



happiest minds
The Mindful IT Company
Born Digital . Born Agile

Moving into a smart energy retail store





We are living in the age of a retail digital transformation powered by disruptive technologies including Big Data, Cloud Computing, IoT and Mobility. This revolution is visible in both the e-commerce space as well as the brick and mortar stores, with a fierce competition between the two for more footfalls and revenue. Various statistics reveal that 61% of the consumers prefer in- store shopping in comparison with only 31% who shops online. The advent of technology has transformed the brick and mortar shopping experience with Point of Sales systems, Automated Inventory Management, Smart Shelves, Beacon Technology and Analytics driven sales and so on. On one side all these technological enablement are bringing in more sales opportunities and increased customer experience. However, on the flipside, the increasing cost of operations including repair and maintenance cost and energy costs is a major concern for many players in the [retail sector](#). This whitepaper explores an efficient approach from Happiest Minds to enable a smart energy retail store

The omnichannel experience and smart energy management

The Retail sector is one of the most celebrated industry verticals which witnessed paradigm changes as a result of e-commerce revolution. However, after the initial hustle and bustle, retailers have realized the fact that despite the online shopping revolution, the significance of the brick and mortar stores have not faded away. Smart and successful retailers realized the need for an [omnichannel retail](#) strategy and have started merging their online and physical stores to provide a seamless customer experience across the web and in- store. Having said that, both the e-commerce and physical stores in retail hold its own pros and cons. While we consider the brick and mortar stores, one of the biggest challenges that retailers experience is the cost of operations and maintenance in comparison with their e-commerce counterparts. Among this, the rising energy cost and the associated overheads with inefficient energy management are serious concerns for many of the retailers including top notch players like Walmart and Walgreens.

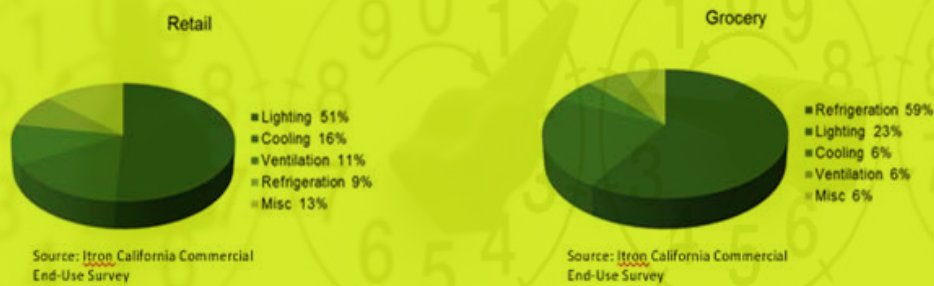
Since we are living in a world, where natural resources are getting depleted and serious environmental hazards like global warming are crippling in, it is high time for Retail brick and mortar stores to keep an efficient track of their energy consumption. Smart Energy Management is the keyword that every retailer must stress on, for increasing the sustainability and longevity of efficiently handling in- store operations and providing a compelling customer experience.

Energy consumption in retail stores- What are the challenges?



If we consider the example of a typical fashion retail store, the lighting consumes the maximum of energy whereas in the case of grocery stores, the refrigeration alone consumes more than 50% of the total energy use.

In the case of the big chain drug retail stores which are open 24 hours a day, maintaining the correct temperature without energy wastage can significantly boost margins. In such stores, refrigeration alone consumes a huge amount of energy and the maintenance cost will be relatively high. In certain cases, the outdated systems lead to energy leakage that the retailer might not be able to monitor thus leading to high overhead cost. This unnecessary cost of maintenance and repair often consumes a huge spend which can otherwise be used for **customer experience** initiatives, for better stocking and innovation.



Customer experience is key in any business. A comfortable shopper tends to buy more if the store is presenting him a convenient environment for shopping. Otherwise, with fierce competition in this space, over cost and customer experience, he can easily switch his choice and in no time can move onto another retail store. Many retailers are unaware of the benefits of taking simple and significant moves to ensure energy efficiency like coating the rooftops of stores with reflective color to reduce absorption of heat. Knowing how much they are saving can help them intelligently plan for recoating and painting activities. Commitment to sustainability efforts and to reducing their carbon footprints can also be highlighted to engage consumers and improve brand loyalty.

The Technological Enablers of Smart Energy Management in Retail Stores

An outcome driven framework to Energy Management in Retail Store and Corporate environment enabled by the right technology components at every step is crucial for an efficient energy management strategy.

Smart Energy Management Framework for Retail



1

Identify key energy consumption drivers:

The first step for a Smart Energy Management plan is to identify the key drivers of energy consumption in store and map out the processes that lead to this energy consumption pattern. Having this awareness is half the battle won as in many cases, energy leakages remain unknown. Especially when it comes to old equipment, poorly maintained premises/ infrastructure, hidden leakages are not visible to take action on. A thorough energy audit hence becomes essential to identify the points of energy consumption or leakage.

For instance, for a grocery retailer,

Lighting, Air conditioners, refrigeration contributes a lot to the energy spend which can be optimized to obtain a high return on capital expenditure. Also, since profit margins on grocery and other daily needs items are less, smart energy management can help bring the cost down in the long run.

Device / Asset monitoring for health and downtime is another significant aspect that helps in smart energy management. This can be enabled by IoT enabled Energy management solutions which can help not only in optimizing energy but also to ensure optimal temperatures and storage conditions which increases the shelf life of the product.

2

Measure energy consumption and leakage:

Having identified the key energy consumption drivers, a 360° view of energy consumption patterns for the critical points over a period of time can enable retailers have a constant measure on abnormal energy consumptions by faulty devices if any, under-used or over-used infrastructure, wasted resources etc.

Connecting this with footfall solutions to understand store footfall patterns can indicate the usage pattern. For instance, if a certain area of store is poorly lit or heated for footfall experienced vs. a different area is overly lit for the much lesser footfall in that zone. HVAC configuration, lighting and power infrastructure can be re-looked at to take corrective action improving both customer experience and cost of operations.



3

Monitor & Control

As measurement of energy parameters begins for the key energy driver points, there is also a need to build in rules and alerts that help monitor abnormalities. Additionally retailers should also set up controls that help take automated decisions on energy consumption where all possible.

Data visualization and dashboards help in monitoring consumption by sector and across properties, devices and also identify if there is any sudden increase in consumption, catch wastage and improper billing. The dashboard view enables planned maintenance and servicing of electrical devices and appliances before it either breakdowns or consume more energy than it intends to consume. This also helps in making smarter and intelligent energy efficient decisions by monitoring the energy consumption by different devices and appliances in the store and implementing controls in an automated or manual manner.

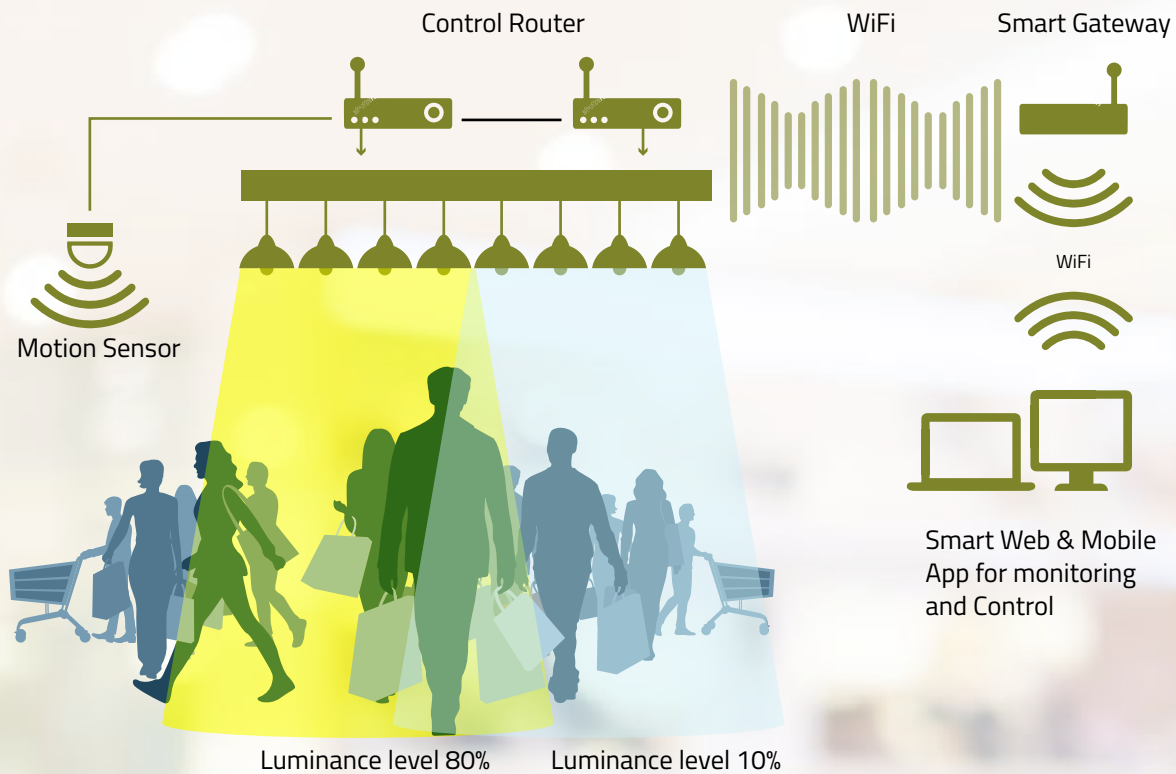
For instance -

- Implementing **Smart Lighting** Technology helps in monitoring and controlling the ambience lighting intensity remotely
- Implementing **Motion activated lights** with sensors optimizes the use of energy by the lighting system depending upon the occupancy in the store.
- Implementing **Smart HVAC system** for a store helps measure occupancy levels, indoor air quality and humidity to fine-tune its program and control comfort set points, fresh air and energy usage more effectively
- Automatic doors with low power consumption, controlled by store manager, avoids energy loss due to air exchange from outside.
- Control and monitor **store refrigeration, digital signage** etc. helps energy saving in real time by communicating with these devices through gateways that understand protocols from far off locations.



Implementing gateways to collect and tag data from in-store devices such as sensors, smart HVAC systems, smart thermostats and relaying it on to a platform for better visualization and taking automated energy efficient actions via control algorithms therefore plays a key role in smart energy management. Gateways will also help trigger alerts in case of anomalies or if there are variations in electrical devices.

Below is shown how smart lighting adjust usage of power as per feed from people counting sensors:



Motion tracking heating and cooling as per human presence can help save energy wastage due to cooling/heating empty retail stores by creating a personalized climate for each customer.

Dehumidification solutions reduces the pressure on compressors and also prevents fogging of the glass of the refrigerator saving energy on anti-sweat heaters. This is specifically useful for food and drug stores where moisture can hamper food/drug quality. Operating cost of the HVAC system will come down and a more comfortable environment for the consumer will also be created.

4

Analyze and Predict

As energy consumption patterns get collected from the sensors onto the platform over a period of time, analytics and modeling on the data can provide rich insights on patterns and trends in consumption levels.

Machine learning and cognitive analytics tools can break this data further to identify granular level patterns and pave the way for the next level in Energy and Equipment management: **Predictive maintenance.**

Models and deep data science approaches to predict points of failure, expected time period of failure can be leveraged to set energy usage conditions that trigger automatic real time adjustments. Such Smart energy platforms accessed via web browser or a mobile app can enable retailers set up business rules as per their own energy usage.

Data of real time people counting and measuring people density within certain sections of the store can be fed into control routers and gateways to trigger smart energy decisions.

This can be achieved by way of cost effective thermal imaging based sensors which work by detecting emission from a moving target. These sensors will track individuals as they walk through the field of view and can track direction of people from entrance to other areas of the store.

Analytics engine can help drive insights and actions from the valuable data collected. Heat Maps can be visualized by retailers through data relayed on to the platforms by smart gateways

5

Plan and Prevent

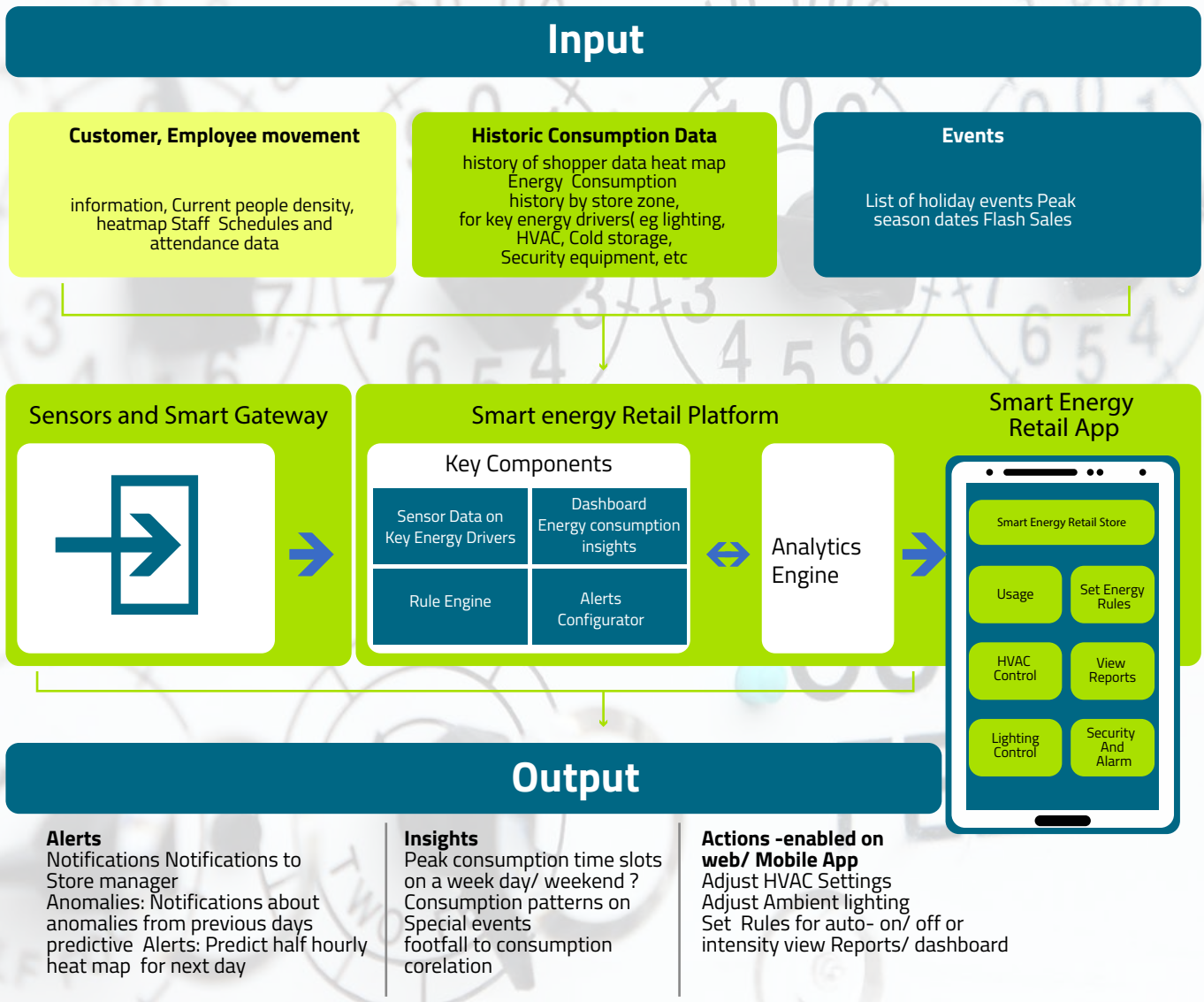
With rich insights on energy usage, expected trends or patterns based on past history – like seasons with higher expected usage, days of week or hours of a day with higher consumption levels, black-out zones etc. retail operation executives can start planning better the cost of operations and avoid deviations.

With the added ammunition of predictive models that alert on impending equipment failure or break-down points based on pattern of device behavior and energy utilization, retail managers can prevent the impact of a break-down with preventive maintenance and back-up equipment for smooth operations.

Smart Energy Retail Platform

An indicative representation of a Smart Energy Retail Platform is provided below. Apart from the device specific sensors and gateways, the core components would likely include

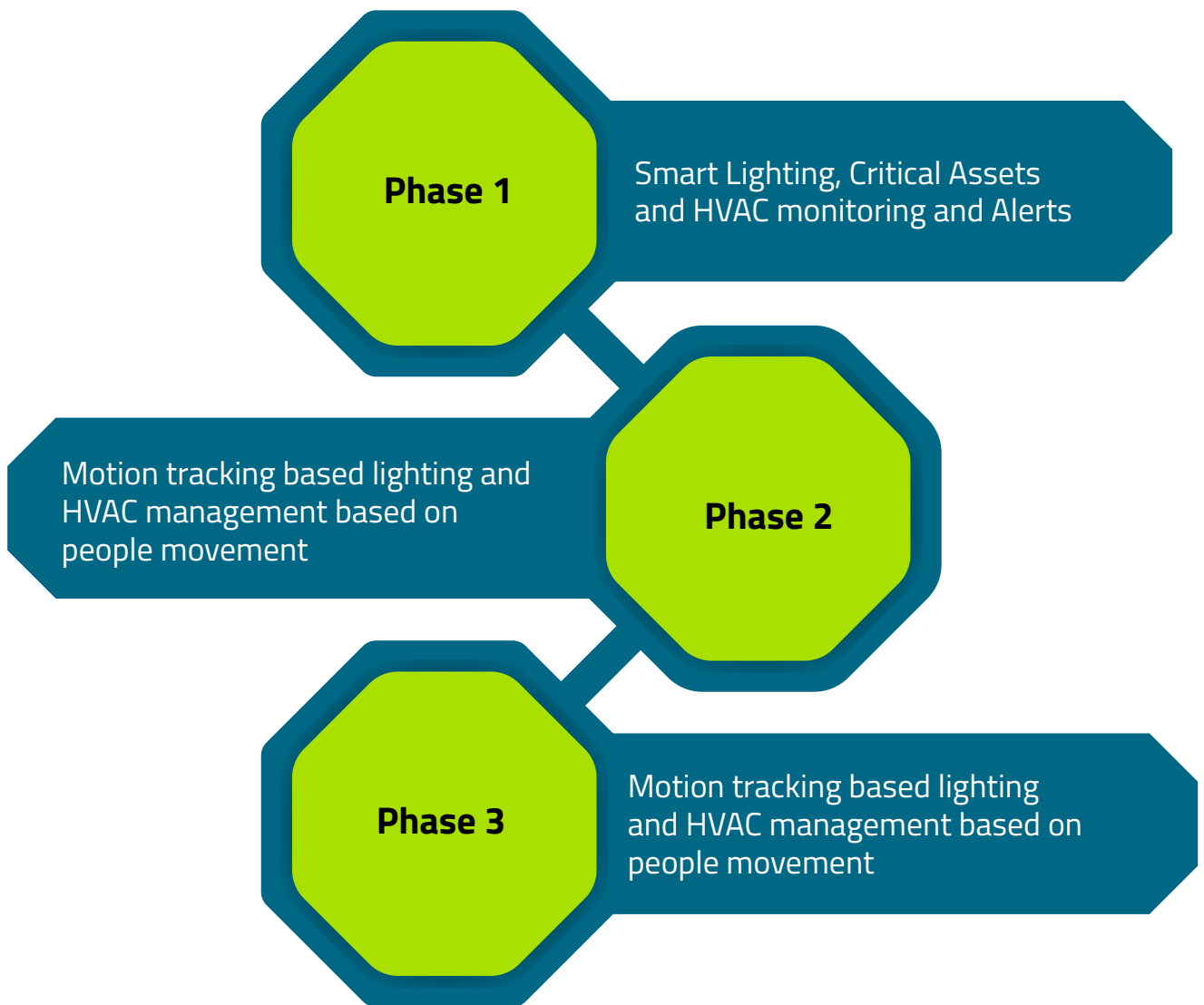
- A data ingestion hub that would facilitate collation of critical energy metrics from the key drivers that have been identified.
- A rule engine to help configure the monitor and measure rules
- A Dashboard / reporting component to enable visual representation of consumption patterns , trends and anomalies
- An alerts and notifications configurator to tune the events and triggers on which to receive alerts
- An Analytics engine with modeling techniques – both historical and predictive modeling algorithms built to delivery deep insights
- And finally a mobile/ web application that is with the store manager/ operations head to measure, monitor and act on critical alerts and deviations in a real-time thereby leading to a truly energy efficient store.



Our Three Phase Approach to enable a Smart Energy Store:

Energy is the largest and constantly growing expenditure for retailers globally, and it is imperative that the retailers implement steps to monitor, manage and control their energy consumption and the associated carbon footprints. Retailers should look at defining a road-map for the Smart Energy initiative starting with steps that leverage what is already available or can be ported on a platform with minimal gateway integration, followed by where additional sensors and device end-points need to be setup. They should understand and look at their own business and decide whether implementing these technologies would benefit them in the long run in terms of revenue or cost control or margins. This should begin with implementation of smart energy initiatives in phases to understand more on this and reap the benefits.

An implementation strategy which smart retailers can adopt can be looked at in three phases:



About Authors



Anitha Rajagopalan

Anitha Rajagopalan is a Principal Consultant with Happiest Minds Technologies. She has 12+ years of experience in the IT industry on Digital Transformation Strategy, Consulting and Thought leadership. Her expertise and interest lies in enabling Retail organizations build transformational Digital Commerce and Omnichannel Business Capabilities leveraging multiple technology levers’



Vidur Kaul

Vidur Kaul has 3.5 years of experience in IT with expertise in business analysis, application management and development. Currently he is a part of BA presales team at happiest minds, with prior work experience in application support & development for an e-commerce platform working on modules like content management, order management, customer service and requirement gathering for retail, CPG projects. He is a creative person with high idea orientation who believes in being altruistic.

Happiest Minds

Happiest Minds, the Mindful IT Company, applies agile methodologies to enable **digital transformation** for enterprises and technology providers by delivering seamless customer experience, business efficiency and actionable insights. We leverage a spectrum of disruptive technologies such as: Big Data Analytics, **AI & Cognitive Computing**, Internet of Things, Cloud, Security, SDN-NFV, RPA, **Blockchain**, etc. Positioned as “Born Digital . Born Agile”, our capabilities spans across product engineering, digital business solutions, infrastructure management and security services. We deliver these services across industry sectors such as retail, consumer packaged goods, edutech, e-commerce, banking, insurance, hi-tech, engineering R&D, manufacturing, automotive and travel/transportation/hospitality.

Headquartered in Bangalore, India; Happiest Minds has operations in USA, UK, The Netherlands, Australia and Middle East.

To know more about our offerings. Please write to us at business@happiestminds.com