CHECKLIST

THE ROI ON TELECOM SITE AUTOMATION SOLUTIONS

Application Savings In Network Resilience and Network Efficiency

Asentria®

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Introduction

The ROI on telecom site automation (TSA) solutions comes from savings within two main categories: network resilience and network efficiency. Most TSA applications will lead to savings in either network resilience, efficiency, or both. The solutions are modular, so not every installation includes all the parts described below. One significant advantage of having a modular solution is how you can extend the initial purpose of the SiteBoss site solution for other uses. We found most customers expanding the use of their SiteBoss after gaining more knowledge on the power of the site automation solutions. Calculating the exact savings will depend on variables like the amount paid for electricity, how truck rolls are valued, or what is considered the cost per minute of network downtime. Regardless of those exact values, you can gain ROI in the following ways outlined in our checklist. We categorize most savings as falling into the fourteen categories below:

Network Uptime - Improved Product Quality

CAPEX Savings – Damage due to Theft/Cost of Stolen Asset
CAPEX Savings – Improved Vendor Evaluation
CAPEX Savings – SiteBoss is alternative to separate piece of equipment
CAPEX Savings – SiteBoss extends life of other equipment
CAPEX Savings – Prevent Damage to Equipment

OPEX Savings - Direct Energy Savings
OPEX Savings - Direct Labor – Truck Roll
OPEX Savings – Maintenance
OPEX Savings – Installation Costs
OPEX Savings – Regulatory Compliance

Operational Data (to detect sub-optimal sites)

Green Issues – Energy Savings
Green Issues – Saving Use of Vehicle

Instructions: Mark the boxes next to the category variables that you'd like to implement in your telecom site automation solutions. At the end, we will tally up the savings in each category to help you determine a rough estimate of postive ROI impact.

Power Applications

Site power is one of the most critical variables at any telecom site. The SiteBoss units enable power-related automation to increase site life and reduce costs. The list below is a representative list of variables that the SiteBoss can easily monitor and enabling various applications for automation.

Generator / ATS Control

The SiteBoss can centralize control and management of generators across all makes and models. We can provide operational data on fuel levels, detect fuel theft, and remotely or autonomously start and stop the generator. Application examples include:

- [ ] **Remotely exercising all generators to search for generators that fail to start prior to hurricane landfall.**
  - Network Uptime – Improved Product Quality

- [ ] **Checking on backhaul availability to determine whether to run the generator or to hibernate a site.**
  - Network Uptime – Improved Product Quality
  - OPEX Savings - Direct Energy Savings
  - Green Issues – Energy Savings

- [ ] **Automation can be created to extend site life per liter of diesel when site is running on generator.**
  - Network Uptime – Improved Product Quality
  - OPEX Savings - Direct Energy Savings
  - Green Issues – Energy Savings

- [ ] **De-averaging" maintenance cycles to correspond to generator run time instead of doing generator service on a schedule.**
  - OPEX Savings – Maintenance

Diesel or LP (or Natural Gas for rooftop sites) Measurements

- [ ] **Prioritize refueling immediately after a storm event to sites with lowest fuel level.**
  - Network Uptime – Improved Product Quality
  - Operational Data (to detect sub-optimal sites)

- [ ] **Detect Fuel Theft**
  - Network Uptime – Improved Product Quality
  - CAPEX Savings – Damage due to Theft/Cost of Stolen Asset

AC Power Monitoring

The SiteBoss can be integrated to most power meters. Application examples include:

- [ ] **Simplifying the billing by a towerco of AC charges in a multi-tenant site by delivering all AC usage to the NOC.**
  - OPEX Savings - Direct Labor – Truck Roll

- [ ] **Comparing site's power usage vs. one another to identify outlier sites.**
  - Operational Data (to detect sub-optimal sites)

AC Power Sensing

- [ ] **Simple ability to sense presence or absence of current on a 120V/240V AC circuit.**
  - Network Uptime – Improved Product Quality

DC Current Monitoring

- [ ] **Ability to measure DC currents on circuits through use of current transformers.**
  - Network Uptime – Improved Product Quality
  - CAPEX Savings – Improved Vendor Evaluation

DC Rectifier Integration

- [ ] **Access and gather data from DC rectifier "smart controller".**
  - CAPEX Savings – Improved Vendor Evaluation

Battery Monitoring

- [ ] **Ranging from simple measurements up to controlling specialized battery monitoring sub-systems.**
  - Network Uptime – Improved Product Quality
  - OPEX Savings – Maintenance

DC Reboot

Asentria has a range of abilities to directly reboot or shutdown DC circuits. The two most common applications are listed below. The SiteBoss can switch 10A, 30A, 60A, and 90A circuits (@ 48V) depending on configuration.

DC Reboot

- [ ] **This application commonly involves a wireless modem as well. If the primary communications path to the site is disrupted, the wireless modem can be used as an alternate out-of-band method of communicating to the site. Troubleshooting can occur over this connection via the SiteBoss, and devices (eg. Microwave) can be re-booted to quickly re-establish primary communication and prevent a truck roll.**
  - Network Uptime – Improved Product Quality
  - OPEX Savings - Direct Labor – Truck Roll
  - Green Issues – Saving Use of Vehicle

Load-Shedding

- [ ] **This application most often involves the SiteBoss detecting a loss of AC power to the site, and taking independent action to reduce power usage at the site by shutting down controlled equipment at the site in a certain order to extend site life and save power, as well as controlling the order in which equipment is powered up after power restoration to prevent possible damage to site equipment.**
  - Network Uptime – Improved Product Quality
  - CAPEX Savings – Prevent Damage to Equipment

Physical Security Applications

Direct physical security of a site can be directly related to site resilience. Theft or someone directly harming a site can both lead to network downtime and costly repairs. In some cases, without a method of measuring variables at the site, theft or damage could occur and not be known about until a crisis caused a site to fail. A simple example of this would be diesel fuel theft, with no knowledge of the low fuel condition until the generator fails to start when needed.

Indoor/Outdoor Door Sensors, Simple Motion Detectors

- [ ] **Simple monitoring of doors and motion.**
  - Network Uptime – Improved Product Quality
  - CAPEX Savings – Damage due to Theft/Cost of Stolen Asset

Door Access Control - RFID Card Interface

- [ ] **Custom solutions to manage Wiegand controllable card reader access controllers, ranging from simple controls to large network-wide door access control utilizing Asentria's new Asentria Site Management software.**
  - Network Uptime – Improved Product Quality
  - CAPEX Savings – Damage due to Theft/Cost of Stolen Asset
  - CAPEX Savings – SiteBoss is alternative to separate piece of equipment

Tower Lighting Alarms

- [ ] **Interface to tower light control systems for alarming and regulatory compliance.**
  - OPEX Savings – Regulatory Compliance

IP Camera Integration

- [ ] **Integrate to any IP based camera, with specialized features to reduce bandwidth usage from the remote site. Improve security and reduce theft.**
  - Network Uptime – Improved Product Quality
  - CAPEX Savings – Damage due to Theft/Cost of Stolen Asset

Environmental Applications

Site environment is a key variable in both the cost of operating the site as well as the resilience of the site. Several simple important variables can be measured, but the most interesting applications relate to the SiteBoss taking over network-wide control of the HVAC.

HVAC Control

Manage all HVAC regardless of make and model.

- [ ] **Smart Controller Interface - Interface to intelligent HVAC controllers to provide access and control of the smart controller.**
  - CAPEX Savings – SiteBoss is alternative to separate piece of equipment
  - CAPEX Savings – SiteBoss extends life of other equipment
  - OPEX Savings - Direct Energy Savings
  - Green Issues – Energy Savings

- [ ] **Direct HVAC control – Replace old thermostats directly with functionality within the SiteBoss. Enables many advanced HVAC control functions, as well as allowing centralized control of HVAC (eg. HVAC setpoints) from the NOC.**
  - CAPEX Savings – SiteBoss is alternative to separate piece of equipment
  - CAPEX Savings – SiteBoss extends life of other equipment
  - OPEX Savings - Direct Energy Savings
  - Green Issues – Energy Savings

Temperature/Humidity, Smoke, Water, Airflow, Hydrogen, Weather Station

- [ ] **General Envrionmental Variables**
  - Uptime – Improved Product Quality
  - APEX Savings – Prevent Damage to Equipment
  - Operational Data (to detect sub-optimal sites)

Networking Applications

(Scripting/RESTful API/Custom Web Interfaces)

Many of the most interesting applications relate to the SiteBoss' onboard LUA scripting language and the RESTful API. The SiteBoss is connected to all major site sub-systems, and can make decisions based on complex logic. Several brief examples are listed below, but there are many new possible applications using these functions.

Scripting

- [ ] **Site Hardening – SiteBoss recognizes AC main power is lost to a site. SiteBoss doesn't start generator unless battery charge is below a certain level, and temp is above a certain level, extending diesel fuel and site life.**
  - Network Uptime – Improved Product Quality
  - OPEX Savings - Direct Energy Savings

RESTful API

- [ ] **Telemetry Representations – Any data that a SiteBoss is gathering at a telecom site can then be sent to various Business Intelligence software for dashboards, reports, site and equipment comparisons, etc.**
  - Operational Data (to detect sub-optimal sites)

Custom Web Interfaces

- [ ] **Custom Device Management – Asentria has created specific custom web interfaces so that associated systems can be directly controlled from a SiteBoss, with all the variables being represented in the SiteBoss web interface.**
  - CAPEX Savings – SiteBoss extends life of other equipment

Network Growth

A common problem in mobile networks is a lack of Ethernet ports at the site or IP addresses on the network. A SiteBoss can be equipped with a four-port or eight-port Ethernet Layer 2 switch. This solves several problems:

- [ ] **Ethernet Ports – More "smart" controllers are being added to sites and site routers don't have the physical ports to accommodate them. The SiteBoss adds additional Ethernet ports for expansion at the site.**
  - CAPEX Savings – SiteBoss is alternative to separate piece of equipment

- [ ] **IP Addresses – IP address management is complicated by the addition of networked devices at sites. The SiteBoss provides a separate network for attached devices with IP addresses served from the SiteBoss by DHCP. Only the IP address of the SiteBoss needs to be added to the network.**
  - CAPEX Savings – SiteBoss is alternative to separate piece of equipment

- [ ] **Security – Many operators have network security concerns, and the SiteBoss can perform as the single approved secure device on the network, with non-approved devices (eg. HVAC smart controllers) on the separate network created by the SiteBoss.**
  - CAPEX Savings – SiteBoss is alternative to separate piece of equipment

Network Secure Remote IP Access

This function most often enables someone within the NOC to communicate securely to the SiteBoss unit, and then pass through the SiteBoss unit to communicate to other equipment at the site.

- [ ] **Wireless Modem to Ethernet (or Serial) – A wireless modem option can be used to connect to the SiteBoss, and then connect through the SiteBoss unit to any attached Ethernet or serial based device.**
  - Network Uptime – Improved Product Quality
  - OPEX Savings - Direct Labor – Truck Roll
  - Green Issues – Saving Use of Vehicle

SNMP Applications

- [ ] **SNMP OID Creation – If polling of the SiteBoss is preferred to SNMP traps, the SiteBoss also has OID's corresponding to all measured values that can be polled. New OID's can be created to create new values at the site**
  - CAPEX Savings – SiteBoss extends life of other equipment

- [ ] **SNMP Proxy – Allows SNMP agents to poll devices that are connected to the SIteBoss, but which are not on the same network as the agent. A means of keeping smart controllers that aren't considered fully secure off the primary network.**
  - CAPEX Savings – SiteBoss extends life of other equipment

- [ ] **SNMP Trap Capture – SNMP traps can be sent from local devices at a telecom site directly to the SiteBoss. The SiteBoss can then take various pre-set actions based on the trap received, or information contained within the traps.**
  - CAPEX Savings – SiteBoss extends life of other equipment

- [ ] **SNMP Polling – SiteBoss can poll specific OID's from other SNMP devices, and build internal files of that data that can be used by our alarming or scripting functions.**
  - CAPEX Savings – SiteBoss extends life of other equipment

Legacy Alarm Applications

Asentria can provide support as an upgrade path for legacy alarms. Asentria can create custom cables or adapters to enable an easy way to move legacy contact alarms to the SiteBoss. This is common where alarm contacts have been terminated from a punch-down block to a legacy device (eg. Badger RTU, or 2G/3G RAN that is being decommissioned).

- [ ] **The SiteBoss can simplify the removal of legacy devices by taking over these alarms with a minimum of new cabling labor.**
  - OPEX Savings – Installation Costs

Conclusion

Telecom site automation solutions have evolved significantly. The purpose of older remote terminal units (RTU's) was to deliver basic alarming. Alarming is certainly useful, but modern TSA solutions have many other new benefits, which can completely change ROI calculations. All of the functions listed above are in use in telecom operators networks today and are real-world benefits that TSA can deliver.

Asentria is a 30-year-old company based in Seattle, Washington, and has multiple hardware deployments of 10,000 or greater sites in the largest mobile network operators worldwide.

Checklist Worksheet

Instructions: Count the times each category was listed in a variable you have marked above in the checklist. Write down that number next to each category to give you an overall picture of the impact of telecom site automation solutions. Use that number to help you predict and roughly estimate the ROI considering the value and cost.

Count	Category	Value	Estimated Cost	
5	*EXAMPLE*	*(High, Med, Low)*	*$xxxx.00 per KW*	
	Network Uptime - Improved Product Quality			
	CAPEX Savings – Damage due to Theft/Cost of Stolen Asset			
	CAPEX Savings – Improved Vendor Evaluation			
	CAPEX Savings – SiteBoss is alternative to separate piece of equipment			
	CAPEX Savings – SiteBoss extends life of other equipment			
	CAPEX Savings – Prevent Damage to Equipment			
	OPEX Savings - Direct Energy Savings			
	OPEX Savings - Direct Labor – Truck Roll			
	OPEX Savings – Maintenance			
	OPEX Savings – Installation Costs			
	OPEX Savings – Regulatory Compliance			
	Operational Data (to detect sub-optimal sites)			
	Green Issues – Energy Savings			
	Green Issues – Saving Use of Vehicle			