



Improved Energy Relationship

## Orvito Energy Efficiency Solution

Opportunities for reduction in energy  
costs across all buildings



## THE CLIENT

Vasathi Housing is a private real estate firm involved in the development and operation of residential and mixed use real estate assets. Vasathi's investments total over \$15 million. The company's business focuses on residential and mixed use buildings located in upcoming urban pockets.

Vasathi has made a strong commitment to sustainable operations - over 15,76,000 square feet of the Vasathi Portfolio is LEED Certified. The corporation has operations spread over three states of India with head-quarters in Hyderabad.





## THE PROJECT

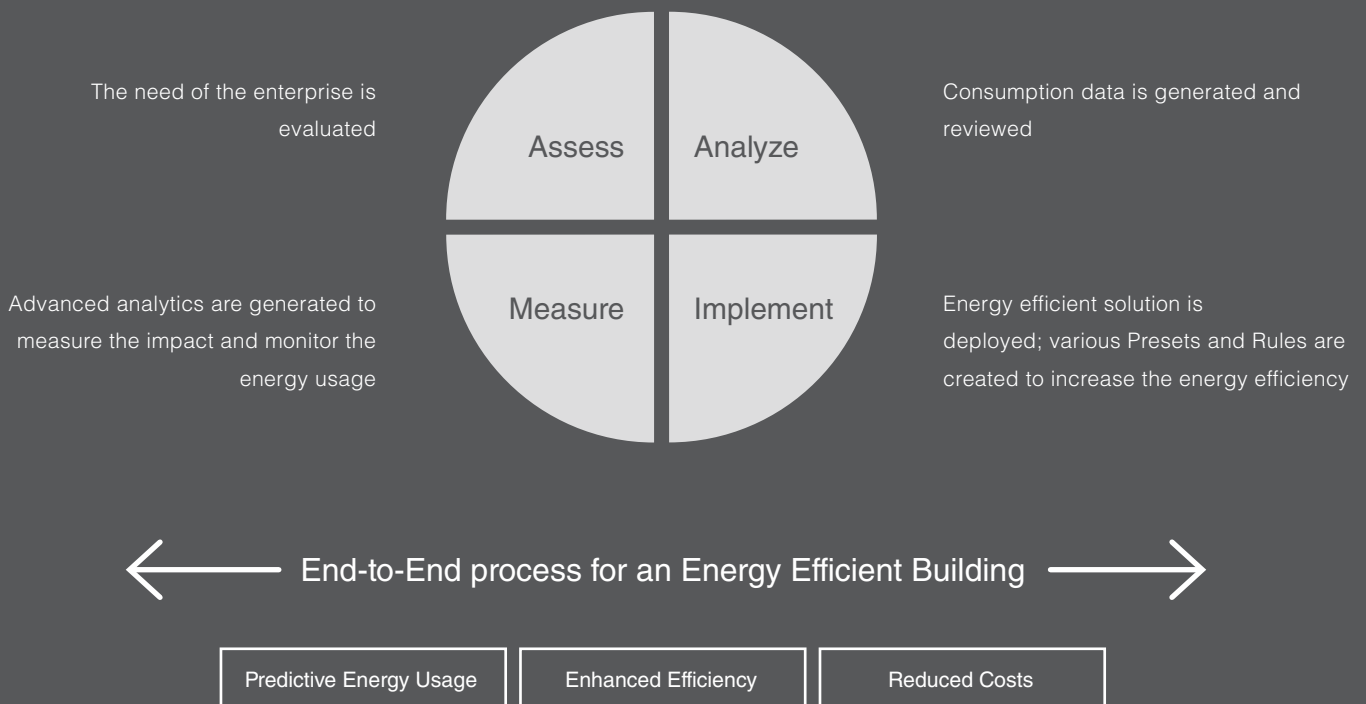
Energy efficiency is imperative for Vasathi as one of its major business operations involves building management where energy efficiency is a critical concern. In order to actively manage energy across all the buildings, the Administration General Manager, wanted real time energy usage analysis to recognize opportunities for reduction in energy costs.

As a pilot project Orvito deployed its Enterprise Intelligence Solution in its Hyderabad office spanning over 13,580 SFT and occupied by over 100 employees. The office operates during regular working hours 9:00 am to 5:30pm.

## THE CHALLENGE

1. The company occupied a 20 year old building with legacy circuitry and lighting loads. Rewiring was not an option.
2. The office was designed to give a luxury and premium appearance. This hindered optimal usage of space and lighting.
3. Being a real estate company they did not focus on procuring and maintaining the top of the line IT systems for the company. Integration of software and new products was a challenge.

## THE APPROACH



## THE SOLUTION

Orvito deployed complete automated lighting solution based on its innovative IoT platform Nucleo™.

The components of the solution used for the project site:

1. Smart Switch Panel
2. Orvito Smart Hub
3. Orvito Smart Sensor
4. Orvito Standalone Sensor
5. Applications on Phone & Cloud

The touch enabled tempered glass Orvito Smart Switch Panel replaces the legacy 2, 4, 6 and 8 gang modules without the requirement of additional wiring. With a simple installation of connecting the Phase and Neutral wires to the building wall power, the downtime for the site is minimum. The Switch Panel connects to the buildings Wi-Fi network, and communicates with the Orvito Smart Hub to ensure seamless control of lights and appliances.

The minimal design of Orvito Smart Hub enables it to be placed discreetly anywhere in the facility. The Smart Hub can connect to the IT network on either LAN or Wi-Fi interface. Zero configuration, maintenance or monitoring requirement along with self-healing capability makes Orvito Smart Hub a true high technology IoT product. The Smart Hub acts like a central nervous system that connects all the home automaton components and gathers information, aggregates the data, executes

rules for the building, and synchronizes data with Nucleo Cloud. The settings and access control to Cloud can be managed by the end customer.

Orvito Smart Sensors, combine multiple sensors into one device powered by wall power and a battery back-up. The sensors can detect motion, Temperature, LPG gas, smoke and fire, raises alarm and communicates with the Smart Hub over the Wi-Fi network. They have the capability to notify the emergency services through various mediums without a need of human intervention.

Orvito Standalone dual load sensors perform simple functionality of switching on/off of lights and appliances based on motion and occupancy.

Orvito's Nucleo platform provides all end points that control and monitor the physical world around you. The platform enables a user to access, monitor, assess and analyze the digital data from the platform using the Smartphone, Tablet and Web Applications. The applications are available on iOS® and Google Android® store. The Web Applications can be accessed from Orvito's cloud at <http://www.iot.orvito.com>

The applications enable the user to control any appliance from anywhere & anytime. Users can monitor energy usage of each node, zone and group over time.

## THE OPPORTUNITY

- The old circuitry challenge in the building was hardly a road block for Orvito as all the products are retrofittable and based on Wi-Fi
- The premium look was matched and enhanced by Orvito's minimal designed tempered glass switch panel
- With zero requirement of IT sophistication Orvito products can transform any building into a future ready automated facility with minimum downtime







# THE IMPLEMENTATION

## INSTALLATION

The first step towards the installation was load and Wi-Fi signal mapping by Orvito FAE team. Through this activity the team records the wattage and exact location of the load of the entire facility.

The Wi-Fi Signal mapping requires the Orvito FAE team member to survey the building locations for Wi-Fi signal strength that helps Orvito to establish locations for our products. For additional security Wi-Fi signal is always encrypted with WPA2-PSK key on 802.11n Wi-Fi signal for optimized range.

All the products are installed with minimum downtime as no additional wiring is required making Orvito's solutions completely retrofittable.

## ACTIVATION & CONFIGURATION

Smart Switch Panels and Smart Sensors are activated in Smart Hub and the Nucleo cloud simultaneously. In matter of few minutes, the FAE enables the following rules to improve energy efficiency of the entire facility

1. Motion event based lighting control for the zone
2. Time based control of lighting and Air Conditioning
3. Temperature measurement and AC control in the room
4. Intruder alarm event based on motion event during certain times of the day

## TRAINING

The project took about a month for installation. It required 1 week of training to following teams

1. Customer IT teams
2. Customer Senior Management
3. Customer Administration team

## MEASUREMENT & ANALYSIS

The building administration was given access to real time web based dash board and rules to control all the Lighting Appliances and Air Conditioning. The rules were modified for optimized energy usage. This helped the management to estimate their energy bill and take corrective actions on the go.

Over a period of time the System started to learn the energy behavior of the building and many of the Lighting, Personnel Computers and Air Conditioning loads were controlled down to the number of minutes of Switch-ON and Switch-OFF of the loads.

# 15-18%

## COST SAVING PER ENERGY CYCLE

### THE RESULT

With dynamic and easy to read charts the customer can

1. Measure the true usage of energy.
2. Identify critical and non-critical loads
3. Understand the energy expenditure across loads and zones
4. Decide on loads which needed to be removed from the building
5. Select rules which helped them reduce energy
6. Predict their energy usage and bill for every week
7. Total energy bill reduction was done to 13% (see Appendix)
8. They were not able to use the hourly dynamic energy pricing module due to lack of support from their utility company



# APPENDIX

## Load List & Wattage

Floor	Load Type	Watts	Quantity
Ground	T-5 Light	36w	31
	CFL Lights	11w	8
	AC	1640w	7
	Fan	25w	2
	Desktop Computers	50w	10
First	T-5 Lights	36w	44
	CFL Lights	11w	
	AC	1640w	11
	Fan	25w	2
	Desktop Computers	50w	37
Second	T-5 Light	36w	54
	CFL Light	11w	5
	AC	1640w	11
	Fan	25w	5
	Desktop Computers	50w	20
Third	T-5 Light	36w	1
	CFL Light	11w	49
	AC	1640w	11
	Desktop Computers	50w	2

### Rules for saving energy based on time

1. The T-5 lightings on Second & Third floor were switched off automatically from 1:00 pm to 2:00 pm.

Total energy reduction of 1950Wh for the hour.

2. AC Load reduction

a. The AC loads were switched off at 5:15 pm in the entire building. This was 45 minutes before the regular switch off period. A total of 49KWh.

b. The AC loads were switched off during 1:00 pm to 2:00 pm. A total reduction of 65.6KWh.

c. The AC loads were switched off to control for 4 degree of temperature band. The variation of energy consumption varied across the day and season. The average reduction was 39.4KWh (6

hours x 10% in band switch off x Total units (40) x Per unit wattage 1640w)

3. Desktop Computers

a. Computers were for First floor was switched off from main power supply at 5:20 pm. Employees on this floor were found to be leaving office on this floor by 5:00 pm with the computers being left in ON state. A rule was created to switch off the computers by default at 5:20pm and switch ON at 9:00am in the morning. Average energy reduction of 29.6KWh (50w x 37units x 16 hours)

Total reduction in Energy usage is 119.9 KWh per day (1.9KWh + 49KWh + 39.4KWh + 29.6KW)

# ANNEXURE

Best Practices For Improved Energy Relationship

Orvito over a period of time developed some best practice rules which are shared with our install base.

The rules are created for one customer and can be shared through the Nucleo Cloud, the SmartHub pulls the shared Rules, analyzes if these meet the customer site requirements and can update the same. Orvito Call center is available for any kind of support with installation, configuration and update support.

Some sample rules which were configured for the current client

1. All lights were switched off during lunch time 1:00 pm to 2:00 pm. No occupancy was detected at certain floors during this time.
2. Motion event based lighting control was enabled after 5:45 pm. During initial phase, it was found that employees other than finance left the office by 5:30 pm. Some employees of select departments stayed late and required lighting in certain zones only.
3. Zone based temperature control of Split Air Conditioners. The customer did not use centralized Air Conditioning. This required each Zone AC to be

controlled individually. A 4 degree temperature band was defined. Orvito sensors were placed at strategic locations in the zone. The AC was controlled (Switched OFF/ON) only if the temperature went outside the defined temperature band. A 2 Degree adjustment to room temperature did not affect comfort of employees, however, it resulted almost 10% reduction in energy usage by AC units.

4. Integration with Real Time Energy pricing modules. This feature is part of the Orvito Energy Management module. However, it is dependent on the utilities providing real time energy billing program. Certain geographies like USA provide Real Time Energy pricing by the hour. The program is referred to as RTTP Residential Real Time Pricing: where the cost of unit of energy changes by the hour. This is dependent on wholesale rate from the energy producer. (<https://rrtp.comed.com/>) Orvito system is designed to plug into the RTTP program of the utility, identify critical and not so critical loads and control them for different pricing segments.

## About Orvito

Orvito designs, manufactures and markets the “Internet of Things” devices. With focus on automation and security surveillance products for Home, Hospitality and Enterprise sectors, Orvito’s goal is to enhance security, increase energy efficiency and simplify life. Led by a team of professionals with strong technology background and a keen focus on innovation and quality, we strive to create future-ready automation & security products.

At Orvito, we aim to create a wireless world and provide an unprecedented value and opportunity for our customers, employees and ecosystem partners. Headquartered in Massachusetts, USA, Orvito operates in North America, South Asia, Middle East and Africa. With a strong network of distributors, partners, direct sales force and after sales support team, Orvito enables smooth installation and service of products

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