Big Data: Analytics and Higher Education

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Acknowledgement:
Kristy Bishop – MCC IR

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.

![Metropolitan Community College — Blue River | Business & Technology | Longview | Maple Woods | Penn Valley]

- 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

MCC - Blue River
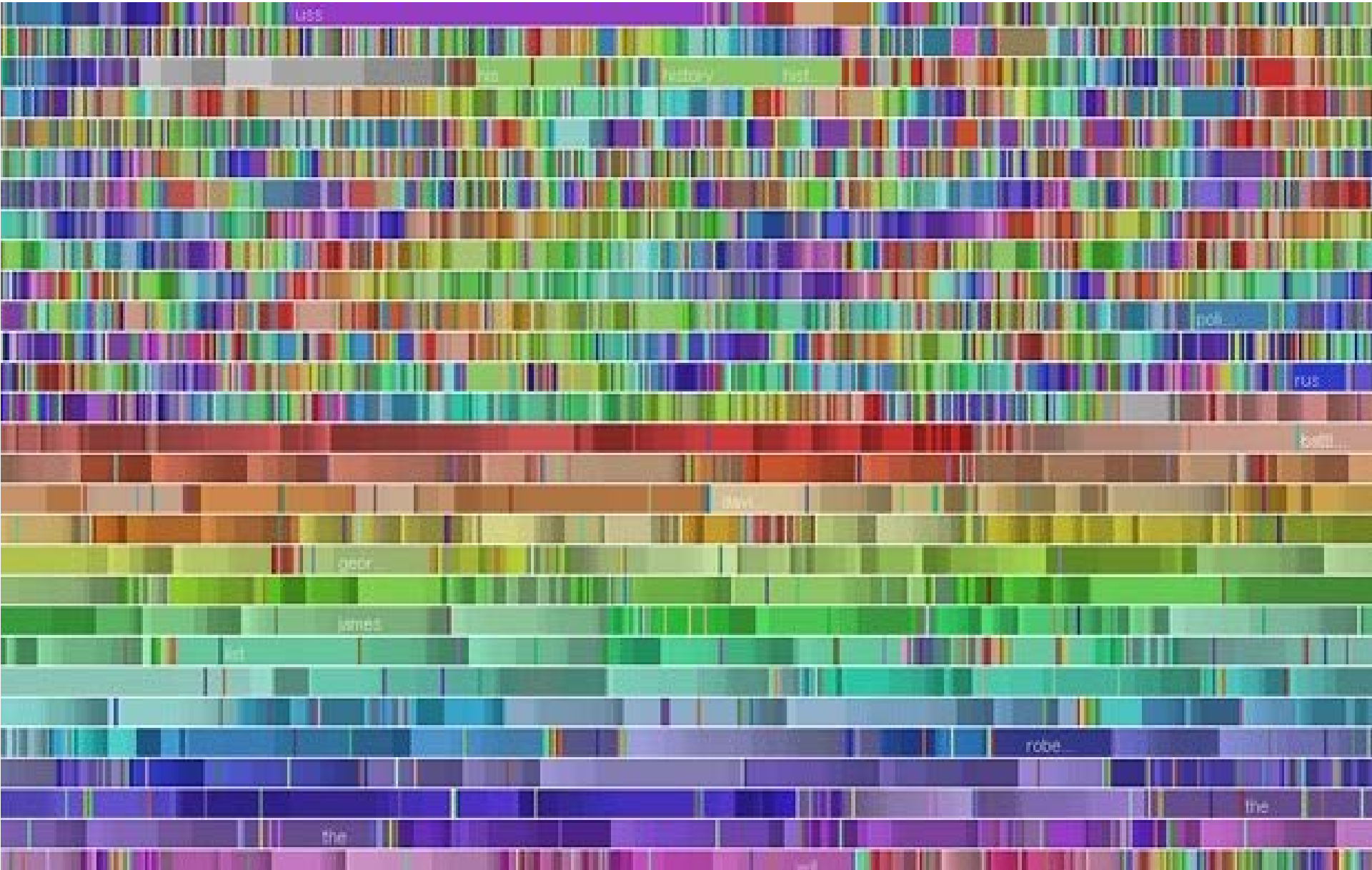
MCC - Maple Woods

MCC - Business & Technology

MCC - Penn Valley

MCC - Longview

Creating Opportunities | Serving Communities | Preparing Students

What is Big Data?

Metropolitan Community College

Blue River | Business & Technology | Longview | Maple Woods | Penn Valley

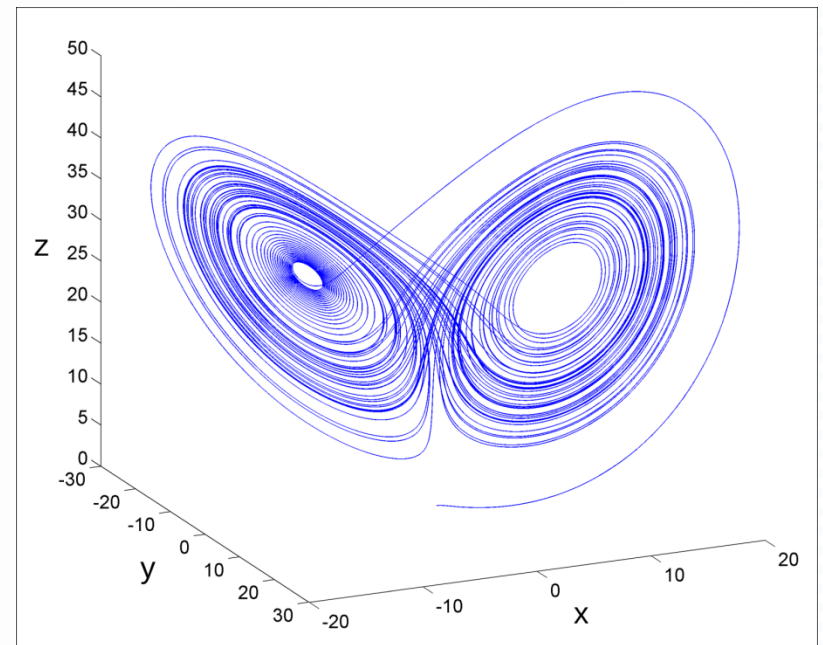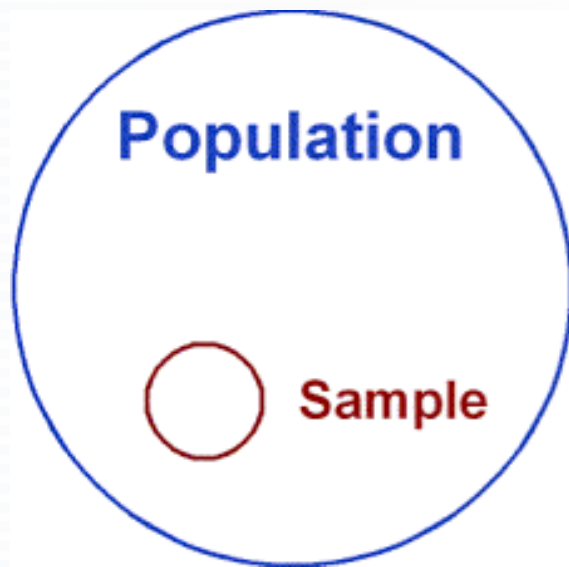Business Intelligence

Big Data means more & messy data

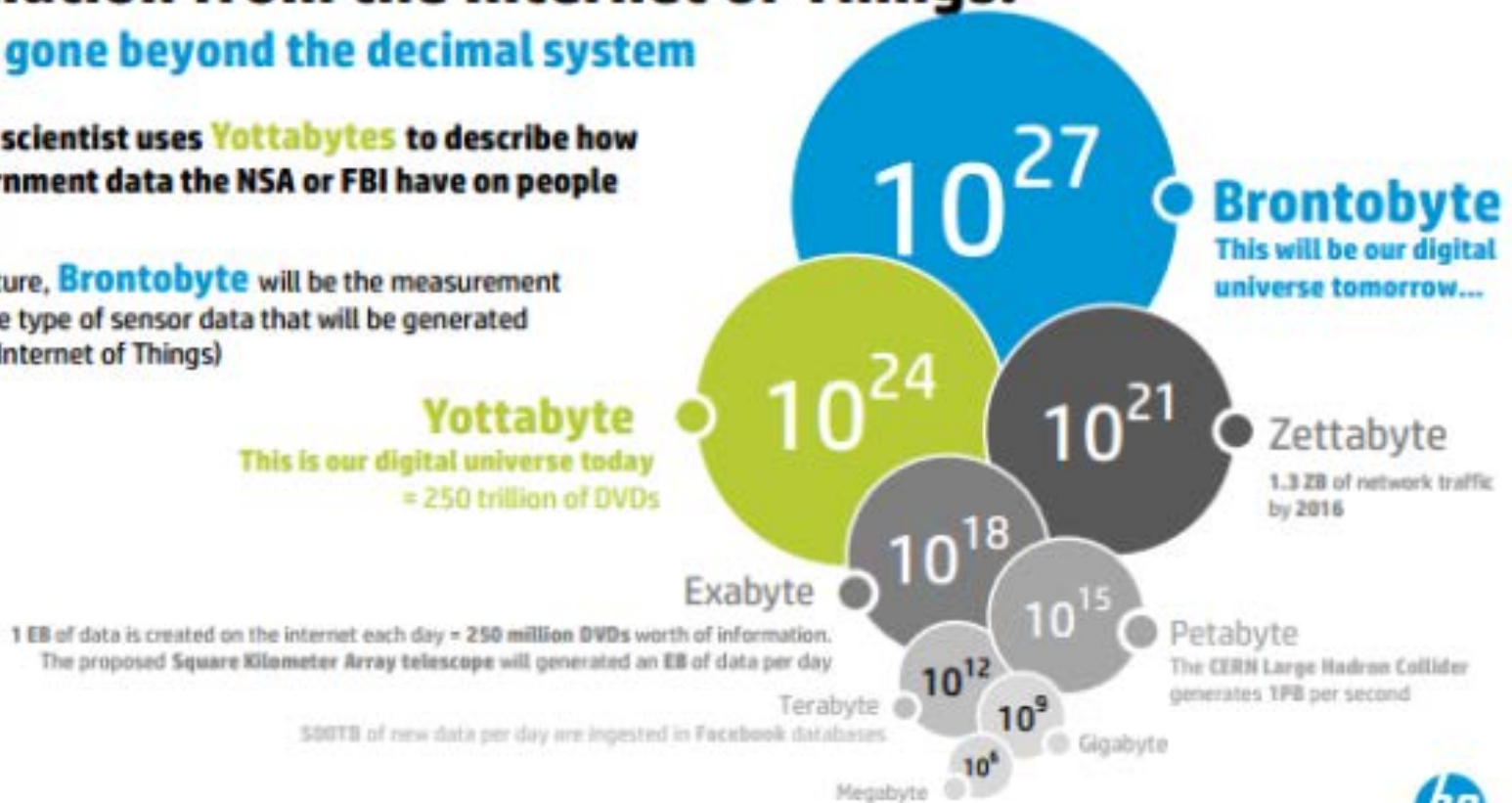# Three Characteristics of Big Data - 3Vs

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)

10^{27}

Brontobyte
This will be our digital universe tomorrow…

10^{24}

Yottabyte
This is our digital universe today
= 250 trillion of DVDs

10^{21}

Zettabyte
1.3 ZB of network traffic by 2016

10^{18}

Exabyte

10^{15}

Petabyte
The CERN Large Hadron Collider generates 1PB per second

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

10^{12}

10^{9}

Terabyte

Gigabyte

500TB of new data per day are ingested in Facebook databases

10^{6}

Megabyte

hp

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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?

Big Data is Collected By Us
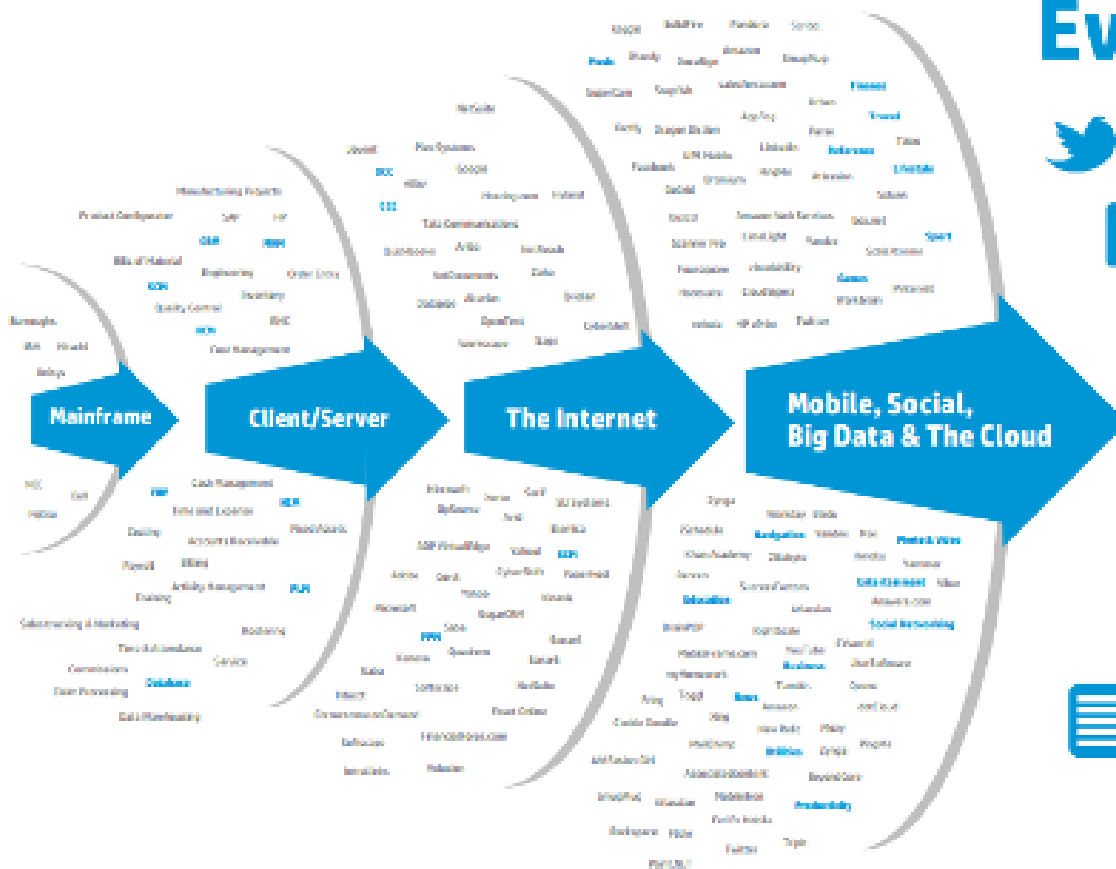
Big Data is Collected By All

Big Data is Collected By All

Big Data is Collected By All

Why Should Higher Education Pay Attention?

BIG DATA & HIGHER EDUCATION

"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*

The Higher Education Online Landscape
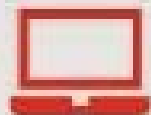
6.7 MILLION

$91 BILLION

**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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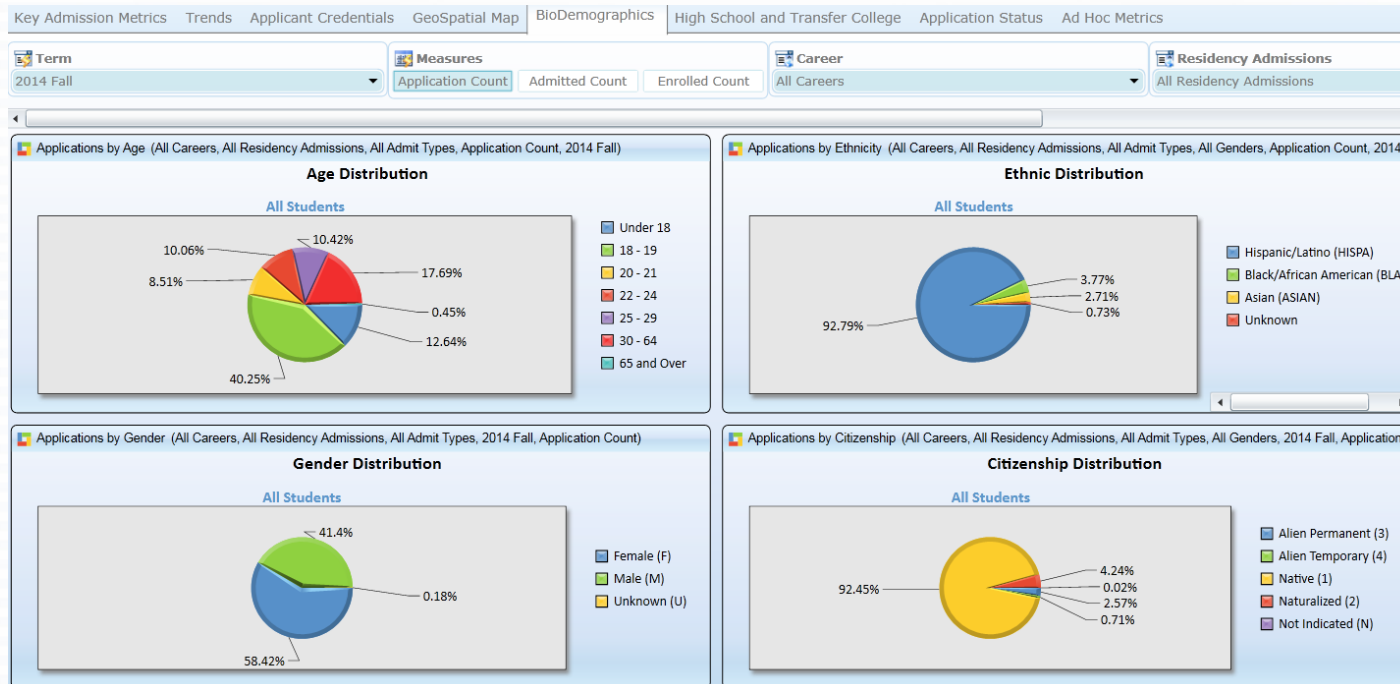
Key Admission Metrics

Residency Admissions
All Residency Admissions

Admit Type
All Admit Types

Career
All Careers

Measures
Application Count ~~ | Admitted Count ~~ | Enrolled Count ~~~

Same Day Comparative KPI's (All Careers, All Residency Admissions, All Admit Types, 2014 Fall)

10/24/2014	This Year	PY Same Day	% Chg PY Same Day		2 PY Same Day	% Chg 2 PY Same Day	
	Current	Current	Current		Current	Current	
Application Count ~~	14,378	14,699	⇨	-2.18%	16,094	⬇	-10.66%
Incomplete App Count ~~	14,378	14,699	⇨	-2.18%	16,094	⬇	-10.66%
Admitted Count ~~	14,378	14,699	⇨	-2.18%	16,094	⬇	-10.66%
Matriculated Count ~~	14,378	14,699	⇨	-2.18%	16,094	⬇	-10.66%
Deferred Count ~~			⬆			⬆	
Pending Count ~~			⬆			⬆	
% Applied Admitted ~	100.00%	100.00%	⬆	0.00%	100.00%	⬆	0.00%

PY Same Day Comparison (All Careers, All Residency Admissions, All Admit Types, Application Count ~~, 2014 Fa...)

Legend: This Year, PY Same Day, 2 PY Same Day

Y-axis: Application Count ~~
X-axis (As of Day): 6 months prior, 5 months prior, 4 months prior, 3 months prior, 2 months prior, 1 month prior, 21 days prior, 14 days prior, 7 days prior, Current

Admitted Counts by Admit Date (All Careers, 2014 Fall, All Admit Types, All Residency Admissions)

Admit Count and Yield by Admit Month *

X-axis: Aug 2013, Sep 2013, Oct 2013, Nov 2013, Dec 2013, Jan 2014, Feb 2014, Mar 2014, Apr 2014, May 2014, Jun 2014, Jul 2014, Aug 2014, Sep 2014, Oct 2014

Legend: Admitted Count [P], % Admitted Enrolled [S]

Applications Funnel (Application Count, All Careers, 2014 Fall, All Admit Types)

Funnel by Current Program Status (excludes Cancelled)

In District Resident (IN): 10,269
International Resident (INTL): 94
Midwest Student Exchange (MDWST): 1

Out of District Resident (OUT)
Out of State Resident (OUTST)
Unknown

Legend: Active in Program
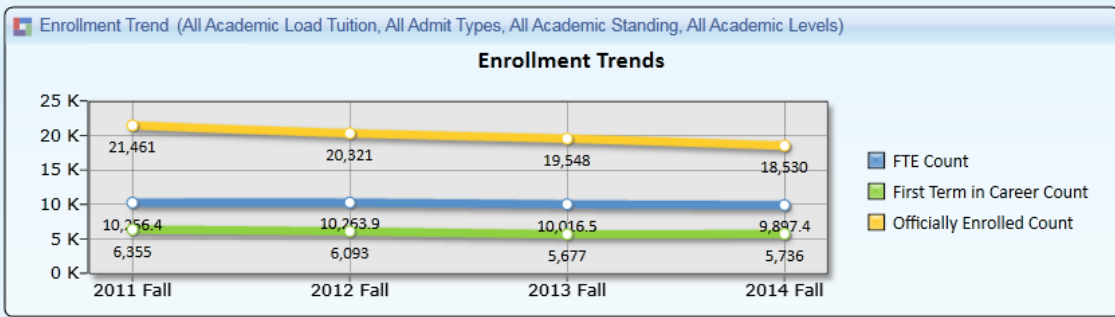
Building Utilization

	Section Count	Section Capacity	Official Class Enrollment	Avg Official Enrollment per Section	Course Utilization %	Room Capacity	Room Utilization %
All Rooms	3,766	94,338	65,297	17.3	69.22%	79,756	81.87%
Blue River - Campus Cntr Bldg (BRCC)	153	4,736	4,209	27.5	88.87%	6,180	68.11%
Blue River-Arts & Science Bldg (BRAS)	93	2,745	2,014	21.7	73.37%	3,910	51.51%
Blue River-Education Cntr Bldg (BREC)	59	1,448	1,305	22.1	90.12%	1,924	67.83%
Blue River-Public Safety Bldg (BRPS)	6	125	81	13.5	64.80%	160	50.63%
BTC North Annex (BTNA)	4	120	100	25.0	83.33%		
Business Tech - Tech Cntr Bldg (BTTC)	56	1,149	816	14.6	71.02%	1,481	55.10%
Business Tech-Campus Cntr Bldg (BTCC)	128	2,384	1,621	12.7	67.99%	2,825	57.38%
Longview - Business Bldg (LVBU)	141	3,580	2,885	20.5	80.59%	4,686	61.57%
Longview - Campus Center Bldg (LVCC)	33	1,074	914	27.7	85.10%	1,145	79.83%
Longview - Cultural Arts Cntr (LVCAC)	3	56	41	13.7	73.21%	522	7.85%
Longview - High Tech Bldg (LVHT)	37	682	580	15.7	85.04%	902	64.30%
Longview - Liberal Arts Bldg (LVLA)	235	5,997	5,163	22.0	86.09%	8,292	62.26%
Longview - Lrng Resources Bldg (LVLR)	15	298	245	16.3	82.21%	381	64.30%
Longview - Rec Center Bldg (LVRC)	2	44	32	16.0	72.73%	24	133.33%
Longview - Science Tech Bldg (LVST)	197	5,831	5,051	25.6	86.62%	6,778	74.52%
Maple Woods - Campus Cntr Bldg (MWCC)	49	1,449	1,263	25.8	87.16%	1,876	67.32%
Maple Woods - Humanities Bldg (MWHU)	127	2,783	1,982	15.6	71.22%	3,689	53.73%
Maple Woods - Stdnt Cntr Bldg (MWSC)	12	313	266	22.2	84.98%	535	49.72%
Maple Woods - Vet Tech Bldg (MWVT)	11	342	332	30.2	97.08%	224	148.21%
Maple Woods-Computing,Bus Bldg (MWC)	156	5,099	4,149	26.6	81.37%	5,632	73.67%

Key Enrollment Metrics

Filters

Academic Standing	Academic Level	Academic Load Tuition	Admit Type	Term
All Academic Standing	All Academic...	All Academic Load Tuition	All Admit Types	Non-credit 7/1/2014-6/30/2015

Enrollment Same Day Comparison (All Academic Load Tuition, All Admit Types, All Academic Lev...)

	Day 56	
	10/14/2013	10/13/2014
	2013 Fall	2014 Fall
Officially Enrolled Student Count	🟢 19,474	🟥 18,536
Officially Enrolled Credits	🟢 178,267.5	🟥 166,740.5
Officially Enrolled Class Count	🟢 70,716	🟥 65,382
Actively Enrolled Student Count	🟢 18,761	🟥 17,861

Enrollment Trend (All Academic Load Tuition, All Admit Types, All Academic Standing, All Academic Levels)

Enrollment Trends

	2011 Fall	2012 Fall	2013 Fall	2014 Fall
Officially Enrolled Count	21,461	20,321	19,548	18,530
FTE Count	10,256.4	10,263.9	10,016.5	9,897.4
First Term in Career Count	6,355	6,093	5,677	5,736

Legend: FTE Count, First Term in Career Count, Officially Enrolled Count

This Term vs. PY End of Term KPI's (All Academic Standing, All Academic Load Tuition, All Admit...)

	This Term	PY End of Term	% Chg PY End of Term	
Officially Enrolled Count	2,380	5,550	⬇	-57.12%
Actively Enrolled Count	2,380	5,550	⬇	-57.12%
Audit Only Count			⬆	
FTE Count	4,527.2	11,683.3	⬇	-61.25%
First Term at Institution Count	1,162	2,680	⬇	-56.64%
First Term in Career Count	1,548	3,769	⬇	-58.93%
Withdraw Count			⬆	

Term Enrollment Indicators (Student Term Count, All Academic Standing, All Academic Levels, All Academic Load Tuition, All Admit Types, All S...)

All First Term in Career Indicators		First Term Enrolled	Continuing or Returning	Not Enrolled
All Term Enrolled Indicators	15,639	🟥 1,548	🟥 832	🟥 13,259
Enrolled or Waitlisted	2,380	1,548	832	
Officially Enrolled	🟥 2,380	1,548	832	
Actively Enrolled	2,380	1,548	832	
Withdrawn with Enrollment				
Waitlisted Only				
Not Enrolled or Waitlisted	13,259			13,259
Dropped All Classes	181			181

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
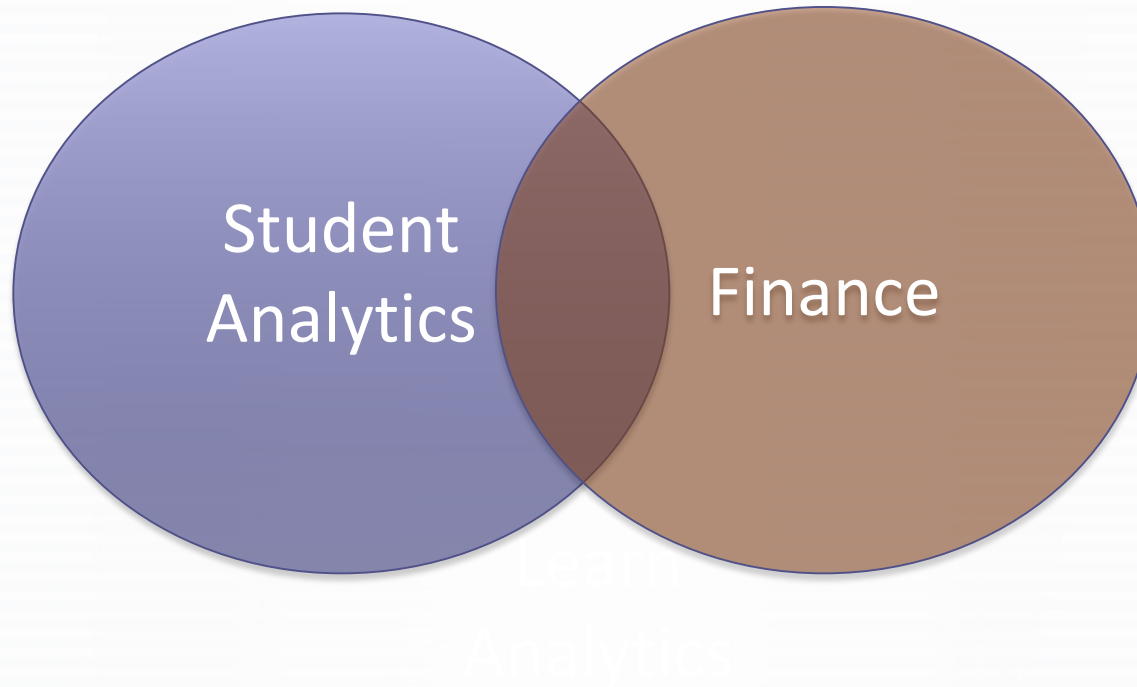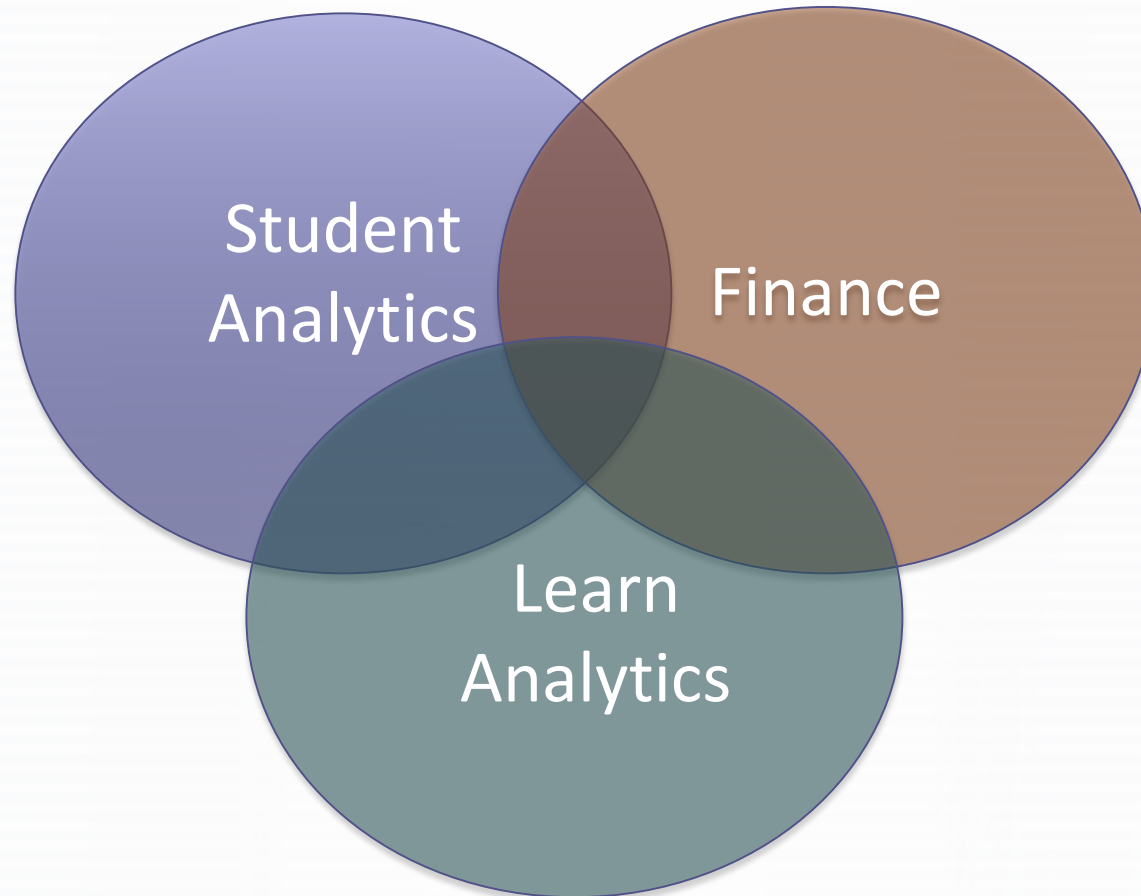
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