Innovative Tools for Today's Auditor

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Presentation Goals

1

Continuous audit programs; their advantages and challenges

2

Current tools in use for audit analytics and visualizations

3

Evolution of our tools and examples of data visualization

Continuous Auditing

Evolution

1

Analyze opportunistic data sets to identify risks, patterns, outliers

2

Assist teams with risks they identified and automate scripts

3

Identify risks and inform audits

Audit Process and Continuous Auditing

Challenges

Compliance with GAGAS

Training staff

Cost of operations

Cost

Initially expensive to set up

Long term efficiencies and more effective audit work compensate for initial costs

Training

Time and cost intensive to learn new software

Need more than one person to know the software for QA

Independence Considerations

3.07

- GAGAS conceptual framework approach to independence

Independence Considerations

3.14

Threats to independence

- Self-interest
- Self-review
- Bias
- Familiarity
- Undue influence
- Management participation
- Structural

Fieldwork Requirements

6.36

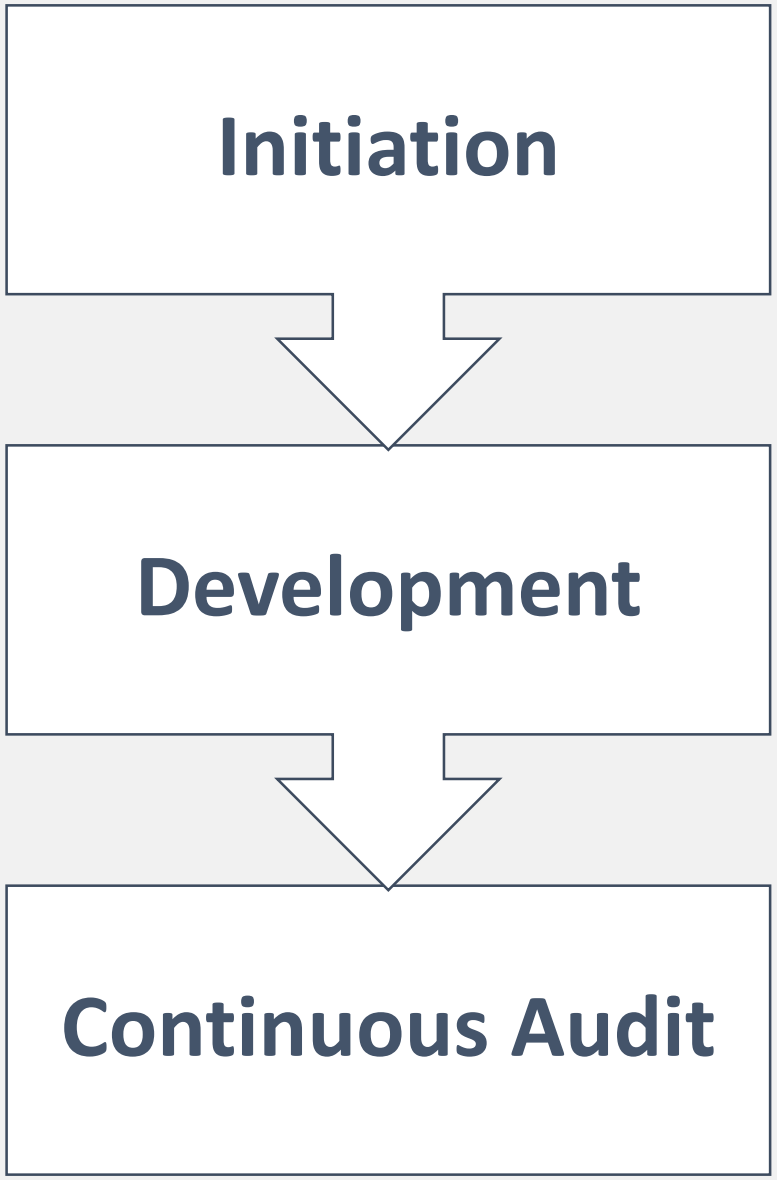
- Corrective actions taken on previous audits and attestation engagements applicable to audit objectives

Fieldwork Requirements

6.47

Communicating with management, those charged with governance, and others

- Project initiation
- Communicate scope, objectives, and methodology
- Updates
- Reporting format



Continuous Audit Process

A method to identify high risk areas of the city in an efficient and timely manner

Audit Services Division
Auditor's Office
City and County of Denver

Timothy M. O'Brien, CPA
Denver Auditor

1. Initiation

- Select information system and target data for continuous audit
- Assemble team and hold internal kick-off meeting
- Meet with Technology Services regarding target data
- Verify the target data is appropriate for the audit objective
- Determine if target data is accessible to the continuous audit software
- Engage with necessary departments
- Establish point of contacts with data owners
- Hold initiation meeting with necessary departments

2. Development

Technology Services:

- Place non-production copy of target data for auditors into a secure location

Auditor's Office:

- Determine data reliability of target data
- Perform interviews with subject matter experts
- Test scripts on sample data
- Analyze initial results
- Distribute preliminary results as necessary

3. Continuous Audit

- Establish frequency of running the continuous audit script
- Schedule the script on full data set
- Review the outputs after running the scripts

No Risk Identified

- Report on findings

Risk Identified

- Report findings internally
- Inform data owners of findings
- Add risk to audit plan
- Determine schedule for full audit as necessary

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Advantages of Continuous Auditing

Improved audit quality

- Cover entire population
- Direct access to data
- Continuous aspect

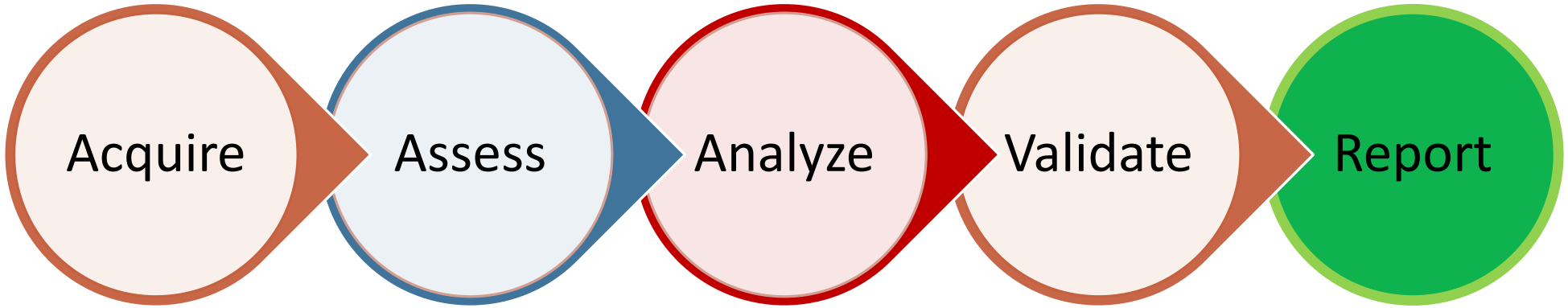
Improved audit productivity

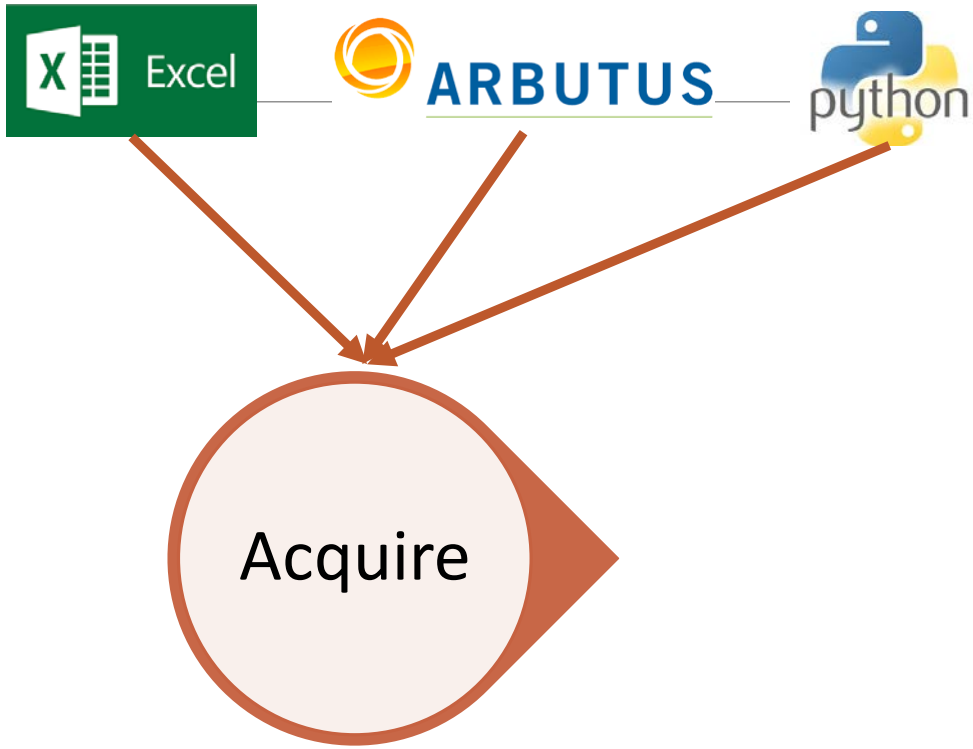
- Better defined scopes
- Increased effectiveness from improved risk analysis
- Automation of audit steps
- Potentially less travel costs

Mixed Methods Approach

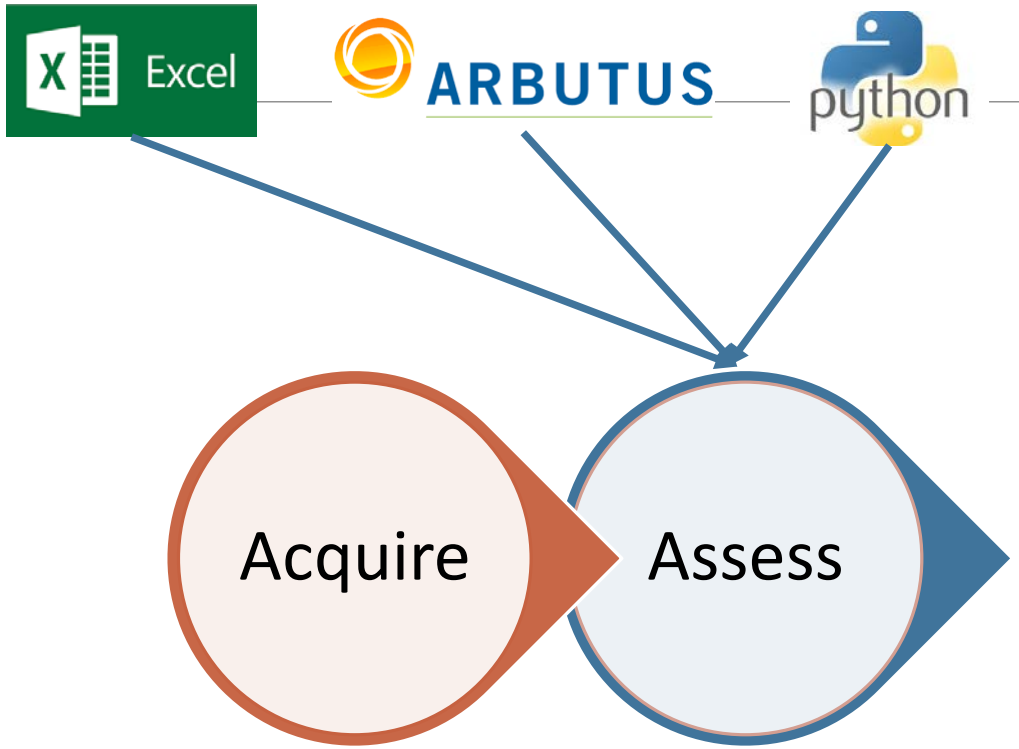
- Combine quantitative with qualitative data analyses to gain comprehensive evidence for audit analysis

Tools for each step of data analysis



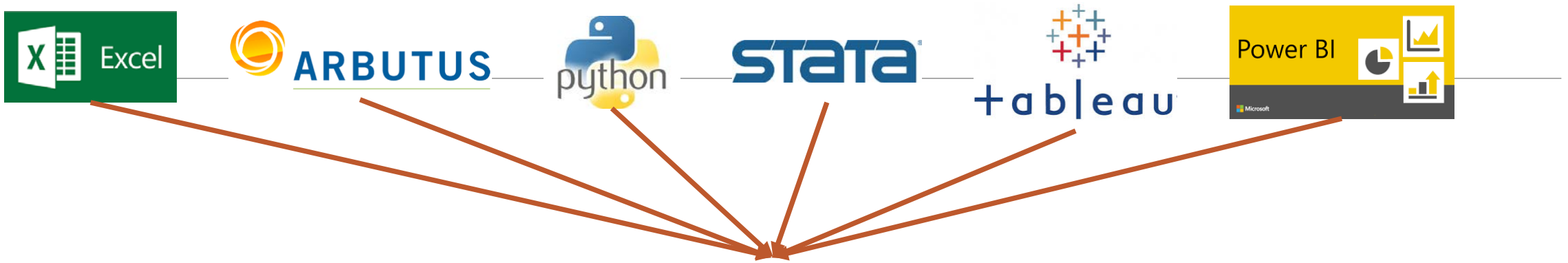


- Receive, connect to, or find data



- Receive, connect to, or find data

- Reliability, usability
- Verify understanding of the data



Acquire

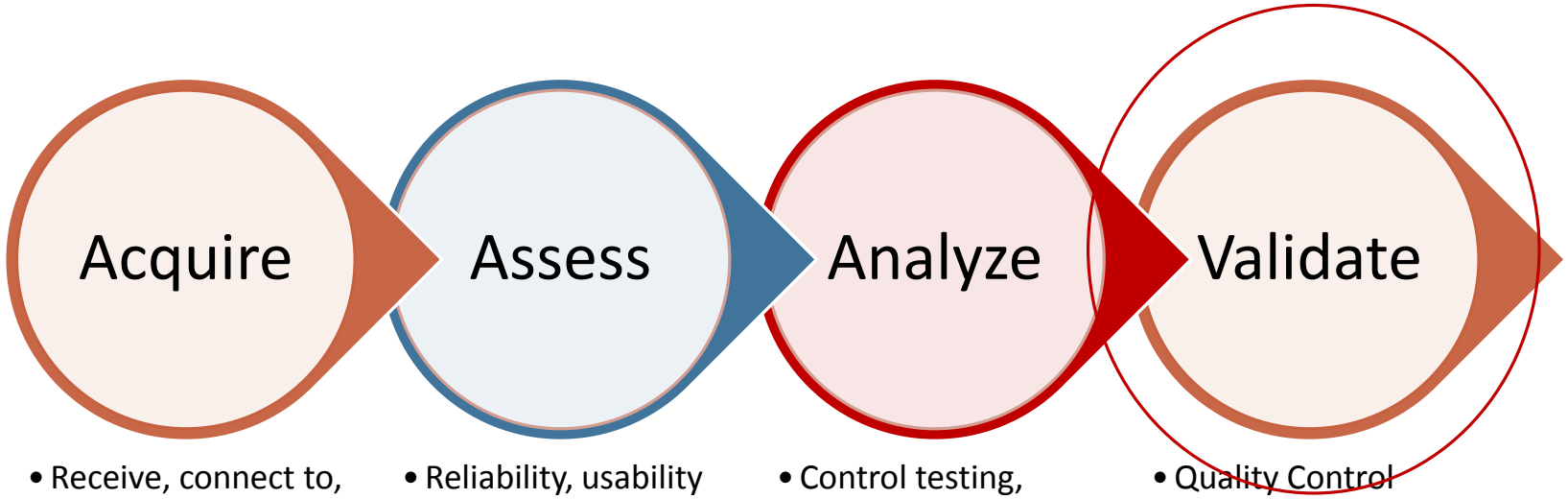
- Receive, connect to, or find data

Assess

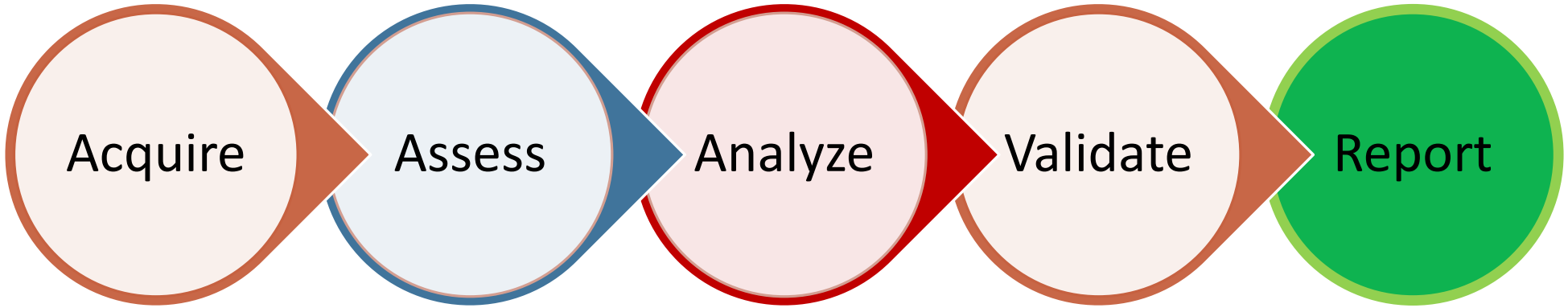
- Reliability, usability
- Verify understanding of the data

Analyze

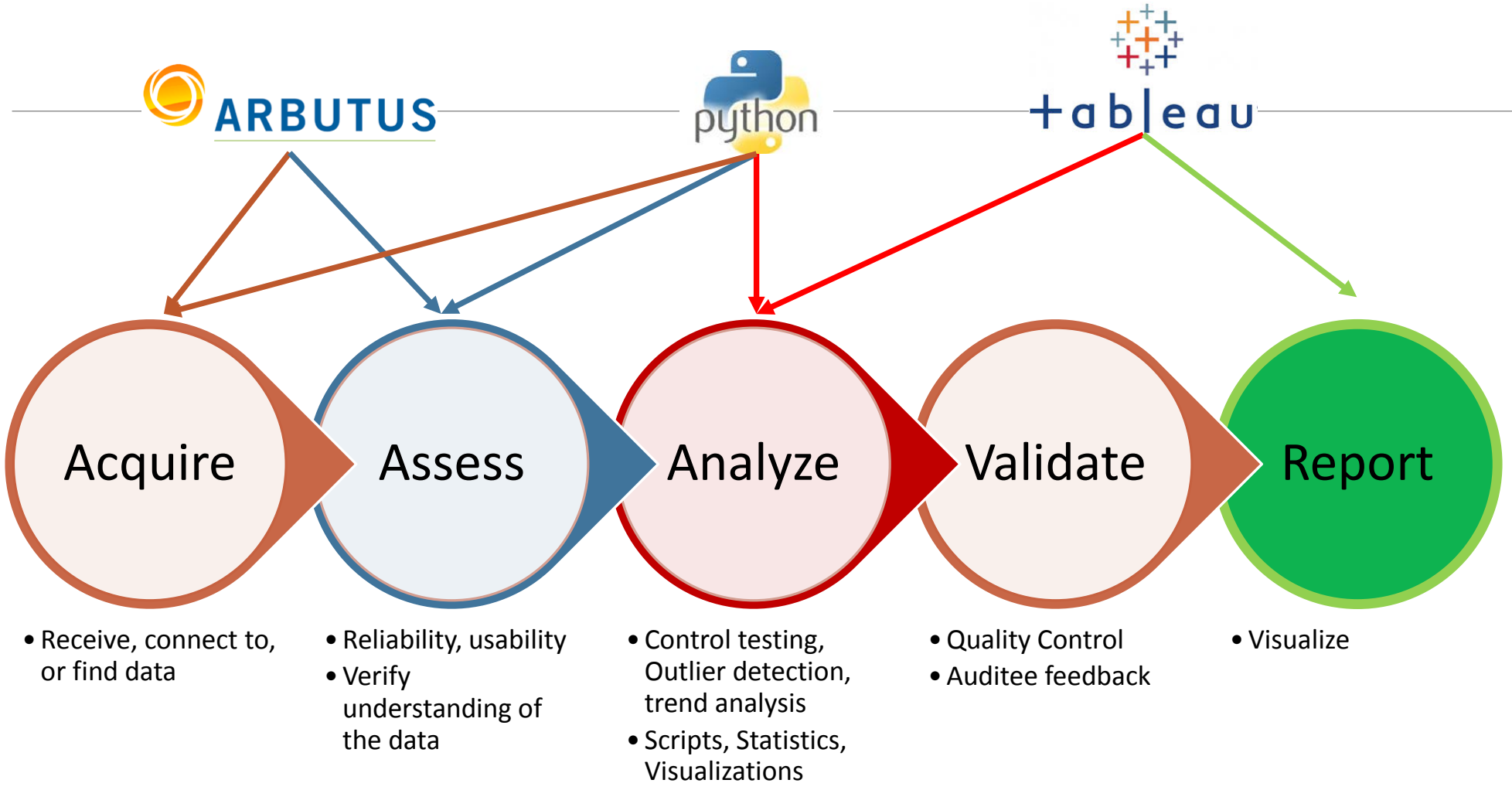
- Control testing, Outlier detection, trend analysis
- Scripts, Statistics, Visualizations



- Receive, connect to, or find data
- Reliability, usability
- Verify understanding of the data
- Control testing, Outlier detection, trend analysis
- Scripts, Statistics, Visualizations
- Quality Control
- Auditee input



- Receive, connect to, or find data
- Reliability, usability
- Verify understanding of the data
- Control testing, Outlier detection, trend analysis
- Scripts, Statistics, Visualizations
- Quality Control
- Auditee feedback
- Visualize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python
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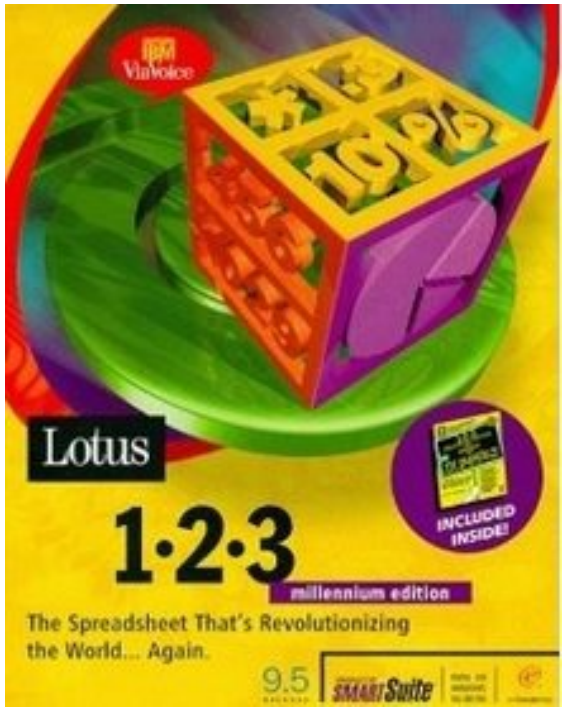
Acquire
Assess
Analyze
Validate
Report
• Receive, connect to, or find data
• Reliability, usability
• Verify understanding of the data
• Control testing, Outlier detection, trend analysis
• Scripts, Statistics, Visualizations
• Quality Control
• Auditee feedback
• Visualize

Mentalities for Exploring Tools

The Academic

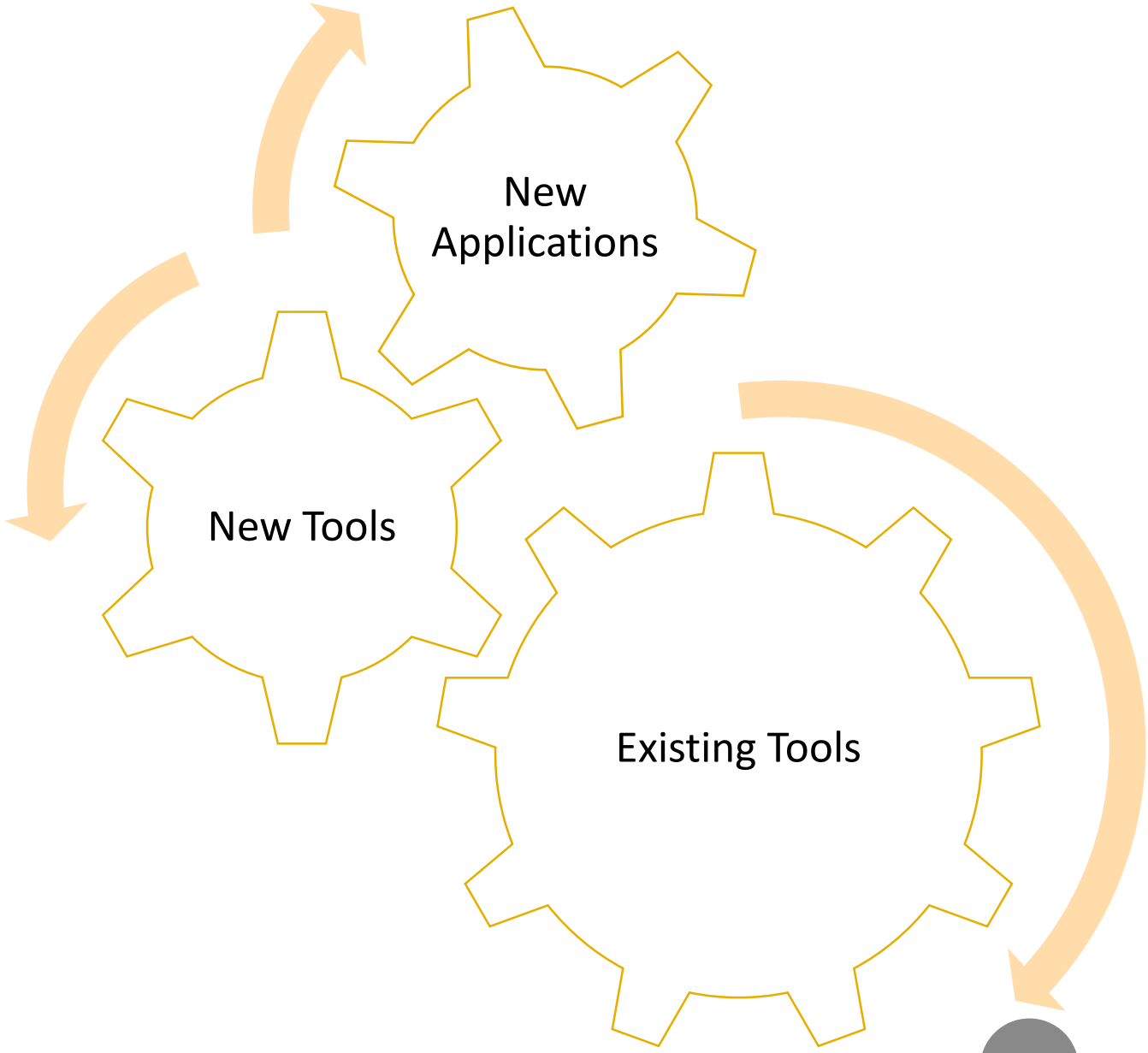
Experienced Auditor

Early Adopter



Evolution of Tools

Learning Process



Challenges with new tools

- Documentation
- Review
- Threats to Independence
- Changes to Procedures

Benefits of Tools

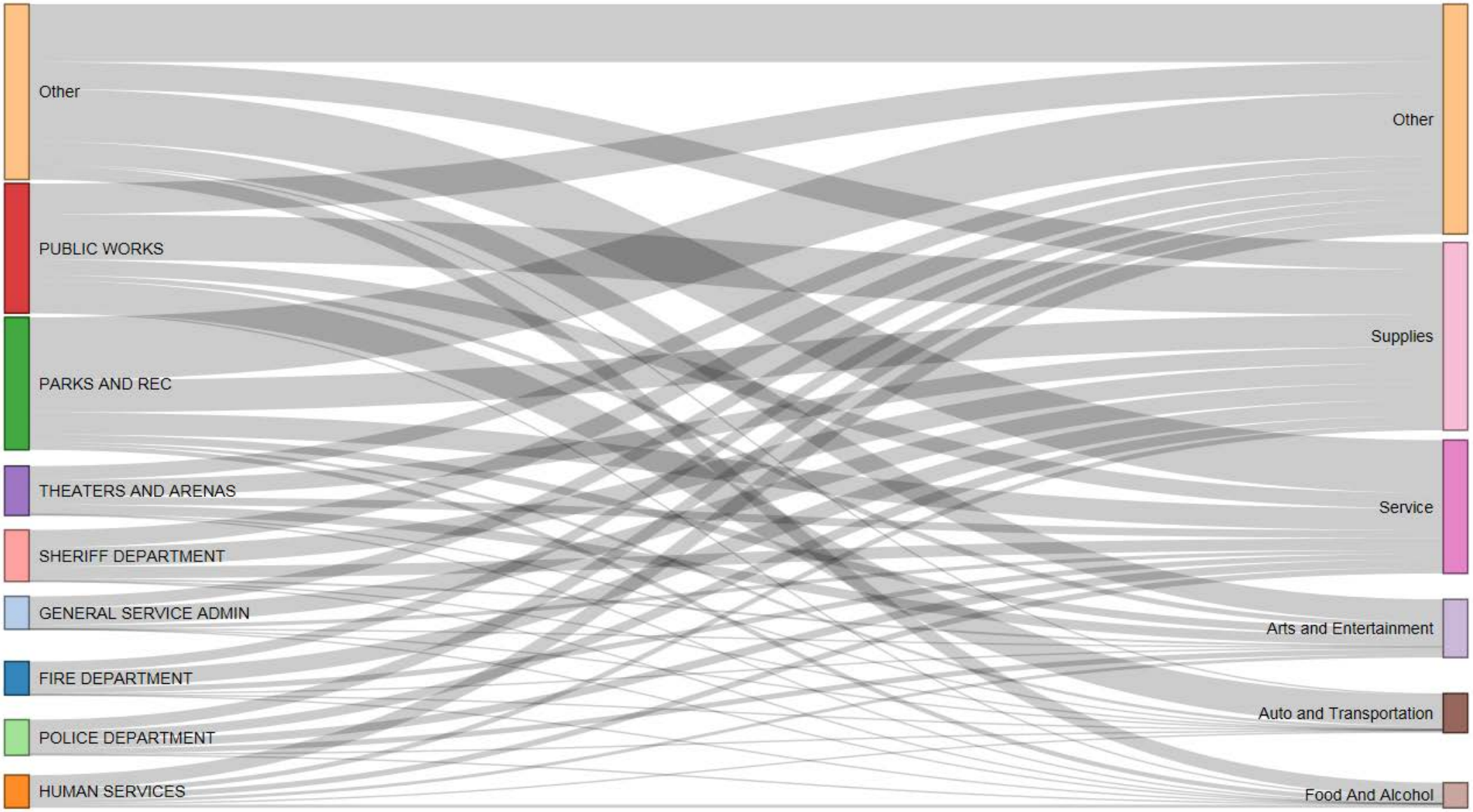
Population Testing

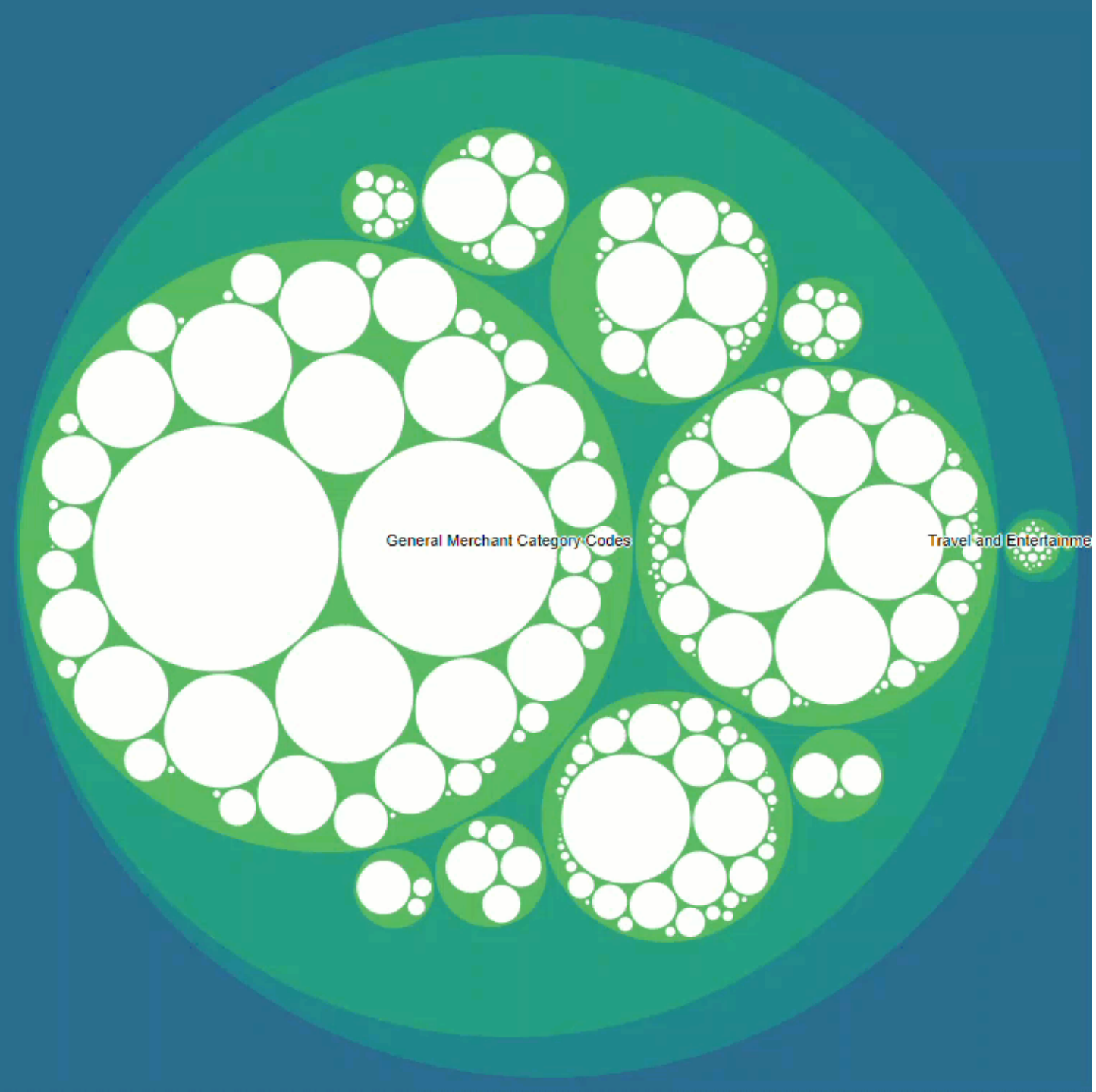
Familiarity with Data

Reliability

Visual Stories

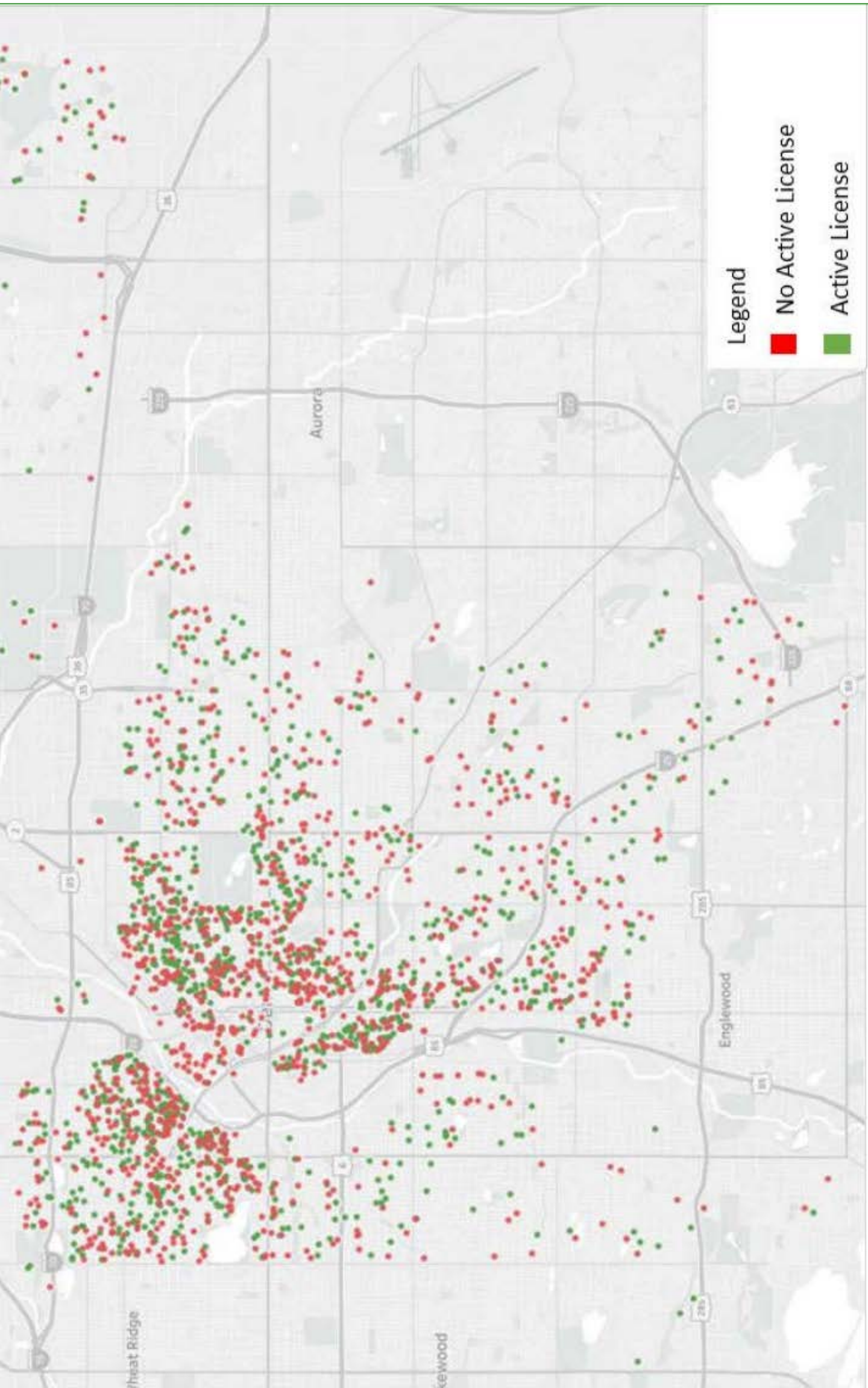
D3 Sankey


Other
PUBLIC WORKS
PARKS AND REC
THEATERS AND ARENAS
SHERIFF DEPARTMENT
GENERAL SERVICE ADMIN
FIRE DEPARTMENT
POLICE DEPARTMENT
HUMAN SERVICES
Other
Supplies
Service
Arts and Entertainment
Auto and Transportation
Food And Alcohol



D3 Circle Packing (Petrie Dish)

Tableau Interactive Maps



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Thank you!