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Data Analytics and Evaluation

-- Survival of the Fittest

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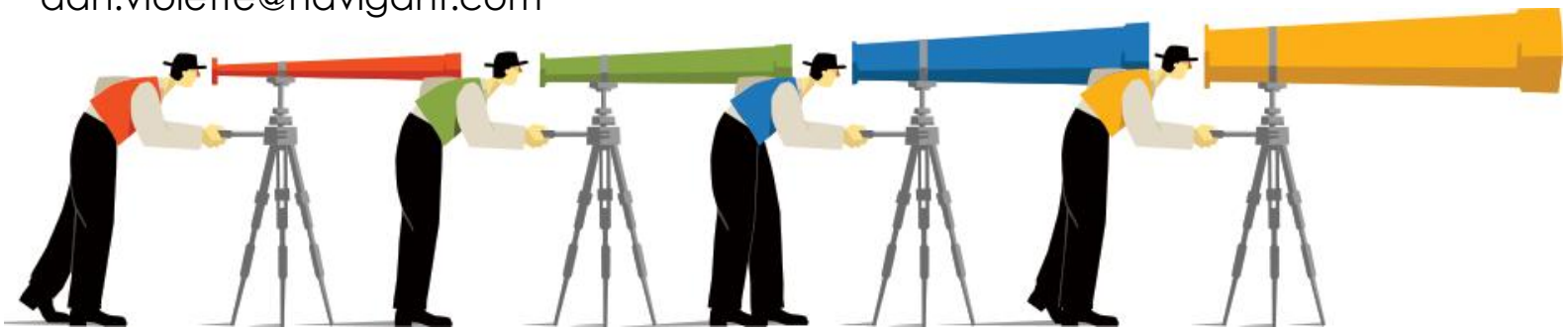

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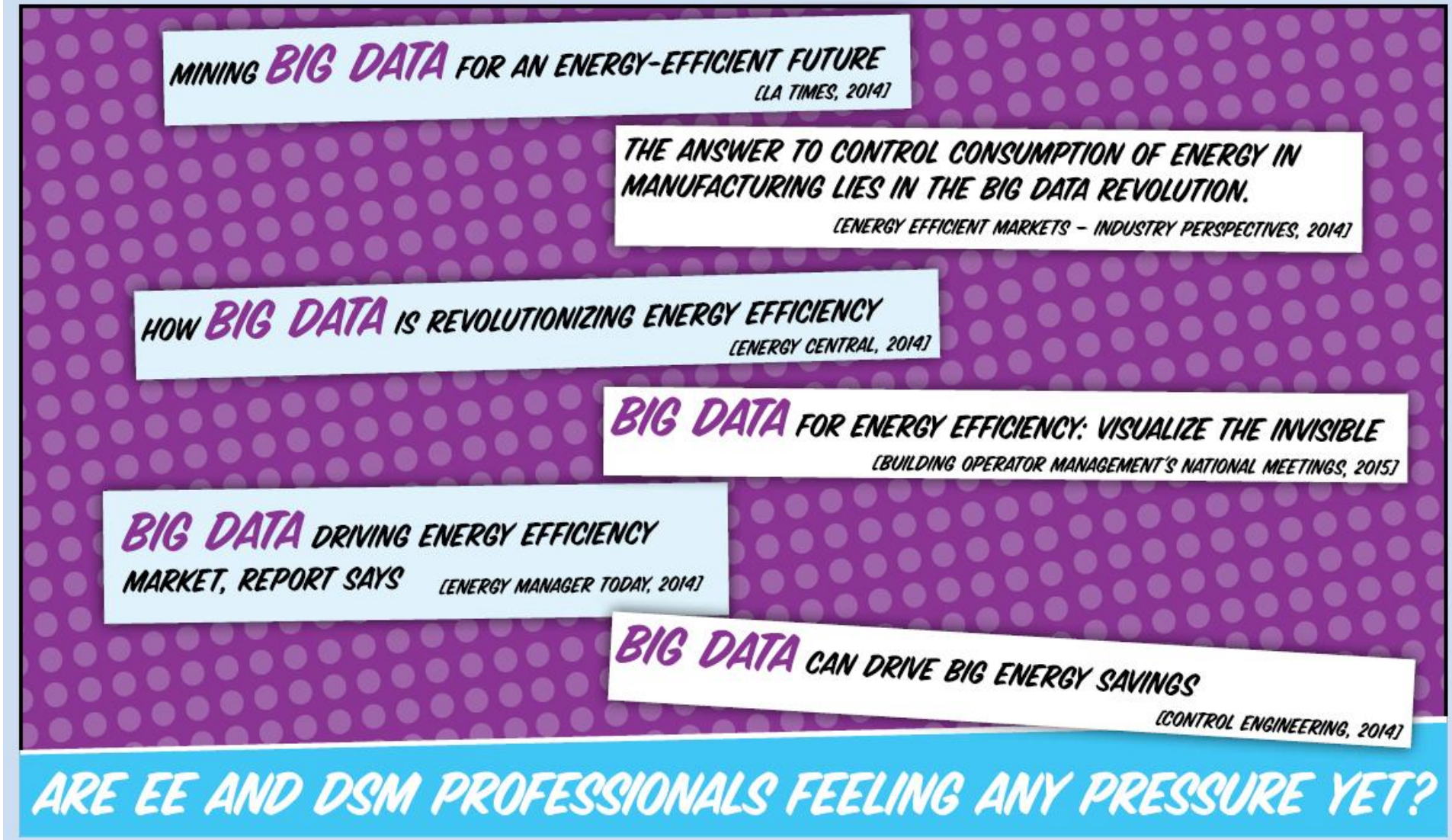
The Challenge of Data Analytics for DSM (not just evaluation)



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http://www.navigant.com/insights/library/energy/2015/evaluation-aesp/

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Data Analytics: Summary Key Points and Issues

1. There is "information clutter" around the possible uses of data analytics and 2.0 types of analyses.
   - Definitions are hard to come by, and methods and problems to be addressed not always clear.
   - Often comparisons across methods are not appropriate.
2. Need to distinguish between Evaluation 2.0, EM&V 2.0 and M&V 2.0.
3. What is "real-time evaluation or M&V" – post-consumption data is needed savings assessments? So, is one week of post data needed, or is a season of data needed?
4. Many 2.0-types of tools focus on implementation, i.e., increasing the yield from EE programs.
5. Process evaluation may need to assess whether appropriate 2.0-type tools are being used to get the most out of program delivery.

Data Analytics: Summary Key Points and Issues (cont.)

6. Programmatic impact evaluation may be applied to determine if the 2.0-types of analysis actually improve yield from EE programs.
7. 2.0-type analyses may improve programmatic evaluation by focusing the questions.
8. Will all 2.0-type tools actually be cost-effective?
9. Will 2.0-type tools have the transparency needed by regulators?
10. In the future, evaluation may focus begin to address grid-edge issues such as changes in feeder loadings in combination with other distributed resources.

Issues

Information Clutter is a Big Issue

- Blogs can present miss-leading information.
- Few actual validated uses.
- Hype is still a factor.
- Statements of underlying analytics and problems to be solved may not be clear.

Care is needed to understand the roles and limits of tools

- Analysis terms have included Evaluation 2.0, EM&V 2.0, M&V 2.0 and even M&E 2.0.
- A start would be a common framework.
- We are gaining valuable 2.0-type tools, but we are not redefining evaluation.
- It is an evolution not a revolution with many applications being variants on current practice.

High-frequency consumption data does not solve all problems

- More observations on consumption does not address all evaluation problems.
- Many of the proposed applications focus on site-specific rather than programmatic evaluation.
- Some of the most innovative ideas address implementation, i.e., improve the yield from EE programs.

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Evaluation can have multiple meanings in DSM

1. Producing initial estimates as part of program implementation and M&V tracking require a baseline and estimate of savings.
2. Estimating the contribution of different measures based on initial tracking and consumption data at a site is another form of evaluation.

2.0-type M&V analytics using site-specific consumption and weather data can contribute to gross savings estimates in 1 and 2 above, but should not be miss-interpreted to be overall program evaluation.

» Overall program evaluation:

- Validated gross savings (often on a sample of participants).
  - Unique equipment configurations can help increase realization rates.
  - Customer characteristics and occupancy can be important.
- Determining savings attributable to the program (i.e., net savings)
  - Selection bias may need to be addressed.
  - Spillover and market effects components.
- Process evaluation constructs – validation of program theory, etc.

*(For another view of the role of high-frequency consumption data in evaluation see LBNL – "*How Accurate is Automated, M&V2.0?" *https://cc.readytalk.com/cc/download/schedule/t9pppafqtcwu - cut and paste into browser.)*

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All Organizations are Adjusting -- Navigant Data Sciences Team

Assessments and adjustments that Navigant has made internally – Example:

Tool	Product (P), Analysis Platform (AP), Study (S)	Pro	Con	Use
R	P, AP, S			
Excel	P, S			
SQL	AP, S			
Analytica	P, AP, S			
SAS/SPSS	AP, S			

Use Color	Use
	Uncertainty/Risk Analysis
	Scenario Analysis/Decision Support
	Regression/Billing Analysis
	Reporting/Presentation
	Big Data
	Engineering Models
	Logger/Meter Analysis
	Sampling/Experiment Design
	Web-based Data Systems
	Optimization
	Extract/Transform/Load/Data Cleaning
	Forecasting
	Data QC

Definitions	
Product	Tool or data system we deliver to the client, and the client owns
Analysis Platform	Reusable tool or code base that we leverage across several projects/clients
Study	One-off analysis

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Questions (considerations of cost and value):

1. What is real-time M&V and is real-time evaluation a realistic concept?
   - Does it start the day after implementation?
   - Do you need a week, a month, a season or a year's worth of post data to meet stated needs for M&V and initial tracking estimates?
2. Can analysis of consumption data on a continuous basis can help identify where programs can be improved?
3. Can analysis of consumption data target sites that will produce high savings?
4. Can continuous M&V help identify sites where additional work is needed, check on measures installed, or identify equipment not operating properly?
5. Can continuous M&V stream-line evaluation by helping to focus the evaluation questions on important sites or sets of measures?
6. Might the 2.0 M&V tools help quality check data in program tracking and produce higher quality initial estimates for validation in evaluation?
7. Will the needed transparency be available from these 2.0-type tools?
8. Other cost-effective uses.

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