

Data Driven Influence by the University of Arizona & McKinstry





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In this session:

- Move from *leader* to *influencer*
- Find what's important and useful
- Prioritize for real time processing
- Translate to drive change
- Actionable results
- Transform decision making impetus







a Ia Climate Action Response November 2010

UA Campus Overview

- +42,000 students
- 11 Million Square Ft.
- +267 buildings
- 600 Facilities Staff
- 3 Central Plants









Central Heating and Refrigeration Plant

- 12,000 Ton Cooling Tower
- 10,000 Water Chillers
- 800 Ton Glycol Chiller
- 6,400 Ton-hr Ice Storage
- 180,000 lb/hr Steam
- 7 MW GTG



Central Refrigeration Building

- 13,000 Ton Cooling Tower
- 12,000 Water Chillers
- 2,400 Ton Glycol Chiller
- 20,000 Ton-hr Ice Storage



Arizona Health Sciences Central Plant

- 8,000 Ton Cooling Tower
- 7,500 Water Chillers
- 155,000 lb/hr Steam
- 6 MW GTG





UA Facilities Change Management

Number of Employees Eligible to Retire (80 points/62 years) Per Year																				
	Current ## FTE	201	2 2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	Reti	rement Potential	Total	Per	cen	itagi	e	
Electric	23		X	1	2	2		1	3					13 out of 23				57	96	
Plumbing	20		2	ĺ	1		1	1	1	2				8 out of 20				40	96	
HVAC	12		4 4					2		/				7 out of 12				58	96	
HVAC Mechanical	11	5	5					1		1	/	1		8 out of 11		-		73	96	
Utilities	tuno 20		1	/	1	1	з	1	2	/	1		-	14 out of 20				70	96	
Sheet Metal	0 번 14		3			1			2	/	1	. 1		8 out of 14	-			57	96	
Paint/Sign	22	0 4	3 1	1			2	1	1	1	2			17 out of 22		_		77	96	
Carpentry	21	:	2 2	2	1	4	4		1					16 out of 21				76	96	
GMM	11		3 1	2	1			1	1					MANAGEMENT ANALYSIS Departmental Reorganization -		July	Aug.	Sept.	Oct. Nov.	Dec. Ja
														See attached org. charts		Ŷ			i	++
Garage/Motor Pool/ Small Engine Shop	10	5	1 1	1	1		1		1		2			FM Centralization FM Administration moved to 161 Mabel. Renovation Services moved to Vine. HVAC moved to 1526 E Lester.	10 N Vine. o 1240 E 1810 N	x			x	
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														Succession Planning		х.	=	=	— —	+++
														Square Footage Analysis – Sight Lines					í – † –	+×+
														Utility Metering Analysis					×	$\pm \pm$
														Monthly Leadership Training		×	\equiv			
														Sustainability Climate Action Response Audits: Metal Key, Keyless Access	2	<u>x</u> .	$ \rightarrow$		X	++
														Federal Metering		\rightarrow	\rightarrow	×	i	× +
														Sierra Southwest Contract Review	w	$ \rightarrow$	\rightarrow	x	Ħ	<u>₹ `</u>

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Human Resources

Operations

Utilities





The need for the *right* data

- Leadership Development
- Responsibility Centered Management
- Maximize Operational Efficiencies
- Data Driven



Team buy-in and collaboration







The Right information at the Right time



"We had to move past 'data drowning' and get to a point where we collect and sort the critical information in real time. This program allows us to make informed decisions and then see, understand and monetize the results of those actions."

Chris Kopach, Vice President





Active Energy Management Overview

Monitoring-Based Commissioning employs remote energy system metering with trend log capability to identify previously unrecognized inefficiencies in energy system operations

-California Institute of Energy and Environment

Active Energy Management is..

- "The concerted deployment of monitoring-based technologies and onsite building system operations experts to drive continuous efficiency improvements"
- Engagement with systems and operators to effect both operating and operator performance excellence

What AEM is not...

- A controls system
- A software
- A product
- Not vendor-specific





Active Energy Management Outcomes

- Persistence of energy savings
- Increased systems visibility
- Institutionalizing technical data
- Saves staff time
- Real time building performance
 monitoring
 - Remote-response to faults
 - Root cause determination
 - Specific operator actions
 - Continuous facility optimization







Conventional vs. High Performance

- \checkmark Component-based
- ✓ Moment-in-time
- ✓ Individual investigation
- ✓ Reactive
- \checkmark Institutional



- ✓ System-based
- ✓ Continuous monitoring
- ✓ Collective intelligence
- ✓ Predictive
- ✓ Documented







UA AEM Data Flow + Process Mapping



- Collaboration with UA facilities and plant staff
- Decided to start with CHW plant
- Building a scalable, cost-effective system
- Optimal visibility and savings opportunities



✓ Open data sharing between Owner and McKinstry AEM Program







- Units
- Other meaning and descriptors





✓ Analytics, Models, Virtual Points, Post Processing

- Device failure notice
- Operational bounds testing
- Performance Analytics

$$PlantDemand_{(x)} = \sum_{n=1}^{Equipment} (kW_n) \{OR\} (Amps * Pf * Volts)_n$$

Chilled Water Cycle FFT(x) =
$$a_0 + \sum_{n=1}^{\infty} \left(a_n \cos \frac{n\pi x}{L} + b_n \sin \frac{n\pi x}{L} \right)$$



✓ Ongoing response, monitoring, and performance optimization

- On-site evaluation and problem remediation
- Remote Monitoring







Project Status

- Initial ~\$500,000 in operational opportunities
- Developed KPIs and analytics
- Refined plant operating practices and operator intent
- Developed performance dashboards for key measures
- To "move the needle" --- you need to have a needle



Equipment	Rule	Times (Sun - 2/21)	Sun - 2/21	Sat - 2/20	Fri - 2/19	Thu - 2/18	Wed - 2/17	Tue - 2/16	Mon - 2/15	Sun - 2/14
AHSC CH- 03	CW dP Thru OFF Chiller	12:00a (1day)	100%	100%s	<u>100%; 24u</u>	100%s 24hr	100% 24hr	100%) 2.4hr	100%s	<u>90%</u> 15.75h
CHRP CH- 07	CHW dP Thru OFF Chiller	12:00a (1day)	100%s 2.4hr	100% a	100% 24hr	100%s 24hr	100% 24hr	100%5 24br	100%s 24hr	100%s 24br
CHRP CH- 09	Chiller Design Evaporator dP Exceeded	12:00a (1day)	100% 2.4hr	100%。 24hr	100%) 24hr	<u>100%</u> 24hr	100%s 14.25hr	100%) 12.5hr	<u>9556 .90</u>	100%519h
CHRP CH- 09	Chiller Evaporator dT Not Meet	12:00a (1day)	100% 2.4hr	100% 24br	99%s _23.75hr	<u>33% 8hr</u>	1698 2.25hr	69a) 45min		89a 45min
CHRP CH- 11	Chiller Design Evaporator dP Exceeded	12:00a (1day)	100% 2.4hz	100%s	100%; 24hr	100% 12.5hr	100%; 22hr	100% 24hr	98%i 23.5hr	100% 24h
CHRP CH- 11	Chiller Design Condenser dP Exceeded	12:00a (1day)	100%	100% 24hr	<u>100%; 24hr</u>	<u>98%</u> 12.25hr	99%) 21.75hr	97% 23.25hr	100%s 24hr	100% 124h
CHRP CH- 11	Chiller Condenser dT Not Meet	12:00a (1day)	100%		<u>99%;</u> 23.75hr	-	14%) 3hr	<u>36%</u> 8.75hr	24% 5 75hr	45% 10.75h
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Initial Project Results

- Successful collaboration
- Resolved deficiencies
- New understanding enabling influence
- Identified actionable KPIs to drive change
- Written operations knowledge is power



Shifting from theoretical to data driven decisionmaking.

- Many APPA Members are overwhelmed by both floods of data and lack of the right data when changes to systems or practices causes uncertainty, excuses or delay. This defaults to the "if it ain't broke, don't fix it" mentality.
- By filtering meaningful data leaders critical insights resulting from changing operating practices and energy consumption.
- You can become "Influencers" if you choose to lead your operational paradigm shift from theoretical to data driven decision-making.



But can we change people?

"I haven't got the slightest idea how to change people, but I keep a long list of prospective candidates just in case I should ever figure it out."

David Sedaris





Influence: The ability to change behavior. It's one of the most important capacities we possess.





PROBLEM One of the most important capacities we possess is our ability to influence behavior. Yet most of us don't have a careful way of thinking about our influence challenges.

SOLUTION Understand and apply the most scholarly, proven, and powerful approach to exerting influence—the ability to change our own behavior or the behavior of others.



If you want to influence a persistent problem, you'll need to **draw on many sources of influence.**







The key to personal motivation is to help people see the true implications of their actions and choices by connecting the new behaviors to deeply held values.

Although personal motivation is necessary, it's rarely enough. Successful influencers engage personal motivation, but then combine it with several additional sources of influence.









The Three Keys to Influence Successful influencers do three things:

- 1. Focus and measure (covered in lesson 1): They're clear about the results they want to achieve and how they will measure those results.
- 2. Find vital behaviors (covered in lesson 2): They focus on a small number of vital behaviors that will help them achieve those results.
- 3. Engage all Six Sources of Influence (covered in lessons 3–8): They identify and leverage all the forces influencing the vital behaviors





Influencing data to drive change

ORGANIZATIONAL BENEFITS OF INFLUENCER TRAINING®

• workplace safety, customer service, compliance, and profitability

PROVIDES SKILLS TO:

- Identify the high-leverage behaviors you should focus on
- Diagnose the real causes behind behavior problems
- Effectively motivate and enable others-regardless of formal authority
- Create behavior-change strategies that yield rapid, lasting results



"Theoretical to Data Driven Decision Making"

Results being realized by UA:

- Operational paradigm through Active Energy Management (AEM)
- Solving the "data drowning" problem by filtering the right data
- Over \$500,000 of initial cooling plant savings
- AEM is driving a renewed passion and purpose by facilities staff
- Tracking real savings & additional Facility Improvement Measures





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"Leadership is intentional influence." — Joseph Grenny

Thank you for your attendance and we look forward to your questions.

https://www.vitalsmarts.com/influencer/





Thank You

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