

# Process Mining for Operational Performance Improvement

Process Mining Camp, 2013

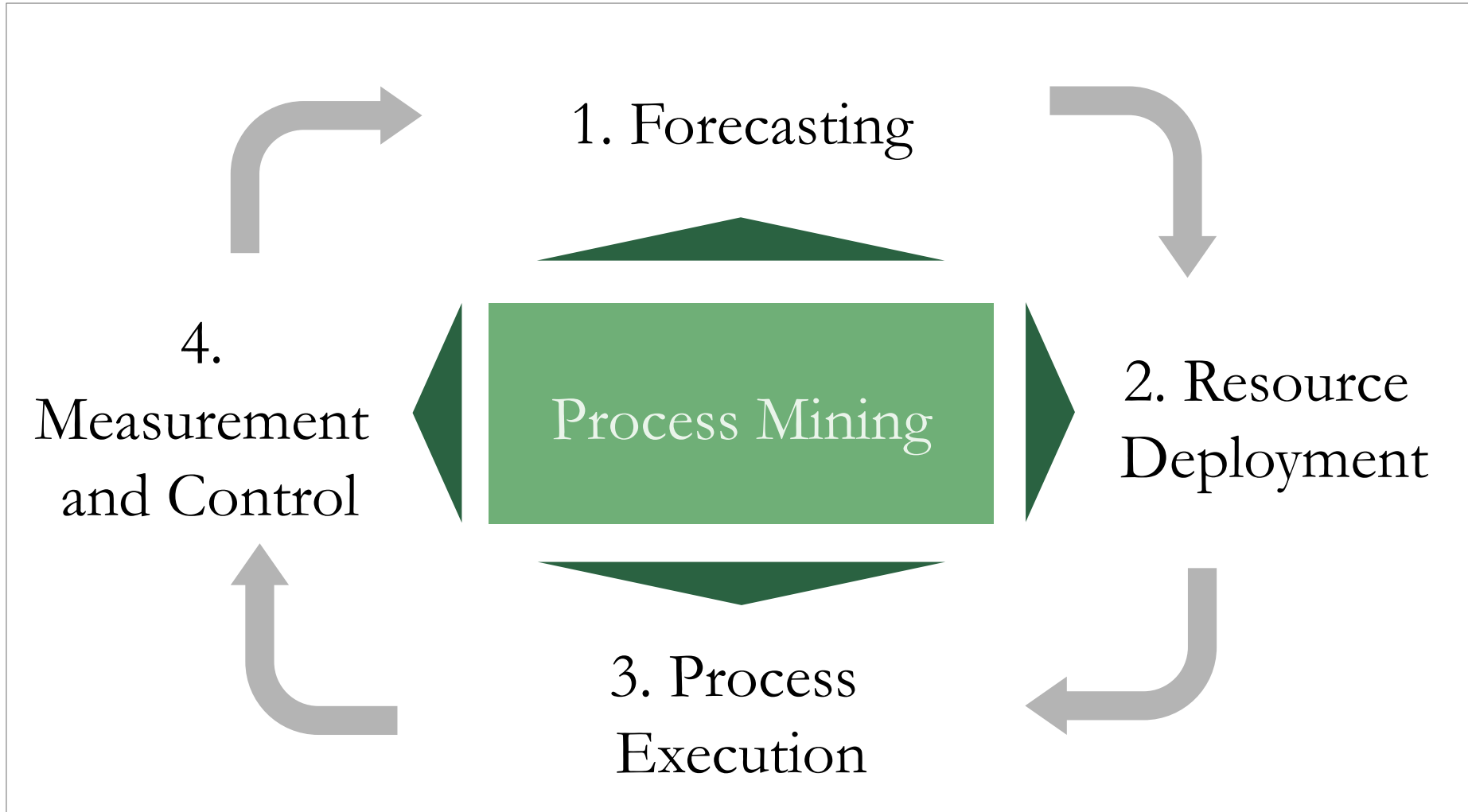
May 28, 2013

# Context

- Two of the largest global financial services companies
- Two different areas:
  - Risk management: loan underwriting
  - Enterprise IT services
- Processes deemed complex: “Job-Shop” vs. “Assembly Line”
- Broad mandate: identify opportunities in operations
- Our first two assignments in using process mining: we are still learning!



# Process mining contributes to improving all four key dimensions of operations management



# Starting Point: Some Key Questions

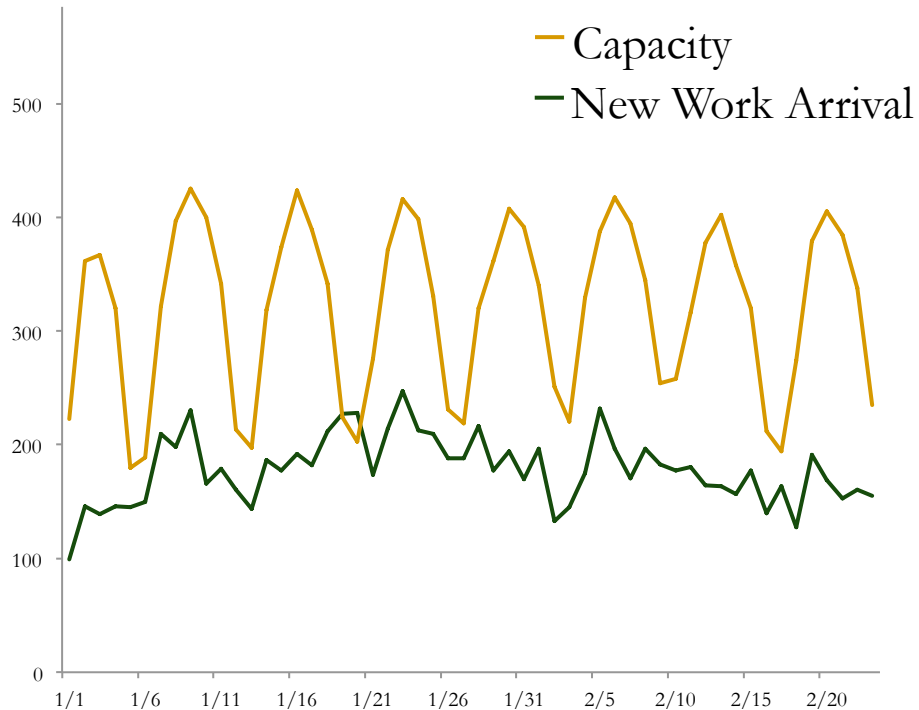
- Capacity: Right capacity at the right time
  - How much work can be done with resources we have?
  - How can we improve resource utilization?
- Productivity: More output for the same capacity / support a bigger business with same capacity
  - Process improvement
  - Right person for the right job
  - Root cause: eliminate work without any adverse business impact



# Capacity Assessment

*Illustrative*

## Daily Capacity vs Work Arrival



- Capacity based on staffing / attendance records
- Work arrival based on event log analysis

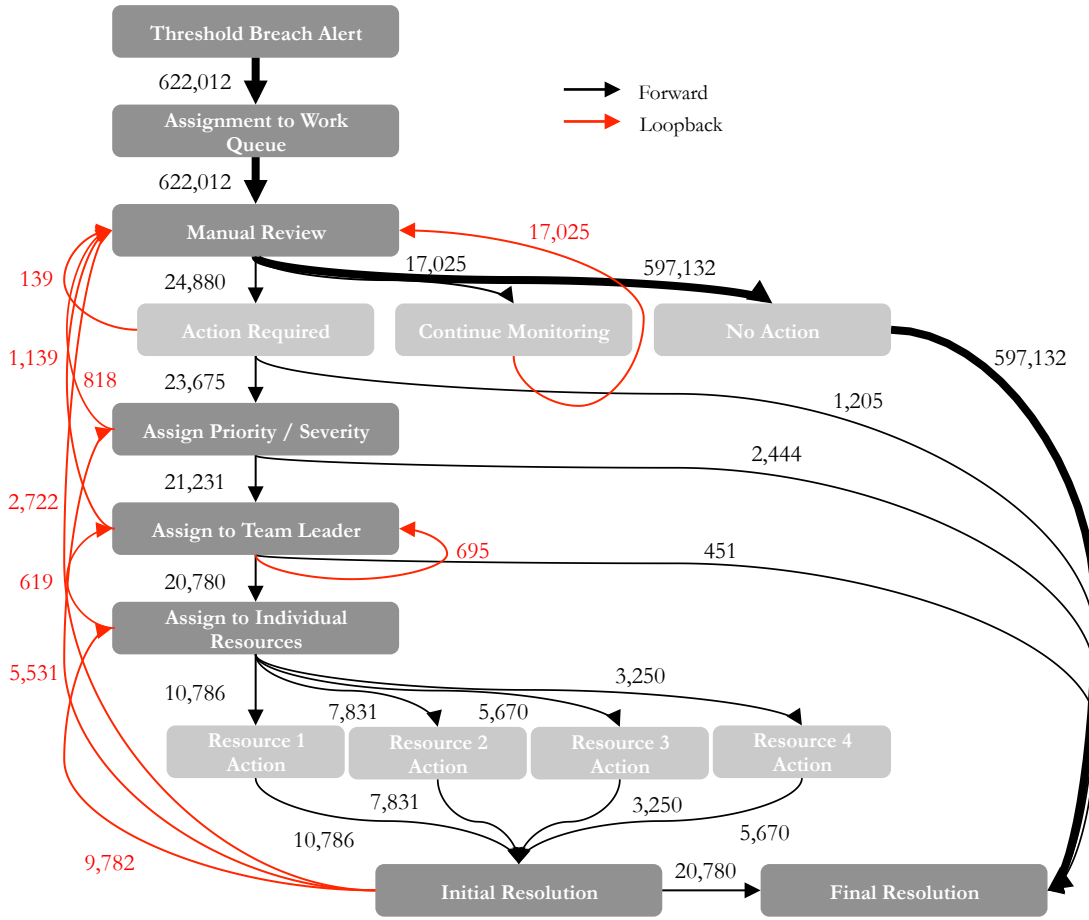
# Planning Capacity: Ideal State

- Forecast likely work volume based on historical experience, linked to underlying business drivers:
  - Expected market conditions
  - Planned activity, current portfolio, etc.
- Determine staffing levels using optimization techniques
  - Constraints: work type, arrival pattern, associated volatility, and SLAs
  - Optimize for cost of delivery, including cost of not being able to serve

# Process Understanding

Example

**IT Incident Management Process Flows**  
(Arrow weight is proportional to request volume)



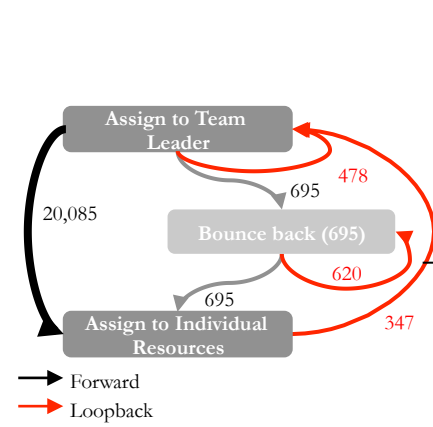
- Review formal processes
- Identify “hidden” processes by examining process logs, email and other organizational data
- Map hidden processes to formal processes
- Identify bottlenecks, redundant work effort & inefficiencies
- Design improved process
- Implement and monitor for adoption and improvement



# RCA: Text Mining and Detailed Case Review

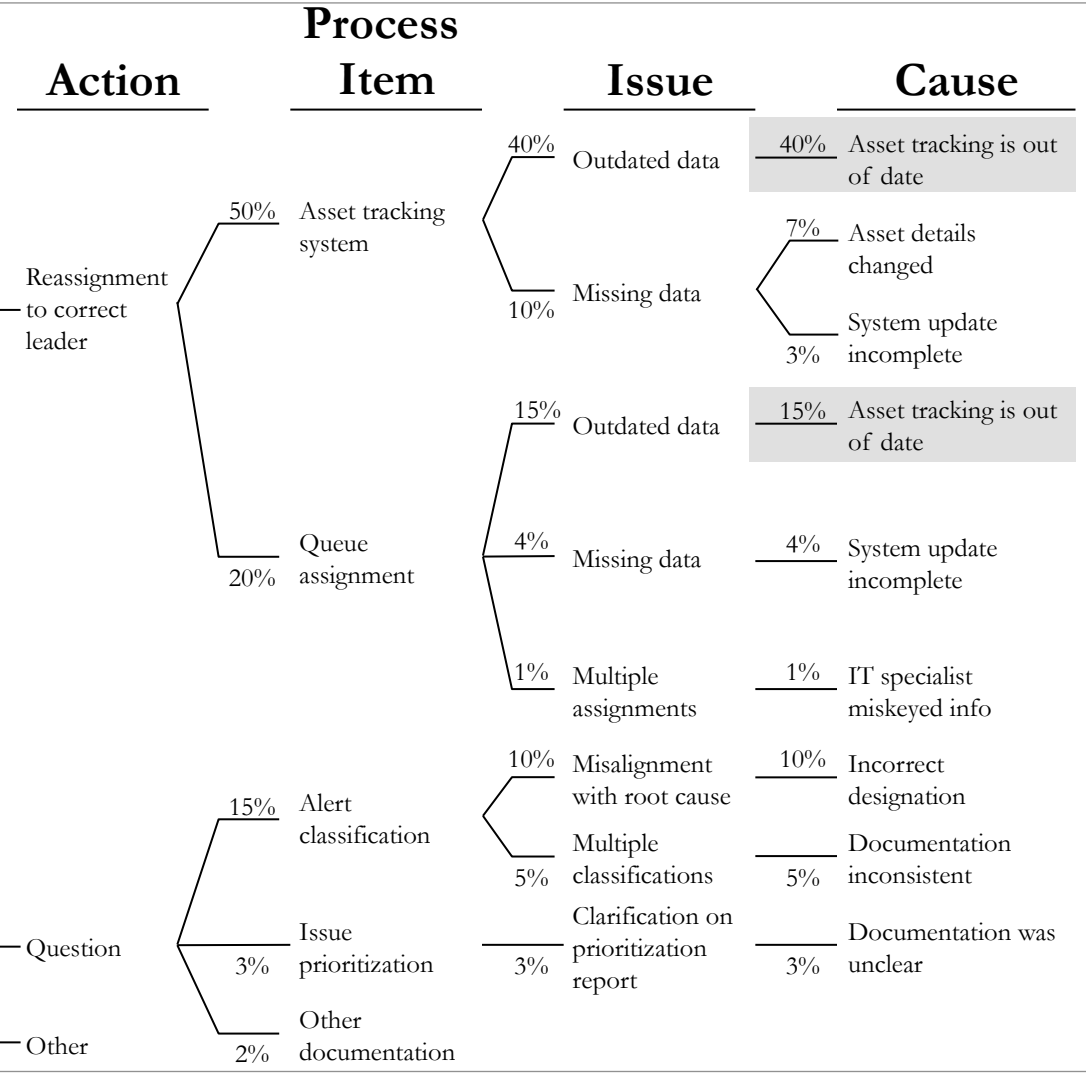
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## Root Cause Analysis



→ Forward  
→ Loopback

55% of rework caused by documents that expired during the loan application review process

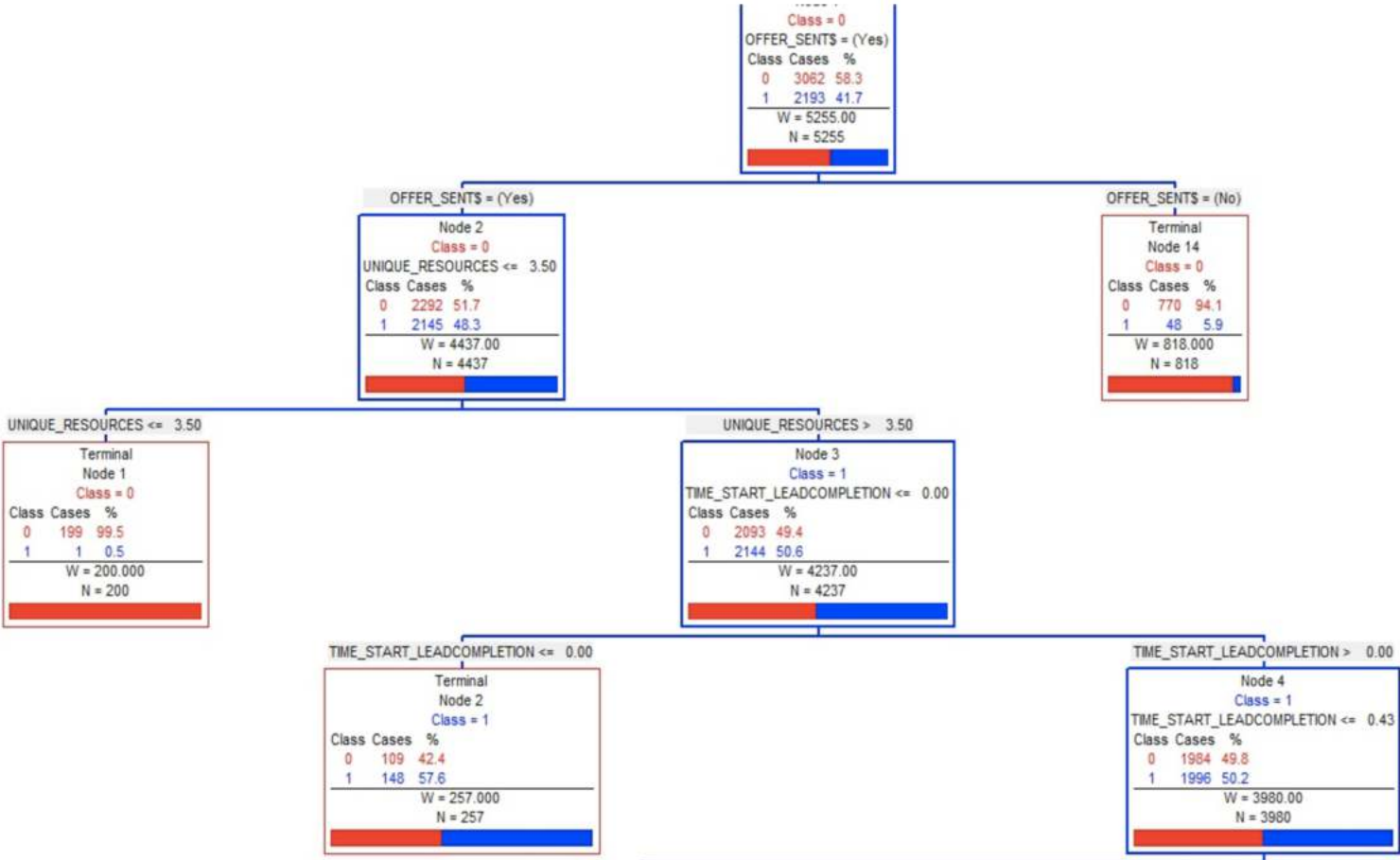




# Prioritizing Effort: Predictive Modeling

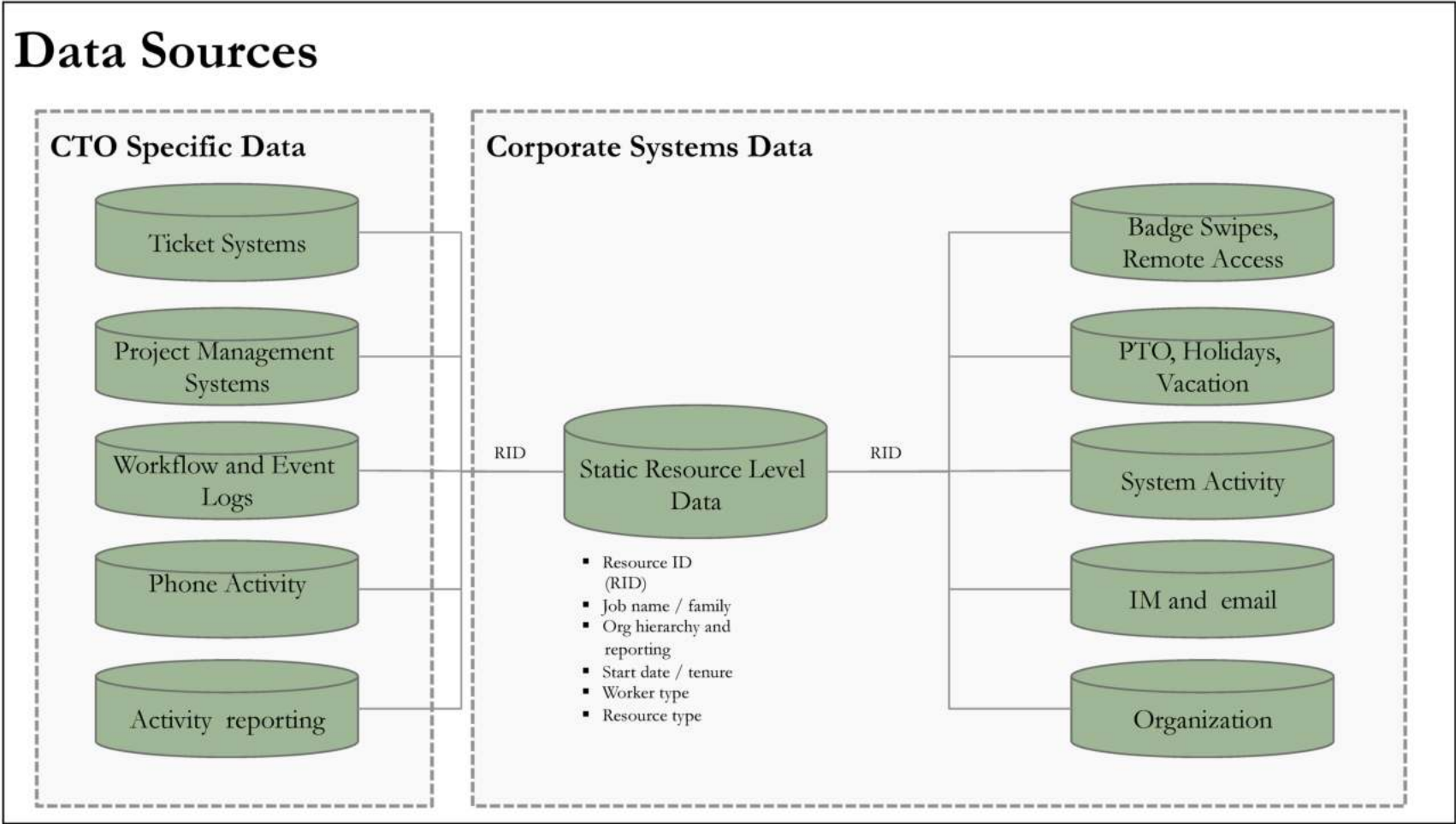
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## Root Cause Analysis



# Extensive Data Gathering to Support Analysis

## Data Sources



# Tools We Use

## Data Querying

- MS SQL
- MySQL
- PostgreSQL
- Other data extraction interfaces (BI tools etc.)

## Data Analysis Tools

- R
- Disco
- ProM
- Tableau
- Perl
- Python
- SAS
- SPSS
- CART
- Microsoft Excel (how can we not!)



# Q&A

