Business Intelligence in the Construction Industry

Presented by:
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Anterra
Goals for this Session

- Review Business Intelligence concepts
- Evaluate report effectiveness against best practices
- Review the purpose and use of Excel
- Understand Construction Key Performance Indicators
- Review dashboards and scorecards
Business Intelligence is Information

BI is the intersection between

• Processes
• Data Quality
• Data Governance
• Cross System Reporting
Business intelligence (BI) is an umbrella term that includes the applications, infrastructure and tools, and best practices that enables access to and analysis of information to improve and optimize decisions and performance.

Gartner Group
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Good BI Provides Useful Information

Not what’s obvious
Construction Business Intelligence –
Provides information across multiple systems to allow each person to succeed in their role.

Anterra
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Construction Roles

- CEO/ President / Family
- CFO / Controller / Finance Staff
- VP Construction
- Project Manager
- Site Super

Each role has “customers” with information requirements
## Current Reporting Technology

<table>
<thead>
<tr>
<th>Category</th>
<th>Equipment Cost</th>
<th>Hardware/Software</th>
<th>Total Cost</th>
<th>Percentage of Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Personnel</td>
<td>7,955,062</td>
<td>1,023,610</td>
<td>9,252,48</td>
<td>12.11%</td>
</tr>
<tr>
<td>Travel</td>
<td>169,857</td>
<td>1,245,280</td>
<td>1,415,137</td>
<td>1.99%</td>
</tr>
<tr>
<td>Support</td>
<td>1,605,940</td>
<td>967,984</td>
<td>2,573,924</td>
<td>3.61%</td>
</tr>
<tr>
<td>Development</td>
<td>844,112</td>
<td>1,613,002</td>
<td>2,457,114</td>
<td>3.45%</td>
</tr>
<tr>
<td>Consulting</td>
<td>1,994,250</td>
<td>1,994,250</td>
<td>3,988,500</td>
<td>5.69%</td>
</tr>
<tr>
<td>Overhead/Other</td>
<td>1,298,472</td>
<td>1,298,472</td>
<td>2,596,944</td>
<td>3.74%</td>
</tr>
</tbody>
</table>

### Detailed Breakdown

<table>
<thead>
<tr>
<th>Subcategory</th>
<th>Equipment Cost</th>
<th>Hardware/Software</th>
<th>Total Cost</th>
<th>Percentage of Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ad/Marketing</td>
<td>7,099,697</td>
<td>1,023,610</td>
<td>8,123,307</td>
<td>11.74%</td>
</tr>
<tr>
<td>Information Technology</td>
<td>105,679</td>
<td>1,245,280</td>
<td>1,350,959</td>
<td>1.93%</td>
</tr>
<tr>
<td>Insurance</td>
<td>14,256</td>
<td>967,984</td>
<td>982,240</td>
<td>1.40%</td>
</tr>
<tr>
<td>Other Insurance</td>
<td>1,605,940</td>
<td>1,613,002</td>
<td>3,218,942</td>
<td>4.60%</td>
</tr>
<tr>
<td>Development</td>
<td>844,112</td>
<td>1,994,250</td>
<td>2,838,362</td>
<td>4.08%</td>
</tr>
<tr>
<td>Support</td>
<td>1,994,250</td>
<td>1,994,250</td>
<td>3,988,500</td>
<td>5.75%</td>
</tr>
</tbody>
</table>

### Additional Notes

- The majority of costs are allocated to personnel and software development, reflecting the significant investment in human resources and technology infrastructure.
- Travel expenses are relatively low, indicating efficient management of company travel.
- Consulting services account for a substantial portion of the expenses, highlighting the importance of external expertise and knowledge.

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**Safety**

- Equipment: 4,872,805
- Software: 3,252,800
- Total: 8,125,605

**Training**

- Equipment: 1,010,150
- Software: 1,000,000
- Total: 2,010,150

**Part & Equipment/Equipment**

- Equipment: 677,300
- Software: 700,000
- Total: 1,377,300

**Small Part Acquisition**

- Equipment: 2,656
- Software: 500
- Total: 3,156

**Small Equipment**

- Equipment: 7,868
- Software: 2,456
- Total: 10,324

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This detailed breakdown provides a comprehensive view of the current reporting technology costs, highlighting areas of investment and potential areas for optimization.
Current Report Challenges

- Hard to read!
- Can’t tell what is important
- Can’t sort columns
- Often have to run more reports to dive in
- No color
- Need a highlighter to use

Each role has “customers” that require information.
Reporting Challenges

- Reporting across multiple databases & systems
- Reporting technology –
  - Speed
  - Complexity of reporting tools
  - Time to develop
  - Testing
- Access to reports – vpn’s, remote desktops slow users down when they are on site.
Why Improve Reporting?

• Make your organization more proactive
• Consistent monitoring of KPI’s
• Empower people to investigate variances on their own
• Automatic notification of off plan situations
• Alignment of results to plan
Reporting Worst Practices

1. 8.5 x 14, 20 columns, 7 point font – “Kitchen Sink”
2. Report purpose isn’t obvious
3. No context – today’s cash balance by itself
4. Poor sort order – numeric vendor #
5. No page number, date/time info
7. Totaling single line items
1. Immediate meaning, obvious measurement with context
2. Expanding context
3. Trend analytics – graphs
4. Good default parameters
5. Beautiful design – easy to read fonts, good use of color
6. Intuitive sorting, possibly multiple sorts
7. Clear title tied to purpose
8. Clear totals
Excel Based Reporting Use Cases

• Cross system / folder reporting
• Formatting report output – i.e. Financials
• Creating graphs and charts
• Adding content to reports – i.e. income statement variance comments
2. Overwriting formulas
3. Building and maintaining data connections
4. 2 dimensional, not a database
5. Can be the most expensive program you own
Excel Challenges

• Excel spreadsheet calculations are complex

• Typically only understood by the creator of the spreadsheet

• Act as a computer program but not typically independently tested or documented

• Very expensive system if you count staff time to prepare spreadsheets
Reducing Use / Risk of Excel

- Understand where spreadsheets go and what is really used
- Build in control totals – have a home tab with conditionally colored red cells if cross tab totals do not agree
- Lock down spreadsheet formulas
- Improve reporting technology
• Data quality is the accuracy, timeliness and reliability of your data

• Lack of accurate data reduces report usage

• “Ad Hoc” information streams develop to get the “real information”
Construction Reporting Data Quality

Garbage In – Garbage Out

Garbage → AnterraBI → Ordered, Drillable Garbage

Accurate Data → AnterraBI → Actionable Insight
5 Tips for Improving Data Quality

1. Executive sponsorship to support processes
2. Make people responsible for their submissions
3. Schedule data clean ups regularly
4. Review data entered to ensure it is used
5. Review form design to ensure it supports efficient and accurate data entry
Construction KPI’s

• Forecast Margin - $, %
• Margin Erosion
• Work Backlog
• % Committed
• Construction Gross Margin
• Selling, General and Admin % of Revenue
• NOI, % of revenue
Let’s review these concepts in action.
How to Implement BI

• Look for productivity gains and risk reduction first
• Eliminate Excel as a “report production” system
• Financial statements, statement of cash flow, WIP, margin reporting are often done first
• Ad hoc inquiry – spreadsheets, pivots
Results of a Successful BI Implementation

- Pro active organization
- Consistent monitoring of KPI’s
- Automatic notification of off plan situations
- Common language of performance
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