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Delivering High-Level Analytics Reports

Dr. Tom LaGatta

Senior Data Scientist / Analytics Specialist
Splunk

Cody Harris

SE Manager / Analytics SME
Splunk



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Who Are We?

Intros

- **Dr. Tom LaGatta**
- New York, NY
- Senior Data Scientist
- Analytics Specialist
- NYC Cyclist
- **Cody Harris, MBA**
- Seattle, WA
- SE Manager – NW Majors
- Analytics SME
- Avid Snowboarder

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During the course of this presentation, we may make forward looking statements regarding future events or the expected performance of the company. We caution you that such statements reflect our current expectations and estimates based on factors currently known to us and that actual events or results could differ materially. For important factors that may cause actual results to differ from those contained in our forward-looking statements, please review our filings with the SEC. The forward-looking statements made in this presentation are being made as of the time and date of its live presentation. If reviewed after its live presentation, this presentation may not contain current or accurate information. We do not assume any obligation to update any forward looking statements we may make.

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Business Analytics at Splunk

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Analytics Everywhere with Splunk

- You've already onboarded lots of data
- Now use Splunk to solve Business Problems
- In this talk:
 - Deep dive into doing Analytics with Splunk
 - Operationalizing your Analytics projects
- Analytics use cases:
 - Understand Customers & Business Processes
 - Unify multiple channels of interaction
- Use Splunk as your data fabric



John Lewis



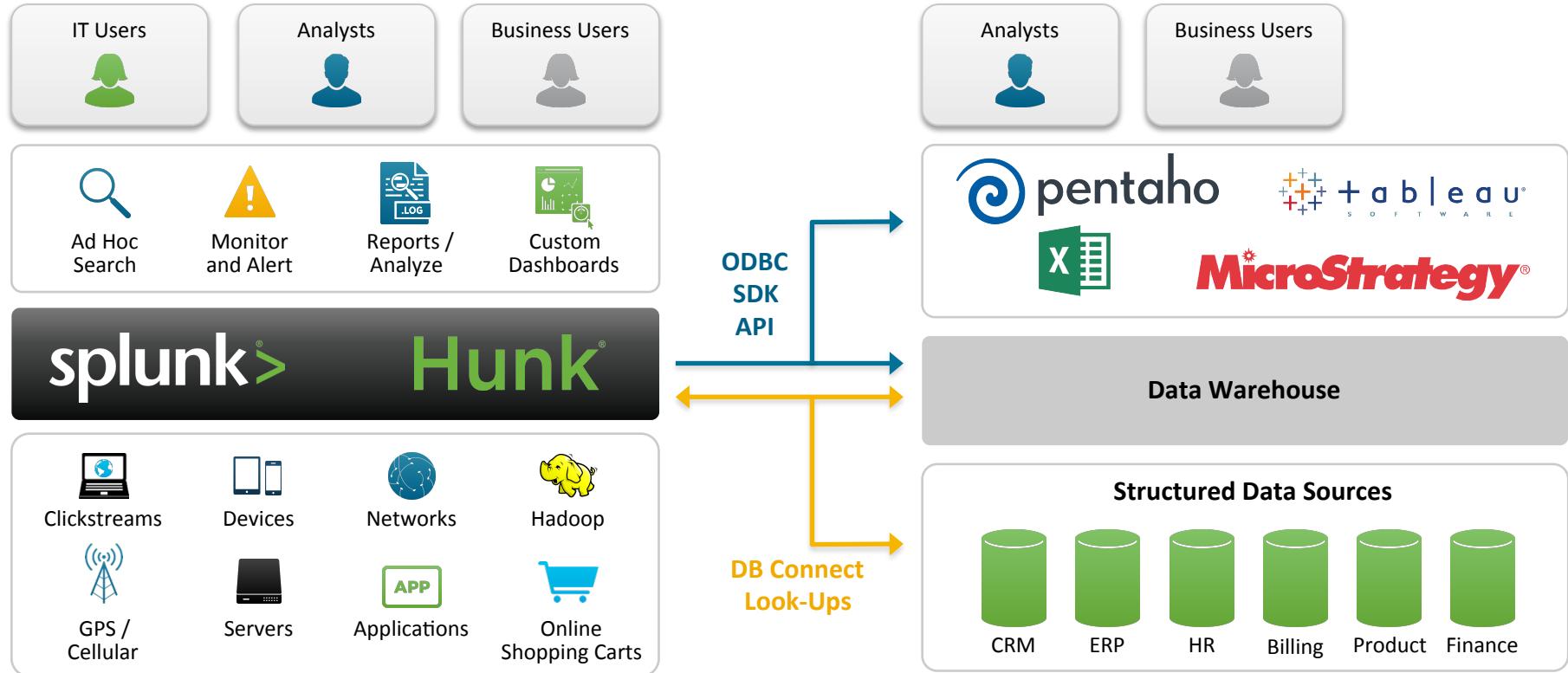
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oscar

TESCO

UniCredit

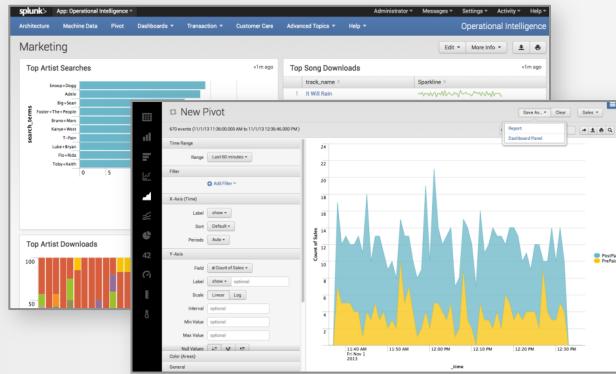
Analytics Ecosystem



Apps & Capabilities for Business Analytics

Apps, Features & Partners

- DB Connect
- ODBC Driver
- Stream
- MINT
- Data Models
- Pivot



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Deep Dive into Analytics with Splunk

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Build a Customer 360 Dashboard

- Deep dive into Customer view
- Improve Customer Experience
- “Is this customer happy?”
- Panels for all user interactions:
 - All web activity
 - All purchase activity
 - All support activity
- Tip: Select Customer with input

```
<<generating search>>
| stats values(Id) as values
| mvexpand values
```

Customer ID

2180

11048321807
2180546637
2180547540
8726121806



Unified Member View Enrollment Claims Other Clinical Customer Service Providers Finance Playground Enrollment Analytics Medical Management

Prescriptions, medical claims, customer service calls, teladoc calls, etc.

Member ID Oscar ID First Name Last Name 7 year window Submit 12m ago

R [REDACTED]	OSC [REDACTED]	POLICY HOLDER	TIMOTHY	J	FAUST	19 [REDACTED]	26	mem_psn [REDACTED]
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Basic Info 12m ago

mem_id1 [REDACTED]	mem_altid [REDACTED]	family_role [REDACTED]	mem_fname [REDACTED]	mem_minit [REDACTED]	mem_lname [REDACTED]	DOB [REDACTED]	Age [REDACTED]	mem_psn [REDACTED]
[REDACTED]	OSC [REDACTED]	Policy Holder	TIMOTHY	J	FAUST	19 [REDACTED]	26	[REDACTED]

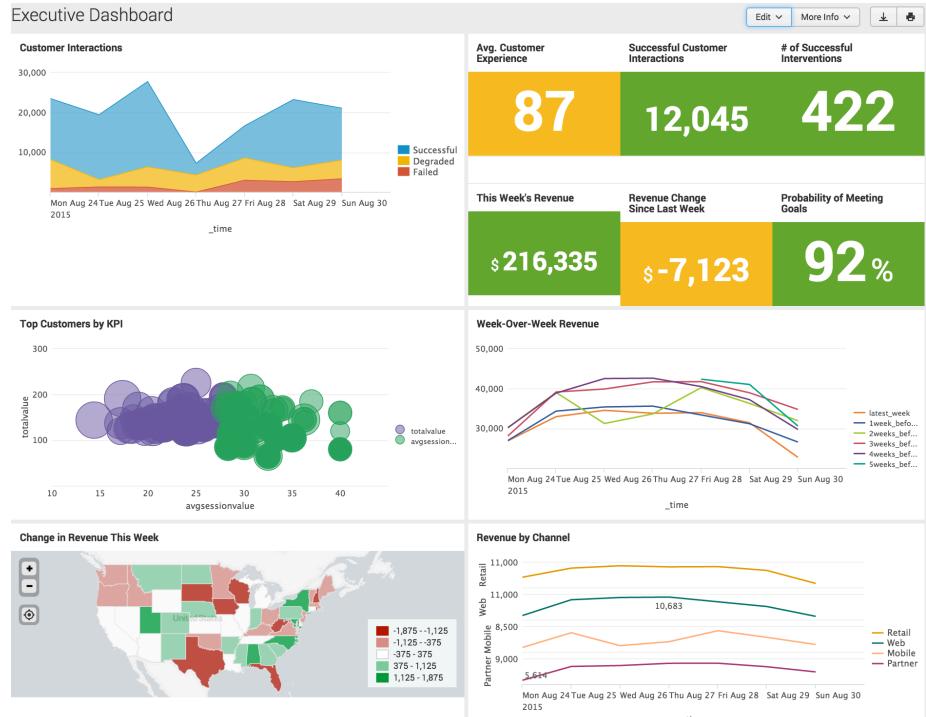
Current Plan Info 12m ago

mem_id1 [REDACTED]	eff_dt [REDACTED]	name [REDACTED]	CSR_Level [REDACTED]	on_or_off_exchange [REDACTED]	is_child_only [REDACTED]	is_standard [REDACTED]	tier_code [REDACTED]	exchange_id [REDACTED]
[REDACTED]	2015-01-01	OSCAR PLATINUM EDGE	NY-off	0	0	EE		

Source: Oscar Health Insurance

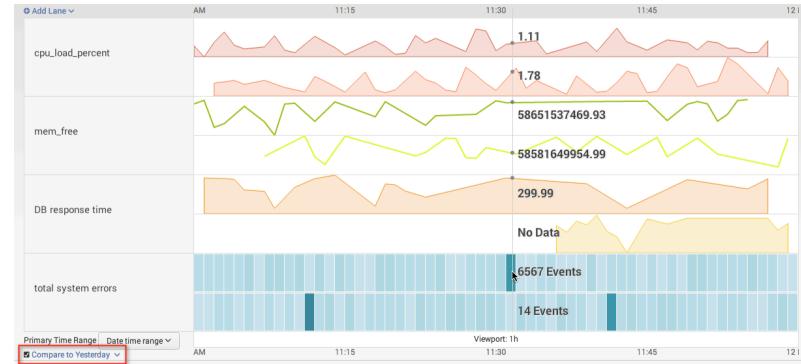
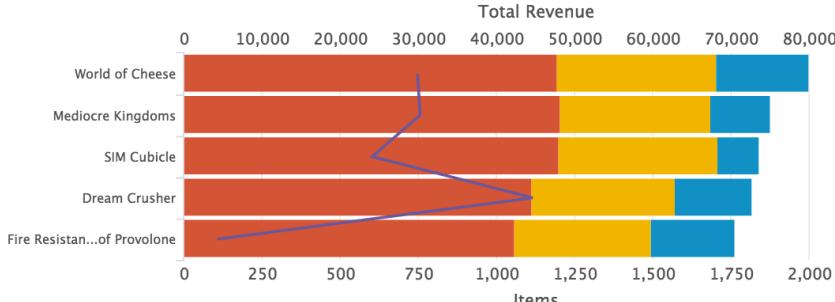
Build Executive Dashboards

- Give exec high-level overview
- Roll up lower level dashboards
- Keep it simple & to the point
- Technical checkup:
 - Make sure APIs healthy
 - Acceptable # of customer interactions
- Business checkup:
 - How much \$ week-over-week?
 - Program revenue vs. cost
- Tip: use tstats for fast visualizations



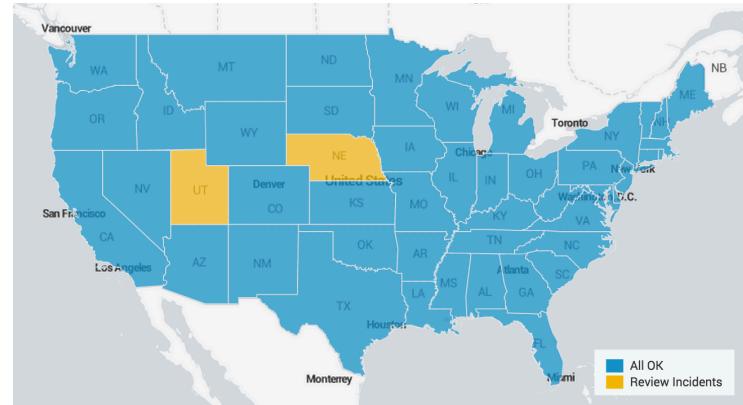
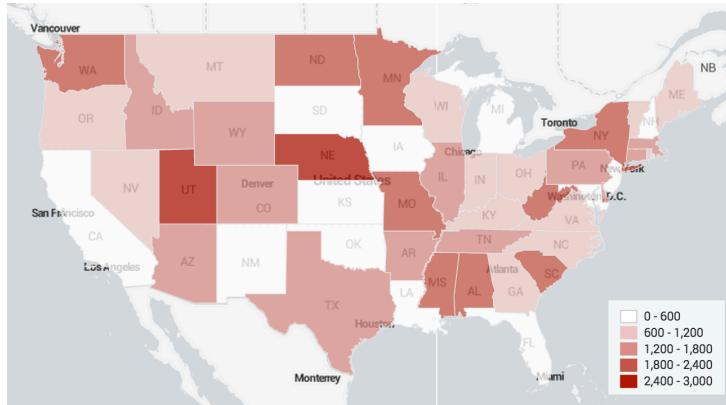
Use Effective Visualizations

- Most powerful viz are the simplest:
 - Single value
 - Stacked bar chart w/ chart overlay
 - Table
- More advanced:
 - Bubble chart: correlate multiple fields
 - Choropleth (new!): view fields on map
 - Swimlanes (ES) & Glass Table (ITSI)
- Cool visualizations make it pop:
 - Boxplot: incorporate error bars
 - Sankey chart: good for visualizing flows
 - Satoshi Kawasaki's Custom Viz app:
<https://splunkbase.splunk.com/app/2717/>



Emphasize Actionable Insights

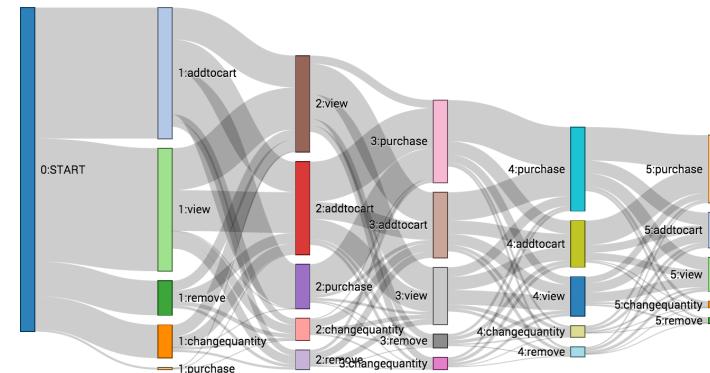
- Avoid eye-candy visualizations
 - “Laser beam” threat dashboards look cool but are useless
- “How does this help me solve my problem?”
- Guide the viewer to drilldown & act quickly



Custom Viz: Sankey Chart

- Visualize Customer flows with Sankey charts
 - Install Satoshi's Custom Viz app
 - Copy the panel reference to your dashboard
 - Modify your dashboard tag: <dashboard script="custom_vizs:autodiscover.js">
 - Edit the search to match your data
- Example search:

```
sourcetype=access_combined action=*
| reverse
| streamstats current=f last(action) by JSESSIONID
| streamstats count as stage by JSESSIONID
| fillnull value=START last(action)
| eval from=(stage-1).":"."last(action)"
| eval to=stage.":".action
| stats count by from to
```



Building Analytics Workflows

- Business Problem: find most valuable customers & improve experience
- People & process:
 - IT onboards the data
 - Power Users write the queries
 - Analysts deep dive into customers
- Example workflow:
 - Gather low-level events which make up transactions
 - Enrich with high-level customer data
 - Assign value scores, then aggregate by Session and User
 - Identify deviations of scores from baselines
 - Flag output for analytics review

customerId	numsessions	avgsessionvalue	totalvalue	flag
1781487709	10	24.990000	224.91	high numsessions high totalvalue
422990013	8	30.704286	214.93	high numsessions high avgsessionvalue high totalvalue
1660015567	8	28.561429	199.93	high numsessions high avgsessionvalue high totalvalue
1539547999	7	27.847143	194.93	high numsessions high totalvalue
1602140392	9	27.847143	194.93	high numsessions high totalvalue

Building Analytics Workflows (cont.)

- Example query for this panel
 - Search web logs
 - Compute value per session
 - Aggregate: avg value & total value
 - Add flags based on baseline criteria

customerId	numsessions	avgsessionvalue	totalvalue	flag
1781487709	10	24.990000	224.91	high numsessions high totalvalue
422990013	8	30.704286	214.93	high numsessions high avgsessionvalue high totalvalue
1660015567	8	28.561429	199.93	high numsessions high avgsessionvalue high totalvalue
1539547999	7	27.847143	194.93	high numsessions high totalvalue
1602140392	9	27.847143	194.93	high numsessions high totalvalue

```
sourcetype=access_combined action=purchase
| stats sum(price) as sessionvalue by customerId JSESSIONID
| stats count as numsessions, avg(sessionvalue) as avgsessionvalue,
  sum(sessionvalue) as totalvalue by customerId
| eventstats perc80(avgsessionvalue) avg(totalvalue) stdev(totalvalue)
| eval flag = mvappend(
  if( numsessions >= 6, "high numsessions", null()),
  if( avgsessionvalue >= 'perc80(avgsessionvalue)', "high avgsessionvalue", null()),
  if( totalvalue - 'avg(totalvalue)' >= 3*'stdev(totalvalue)', "high totalvalue", null() ) )
| fields - perc80(*) avg(*) stdev(*)
| sort 100000 -totalvalue
```



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Operationalizing Analytics Projects

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How To Plan Analytics Projects

- Business Users care about value:
 - High-Level Business Entities
 - Built from Low-Level Data Sources
- Identify Business Problems & Entities
- Identify Data Sources to build Entities
- Do the analysis (call the Power Users)
- Iterate & integrate deliverables into workflow



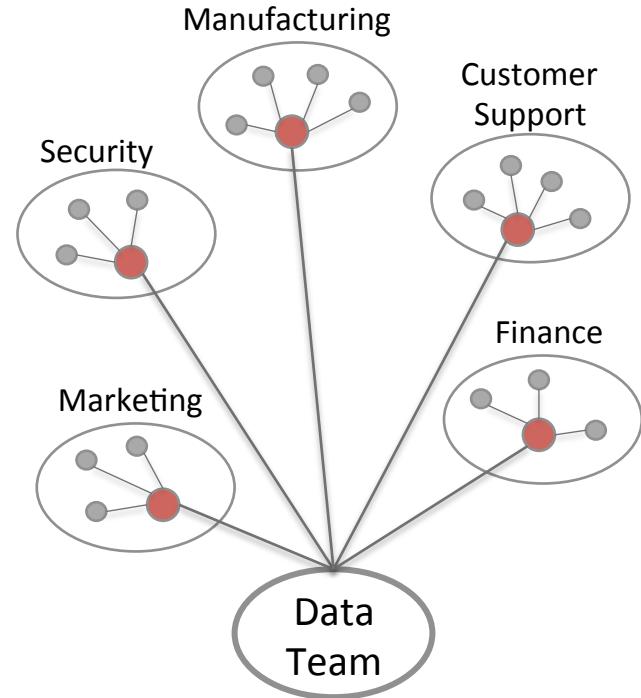
Multiple Paths for Defining Projects

- People first
 - Find target audience
 - Learn their Business Problems & document requirements
 - Build deliverables
 - Iterate to meet needs
 - Integrate into workflow
- Problems first
 - Identify Business Problems
 - Build a prototype app
 - Show target audience
 - Iterate to meet needs
 - Integrate into workflow



Every Department Is Different

- Nominate a Power User on each team
 - Power User knows the team's data
 - Works with dept Business Users
 - Builds basic dashboards
- Data team or Splunk COE
 - Onboards new data sources (with IT)
 - Responds to escalations from Power Users
 - Helps Power Users with adv. dashboards
- Benefits:
 - Deliver actionable insights to everybody
 - Clear division of responsibility



Enrich Your Data Fabric

- Business Data
 - All your customer records via DB Connect
- Social Media Data
 - Brand sentiment → customer experience
- Open Data
 - Weather data → machine operations
 - Financial & economic factors → revenue
 - Splunk4Good.com
- Get External Data via REST API Modular Input:
 - <https://splunkbase.splunk.com/app/1546/>

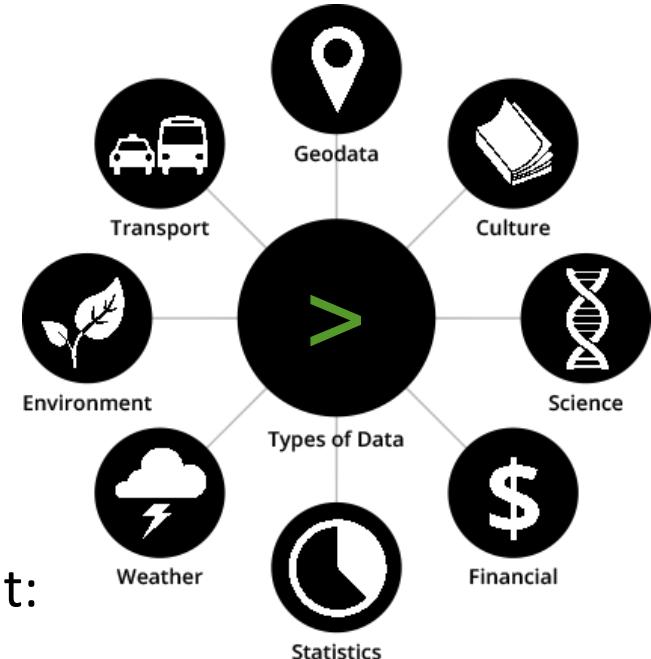


Image modified from okfn.org



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Closing Remarks

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Call to Action

- Deliver actionable insights
 - Build Customer 360 & Executive dashboards
 - Help Business Users solve problems
 - Implement Analytics workflows
- Join your local Splunk User Group
- Need help? Reach out to your tech team!
 - Analytics SMEs are here to help
 - Analytics Specialists available for advanced use cases

