Smart Solutions for FMCG Retailers

Remote monitoring made easy

Villa House
Freezing Truck
Supermarket
Hospital Blood Room
Cold Room

GSM /GPRS network
GPRS GPS Monitoring center
User’s mobile phone

Author Name: Tata Tele Business Services
Smart Solutions for FMCG Retailers

Table of contents

1. Ensuring the best consumption experience
2. The Solution - Remote Monitoring of Storage Equipment
3. Implementing the Solution
4. Device and Sensors
5. Connectivity
6. Application Platform
7. Reporting Dashboard - Mobile & Web Applications
8. Conclusion
Ensuring the best consumption experience

One of the key differentiators of a successful FMCG player is the strength of its distribution network. A complex distribution network, having wide geographical footprint, brings along with it unique set of challenges - the most relevant of which is perhaps to ensure a predictable, high quality consumption experience to its end-consumer. Most of the top FMCG players are aware that the distribution challenge is not limited to merely delivering the products to the retailers; it is the form in which the products are delivered to the end-consumer that has a defining implication on the moment of truth.

The challenge becomes overwhelming; particularly for temperature-sensitive products such as perishable frozen food items and beverages that require temperature control for storage. The consumer gratification associated with these products is predominantly sensory related and any unwarranted variation in color, texture or taste is unacceptable. One of the ways, in which FMCG companies have attempted to tackle this, is by providing retail outlets with refrigerators or visi-coolers. The companies provide these coolers free-of-cost and also take responsibility of their maintenance and servicing. Besides the regular use, these coolers offer an added advantage - that of being an ideal branding piece, owing to their prominent visibility (hence the name visi-cooler).

While the visi-coolers appear to be an ideal solution for ensuring healthy shelf-life of frozen products, they are also capital equipment susceptible to malfunction that has to be addressed promptly to ensure they serve the intended purpose in a cost effective manner. The common issues range from maintenance to ensuring that the retailer is indeed using the equipment regularly. Another major concern is that of missing coolers – a result of unauthorised change of hands (of the cooler) at the retailer’s end.

Thus the FMCG companies which have provided such coolers/refrigerators to retailers find themselves facing a new set of challenges concerning the monitoring of these rather expensive assets. Since the onus of maintenance rests on the company, it results into added cost pressure on the already margin-stressed distribution chain. The cost of periodic manual monitoring and untargeted servicing is a burden which the FMCG players cannot afford. The FMCG companies now need a smart solution that can address these monitoring needs, that too remotely.

Author Name: Tata Tele Business Services
### Smart Solutions for FMCG Retailers

#### The Solution – Remote Monitoring of Storage Equipment

Remote monitoring of these coolers can offer a composite solution to optimise the service related costs and also to keep a tab on the possible unauthorised handling of the coolers at the retailers’ end. The three core benefits of remote monitoring of visi-coolers can be summarised as:

<table>
<thead>
<tr>
<th>S.No.</th>
<th>Current Scenario – Challenge Faced</th>
<th>How Remote Monitoring offers a solution</th>
</tr>
</thead>
</table>
| 1.    | **Temperature related issues:**  
  - Thermostat mal-function  
  - Non-attainment of temperature even after continuous running  
  - Multiple complaints for “No Cooling” | **Real-time temperature monitoring:**  
  - Automatic detection of thermostat mal-function  
  - Remote validation of continuous running time  
  - Real-time validation of “No cooling” complaints with temperature reading |
| 2.    | **Power fluctuation**  
  - Frequent powering ON/OFF cases  
  - Retailers switch OFF coolers at night/in winters | **Real-time power status monitoring:**  
  - Real-time verification of “actual operational hours/time” to address “no cooling” complaints  
  - Alert on frequent/untimely power ON/OFF |
| 3.    | **Monitoring of the cooler door**  
  - Frequent opening/shutting of door  
  - Door not shut properly  
  - Indication/proxy for inventory consumption out of the cooler | **Door open/close Monitoring**  
  - Auto-correlation through analytics between door-opening frequency and temperature profile  
  - Alert for inventory depletion; monitored via opening and closing of the door |
| 4.    | **Missing coolers:**  
  - Un-authorised change of hands  
  - Theft/tampering with M2M device | **Cooler Location Track**  
  - Instant real-time alert on sudden route deviation of cooler from designated location  
  - Real-time geo-location based monitoring - based on GSM cell-tower or GPS  
  - Instant alert for any device tampering/removal from designated location |

1. Predictive maintenance  
2. Reduction in service cost  
3. Prevention of asset loss - missing coolers

*Author Name: Tata Tele Business Services*
Implementing the Solution

The visi-coolers are fitted with M2M (Machine-to-Machine) communication devices capable of receiving, processing and transmitting sensor data (such as temperature, power status, location deviation, etc) to cloud servers through a VPN network. The M2M devices fitted with the coolers will have the capability of data transmission on GSM network. The cloud servers will host the application as well as the database.

The solution will comprise:

1) Remote Monitoring - M2M Device with temp, door and power monitoring sensors
2) Connectivity
3) Application Platform
4) Reporting Dashboard – Mobile and Web applications

Device and Sensors

The figure below illustrates the different sensors that are connected with M2M devices and are fitted onto the coolers. It also illustrates that the devices share a GSM communication module to transmit data, rechargeable battery to keep the device functioning - even in case of power failure at the retailer’s site.
Smart Solutions for FMCG Retailers

<table>
<thead>
<tr>
<th>Temp. Monitoring</th>
<th>Power Status</th>
<th>Location Tracking</th>
<th>Door Open / Close</th>
<th>Sudden Movement Detection</th>
</tr>
</thead>
<tbody>
<tr>
<td>Temp. sensor connected to Analog I/P</td>
<td>Digital I/P from Cooler Power Module</td>
<td>GSM Module will enable BTS based Geo-tracking</td>
<td>Sensor for closure detection</td>
<td>Digital I/P from Vibration sensor</td>
</tr>
</tbody>
</table>

Below given maps the requirements and the different device/sensor components that fulfill all specific requirements:

**Temperature Monitoring**
A wired temperature sensor is installed inside the cooling enclosure and is connected to an analog input of the M2M device. It is capable of measuring the temperatures in the range of operation of the coolers. This enables remote temperature profiling of all installed coolers ensuring that the products are stored under mandated conditions. It also helps as a diagnostic tool for cooler health.

**Power Status**
This will indicate the on/off power status of the cooler. When observed with a time-stamp, it will accurately identify the operation time of the cooler - such as how long the cooler was operational and for what duration it was switched off.

**Location Tracking**
The GSM module will enable cell-tower based location tracking. If a GPS module is also incorporated within the M2M device, location tracking can be done using GPS location information also.

**Door Status: Open/Close**
Door sensor enables detecting the opening and closing of cooler door. The sensor can be attached in a manner that it has contact-free operation, as contact detection sensors tend to wear off with repeated opening/closing of the door.

**Sudden Movement Detection**
The vibration sensor fitted within the M2M device will provide this signal through a digital input. The cooler once installed is expected to be largely stationary, thus any unexpected movement may be a sign of unauthorised movement or theft.

**Connectivity**
The communication between the M2M device fitted on the visi-cooler and the back-end server is enabled through GSM connectivity. Cellular communication owing to its wide-spread reach and penetration is an optimum choice of connectivity for this remote monitoring application. The added advantage of using GSM connectivity is the useful feature of SMS. SMS service can be used for remote configuration of the M2M device and also for partial implementation of edge intelligence in the form of SMS alerts.

**Application Platform**

![Application Platform Overview](image)

**Application & Diagnostics**
- Monitoring, Reporting & Control
- Device Diagnostics

**IoT Platform**
- Analytics & Machine Learning
- Business Rules
- Data Conditioning/cleansing
- Data Extraction

**Network**
- Connectivity

**Devices**
- Phone
- WiFi
- Bluetooth
- Car

*Author Name: Tata Tele Business Services*
Smart Solutions for FMCG Retailers

- **Device Agnostic Platform** enables seamless remote monitoring of diverse set of devices
- **Modular/layered structure** for data extraction, applying business logic and analytical decision making
- **Can provide APIs** for diverse set of interactive dashboards - for monitoring, reporting, controlling and also for device diagnostics
- **The platform can serve as a single unified** backbone architecture for all applications designed for reporting and monitoring consumption

**Pan-India Installation Base** with Geo-location & basic diagnostics

Report showing Pan-India installation on a map with their runnings status

**Specific Device - view Report**

Complete set of details about a specific device including power status, real-time temperature geo-location etc.

**Alerts**

Such as “Rapid Movement” or “Change in Geo-Location”, “Non-attainment of temperature” after “x-running hours”

**Prevent maintenance Report**

Report showing equipment that are showing abnormal readings (of temperature, door opening frequency, power status)

**Service Adherence Report**

Report indicatings service levels- timely served service requests for a region for a given period, using Geo-tracking of dervice persons

*This is an illustrative set of reports which can be customized / supplemented with other reports as per requirement*

---

**Reporting Dashboard – Mobile & Web Applications**

The reporting dashboard is a single window offering consolidated view of all the on-field coolers. The dashboard is usually accessible through mobile as well as web based applications. Each of the sensor inputs, connected to the M2M device fitted with the cooler, contributes to the detailed set of reports available on the dashboard.

---

*Author Name: Tata Tele Business Services*
Conclusion
Remote monitoring offers a versatile solution which by ensuring asset visibility and enhanced information flow, simultaneously targets improvements in productivity, cost-control (maintenance) and asset security. The data captured through remote monitoring can be used to derive valuable insights for improving the utilisation and performance of the monitored assets. The solution discussed above is for monitoring of coolers and refrigerators, the same can be customised for different applications with a corresponding set of sensors. FMCG companies can deploy remote monitoring solutions effectively to have a greater degree of control over the critical last leg of the value-chain which determines the consumption experience for the end-consumer.
Smart Solutions for FMCG Retailers

Get in touch

TATA TELE BUSINESS SERVICES
Market leaders with the widest range of products and solutions.

| Collaboration | Connectivity | Cloud & SaaS | IoT Solutions | Marketing Solutions | Security Solutions |

Call 1800 266 1800
Email dobig@tatatel.co.in
Visit www.tatateleservices.com

Find us on

| Youtube | LinkedIn | Facebook | Twitter | Instagram |

Author Name: Tata Tele Business Services