

# 4Daptive

A **data management and analytic insight platform** that organizes facility data to improve asset performance and enable decision making

## CATEGORY: COMMERCIAL SERVICE

## CONTACT



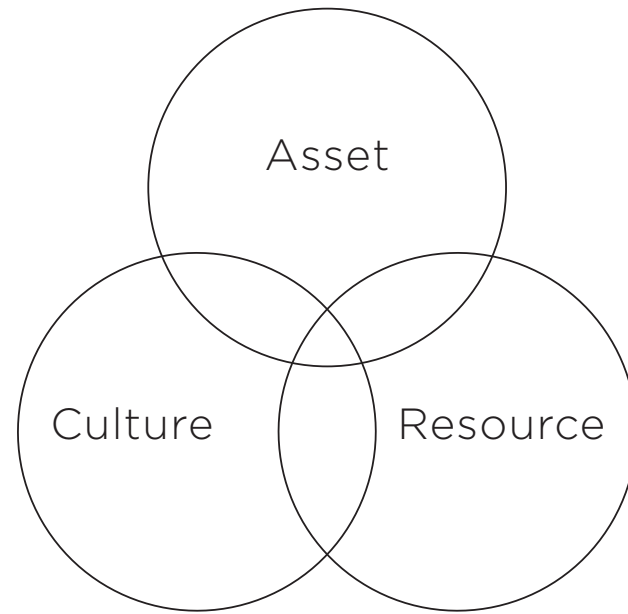
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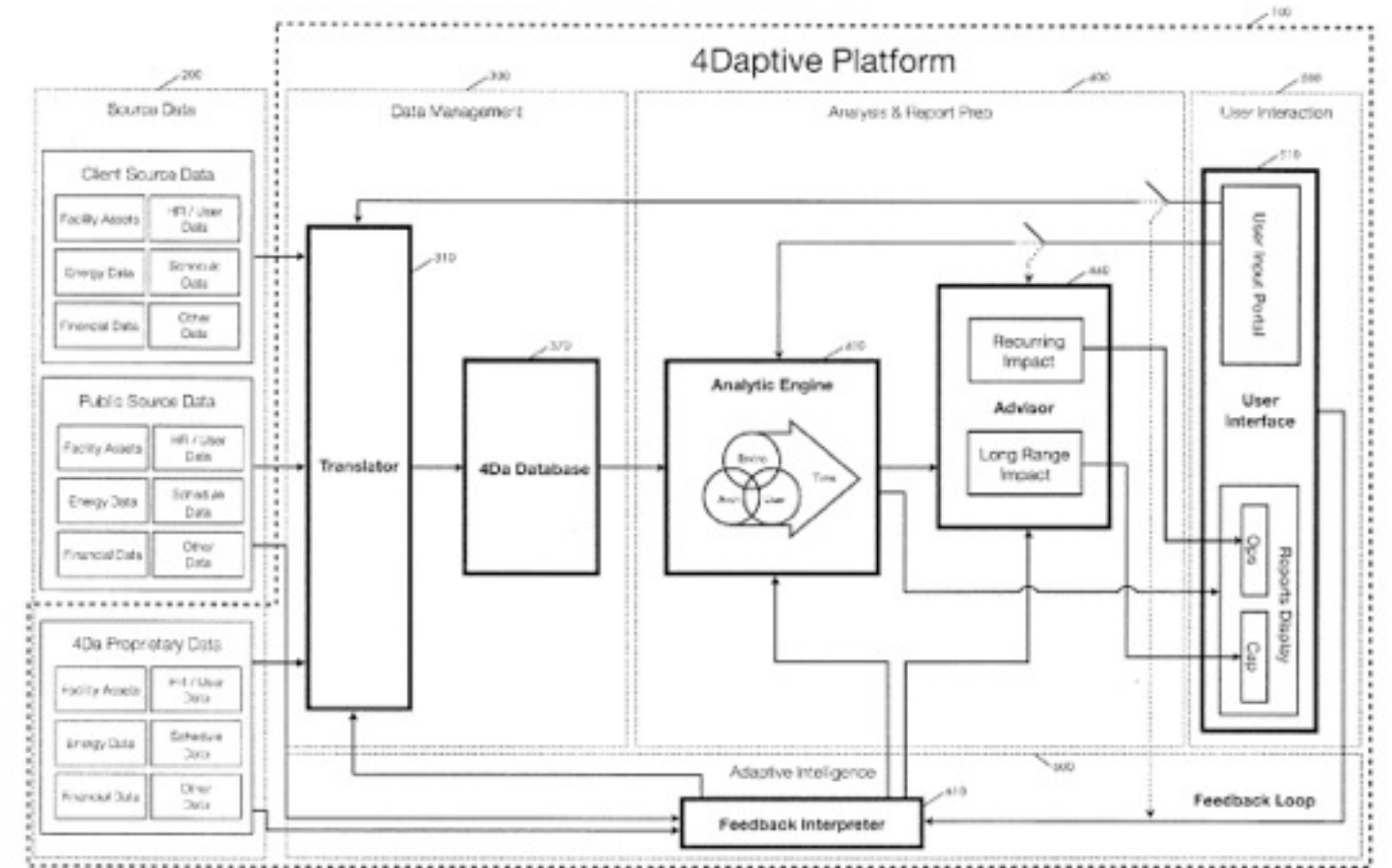
**MKThink** is the IDEAS company for the built environment. We integrate expertise in Strategy, Architecture, and Innovation to achieve alignment between the built environment and human performance. We do this as an interdisciplinary team of consultants, professionals, and entrepreneurs. Our end-goal is to create healthful and high-performance places for high-performance people.

## TEAM

Project Team:  
Mark Miller, Founder, CEO MKThink + RoundhouseOne  
Rachel Posman, Program Manager, RoundhouseOne  
Signo Uddenberg, Manager, Innovation Studio  
Hadar Wissotzky, CTO, RoundhouseOne  
Nate Goore, Director, Strategy Studio  
Doug Humphreys, VP, Consulting



A-C-R DATA MANAGEMENT (ABOVE) AND PROCESS PATENT (RIGHT) 4Daptive platform allows integration and analysis of multidimensional facility data in order to locate inefficiencies and enable facility decision making.



A **data management and analytic insight platform** that organizes facility data to improve asset performance and enable decision making

## INTENDED USE

**CHALLENGE:** Business leaders managing built asset/facilities portfolios often make mission-critical decisions using: 1) no data, 2) the wrong data, or 3) inaccurate data. How can we improve data-driven decision making and also support healthy spaces where high performance organizations can achieve business goals with fewer resources?

**APPROACH:** Create on-demand cloud-based technology to extract, standardize, validate, correlate, enhance, and communicate data related to multi-dimensional enterprise decision making.

**RESULT:** 4Daptive is a cloud-based data management platform that synthesizes building, user, and environmental data to help diagnose operational and spatial inefficiencies and optimize ROI for built environment capital expenditures.

## DELIVERY

4Daptive is a proprietary software that is distributed to our clients via cloud computing. The patented analytic engine applies multi-dimensional logic to fixed Asset, Cultural and Environmental variables to achieve full picture analytics to ensure that decisions aren't made in silos. Data is then analyzed with a findings generation application that creates insight to allow domain experts to make informed, actionable decisions related to quality, quantity and operational change.

Final findings are then delivered in a data card format (pictured at right, and on following page) that yields in-depth information about where the sensors were placed, testing period, time interval of the testing, and other relevant information that paints a complete picture of environmental conditions over time.

CONFIDENTIAL

<b>CLIENT</b>	Project Example	<b>SHEET #</b>	<b>R.27</b>
<b>PROJECT</b>	(Client Address)	<b>DATE - ORIGINAL</b>	8/8/13
<b>CHART</b>	<b>Predicted Mean Vote of All Floors</b>	<b>DATE - UPDATE</b>	9/13/13
<b>DIMENSIONS</b>	1d ✓ 2d 3d T ✓ V	<b>PREPARED BY</b>	BW

DATA INPUTS	1 <sup>st</sup> FLOOR	2 <sup>nd</sup> FLOOR	3 <sup>rd</sup> FLOOR	4 <sup>th</sup> FLOOR
<b>ATTRIBUTE</b>	Predicted Mean Vote	Predicted Mean Vote	Predicted Mean Vote	Predicted Mean Vote
<b>MEAS. DEVICE</b>	Therm, RH, Blk Gib Therm	Therm, RH, Blk Gib Therm	Therm, RH, Blk Gib Therm	Therm, RH, Blk Gib Therm
<b>TEST LOCATION</b>	Center, hung from ceiling	Center, hung from ceiling	Center, hung from ceiling	Center, hung from ceiling
<b>TEST DURATION</b>	6/27/13 – 8/30/2013	6/27/13 – 8/30/2013	6/27/13 – 8/30/2013	6/27/13 – 8/30/2013
<b>TEST INTERVAL</b>	15 minutes	15 minutes	15 minutes	15 minutes

DATA OUTPUTS	1 <sup>st</sup> FLOOR	2 <sup>nd</sup> FLOOR	3 <sup>rd</sup> FLOOR	4 <sup>th</sup> FLOOR	OVERALL STATS	STAT DELTA	MAX DELTA FROM INDEX THRESHOLD (-0.5, 0.5)
<b>MAX</b>	1.77	2.05	1.98	2.26	2.26 (4 <sup>th</sup> Floor)	0.49	1.76 (4 <sup>th</sup> Floor)
<b>MIN</b>	-1.35	-1.73	-2.05	-2.09	-2.09 (4 <sup>th</sup> Floor)	0.74	1.59 (4 <sup>th</sup> Floor)
<b>AVE</b>	0.25	0.23	0.27	0.37	0.28	0.14	N/A (avg's w/in zone)
<b>RANGE</b>	3.11	3.77	4.03	4.34	3.81	1.23	N/A
<b>STDEV</b>	0.63	0.73	0.78	0.82	0.74	0.19	N/A

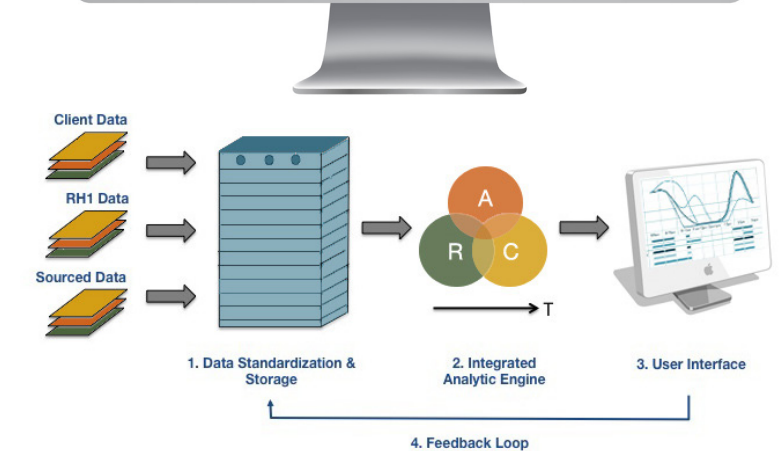
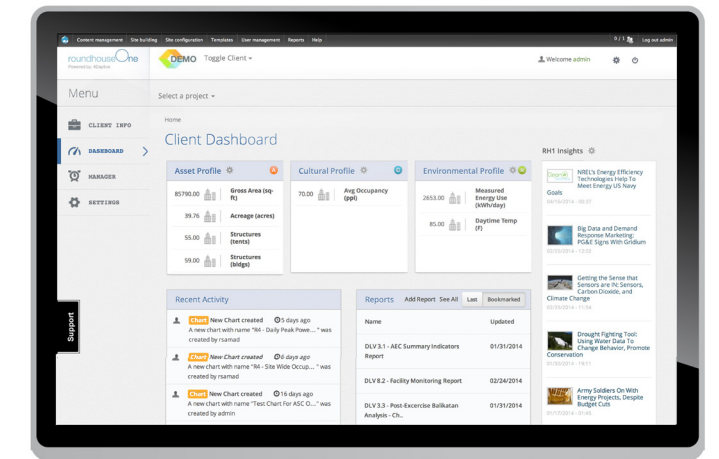
  

**ANALYST FINDINGS**

Predicted mean vote (PMV) is an index that predicts the average indoor comfort level based on the ASHRAE thermal sensation scale. 0 is perfect comfort, +1 is slightly warm, -1 is slightly cool, +2 is warm, -2 is cool, +3 is hot, -3 is cold, and -0.5 to 0.5 represents the comfort zone.

The 1<sup>st</sup> floor was within the comfort zone 53% of the time, the 2<sup>nd</sup> floor was within it 49% of the time, the 3<sup>rd</sup> floor was within it 50% of the time, and the 4<sup>th</sup> floor was within it 39% of the time. (Note that these percentages refer to the specific data points, not the regression fit line in the chart)

The 1<sup>st</sup> floor was the most comfortable and had the least variation in comfort level. The 4<sup>th</sup> floor was the least comfortable and had the greatest variation in comfort level. Each floor was most comfortable during the morning and least comfortable during the early evening.



DATA COMPRESSION AND ANALYSIS 4Daptive captures, validates, and organizes data from a variety of sources to provide full picture analytics. The UI (top) manages facility data, analytics, and findings, providing our clients with the spatial intelligence data they need to manage the life cycle of their facilities. The Feedback Loop ensures that the smart data platform is continuously improving.

## ENVIRONMENTAL RESPONSIBILITY

Understanding existing assets is the first step towards creating a sustainable environment. For many institutions, starting from the ground-up is not an option, whether due to budgetary, temporal, or environmental constraints.

4Daptive allows users to create a repository of asset information, including capacity, condition, resources, and cultural implications (whether or not the built environment supports institutional mission and vision). This information informs the design process, which ranges from reconfiguring existing space to buying and renovating old property to generating new construction.

**Site** Hillbrook School

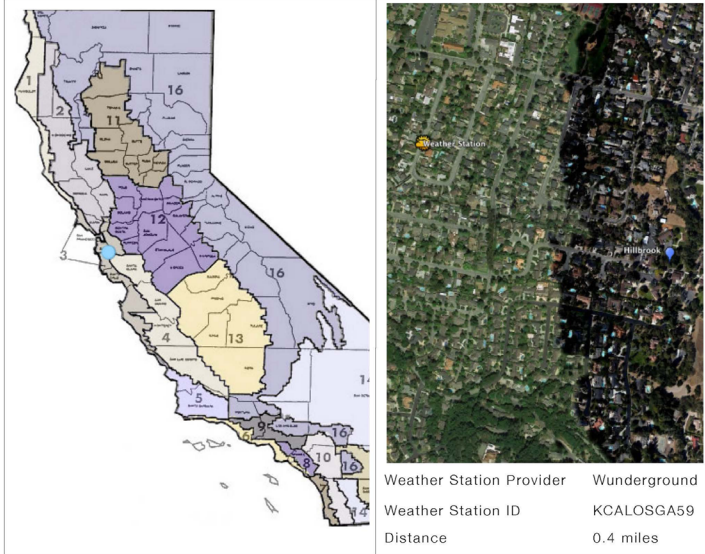
**Address** 300 MARCHMONT DR  
LOS GATOS, CA 95032  
**County** SANTA CLARA  
**Use Type** SCHOOL, PRE-K - 8  
**Site Microclimate** DRY SUMMER SUB-TROPICAL



**Client** HILLBROOK SCHOOL

**R.0 POSITION**

Coordinates	37.22759 N 121.9542 W
Elevation	412 ft MSL
Site Area	585,882 ft <sup>2</sup>
Green Space	210,900 ft <sup>2</sup>
Dist. to City	12.2 miles (SJ)
Dist. to Transit	0.7 miles (VTA)
Walkscore	29 (Car-dependent)



**R.1 CLIMATE**

Climate Type	Mediterranean
Average High	75 °F
Average Low	50 °F
Average Humidity	81%

**R.2 MATERIAL CONSUMED**

Teaching Supplies	-
Admin Supplies	-

**R.4 AIR CONSUMED**

Local Air Quality Index	30.8
Local NO2 Levels	8.85 ppb
Local SO2 Levels	0.49 ppb

**R.6 WATER CONSUMED**

Annual Avg/day	-
Cumulative Use	-

**R.3 MATERIAL GENERATED**

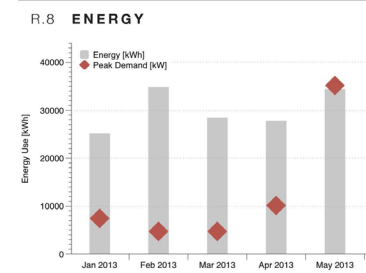
Standard Waste	-
Toxic Waste	-

**R.5 AIR GENERATED**

Heating Degree Days (65)	2688
Cooling Degree Days (65)	568

**R.7 WATER GENERATED**

Avg Annual Rainfall	22.6"
Max Annual Rainfall	51.8" (1909)
Min Annual Rainfall	9.50" (2007)



Total Energy Use	303.7 MWh
Peak Power	129 kW
Days of Sun	330/year
Insolation / yr	1.8 MWh/m <sup>2</sup>
Wind Resource	0.20 MWh/m <sup>2</sup>
Grid Tied	Yes
Grid Power Mix	27% NG 21% Nuclear 19% Renewable

**SOURCES**

**Client Data** BUILDING PLANS  
**RH1 Data** -  
**Public Data** WUNDERGROUND, WALKSCORE, EPA, GOOGLE

**Project No.** 470  
**Date** 09.20.13

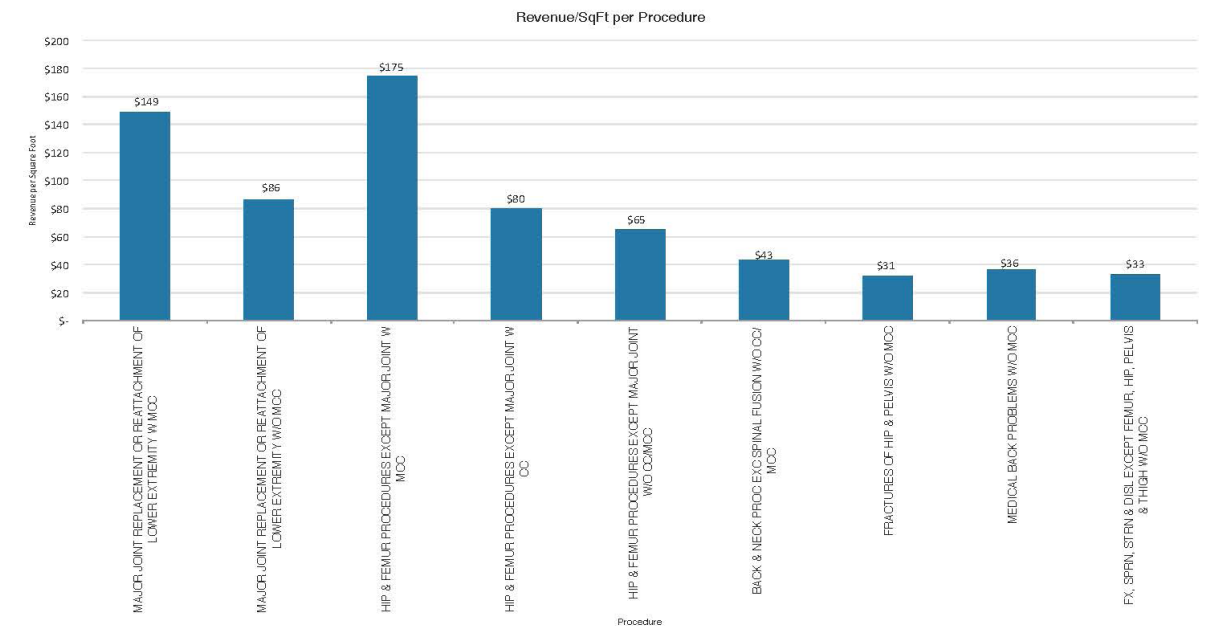
Two additional sample resource cards, generated with 4Daptive.

**Client** STANFORD UNIVERSITY MEDICAL CENTER  
**Project** STANFORD UNIVERSITY MEDICAL CENTER  
**By** RP

V9

## Revenue/SqFt Per Procedure: Orthopedics

DATA INPUTS	Revenue	Procedure
ATTRIBUTE	Revenue Per SqFt	Procedure Type
DATA SOURCE	Medicare Provider Analysis and Review (MEDPAR) inpatient data	SUMC Ambulatory Clinics
TEST LOCATION	300 Pasteur Dr. Stanford, CA 94305	300 Pasteur Dr. Stanford, CA 94305
TEST PERIOD	FY2011	FY2011



OUTPUT STATS	Revenue Per SqFt	Procedure
MAXIMUM	\$175	Hip & Femur Procedures Except Major Joint WCC
MINIMUM	\$31	Fractures of Hip & Pelvis w/o MCC
RANGE	\$144	N/A
AVERAGE	\$77.70	N/A
MEDIAN	\$65.41	N/A

**ANALYST FINDINGS**

Revenue per square feet varies widely by procedure. Procedure type and payor type is both affect revenue per square foot. Highest earning procedure is over 5x income of lowest on per square foot basis.

**Phase** ASSESSMENT  
**Date** 10.31.13