



Slide 1



Please stay tuned – we will start in a few minutes.
Please feel to put advance thoughts about Data Analytics in the chat window.

During the Webinar – please use the Formal Q&A functionality in Zoom for official Questions you would like us to answer at the end.

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Data Analytics: An Introduction to a Process Framework and Collaboration Resources

Trevor Hughes, Virginia Tech
Christine Heise, University System of New Hampshire
Alison Bogart, Florida Institute of Technology


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Speaker Introductions


- Trevor Hughes, CPA; Senior Auditor for Data Analytics
 - Virginia Tech; Blacksburg, VA
- Christine Heise, CPA, MBA; Senior Internal Auditor
 - University System of New Hampshire; Concord, NH
- Alison Bogart, CIA, CFE, CISA, MS; Director of Internal Audit
 - Florida Institute of Technology; Melbourne, FL

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 **Learning Objectives**


- Develop an understanding of a conceptual framework for the data analytics process.
- Discuss analytics as a process and the individual steps within that process.
- At a high level, identify the functions that auditors should complete in each phase of a data analytics project.
- Discuss forthcoming data analytic Kick Starter resources where members can contribute and collaborate to continue learning beyond the webinar.

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 **Agenda**

- Sub-committee Purpose = Make data analytics attainable
- Preview of Kick Starter to be released by November 1
- Future Collaboration
 - Focused Discussions
 - Relevant File Sharing
- Integrated curriculum across learning mechanisms

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 **Polling Question #1**

What is your personal level of experience with performing data analytics (DA) throughout your career?

- None
- We have someone that does it for us
- Less than 3 projects utilizing some kind of DA
- Between 3 - 11 DA projects
- Too many DA projects to remember

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ACUA **WIKIRAT** What *IS* analytics?



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ACUA **WIKIRAT** What benefits does analytics bring?
Who wouldn't want help with the heavy lifting?



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ACUA **WIKIRAT** Preview of Kickstarter

Getting Started with Data Analysis


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1. Data Acquisition and Visualization
2. Data Cleaning
3. Exploratory and Diagnostic Analysis
4. Data Transformation
5. Statistical Inference
6. Communicating Analytical Results
7. Interacting with Data Analysis
8. Elements of Time and/or Time Analysis
9. Case Studies in Machine Learning with Real-World Examples
10. Data Driven Decision Making: From the Data to the Decision (Final Project: Data Analysis, Data Mining, and Data Science)

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What do we mean when we say analytics is a process?




- Analytics is a process, not an output
- The prime goal is to answer a question and/or to recommend a course of action
- Supports decision making and planning

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Getting Started



- Hardest part of the process
- This is about the what, but also the why
- If you can't see the target, it is very hard to hit

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Polling Question #2


What type of software do you use **most** frequently to perform data analytics?

- IDEA by Audimotion
- ACL by Galvanize
- Tableau
- Python
- Other (e.g. Arbutus, etc.)
- Excel - because none of above currently available to me

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First Steps

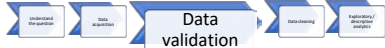


- Identify what data is needed and where data is located
- Data sources:
 - Queries
 - Data dumps
 - Interviews
 - Surveys
 - Public Data
 - Purchased Data
- Security of data

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Validating the Data




- Ensures that the data complies with requirements and quality benchmarks
- Meets expectations for accuracy, completeness and consistency
- Test data through use of data type checks, control totals, range tests, and structure tests.

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Cleaning the Data



- Process of detecting and correcting (or removing) problem data elements
- May include removing duplicates, removing outliers, correcting typos, validating elements, and normalizing data
- Document steps, errors noted, modifications and deletions to data


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 Polling Question #3

How often does your institution use data analytics in audits?

- Daily
- Weekly
- Monthly
- A few times a year
- Very infrequently
- Never (hope to soon)


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 Exploring the Data



- Statistics 101 – mean, median, mode, measures of central tendency and distribution
- Helps the analyst understand the data and highlight attributes that matter most in the data
- Can show which test may be applicable


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 Transforming Your Data




- Modification of every element by application of a standard process
- This might mean changing categorical values to continuous or binary variables
- This can change the measurement scale so pre and post transformation results may not be directly comparable

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Getting In Deep




• This is the heavy lifting!
• Examples include:

- ANOVA
- Principal component analysis
- Logistic regression
- Cluster analysis
- Decision trees
- Interdependence tests
- Neural networks
- Multiple regression

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Making An Impact



• An analyst can do the most cutting-edge work but if the consumer doesn't understand it, the effort is meaningless
• This must tie to understanding the question. If you really understand the question, this should take care of itself
• Find the right media – visualization, tables, descriptive statistics, whatever works

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Polling Question #4

Which software does your institution use for **most** of these functions: HR, Financial, Student Records

- Banner
- Workday
- Oracle
- Peoplesoft
- Legacy Mainframe
- Other (SAP, Kuali, etc)


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Future Initiatives

- Avoid generic posting in large ACUA open forum
- Specific websites for
 - Discussion
 - Files: to get started or to enhance
- Encourage collaboration in focused groups
 - For software specific advice / challenges
 - By auditable area topic


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Knowledge Share with Like Minded

Original Post 12/2018

Add your name to the informal list at this site:
<http://tiny.cc/ACUAdataLOVER>




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New Community for Data Analytics

Special place to have focused discussions by software and/or topic




Posting standardization:

1. Auditable Area Topic (FinAid)
2. Raw Data Software (Banner)
3. DA software (ACL)
4. Expertise Level (Intermed)

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ACUA MEMBERS File Sharing about Data Analytics

Utilize Resource Library File Structure to create subfolders plus #hashtags to aggregate similar relevant content



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ACUA MEMBERS Polling Question #5

Which of the following analytic projects do you have the most interest in?

- P-Cards
- Student Financial Aid
- Sponsored Research
- HR/Payroll
- Travel
- Vendor and A/P process (Conflicts of Interest, Duplicate Payments)

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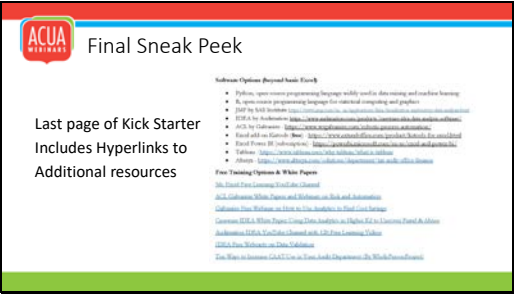
ACUA MEMBERS Integrated Audit Curriculum

Four-year plan that ties AuditCon, AuditInteractive, and webinars together

- **AuditCon**
 - Broad, process-based discussion that focus on a specific project.
 - The goal is how to THINK about analytics
- **AuditInteractive**
 - Specific technical training that puts special topics into the framework we discussed earlier.
 - The goal is how to DO parts of the process
- **Webinars**
 - Discussions about upcoming kick starters.
 - This puts the how to do into the context of the overall process

Future topic: how individual presenters can repurpose their formal ACUA Presentations into our File Resource Area without oversharing protected content

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ACUA WEINBERG Final Sneak Peek

Software Options Beyond Basic Ranks

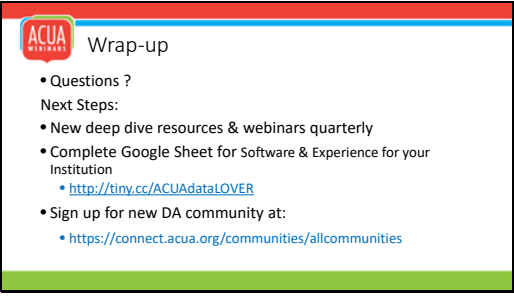
- Python, open-source programming language widely used for data mining and machine learning
- R, open source programming language for statistical computing and graphics
- SAS for SAS Business Intelligence solutions - www.sas.com (includes various software solutions)
- SAS for Analytics - <http://www.analytics.sas.com> (includes various software solutions)
- SAS for Customer - <http://www.customer.sas.com> (includes various software solutions)
- SAS for Fraud - <http://www.fraud.sas.com> (includes various software solutions)
- SAS for Risk - <http://www.risk.sas.com> (includes various software solutions)
- SAS for Compliance - <http://www.compliance.sas.com> (includes various software solutions)
- SAS for Regulatory - <http://www.regulatory.sas.com> (includes various software solutions)

Free Tooling Options & White Papers

- SAS Free Tooling Options - <http://www.sas.com>
- SAS White Papers - <http://www.sas.com>
- SAS Business Intelligence - <http://www.sas.com>
- SAS for Analytics - <http://www.sas.com>
- SAS for Customer - <http://www.sas.com>
- SAS for Fraud - <http://www.sas.com>
- SAS for Risk - <http://www.sas.com>
- SAS for Compliance - <http://www.sas.com>
- SAS for Regulatory - <http://www.sas.com>

Last page of Kick Starter
Includes Hyperlinks to
Additional resources

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ACUA WEINBERG Wrap-up

- Questions ?
- Next Steps:
- New deep dive resources & webinars quarterly
- Complete Google Sheet for Software & Experience for your Institution
 - <http://tiny.cc/ACUadataLOVER>
- Sign up for new DA community at:
 - <https://connect.acua.org/communities/allcommunities>

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Join us for
our upcoming
webinar.

Background image: a laptop, a smartphone, a coffee cup, and a plant on a desk.
