



The Emergence of Outcome-Based Services

Driving Sustainable Outcomes



Leon Surbaugh, Trane Building Services
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A Quick Poll...

By show of hands...

- How many of you have a formal maintenance program in place?
- How many use a maintenance management system such as Maximo?
- How many of you use primarily a calendar-based, list of maintenance tasks?

Discussion Objectives

1. Why operational outcomes are replacing calendar-based service tasks in today's service models
2. Capture data to create more effective service models
3. How to economically justify service

Mystery Question

What is the largest barrier to initiating outcome-based services?

Historical Service Model

- List of tasks to execute
- Time-based schedule
- Unclear benefits
- Assumed benefit – reliability and performance

Research by Trane

- Panel of building operators, owners and managers who had service agreements with assorted vendors
- 60% do not know how to measure the value of their service agreement
- 40% who did – compared execution to schedule
- Time is right for model change to outcome-based services

Outcome-Based Services Defined

Customized aggregation of services to accomplish a specified outcome.

- HVAC outcome examples
 - Energy usage
 - Reliability – uptime
 - Temperature
 - Humidity
 - Air quality
 - Other?



Outcome-Based Example

- Communications technology company
 - Objective 99% uptime
 - First year results

“The Trane Performance Based Agreement, coupled with Trane Central Monitoring, has significantly reduced our downtime by more than 60 percent and cut our truck rolls in half, which has improved response time and turnaround time on system repairs. With Trane Central Monitoring, we’ve been able to maintain a 99 percent uptime commitment to our customers.”

-M.M. Facilities Manager-

Hypothetically,

- Would it make more sense to...
 - Replace all air filters every three months consistently, or
 - Replace all air filters based upon either a pressure drop, an air quality index or an air flow measurement?
 - What if you knew that only 10% of all air filters require replacement in less than six months, and that you were overspending on filter replacement by 60%?

Outcome-Based Services – Getting Started

- Defining the desired outcomes is a collaborative effort with the following process steps

System categorization

System prioritization

Define outcomes by system type

Define measurement and frequency



Outcome-Based Services - Executing

- Execution of outcome-based services steps

System evaluation

System optimization and/or re-commissioning

Establish performance baseline

Monitor and measure against baseline

Regular reporting and review



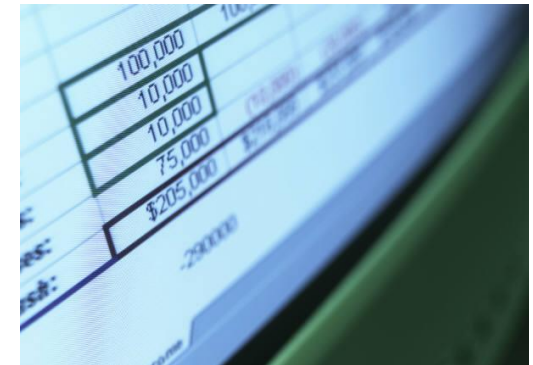
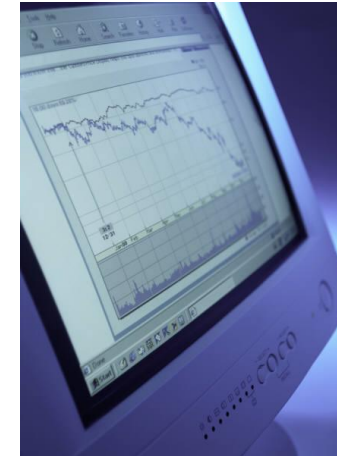
Outcome-Based Service What's Included?

- Outcome-based agreement includes portions of
 - Building automation service
 - Preventative services
 - Predictive services
 - Proactive services
 - Data collection
 - Data analytics
 - Diagnostics
 - Report out
- Building outcomes require a team of experts:
 - Energy engineers
 - Optimization engineers
 - Technicians



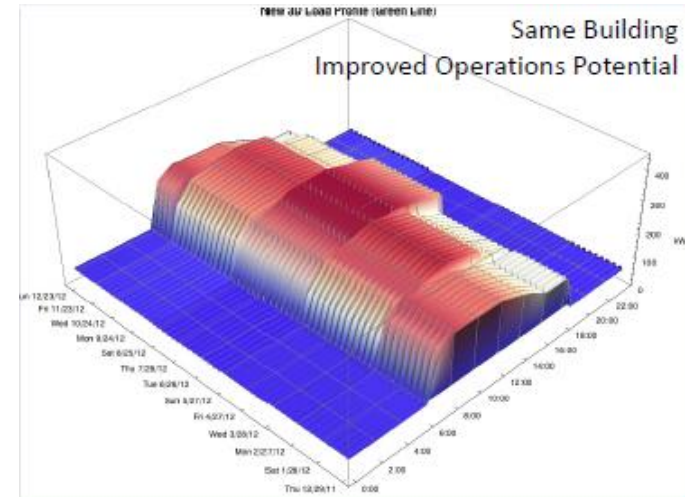
Capture Data

- Where do you capture data?
 - Energy usage
 - Utility meters/vendors
 - Automation system
 - Excel spreadsheets
 - HVAC system
 - Building automation system (BAS)
- Key: Leverage available information

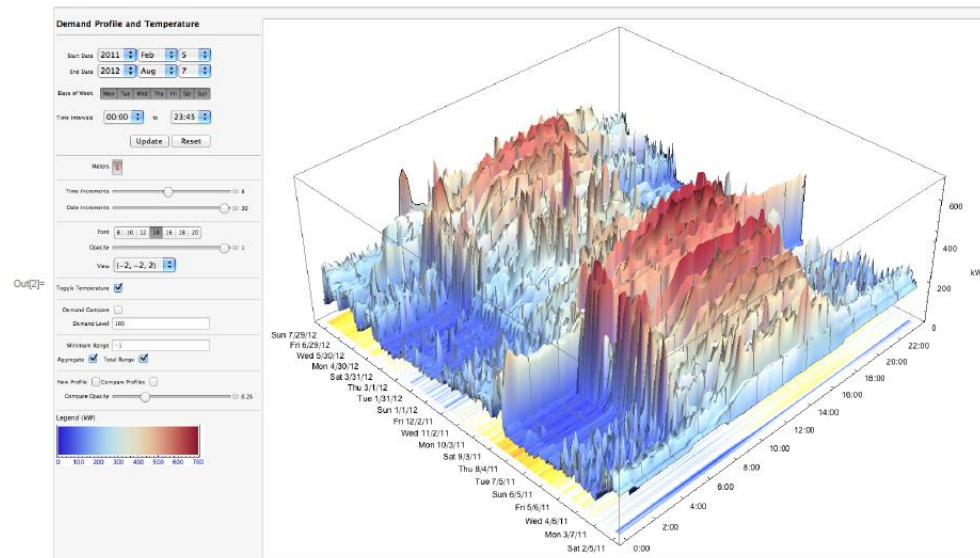


Capture Data – Energy Analytics

- Visual representation of energy usage based on smart meter data
- Makes invisible energy usage real
- Quickly and easily identifies potential energy conservation measures
- Use to validate efficacy of building automation schedule



3D Load Profiles



Capture Data – HVAC System and Component

- **Analytics**
 - Traditional tools
 - Software-based tools
 - Condition-based service
- **Diagnostics expertise**
 - Energy engineers
 - Optimization engineers
 - Technicians



Capture Data – Diagnostics Report Out

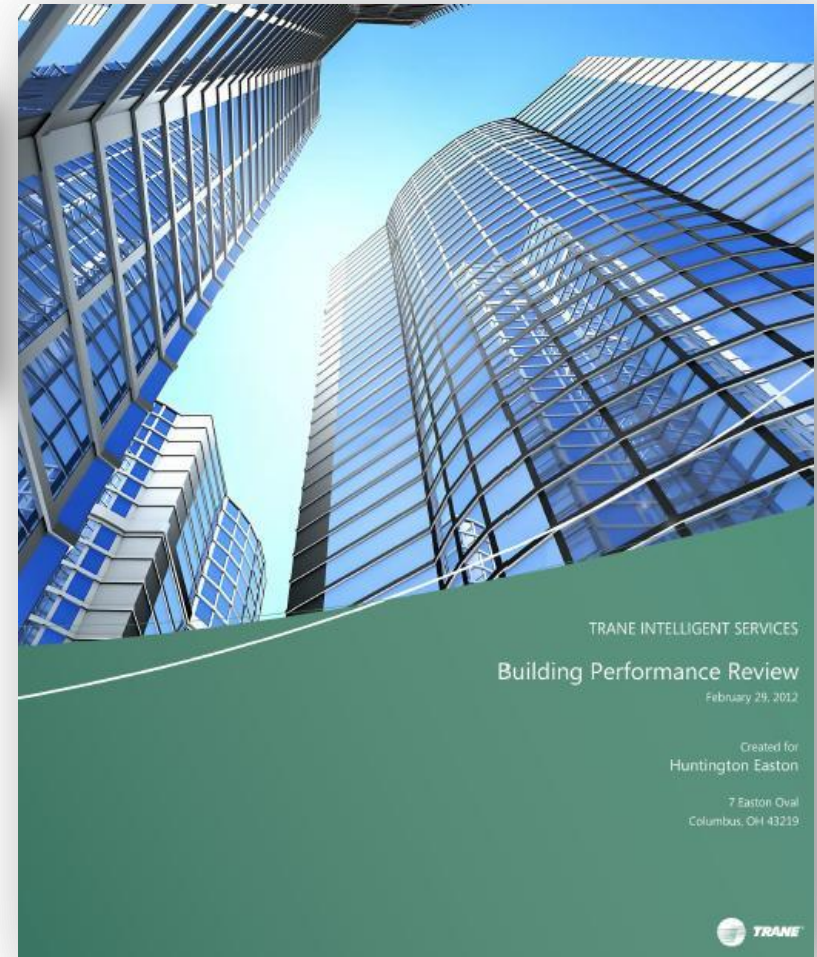
- Reports
- Dashboards
- Frequency



Dashboards

KEY PERFORMANCE INDICATORS SUMMARY
As of Mar 2012

	PREVIOUS	CURRENT***	CHANGE
ENERGY PERFORMANCE*			
Consumption	28 kBtu/ft	23 kBtu/ft	↓ 18%
Energy Cost	\$0.70/ft	\$0.59/ft	↓ 16%
CO ₂ Emissions	351 metric tons	295 metric tons	↓ 16%
FACILITY PERFORMANCE**			
Facility % Time in Normal Operation	66	46	↓ 20%
System % Time in Normal Operation	68	33	↓ 35%
Equipment % Time in Normal Operation	63	58	↓ 5%



Reports

Economic Justification - Resources

- (US) Federal Energy Management Program (“FEMP”) says that formal maintenance can save 5-20% of energy costs
- Estimated services and repair costs via R.S. Means (“CostWorks”).
- Maintenance Management software (Maximo, etc.)
- Trade associations and service portals

What is the Premise for Economic Justification?



- We justify the level of services through offsetting the cost of :
 - Premature capital investment (early degradation)
 - Excessive repair costs
 - Unplanned downtime
 - Degradation of system efficiency and energy cost
 - “Other” costs such as staff overtime, tenant concessions

In Closing

- Identify “mission critical” systems
- Establish priorities and critical system outcomes
- Identify, tap into sources of data
- Validate outcomes, perform services as necessary to maintain within tolerance and project acceptable performance
- Frequently reassess building use, scheduling and operational sequencing
- Establish an economic basis for service costs as related to “avoided” capital, repair and energy cost degradation

Mystery Question

- What is the largest barrier to initiating Outcome-Based Services?

Availability of Data

Discussion



TRANE®

Leon Surbaugh, Trane Building Services

Office: 940-482-7040

lsurbaugh@Trane.com

