

- (I) Transmitting lessons and recording lectures automatically (Idea)
  - Share Knowledge
  - Mosque Website with live Cam
  - Question and Answer

Solution:
- **Website**
- **You Tube Channel**
- **Live Cam**
- **Q&A**

Components:
- **Server**
- **Web Camera gateway**
- **NVR Recorders**
- **Website interactive**

What Ideas can Smart Mosque Add?

- (J) Mosque Façade Color Changing when Prayer (Idea)
  - Prayer call Color
  - Iqama Color
  - Prayer Active Color
  - Lecture Color

Solution:
- Add visual colors to Distinguish activities from Far
- Add Beauty to Mosque, Manara and Qibba

Components:
- DMX
- COLOR LED and GUNS
- Manual Override Modules (Protected)
- Logic Timers and controls
- People Counters and Sensors
- SMS GPRS Module/ RSIP to central office

What Ideas can Smart Mosque Add?

- **(K) Send Duaa Text to Mobile Phones (Idea)**
  - Masjid Duaa
  - Car Riding Duaa
  - Donations and Activities Adv.

Solution:
- Scan Blue tooth of People in Parking lot and Ablution
- Send them Duaa and Announcements for Lectures ++

Components:
- Blue Tooth Radar
- Relays for Energy
- Manual Override Modules (Protected)
- Logic Timers and controls
- People Counters and Sensors
- SMS GPRS Module/ RSIP to central office

G4

The Mosque Can Become an Attract
using Color that Creates 4th dimension

Existing Smart Mosque Case Study

Existing Smart Mosque Case Study

Existing Smart Mosque Case Study

Existing Smart Mosque Case Study

Existing Smart Mosque Case Study

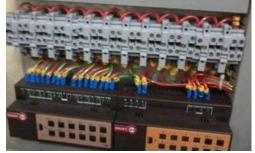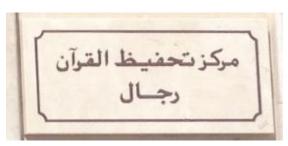# Existing Smart Mosque Case Study
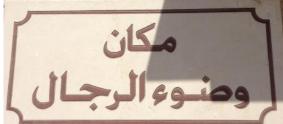
Existing Smart Mosque Case Study

Components of Smart Mosque

- HVAC Modules (Control of AC, Fans, Heating, Fresh Air)
- Weather Station (Temperature and Time Lag calculation)
- Logic and Timer Module (For Scenarios and Prayer Needs Profiles)
- Relay Modules (Power , Smell and Valves Triggers)
- Solenoid Valves (Water Controls)
- Electric Aoud Burners and Electronic Smell enhancers
- Dimmer Modules (Lighting Controls)
- LED (Mihrab Light Change for Iqamah),
- Optional: DMX Driver Modules for outside façade, Qibba and Manara Light Color Control according Activities in Mosque. (Taraweeh, Lesson/Lecture, Prayer, Eid ++)
- Projectors, screens, Camera, Microphones (To transmit Lessons and Prayers to Ladies section)
- Communicable Amplifiers and Speakers (Standard volume and zone switching according to activities)
- Wall Mounted DDP (for Manual override)
- Optional: Occupancy Sensor / People counters (for human sensors and Fresh Air calculation)
- Optional: Blue Tooth Radar (Send Duaa to mobile devices when in Parking)
- Optional: Mobile Jammers (Stop disturbance in Mosque during service)
- Optional: Z-Audio for Automated Athan (Azan)
- Optional: Smart-Mosque App for Central Reporting and Maintenance or supplies Requests.

Energy Scenario Example

Normal Prayers Initiating

15 Minutes Before Prayer Time
Climate control (Start) Temperature Adjustment. Water Timer Release the valves under Occupancy activated command.

5 Minutes Before Prayer Time
Lights are switched ON, Smell Enhancers Are ON, Blue tooth on, CCTV and Audio Visuals are On

Athan Start To Announce, Minirate light up different Color

On Iqama Time Mihrab Green Lights Switches On, Projector and Screen in Ladies Section Trigger transmitting Cameras and Mics.

Energy Scenario Example

Normal Prayers Finished

15 Minutes after Prayer Water Timer closes and disables Occupancy activated command.

50 Minutes after Prayer Time
Climate control (Stop) and Lights Turn Off, all systems turn off except for Lessons ++

Thank you