Big Data: Analytics and Higher Education

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Teaching & Learning Technology
Missouri S & T
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This session will:

- Introduce the emerging topics of “Big Data” and predictive analytics.
- Explore how big data can be applied to higher education to improve student persistence and outcomes.
- Provide an interactive discussion on data trends and application as well as a demonstration of MCC’s current project.

Acknowledgement:
Kristy Bishop – MCC IR
• Kansas City, Missouri
• Five campuses
• Fall enrollment over 19,000 credit students
• Strong transfer programs
• More than 80 career programs
• Part of the 2nd cohort of the Pathways Pioneer
What is Big Data?
Big Data means more & messy data
Three Characteristics of Big Data - 3Vs

Volume

• Data quantity
Information from the Internet of Things:
We have gone beyond the decimal system

Today data scientist uses Yottabytes to describe how much government data the NSA or FBI have on people altogether.

In the near future, Brontobyte will be the measurement to describe the type of sensor data that will be generated from the IoT (Internet of Things)

1 EB of data is created on the internet each day = 250 million DVDs worth of information. The proposed Square Kilometer Array telescope will generated an EB of data per day.

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Three Characteristics of Big Data - 3Vs

Volume
- Data quantity

Velocity
- Data speed
Modern platforms provide the computing power necessary to turn the mass of numbers into meaningful patterns.
Three Characteristics of Big Data - 3Vs

**Volume**
- Data quantity

**Velocity**
- Data Speed

**Variety**
- Data Types
Why is Big Data Important?

Let’s solve this problem by using the big data none of us have the slightest idea what to do with.
Big Data is Collected By Us
Big Data is Collected By All
Big Data is Collected By All
Big Data is Collected By All
Every 60 seconds:
- 98,000+ tweets
- 695,000 status updates
- 11 million instant messages
- 698,445 Google searches
- 168 million+ emails sent
- 1,820TB of data created
- 217 new mobile web users
Why Should Higher Education Pay Attention to Big Data?
“Today, digital innovation is driving unprecedented change across the education sector. In doing so, it has the potential to both improve student learning outcomes and expand access to high-quality education opportunities in ways that would have been unimaginable even a decade ago...”

— From Education and Skills 2.0: New Targets and Innovative Approaches
How Might Big Data Change Business Practices?
• MCC has been experimenting with Big Data methods in combination with the student analytic tools found in Blackboard Analytics.
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Key Admission Metrics

- **Same Day Comparative KPIs**
  - Date: 10/24/2014
  - This Year: 14,378
  - PY Same Day: 14,699
  - Change: -2.18%
  - 2 PY Same Day: 16,094
  - Change: -10.66%

- **Admitted Counts by Admit Date**
  - August 2013: 2,500
  - September 2013: 1,500
  - October 2013: 1,000
  - November 2013: 500
  - December 2013: 100
  - January 2014: 0

- **Applications Funnel**
  - In District Resident (IN)
    - Active: 9,269
    - International Resident (INTL)
      - Active: 9%
    - U.S. Student Exchange (BSSC)
      - Active: 1
  - Out of District Resident (OUT)
  - Out of State Resident (OUTST)
  - Unknown
<table>
<thead>
<tr>
<th>Location</th>
<th>Section Count</th>
<th>Section Capacity</th>
<th>Official Class Enrollment</th>
<th>Avg Official Enrollment per Section</th>
<th>Course Utilization %</th>
<th>Room Capacity</th>
<th>Room Utilization %</th>
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<tr>
<td>All Rooms</td>
<td>3,766</td>
<td>94,338</td>
<td>65,297</td>
<td>17.3</td>
<td>69.22%</td>
<td>79,756</td>
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<td>Blue River - Campus Cntr Bldg (BRCC)</td>
<td>153</td>
<td>4,736</td>
<td>4,209</td>
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<td>88.87%</td>
<td>6,180</td>
<td>68.11%</td>
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<td>Blue River - Arts &amp; Science Bldg (BRAS)</td>
<td>93</td>
<td>2,745</td>
<td>2,014</td>
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<td>Blue River - Education Cntr Bldg (BREC)</td>
<td>59</td>
<td>1,448</td>
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<td>22.1</td>
<td>90.12%</td>
<td>1,924</td>
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<td>Blue River - Public Safety Bldg (BRPS)</td>
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<td>81</td>
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<td>64.80%</td>
<td>160</td>
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<td>BTC North Annex (BTNA)</td>
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<td>120</td>
<td>100</td>
<td>25.0</td>
<td>83.33%</td>
<td>132</td>
<td>55.96%</td>
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<td>Business Tech - Tech Cntr Bldg (BTTC)</td>
<td>56</td>
<td>1,149</td>
<td>816</td>
<td>14.6</td>
<td>71.02%</td>
<td>1,481</td>
<td>55.10%</td>
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<td>Business Tech - Campus Cntr Bldg (BTC)</td>
<td>128</td>
<td>2,384</td>
<td>1,621</td>
<td>12.7</td>
<td>67.99%</td>
<td>2,825</td>
<td>57.38%</td>
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<td>Longview - Business Bldg (LVBU)</td>
<td>141</td>
<td>3,580</td>
<td>2,885</td>
<td>20.5</td>
<td>80.59%</td>
<td>4,686</td>
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<td>Longview - Campus Center Bldg (LVCC)</td>
<td>33</td>
<td>1,074</td>
<td>914</td>
<td>27.7</td>
<td>85.10%</td>
<td>1,145</td>
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<td>Longview - Cultural Arts Cntr (LVCA)</td>
<td>3</td>
<td>56</td>
<td>41</td>
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<td>73.21%</td>
<td>522</td>
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<td>Longview - High Tech Bldg (LVHT)</td>
<td>37</td>
<td>682</td>
<td>580</td>
<td>15.7</td>
<td>85.04%</td>
<td>902</td>
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<td>Longview - Liberal Arts Bldg (LVL)</td>
<td>235</td>
<td>5,997</td>
<td>5,163</td>
<td>22.0</td>
<td>86.09%</td>
<td>8,292</td>
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<td>Longview - Lrg Resources Bldg (LVLR)</td>
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<td>298</td>
<td>245</td>
<td>16.3</td>
<td>82.21%</td>
<td>381</td>
<td>64.30%</td>
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<td>Longview - Rec Center Bldg (LVRC)</td>
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<td>32</td>
<td>16.0</td>
<td>72.73%</td>
<td>24</td>
<td>133.33%</td>
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<td>Longview - Science Tech Bldg (LVST)</td>
<td>197</td>
<td>5,831</td>
<td>5,051</td>
<td>25.6</td>
<td>86.62%</td>
<td>6,778</td>
<td>74.52%</td>
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<tr>
<td>Maple Woods - Campus Cntr Bldg (MWCC)</td>
<td>49</td>
<td>1,449</td>
<td>1,253</td>
<td>25.8</td>
<td>87.16%</td>
<td>1,876</td>
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<td>3,689</td>
<td>53.73%</td>
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<td>313</td>
<td>266</td>
<td>22.2</td>
<td>84.98%</td>
<td>535</td>
<td>49.72%</td>
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<td>342</td>
<td>332</td>
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<td>97.08%</td>
<td>224</td>
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<td>156</td>
<td>5,099</td>
<td>4,149</td>
<td>26.6</td>
<td>81.37%</td>
<td>5,632</td>
<td>73.67%</td>
</tr>
</tbody>
</table>
Where we are today

• Limited access to Deans & Presidents
• Student data warehouse, daily data now for 21 months.
• Rolling out custom reports this summer.
• Still some pesky data translation/transaction items
Challenges

• Education

• Security

• Past Practices
"After careful consideration of all 437 charts, graphs, and metrics, I’ve decided to throw up my hands, hit the liquor store, and get snockered. Who’s with me?!"
Next Steps

Student Analytics

Learn Analytics
Next Steps

Student Analytics

Finance

Learn Analytics

Creating Opportunities | Serving Communities | Preparing Students
Contact Info:

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