Research Triangle Cleantech Cluster

Cleantech Innovators Networking Event

3/8/2017
Smart Meter Driven Energy Analytics
Energy “MRI” for Your Building

Allows for the quick and non-invasive visualization, diagnosis and treatment of energy use issues.

Nothing to set up or install. Instant insight. 10–25% annual savings.

Patented energy decision support system software application uses available smart meter data.

Unique and proven technology. Supervised & unsupervised learning

1000s of buildings evaluated across ~50 different industries.

Large strategic partners. Extensive distribution channels. Complementary direct business.
Agilis Energy Portfolio

Portfolio Size:
• 1000s of buildings
• 800+ clients
• Millions of square feet

Industry Sectors (>50):
• Office
• Retail
• Lower/Higher Ed
• Healthcare
• Municipal
• Hospitality
• Entertainment
• Industrials
• Food
• Religious

4 Continents. 24 Countries
What Can Be Detected? (Short List)

- Scheduling Issues
- Over-conditioning
- Sub-optimal setbacks
- Equipment cycling
- Poor equipment staging
- Economizer performance
- Lighting schedules
- Sensor/control system issues
- Optimal start performance
- Base, cooling and heating loads
- Heating & cooling correlations
- Simultaneous heating & cooling
- Effects of humidity, cloud cover and wind speed
- Inconsistent performance
- Equipment not connected into BMS
- Load shifting opportunities
- Effectiveness of heating cooling transitions
- Effects of buildings changes (“What if”)
- Extensive building benchmarking
Improper Scheduling
No Re-Commissioning After Retrofit (Office Building)
Major Heating and Cooling Control Issues
Cooling System Running at Constant Level
The Value of a Building Control System

Office Building:
• 40% energy reduction – weekdays
• 70% energy reduction – weekends
• Weather adjusted
Effective Use of Building Automation System Data

In this simple example, the "physical" vertical dimension is AHU-1 CHW Valve % and the color scheme is for the HW valve position. The mornings were cool (can also look at temp), so not surprised the HW valves went full open. However, I would not have expected the CHW valves to do the same thing.

You can also see (around 7/31) that the CHW and HW valves were both full open throughout the day.
What Energy Analytics Can Do?

- Detect operational and behavioral issues
- Detect controls problems
- Optimize building performance
- Effectively leverage the facility team’s physical knowledge with Analytics
- Direct third party (e.g. controls) vendors to the issues
- Effectively re-commission
- Perform “What If” analysis on lighting, controls and equipment upgrades
- Conduct transparent M&V
- More effectively deploy building capital after FIRST tuning and optimizing the building’s performance
- Prioritize portfolio of buildings by opportunity

- Achieve 10-25% annual savings with little or no capital spend
## Customer Types & Technology Application

### Indirect

- HVAC & Engineering Companies
  - **Sales**
    - Prequalify
    - Quantify
    - Consultative Selling
  - **Engineering**
    - Efficient evaluation
    - Ability to include more data
    - Improved interaction with service technicians
    - Less data processing and more “engineering”
    - More effective commissioning
  - **Service Technicians**
    - Increased efficiency
    - More knowledgeable before “roll truck”

- Equipment vendors (e.g. solar, thermal storage)
  - **Sales**
    - Quantify facility specific value

- Management Consultants
  - Efficient portfolio savings analysis

### Direct

- Year long managed service
- Coach building team
- Energy savings 10-25%
- Mostly commercial real estate

### Indirect Value Proposition

Increase probability of deal closure while reducing upfront and ongoing service delivery costs.
Etteplan in Brief

- Specialist in engineering, embedded systems, IoT and technical documentation; established in 1983
- 2500+ employees, 500 of which are documentation specialists
- Global operations in Europe, Asia and North America
- ISO 9001, ISO 14000, and ISO 13485 certified
- Shares in NASDAQ OMX Helsinki Ltd. (ETT1V)
- Revenue in 2016: USD 196 million
Engineering With a Difference

**Engineering services** to support our customer’s product development and machine manufacturing.

**Technical documentation services and software** to increase the efficiency of the service business of equipment manufacturers.

**Embedded systems and IoT (Internet of Things) services** to bring intelligence to machines and equipment to enable networking and integration.
From IoT to Technical Documentation

- **Sensors and fault code data**
- **Data → Insights**
- **Feedback**
- **Field Service Application**
- **CMS**
  - Service manuals
  - Spare part manuals
- **Machine info**
  - Machine card
  - Other serial number based information
- **real-time analytics**
- **business rules**
- **Enterprise Asset Management (EAM) system**
- **work order**
- **Forms**
  - Check lists
  - Complex inspection cards Photos etc.
  - Easy document library integration such as Sharepoint, M-Files and Therefore

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*Image description*:

- **Sensors**: IoT devices collecting data.
- **Data Flow**: Data from sensors is sent to the cloud for analysis.
- **Field Service Application**: Central application integrating all data for analysis and feedback.
- **CMS and Machine Info**: Provide detailed information for service and maintenance tasks.
- **Forms**: Tools for checklists and complex inspection tasks.
- **Feedback Loop**: Integrates with EAM system for work orders.
Connecting IoT to Technical Documentation

**Content**
Create, store and manage data, including CAD and service instructions, in standardized ways

**Delivery Mechanism**
Delivery model to allow information to be published on mobile devices (PDF vs app vs experience)

**Data Types**
Connect data (internet) with products (things)

**Applicability of content**
Product identification and what to do next
Etteplan’s Model for Content

1. **XML (DITA /S1000D) for structure**
   - Reuse (single source)
   - Easier to manage
   - Faster to find information
   - Multiple publication formats
   - Data exchange

2. **Simplified Technical English** for authoring

3. **Simplified Technical Illustration**
   - For structure and simplification of illustrations
   - From 3D to reusable SVGs
   - Data exchange

4. **Experienced documentation specialists**
Etteplan’s Service Information Model

**HyperSIS, Dynamic Content Delivery Portal** for Service information that is:
- Fast and easy to retrieve for a better customer experience
- Reduces downtime and optimizes service business
- Complete support for parts ordering, legacy content, mobile devices, and digital channel transformation

**HyperDOC Content Management System** for structure
- Reuse (content single sourcing)
- Easier to manage
- Faster to find information
- Multiple publication formats
- Data exchange support

**HyperSTE** for quality in authoring

**HyperParts** Spare Parts System

Augmented & Virtual Reality
Key Challenges:
- No existing process to manage and expedite spare parts ordering for customers
- Satisfy customer demand and delivery in the shortest possible time
- Need to develop a documentation process to distribute spare parts information

Spare Parts Solution:
- Interactive illustrated Spare Parts catalog produced and delivered on CD and PDF
- 900 recommended spare parts comprised the design concept
- 200 pages, approximately 150 illustrations (exploded views)

Value Delivered:
- Time savings (4 months from concept to delivery), cost savings in creation, maintenance and distribution; reduced machine down-time and increased customer satisfaction
- Clarity on which parts to stock on site versus which parts to order on a just in time basis
- Overall improved quality of spare parts data, fast and easy of detailed product information through the use of visual search
Engineering with a difference

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Revolutionizing Field Service
Empowering Our Finest

Company Overview
**WHAT IS FIELDVETS?**

*FieldVets is a Veteran owned business built to help companies solve their most pressing field service needs by providing access to skilled labor via transitioning military personnel and custom, scalable project execution.*
OUR INDUSTRY FOCUS

Utilities
- Major upgrades planned ($1T by 2025)
- Smart meter installations
- Asset Identification
- Renewable energy grid connections

Telecom
- Fiber expansion
- Cellular densification driving small cell installation
- 5G rollout
- $20B+ spending by 2020

Internet of Things
- 30 billion connected devices by 2020
- Impacts felt in nearly all industries and segments
- Emergence of smart cities
- $100B+ spending today – 13% CAGR forecast

Infrastructure
- $1T Investment plan proposal over next 10 years
- D+ Grade on 2016 Report Card
- $3.6T Investment needed by 2020

Challenges
- Accuracy of Data Capture
- Escalating Turnover
- Quality of Work
- Increasingly Stringent Regulations
- Training Expense and Expertise
- Complexity of Work Performed

What is the biggest dependency?
SKILLED LABOR – THE NEW UNICORN

CHALLENGES ALREADY EVIDENT

“Over the next 10-15 years there will be more jobs than the labor market can support, resulting in the longest period of minimal economic growth that we have experienced in recent history.”
(Real Time Economics – Wall Street Journal)

• Labor participation rates have fallen to lowest level in 38 years – 63%
• 10,000 baby boomers exit the workforce each day and will continue through the end of the next decade
• Utilities planning for roughly 40% of Baby Boomers retiring over the next four years
• Immigrant employment has risen 5 times faster than American employment

KEY DRIVERS

- Retiring Baby Boomers
- Millennial Generation
- High Turnover
- Technology Explosion
- Aging Infrastructure
- Low Labor Participation
UNDERUTILIZED AND HIGHLY SKILLED

“The military Veteran brings instant heft and long-lasting, positive impact to every team they touch – and they are available right now, all over the country in every career field imaginable.”

(Dan Eddinger, CEO FieldVets)

- Current military numbers near 5M with the Veteran population at 24M, 11M of those under the age of 60.
- Nearly 200K military members transition out annually.
- 495K unemployed Veterans in 2015
- The Veteran is a team player, decisive, task oriented and disciplined. They have built in integrity, communicate clearly and ultimately value serving the team above all else.

MULTI-FACETED, MULTI-DISCIPLINED
FieldVets provides a unique combination of custom staffing & deployment solutions leveraging the transitioning military workforce and a breakthrough labor delivery model utilizing platform-as-a-service design.
OUR SOLUTION AT-A-GLANCE

1 - STAFFING PROGRAMS
- DESIGNED FOR W2 MODEL
- TECH SCHOOL PARTNERS/PROGRAMS
- MILITARY BASE RECRUITING
- FEDERAL FUNDING OPTIONS

2 - FIELDVETS MARKETPLACE
- DESIGNED FOR FREELANCE/1099 MODEL
- FULL SERVICE PLATFORM FOR TALENT & JOB SEARCH

3 - TURNKEY PROJECTS
- COMPREHENSIVE PROJECT MANAGEMENT AND STAFFING
- UTILIZING FIELDVET SOURCED TALENT
- SOPHISTICATED DATA CAPTURE & ANALYTICS SOLUTION

AMERICA’S FINEST

CLIENT CHOOSES 1 OF 3 METHODS OF ENGAGEMENT
A DISTINCT COMPETITIVE ADVANTAGE FOR OUR CLIENTS

Labor Sourcing Capabilities

- Relationships with transition offices in major military bases
- Partnerships with military support organizations with access to veterans
- Ability to augment as needed to scale with non-Veterans

National Footprint

- Our platform engages Veteran population in all states
- Training partnership with several technical colleges across US

Speed to Market

- New project campaigns post to platform in minutes
- Quick and easy review of qualifying skill sets with automated onboarding process
- Custom designed certification courses can be executed quickly

Bottom Line: Cost Reduction
A COMPELLING OPTION FOR TRANSITIONING MILITARY AND VETERANS

**Tangible Opportunities**
- Providing a reliable solution upon exiting military service
- Real world employment with leading US companies
- Long and short term projects

**Flexible Options for Schedule, Location and Compensation**
- Allows for work/life balance
- Liquid labor model provides maximum flexibility
- W2 opportunities and 1099

**Skills Enhancement**
- Ability to participate in training programs across multiple industries
- Build marketable skills through participating in world-class training via our SME network

**Bottom Line: Enhanced Quality of Life**
How Work Gets Done Tomorrow
THANK YOU