From IT Troubleshooting & Service Monitoring To Predicting Student Achievement

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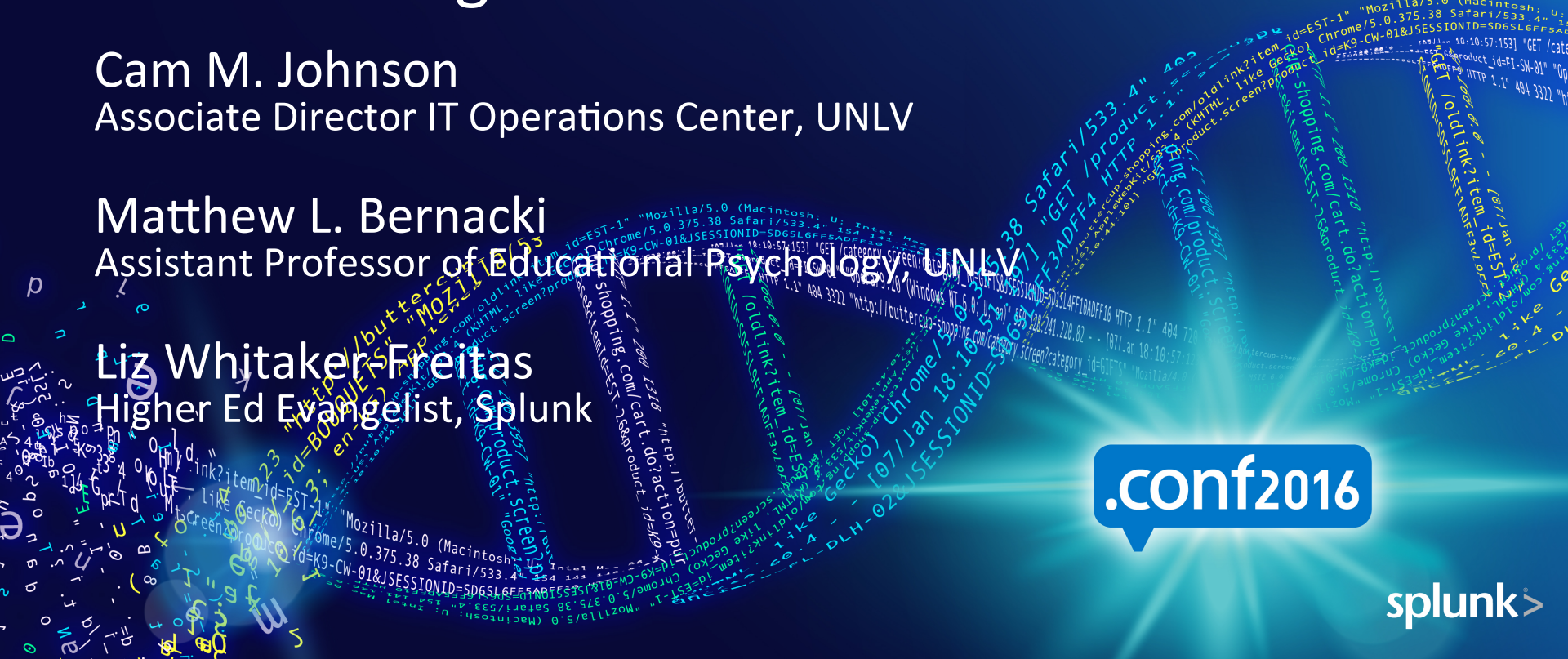

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Student Success And Retention

- Lost immediate and potential future revenue

  (Assume 4,000 1st year students @ $32,405/yr)*

  - Additional **1%** retained: **$3,888,600**
  - Cost of Recruiting: $97,320**
  - Lost Future Revenue: ??

- Performance Based Funding
- Reputation/Rankings

* College Board Average Published Undergraduate Charges by Sector, 2015-16
** Noel Levitz: 2013 Cost of Recruiting an Undergraduate Student Report

Student Success And Retention

- Retain and educate more students
  - Minimize lost revenues
  - Recruit the right students
  - Build lifetime relationships/giving
- Do more with less
- Proactive not Reactive

Turning Machine Data Into Operational Intelligence

Agenda

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Background

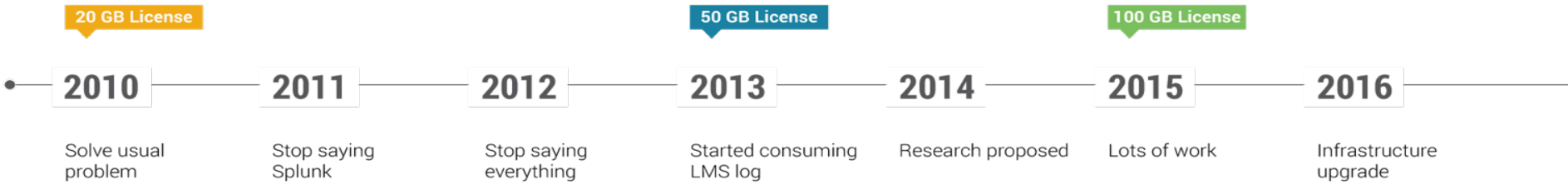
UNLV IT Operations Center

Evolved from Network Development and Engineering team in 2006 to a traditional Network Operations Center.

Currently offer a wide range of services:

- Monitoring
- Log Aggregation and Search
- Data Center
- Tier 2 support

Splunk @ UNLV Timeline



from Aug 23 through Aug 29, 20...

2m ago

Tickets Received by:	Total
Phone	4160
Walk-in	1382
Web-Form	552
Email	337
Voicemail	51
Agent	9
Total Tickets Created:	6491

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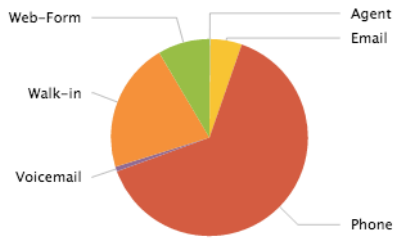

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Password Reset Counts	Total
Active Directory ACE	4973
Wireless	331
Rebelmail	314
OTHER	124
MyUNLV	115

from Jan 17 through Jan 23, 20...

2m ago

Tickets Received by:	Total
Phone	2274
Web-Form	388
Email	313
Voicemail	200
Walk-in	191
Agent	62
Total Tickets Created:	3428

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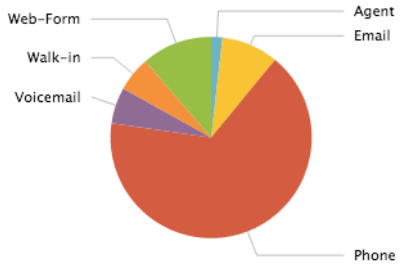

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Password Reset Counts	Total
Active Directory ACE	1335
Wireless	283
Rebelmail	271
MyUNLV	222
OTHER	82

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Project Phases

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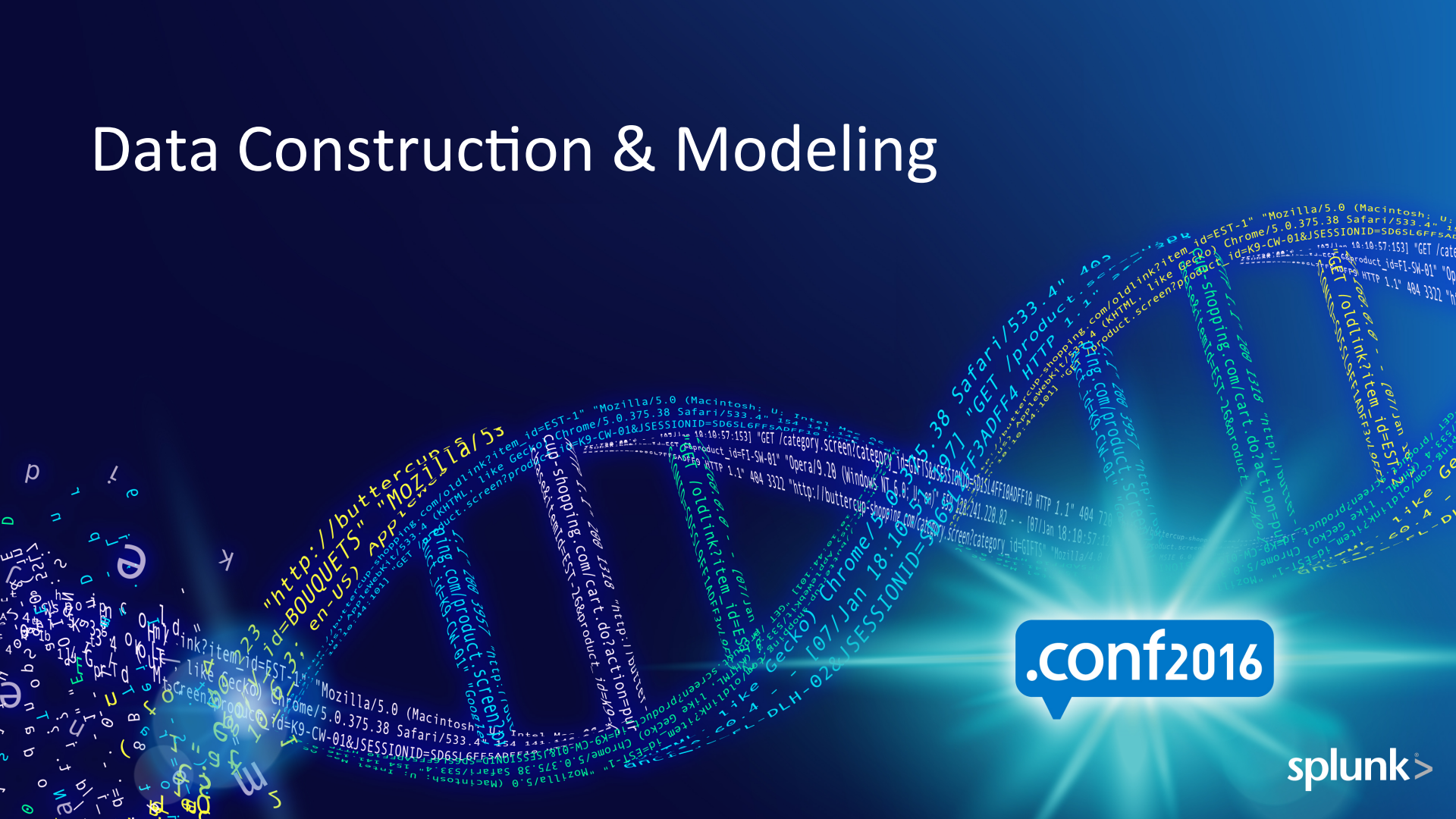
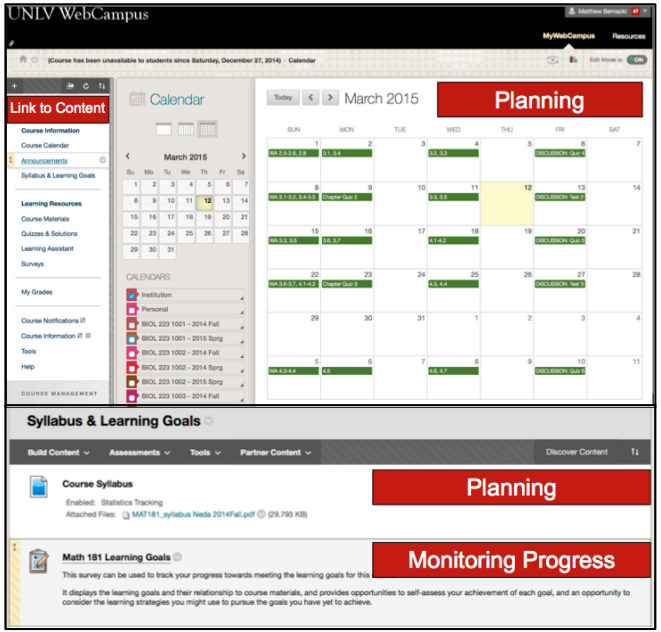
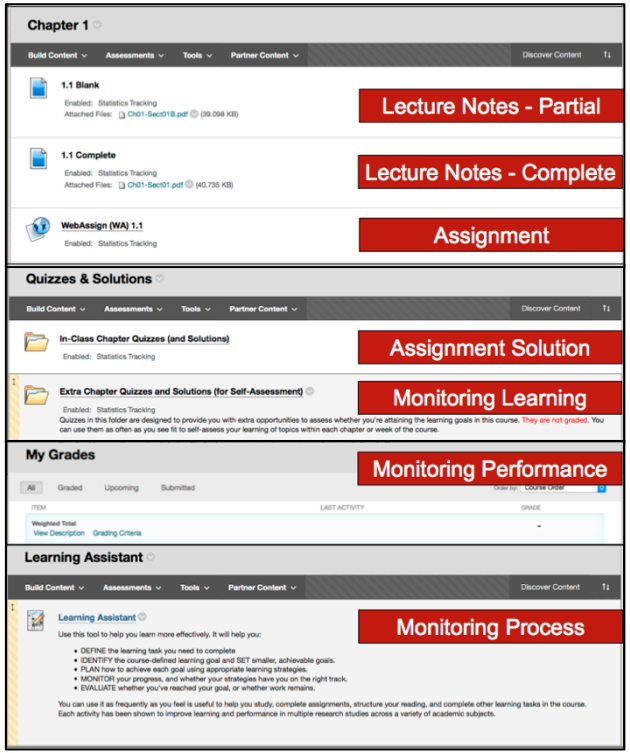
Data Construction & Modeling



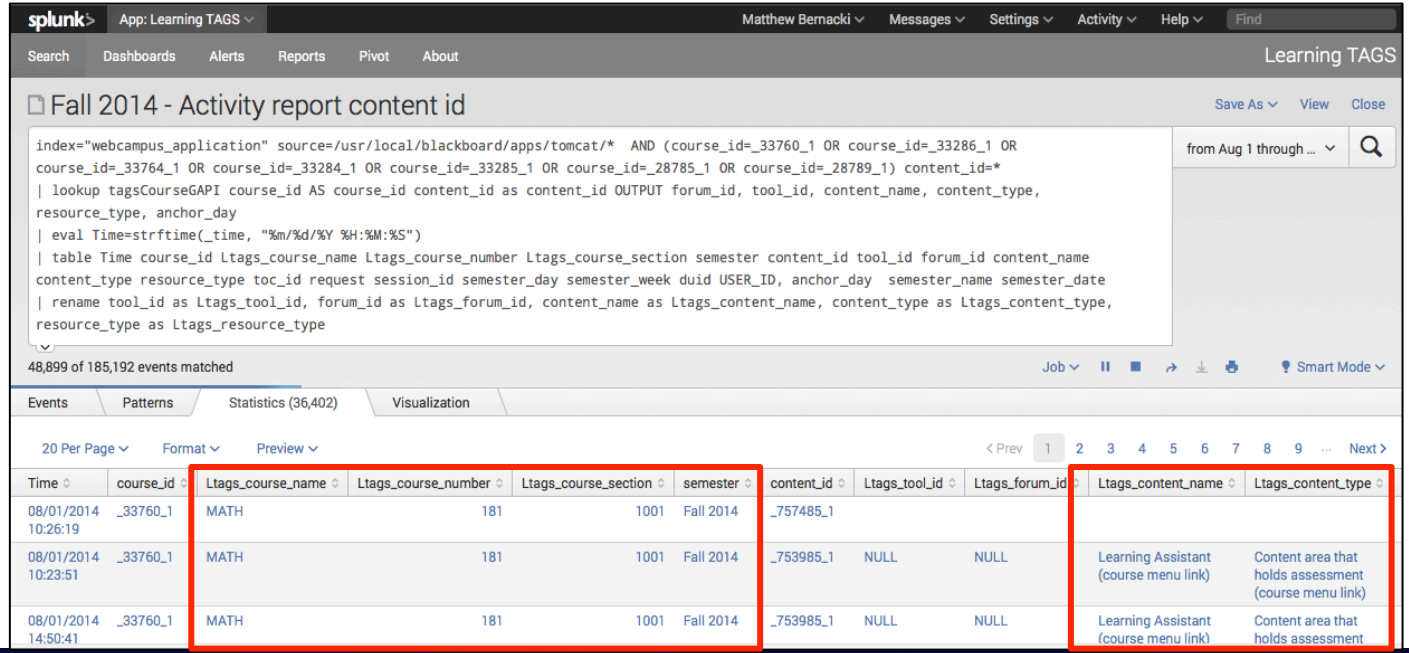
Resources For Learning





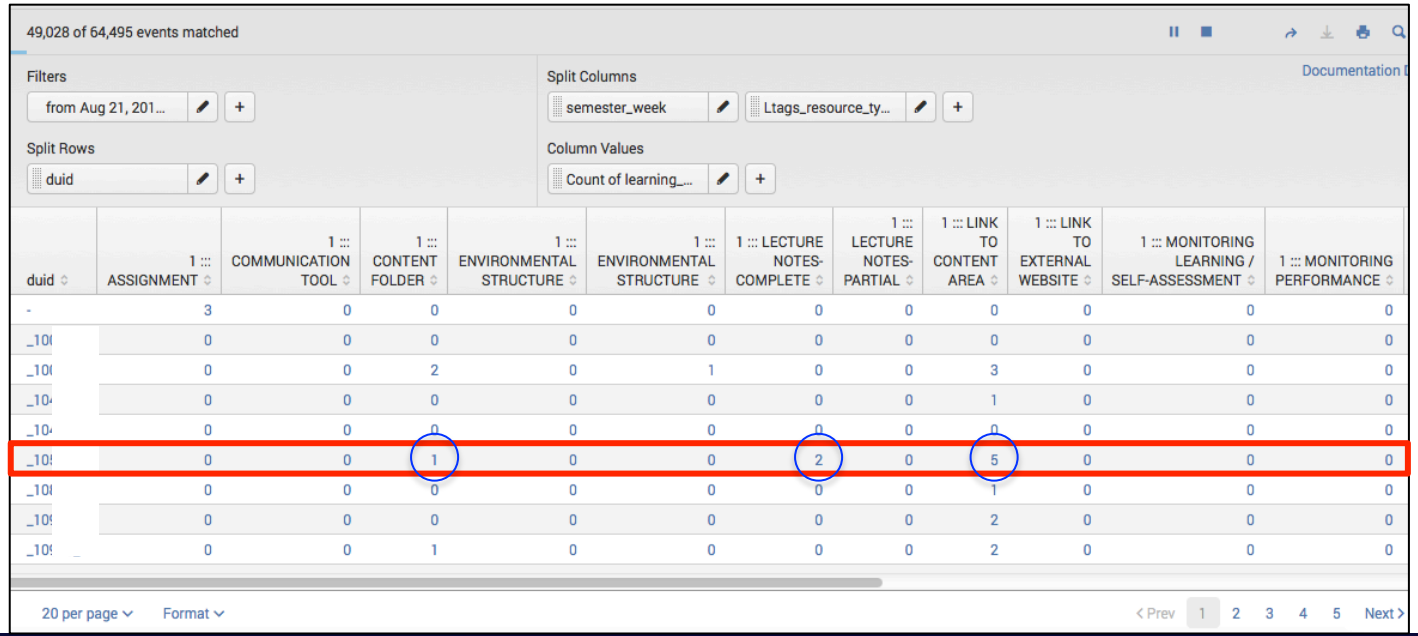
Data Logging & Enrichment

- Use Splunk to grab key terms, organize it into tables; add lookup tables to enrich with meaningful information



Data Logging & Enrichment

- Restructure using PIVOT in Splunk it to represent ***learning events***, based on the content students utilize



49,028 of 64,495 events matched

Filters: from Aug 21, 201...

Split Columns: semester_week, Ltags_resource_ty...

Split Rows: duid

Column Values: Count of learning_...

duid	1 ::: ASSIGNMENT	1 ::: COMMUNICATION TOOL	1 ::: CONTENT FOLDER	1 ::: ENVIRONMENTAL STRUCTURE	1 ::: ENVIRONMENTAL STRUCTURE	1 ::: LECTURE NOTES-COMPLETE	1 ::: LECTURE NOTES-PARTIAL	1 ::: LINK TO CONTENT AREA	1 ::: LINK TO EXTERNAL WEBSITE	1 ::: MONITORING LEARNING / SELF-ASSESSMENT	1 ::: MONITORING PERFORMANCE
-	3	0	0	0	0	0	0	0	0	0	0
_10	0	0	0	0	0	0	0	0	0	0	0
_10	0	0	2	0	1	0	0	3	0	0	0
_10	0	0	0	0	0	0	0	1	0	0	0
_10	0	0	0	0	0	0	0	0	0	0	0
_10	0	0	1	0	0	2	0	5	0	0	0
_10	0	0	0	0	0	0	0	1	0	0	0
_10	0	0	0	0	0	0	0	2	0	0	0
_10	0	0	1	0	0	0	0	2	0	0	0

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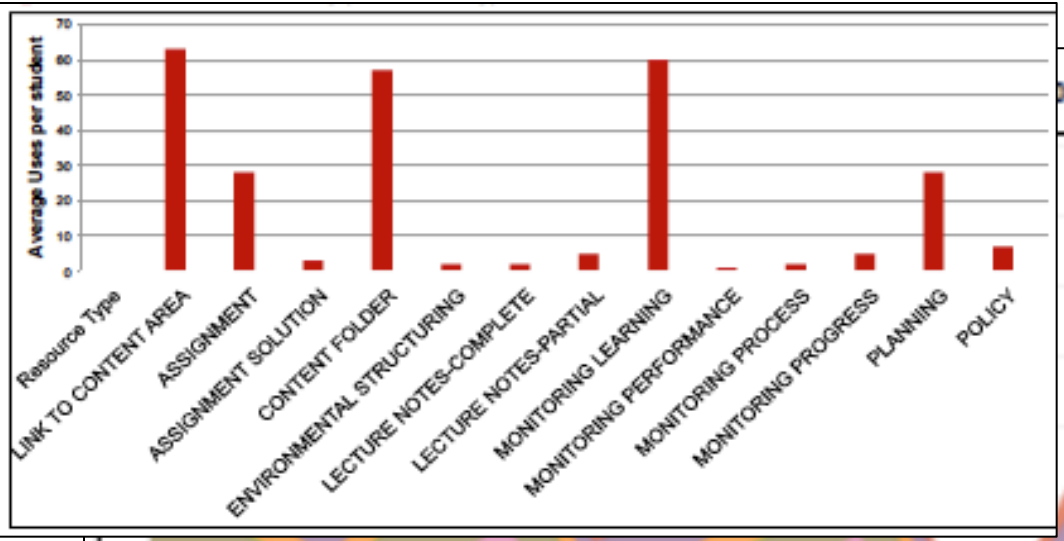
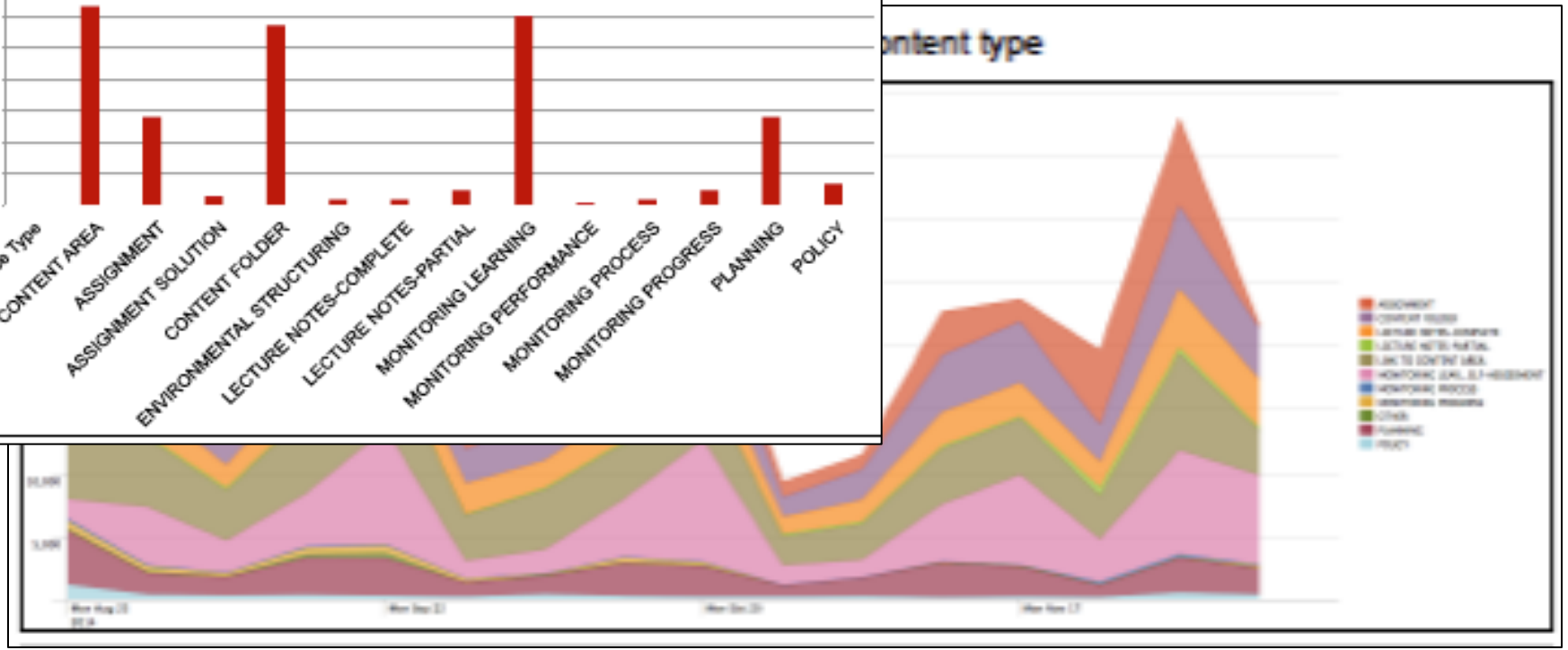
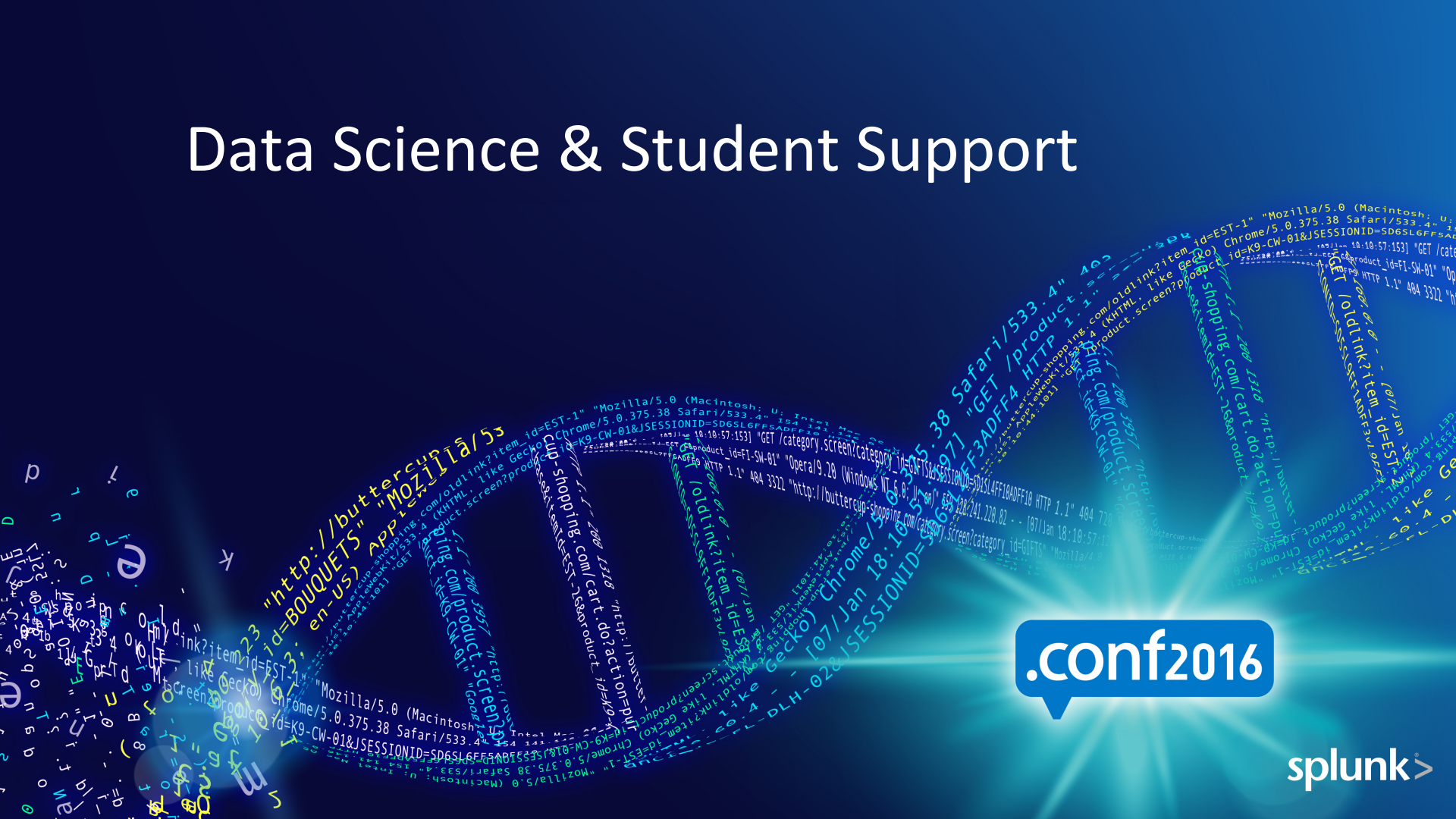
Data Modeling & Analytics





Data Science & Student Support



SEMESTER

Week

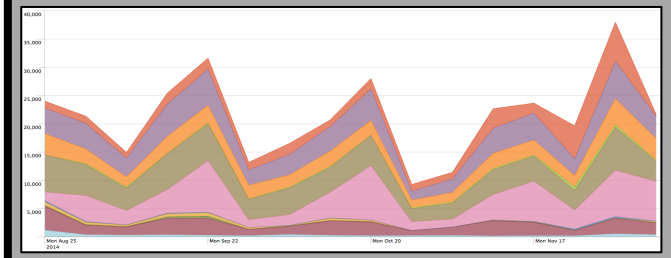
EXAM 1 | EXAM 2 | EXAM 3 | EXAM 4

1 2 3 4 5 6 7 8 9 10 11 12 13 14 15

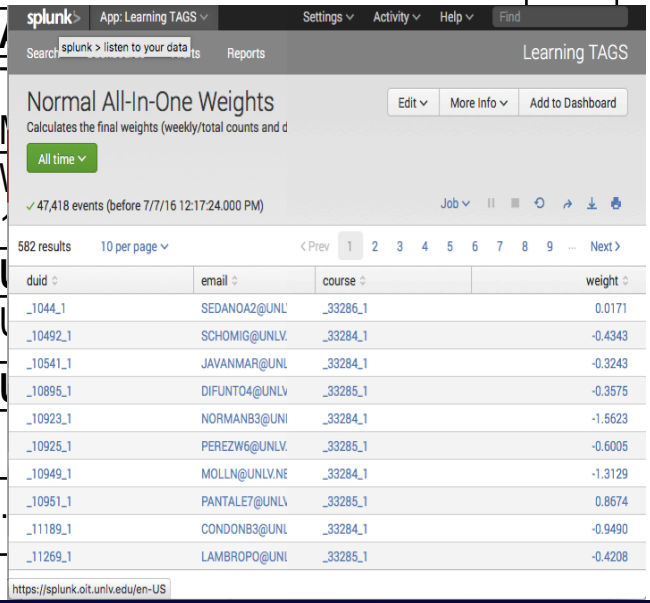
85% accuracy IDing “C or worse” earners
100s receive early alert messages

Prediction Modeling tools available in Splunk 6.4

Log. Model. Apply. Predict. Alert.



Predictor | B



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An Early Warning,
Or “A Check-in On Your Learning”

Hi [Name]!

Our first course exam is coming up in a week or so.

[I'm a little concerned that you might not score so well because of the way you've been using the resources provided on WebCampus so far this semester.]

I want to check-in to make sure each student is on top of our content, learning in appropriate ways, and able to perform well. So, I'd like to direct you to **two** resources that can help you with learning the material in our course:

1. The first is a one-page summary of advice from students who earned As & Bs in the course.
2. A set of learning modules called "The Science of Learning to Learn."
   These modules describe learning strategies you can use with our course materials…

Both resources can be found on the WebCampus site for our course under the **STEM Learning Resources** link in the left panel (and provided in this announcement, below).

I hope you find that these resources help you to learn and perform well!

Dr. Utz

Innovative Learner Support

Student Advice

Tackling Anatomy & Physiology at UNLV

Advice from successful past students:

What helped them learn and score well in Anatomy & Physiology?

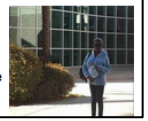
We asked UNLV students to reflect on their experience learning in anatomy and physiology courses. What helped them do well? And what didn't?

See what they had to say!

"Plan ahead! Seek out materials early on, make a study plan, and stick to it."

Britney There's definitely a learning curve in A&P, so it's good to get advice from past students. I personally would recommend that students seek out any helpful materials in the beginning of the course, make a plan on how to use them, and stick to the plan. Courses like anatomy require a lot of memorization, so it is very important to repeatedly try to recall the information. For example, if you need to learn to label something, erase labels, print it out, and then practice labeling it. Certainly read the textbook, but then also look to the learning objectives and the materials the instructor provides and plan from there – there are usually online tools like practice quizzes to help you study. Of course, studying the last minute is the biggest mistake. Definitely space out when you study and make sure to never get behind. I think that a lot of students fail this class because they just cram before the test and then have a very hard time during finals.

"I learned tough concepts best when I explained them out loud to myself and to others."



This class was hard, but I did manage to earn a B. For me, the first trick was to not procrastinate. I reviewed the material on a daily basis so that when a test got closer, all I had to do was review. This also gave me time to ask the teacher questions during office hours.

Skill Training (Science of Learning to Learn)

The Science of Learning to Learn

Welcome to *the Science of Learning to Learn*!

Are you having trouble achieving grades you want?

Is studying taking too much of your time?

Do you soon forget what you studied?

Students often choose learning and studying methods that are familiar to them, but aren't the ones that produce t

Emily's dilemma

In her chemistry class, Emily was told she would have a test in three weeks. Emily wrote the date down in her cal to work. She worked very hard, using all the strategies she had successfully used in high school: she spent hours thought to be important. She worked deep into the night both Wednesday and Thursday and arrived exhausted b

On Monday, Emily returned to Chemistry class and received her graded exam. Despite her intense effort, the **C+**

Epilogue: Student Benefits

The Need: 50% of students who who take BIOL 223 have to retake it

The Benefits: 305 received messages in our project

Next Exam: **108** who received messages (IDed "C or worse") earned **As & Bs**

The Challenge: "science of messaging" isn't perfect yet…

Do alerts always help?

Personalizing the message (Hi So-and-so!) seems to help.

The Promise:

100s of students received data-driven feedback in Biology so far.

1000s more in Calculus, Algebra and Engineering will this year!

Next year..?

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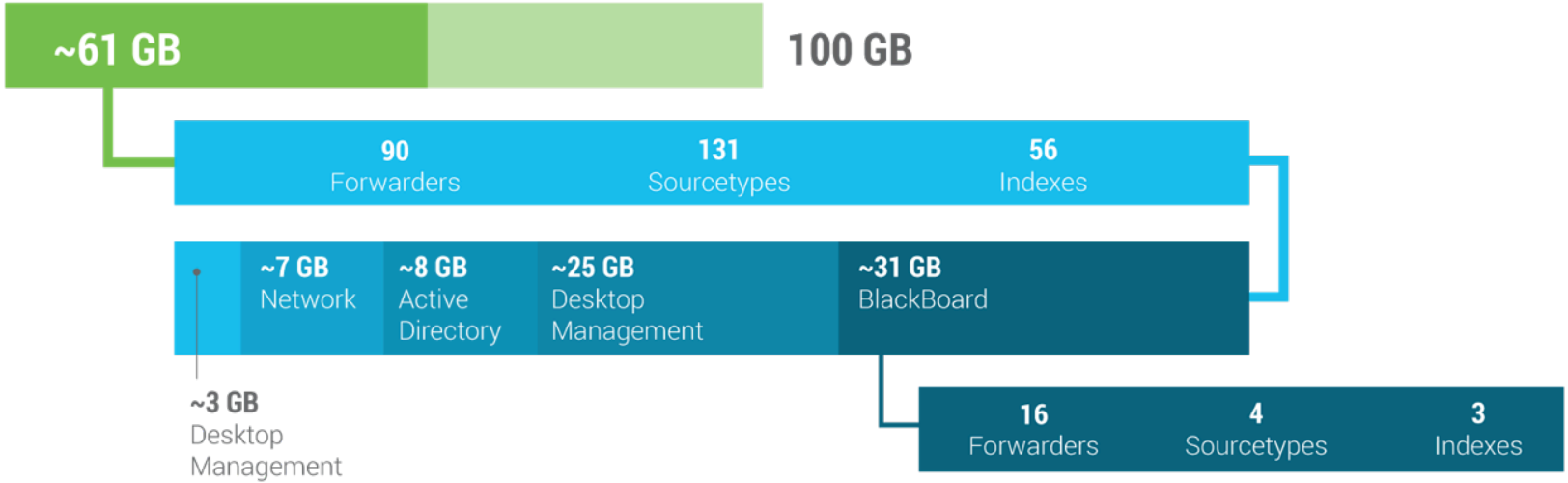
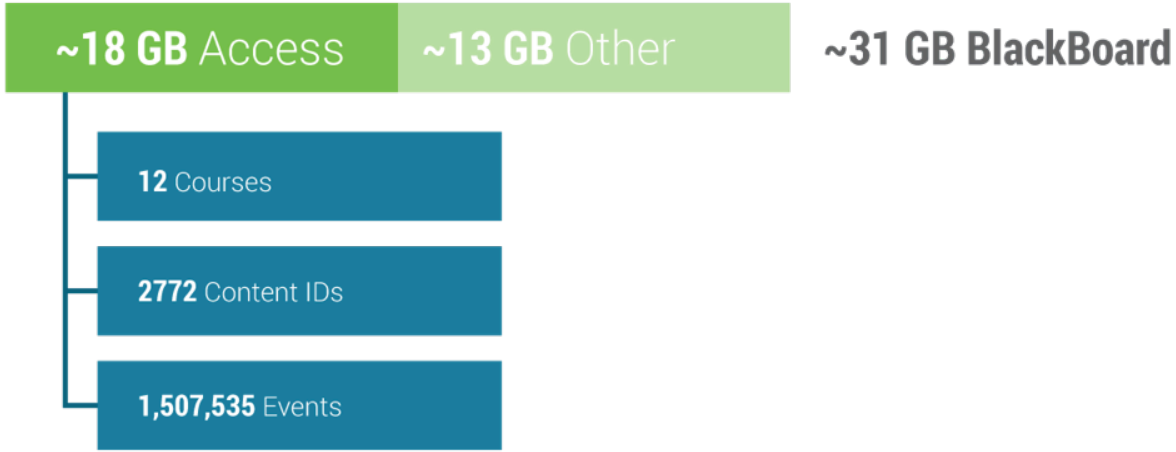
Supporting Research

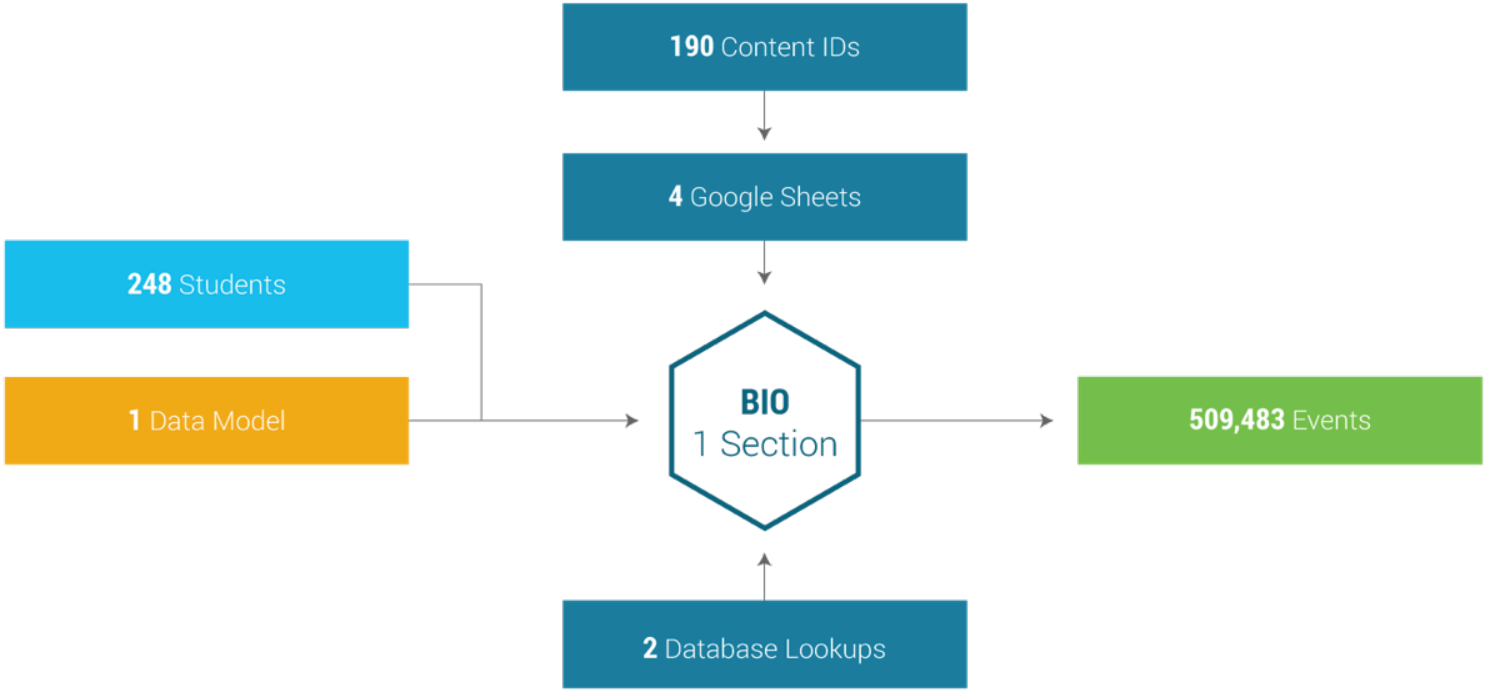
UNLV Splunk Environment



BlackBoard


~18 GB Access
~13 GB Other
~31 GB BlackBoard
12 Courses
2772 Content IDs
1,507,535 Events

Course Details



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UNLV IT Benefits

- Broadened our understanding of the LMS environment
- Created indexing opportunities
  - Student Information System
  - Identity Management
- Validated everything we've done since 2010
  - For some, a solution outside of IT heightened Splunk's standing
  - Pride amongst the Splunk team

Note posted for user

<1m ago

Date	Author	Status	Username	Description
04/18/2016	Cyndi	please forward incoming requests to Cyndi Backstrom.	Cyndi	Working with user on-going issue of accessing application

Footprints issues updated within past 7 days

<1m ago

Last Update	Issue	Title	Status	Customer	NSHE	Username	Employee	Student	Main Category	Service Category	Sub Category
username not found											

WebCampus login activity

<1m ago

Time	IP	Event Name	Node	DUID	First Name	Last Name	Username	ISP Name	OS	Browser (version)	City	Region	Country
2016-07-28 08:07:02 AM	10.248.49.167	Successful Login	oit-wcl-papp-03	_10910_1	Robert	Coe	coer	Internal Wired IP	Windows	Chrome (51)	Las Vegas	Nevada	United States
2016-07-28 07:59:56 AM	10.248.49.167	Successful Login	oit-wcl-papp-03	_10910_1	Robert	Coe	coer	Internal Wired IP	Windows	Chrome (51)	Las Vegas	Nevada	United States
2016-07-31	Null	Session Expiration	oit-wcl-papp-	_10910_1	Robert	Coe	coer	Null					

Enrollment Information - Updated daily at 3:24 AM

<1m ago

Username	Course Name	Year	Semester	Available	Role	Enrollment last updated
coer	STAT 411 1003 - 2016 Sprg	2016	Sprg	Yes	Student	2015-12-23 11:57:30 AM
coer	STAT 411 1001 - 2016 Sprg	2016	Sprg	Yes	Student	2015-12-23 11:57:27 AM
coer	BIOL 197 1003-1018 - 2016 Sprg			Yes	Student	2015-12-23 11:55:42 AM
coer	BIOL 197 1015 - 2016 Sprg	2016	Sprg	Yes	Student	2015-12-23 11:55:42 AM
coer	BIOL 197 1002 - 2016 Sprg	2016	Sprg	Yes	Student	2015-12-23 11:49:13 AM
coer	CS 489 1003 - 2016 Sprg	2016	Sprg	Yes	Student	2015-12-23 11:01:36 AM
coer	CS489_CS689_Section 3 - 2016 Sprg			Yes	Student	2015-12-23 11:01:36 AM
coer	CS 473 1001 - 2016 Sprg	2016	Sprg	Yes	Student	2015-12-23 11:00:49 AM
coer	CS473_673 - 2016 Sprg			Yes	Student	2015-12-23 11:00:49 AM
coer	CS 460 1001 - 2016 Sprg	2016	Sprg	Yes	Student	2015-12-23 10:59:51 AM

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Content Activity

Edit | More Info

Username: coer

course_id: *

Content Type: content_id, forum_id, blog_id

Last 60 minutes

Submit

<1m ago

_time	duid	USER_ID	course_id	COURSE_NAME	content_id	forum_id	blog_id	TITLE	HTTP
2016-07-28 10:35:33	_13426_1	collinik	_80897_1	PHIL 102 1014 - 2016 Sumr	_2283729_1			Module Three Homework	"POST /webа
2016-07-28 10:35:13	_13426_1	collinik	_80897_1	PHIL 102 1014 - 2016 Sumr	_2283729_1			Module Three Homework	"POST /webа
2016-07-28 10:35:12	_13426_1	collinik	_80897_1	PHIL 102 1014 - 2016 Sumr	_2283729_1			Module Three Homework	"GET /webap
2016-07-28 10:35:12	_13426_1	collinik	_80897_1	PHIL 102 1014 - 2016 Sumr	_2283729_1			Module Three Homework	"POST /webа
2016-07-28 10:35:07	_11430_1	odiorne2	_80274_1	SW 785 1002 - 2016 Sumr		_259867_1		Welcome to WebCT	"GET /webap HTTP/1.1"
2016-07-28 10:35:07	_11430_1	odiorne2	_80274_1	SW 785 1002 - 2016 Sumr		_259867_1		Welcome to WebCT	"GET /webap
2016-07-28 10:35:07	_13426_1	collinik	_80897_1	PHIL 102 1014 - 2016 Sumr	_2283729_1			Module Three Homework	"POST /webа
2016-07-28 10:35:27	_168057_1	ruizm5	_80014_1	CRJ 302 1002 - 2016 Sumr	_2292849_1			Interactive Activity 35	"GET /webap
2016-07-28 10:35:25	_168057_1	ruizm5	_80014_1	CRJ 302 1002 - 2016 Sumr	_2292849_1			Interactive Activity 35	"POST /webа
2016-07-28 10:35:19	_168057_1	ruizm5	_80014_1	CRJ 302 1002 - 2016 Sumr	_2292849_1			Interactive Activity 35	"POST /webа
2016-07-28 10:35:15	_33329_1	rubiod1	_80029_1	CRJ 460* 1001 - 2016 Sumr	_2288285_1			Lecture 7 - Proactive Policing	"GET /webap

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UNLV IT Solution Realizations

- Relationships matter
- Identifying roles is important
- Proud of our vanilla solution

What's Next

- Institutional data onboarding from Decision Support Group
- Grow team
- Scale the solution for other departments on campus
- Presidential debate

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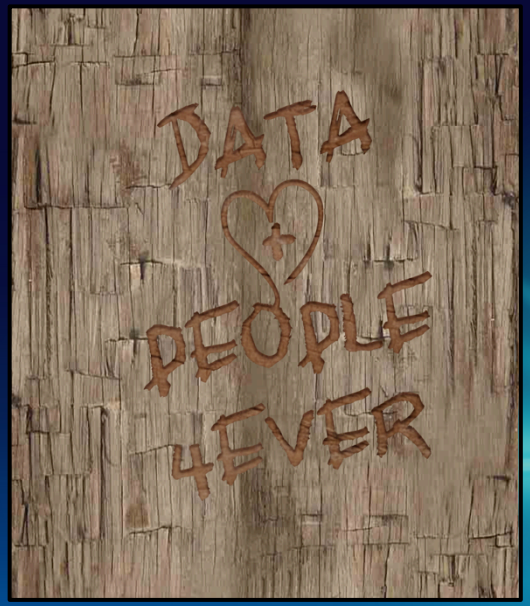
THANK YOU



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