CERIAS
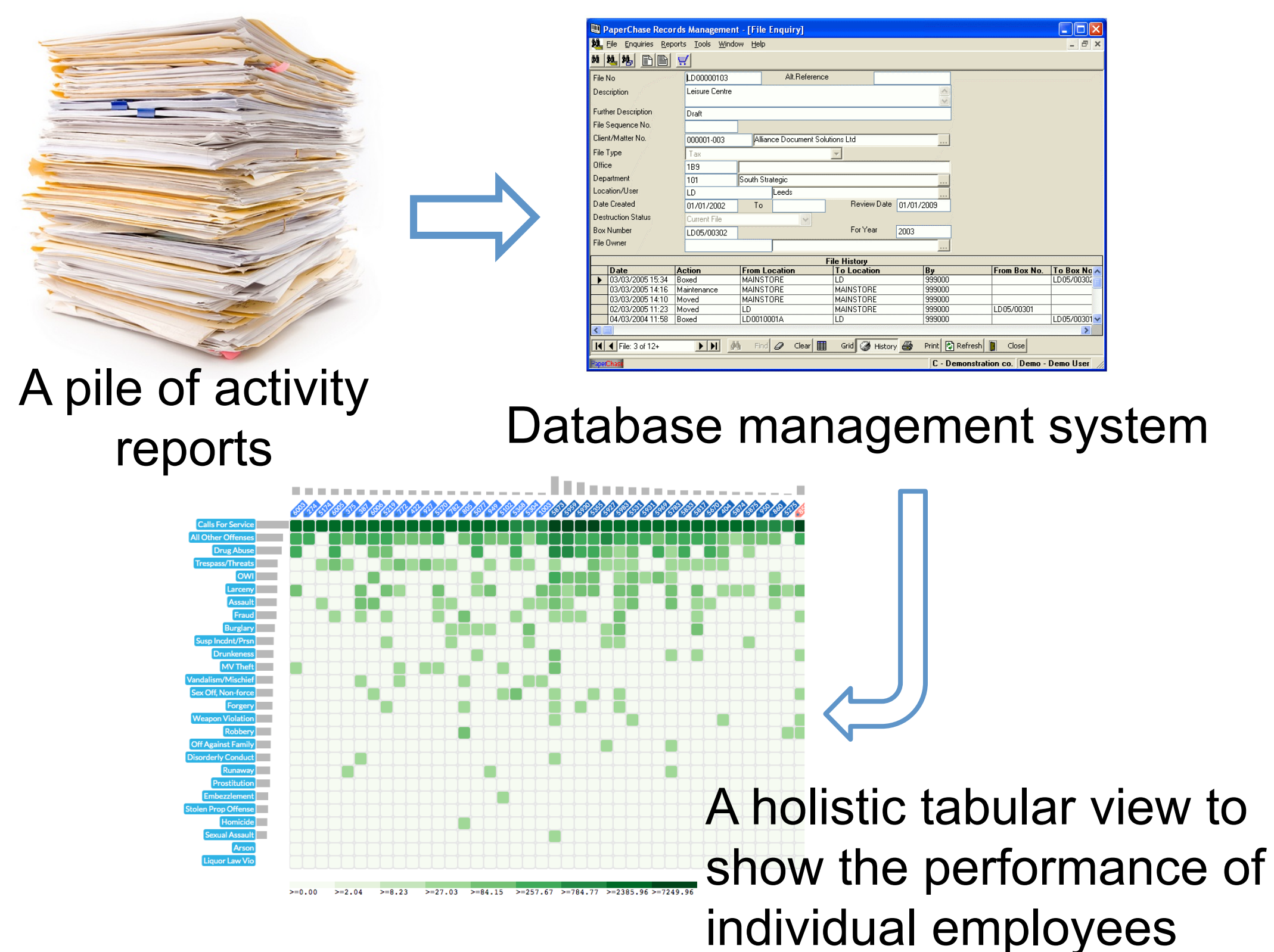## The Center for Education and Research in Information Assurance and Security

MetricsVis: A Visual Analytics Framework for Evaluating Individual, Team, and Organization Performance

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Introduction

- Evaluating employee performance is complex involving numerous factors to accurately indicate performance.
- An effective performance evaluation system can assist in understanding strengths and weaknesses to improve productivity.
- MetricsVis is a visual analytics framework that supports
  - Effective performance evaluation
  - Performance comparison at and between individual, team, and organization levels.
- We focus on organizations with groups of employees perform similar jobs at different locations and shifts.
- We demonstrate the MetricsVis interface with the data records from a medium-sized law enforcement agency.
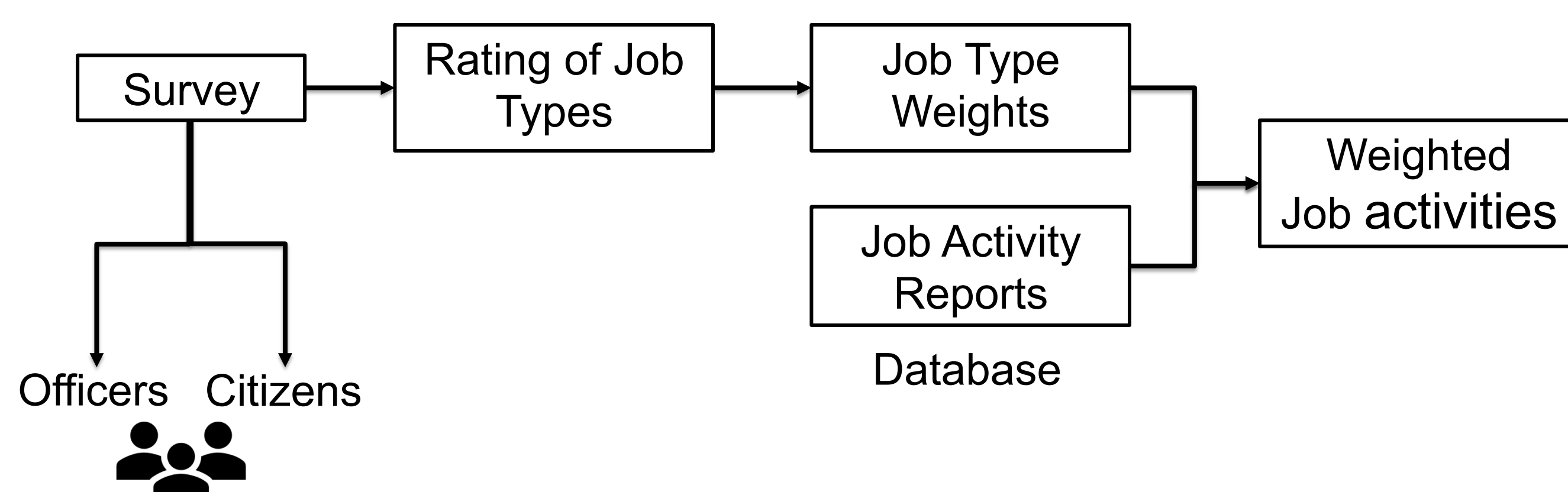
Performance Data Extraction

A pile of activity reports

Database management system

A holistic tabular view to show the performance of individual employees

Challenges:
- How to quantify the performance of induvial officers? (measurement)
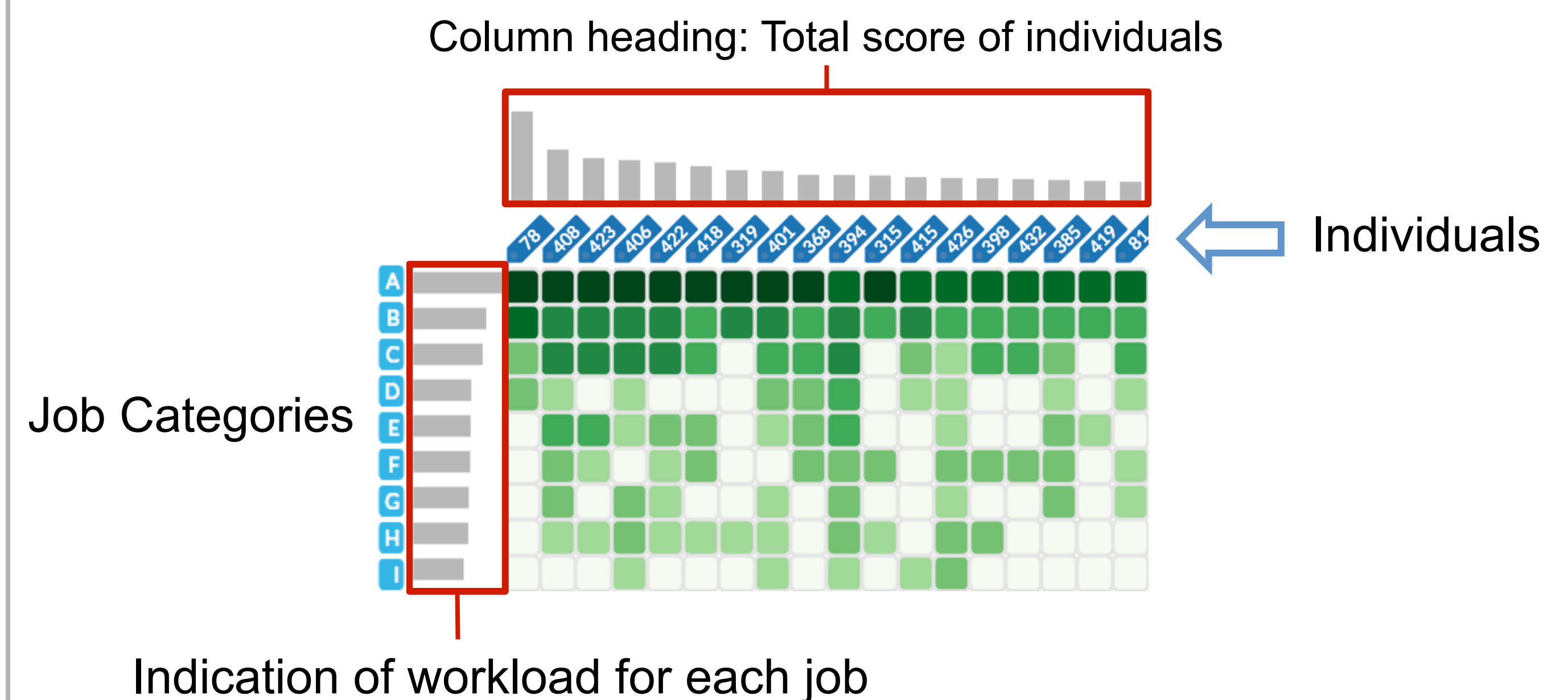- How to compare the performance between officers? (comparison)

Solution:
- Step 1. Extract performance-related quantitative measurements from relational database tables.
- Step 2. Categorize the activities based on the types of job (e.g. offense categories in law enforcement agency).
- Step 3. Conduct crowd-sourcing survey to understand the important of each job type (e.g. the severity of each offense type).
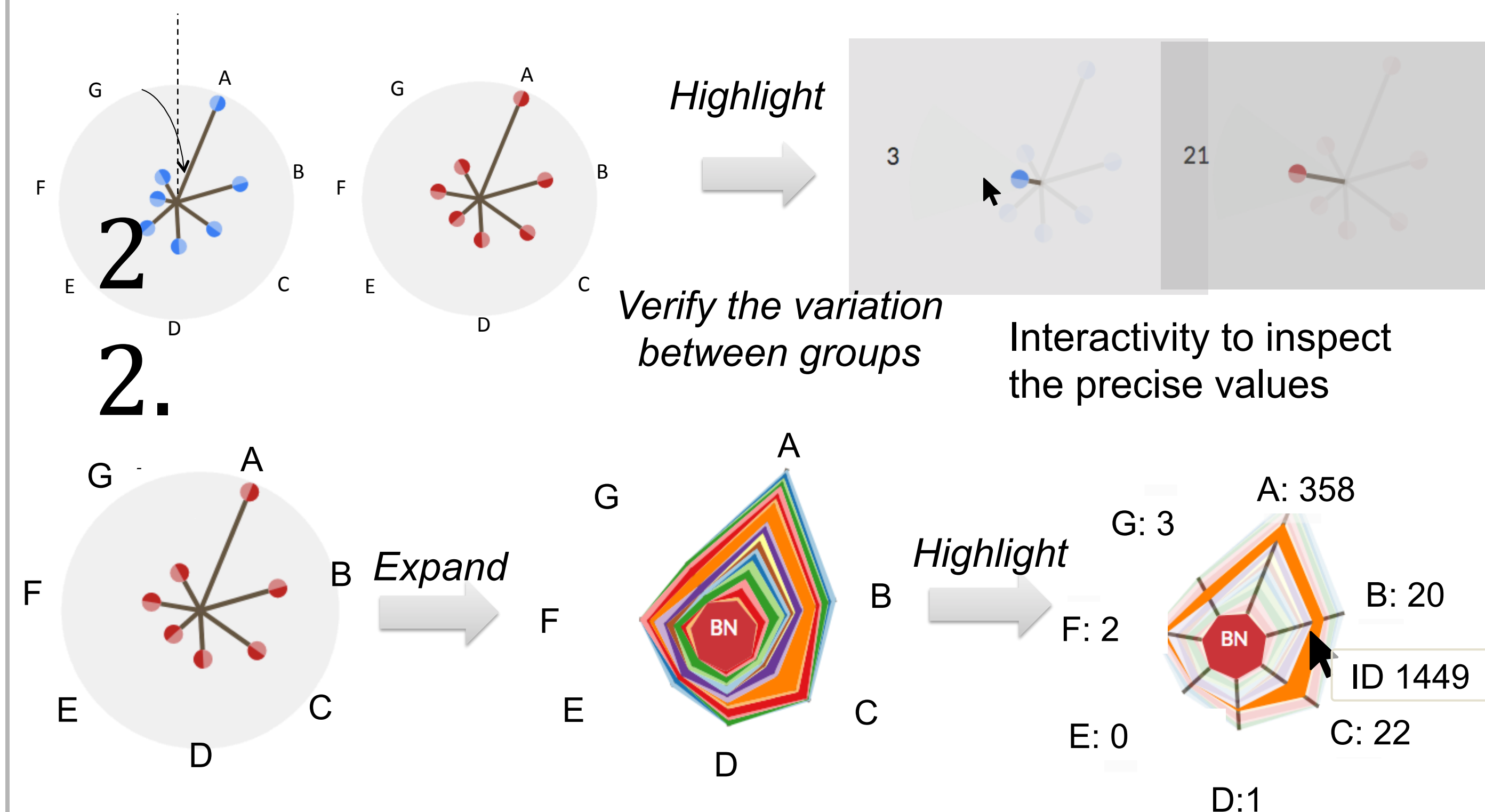

Database

MetricsVis Interface

Individual performance matrix view

Column heading: Total score of individuals

Individuals

Job Categories

Indication of workload for each job

Group Performance View

Highlight

Verify the variation between groups

Interactivity to inspect the precise values

Expand

Highlight

A: 358
G: 3
B: 20
F: 2
E: 0
C: 22
D: 1
ID 1449

Group comparison:
- Explore the variation among groups
- Identify outliers and extreme attribute values

Individual to group performance:
- Identify subordinate individuals' contribution to their groups
- Correlate attributes to identify performance patters of individuals within one group

ID *1449* in performance matrix

References

1. Ingrid Guerra-López. "Evaluating impact: Evaluation and continual improvement for performance improvement practitioners". Vol. 6. Human Resource Development, 2007.
2. Jieqiong Zhao et al. "MetricsVis: A Visual Analytics Framework for Performance Evaluation of Law Enforcement Officers". In 2017 IEEE International Symposium on Technologies for Homeland Security (HST), pp. 1-7. IEEE, 2017.

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