Alexa Optimizes Performance: The Future of Voice Interactive Building Dashboards

April 17, 2018
Getting to Zero National Forum

MacArthur Elementary (Prior to Flood)
VISIONING

- we will respect the energy of the site
- we will heal our relationship with the river
- we will create a net zero fossil fuel building
- we will teach
- we will create a safe and welcoming place for students and the community
Step #0: Make it COOL!
Informational and Interpretive Media for the Museum of Arts and Design, by PENTAGRAM

Ingredient #1: INTERACTIVE
### Ingredient #2: CAPTURE Energy

<table>
<thead>
<tr>
<th>Icon</th>
<th>Lighting power</th>
<th>HVAC heating</th>
<th>HVAC cooling</th>
<th>Total plug load</th>
<th>Water usage</th>
</tr>
</thead>
<tbody>
<tr>
<td>l</td>
<td></td>
<td>h</td>
<td>c</td>
<td>p</td>
<td>w</td>
</tr>
</tbody>
</table>

### Ingredient #3: Behavior influencer

**ELEMENTARY - Positive Behavior Intervention Supports (PBIS) Matrix**
- Consistent student expectations in the BCSD

<table>
<thead>
<tr>
<th>School-Wide Rules/Expectations</th>
<th>Recess</th>
<th>Bus</th>
<th>Special Events/Assemblies</th>
<th>Community</th>
</tr>
</thead>
<tbody>
<tr>
<td>I am RESPECTFUL</td>
<td>Follow directions from all adults</td>
<td>Self-respect (greet, face, and bow to yourself)</td>
<td>Participate appropriately</td>
<td>Use kind words</td>
</tr>
<tr>
<td>I am RESPONSIBLE</td>
<td>Follow directions from all adults</td>
<td>Self-respect (greet, face, and bow to yourself)</td>
<td>Participate appropriately</td>
<td>Walk on sidewalks</td>
</tr>
<tr>
<td>I am READY</td>
<td>Follow directions from all adults</td>
<td>Self-respect (greet, face, and bow to yourself)</td>
<td>Participate appropriately</td>
<td>Accept consequences</td>
</tr>
</tbody>
</table>

**Visual/Reinforcement Weather Iconography**
- Sunny
- Cloudy
- Rainy
- Snowy
- Thunderstorm
Ingredient #4: Create Persona

Visual Refinements
Expressions

- low
- kinds down
- neutral
- good
- happy
- good
- neutral
- feeling slightly strange
- feeling weird

Visual Refinements
Expressions + Energy Tracking Colors

- high usage
- moderate to high usage
- moderate usage
- moderate to balanced usage
- balanced usage
- moderate to balanced usage
- moderate usage
- moderate to high usage
- high usage

- low
- kinds down
- neutral
- good
- happy
- good
- neutral
- feeling slightly strange
- feeling weird
### Grade Content Matrix

<table>
<thead>
<tr>
<th>Pre-K</th>
<th>K</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
</tr>
</thead>
</table>

**Comparisons**
- English (Vocabulary)
- Energy Usage
- Quizzes
  - English (Vocabulary)
  - Math

#### HVAC vs Water
- Today to Yesterday
- Today to Last Week
- Last Week to Last Month

#### HVAC vs Gas
- Today to Yesterday
- Today to Last Week
- Last Week to Last Month

#### HVAC vs Electricity
- Today to Yesterday
- Today to Last Week
- Last Week to Last Month

#### Water vs Gas
- Today to Yesterday
- Today to Last Week
- Last Week to Last Month

#### Water vs Electricity
- Today to Yesterday
- Today to Last Week
- Last Week to Last Month

#### Gas vs Electricity
- Today to Yesterday
- Today to Last Week
- Last Week to Last Month

#### Quizzes
- **Spelling**
  - (what letter is missing)
- **Spelling**
  - (hangman)
- **Writing Letters**
  - (showing direction of strokes)

#### Math
- **Addition**
- **Subtraction**
- **Multiplication**
- **Division**
Arthur Current Modes

**Report Mode**
Report on the school's current energy status.

**Compare Mode**
Compare energy usage of a type over time.

**Weather**
Report the weather for today or tomorrow.

tomorrow it will be 75°
don't forget your sunscreen

Arthur Current Modes

**Weather Compare**
Compare the weather over time.

**Quiz Mode**
Answer math and spelling based questions.

**Time & Date**
Report the time and the date.

\[ 8 + 4 = 12 \]

Temperature:
\[ 65° \]
\[ 34° \]
Arthur Current Modes

Passive Mode
Cycles through updates on energy, weather, date, time and messages.

- +20% this week
- For far away, behind the cloudmotions, far from the countries. Velost
- 25 26 27 28 29
- 02:15:23

Communal Interactive Zones
Message #1

Create narratives to develop and design contents for a customized building dashboard via client/user engagement.

Once upon a time...
Message #2
Use numeric quantitative data to create experiential information that promotes two-way engagement between building user and a digital persona (building dashboard).

Message #3
Establish post occupancy operation/maintenance infrastructure and define roles

Systems Set-up Diagram
Where are we heading?