

2004 Risk Analysis Workshop

How to Collect and Analyze Data

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How to Collect and Analyze Data

- Collecting
- Analyzing
- Justification

Collecting and Analyzing

- Why?
 - Management has clearly defined safety as the number one company priority
 - Safety is never sacrificed to satisfy customer concern, convenience or cost
 - HBAT 99-19
 - Heinrich's Pyramid

Collecting Methods

- Phone
- Paper forms
 - Paper forms (use Inflight example, cursive, readability, smiley faces and hearts humor)
- Electronic
 - Web reporting
 - Email

Collecting Sources

- Departments
 - Flight Ops
 - Main source of reporting
 - Mandatory reporting
 - System Operations
 - Central reporting
 - Maintenance
 - Cancellation and delay summaries

Collecting Sources

- Departments (cont'd)
 - Inflight
 - Quantity
 - Issues
 - Customer Service
 - Above the wing
 - Below the wing

Collecting Tools

- Databases
 - In-house
 - Elaborate systems
 - AA CERS example
 - Vendor
 - Customizable
 - Application integration and information importing

How to Collect and Analyze Data

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Analyzing Methods and Tools

- Safety and event reporting tools
 - The big three
- Descriptive statistics and trend analysis
- Root cause analysis
- Text/Data mining

Safety and Event Reporting Tools

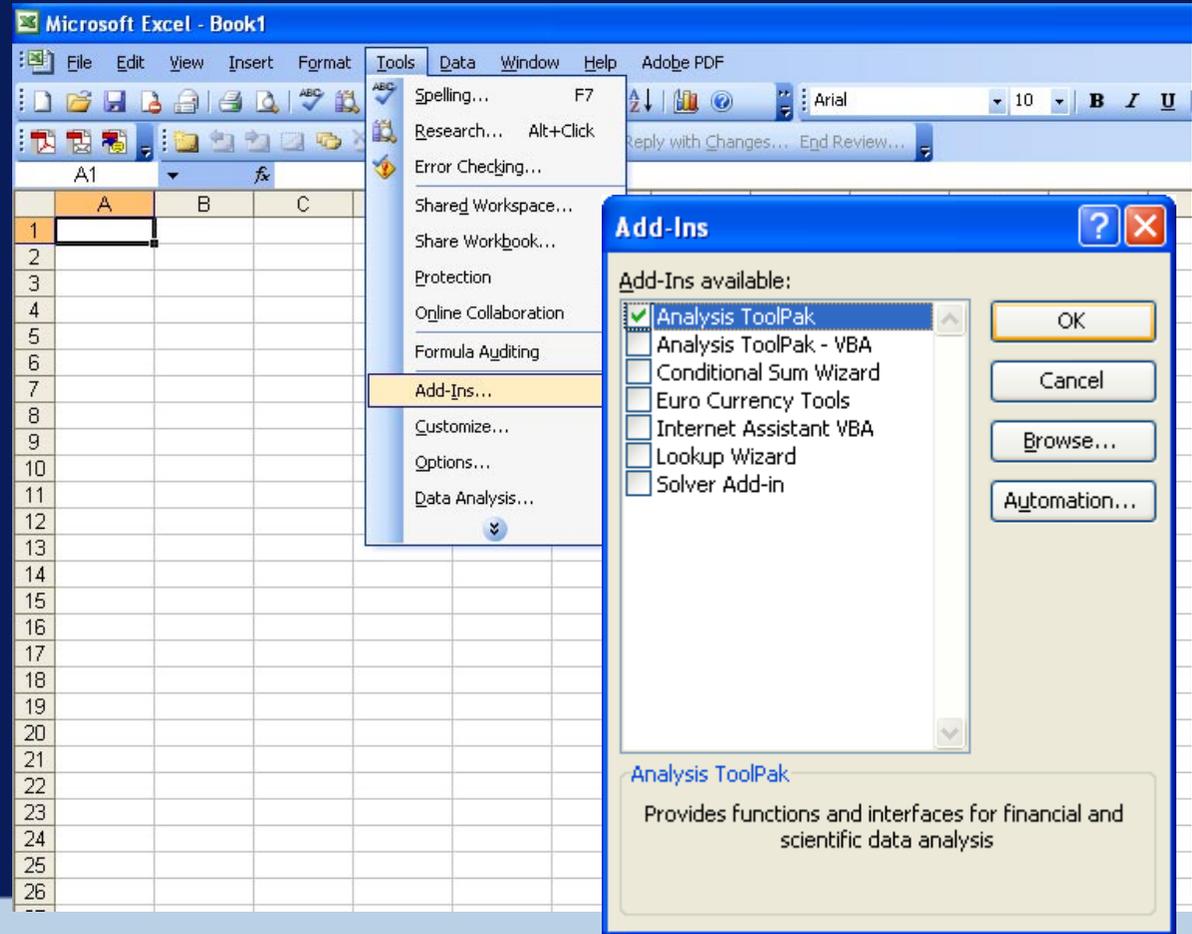
- The big three
 - AQD, Aviation Quality Database
 - BASIS, British Airways Safety Information System
 - AvSIS, Aviation Safety Information System
- Bill

Descriptive Statistics and Trend Analysis

- Microsoft Excel
 - Analysis tool pak
- Improvit Essentials
- StatGraphics

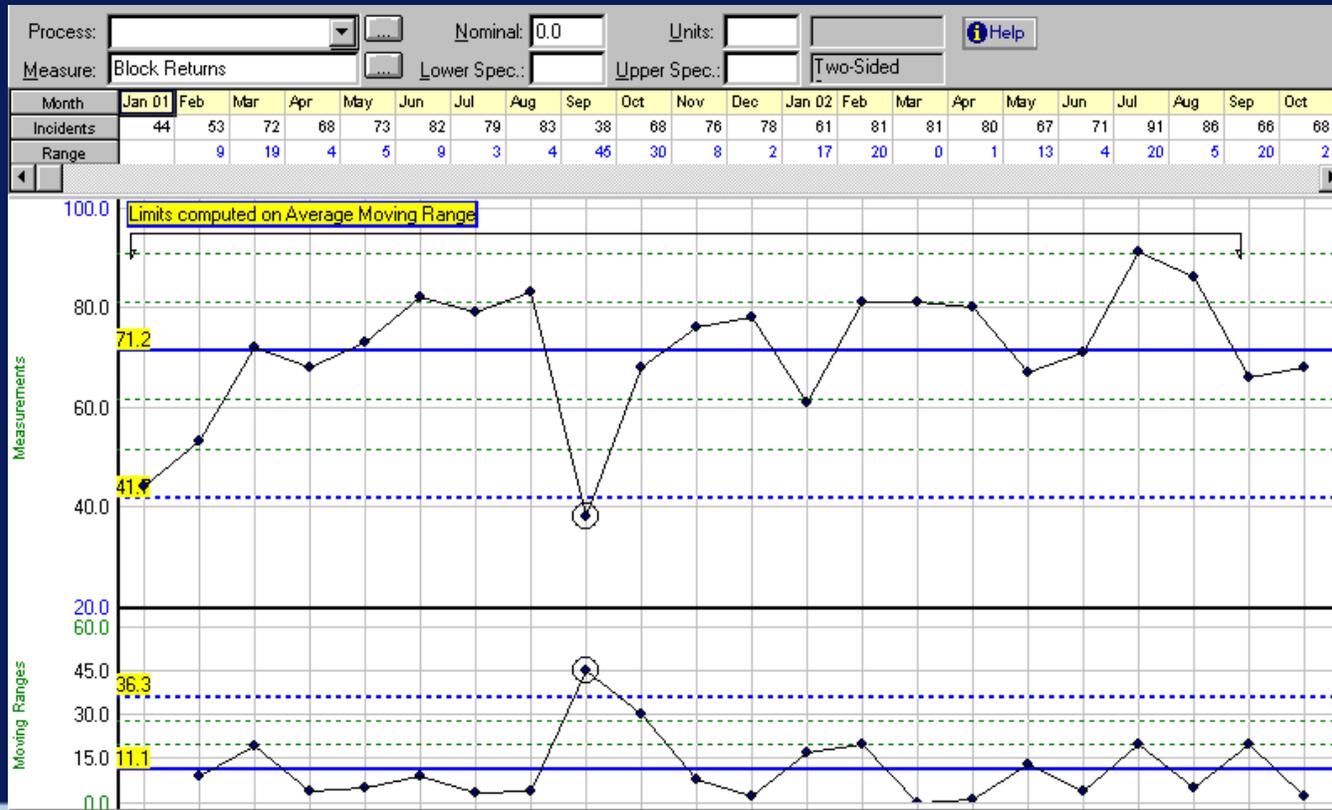
Descriptive Statistics and Trend Analysis

- Microsoft Excel
 - Analysis tool pak



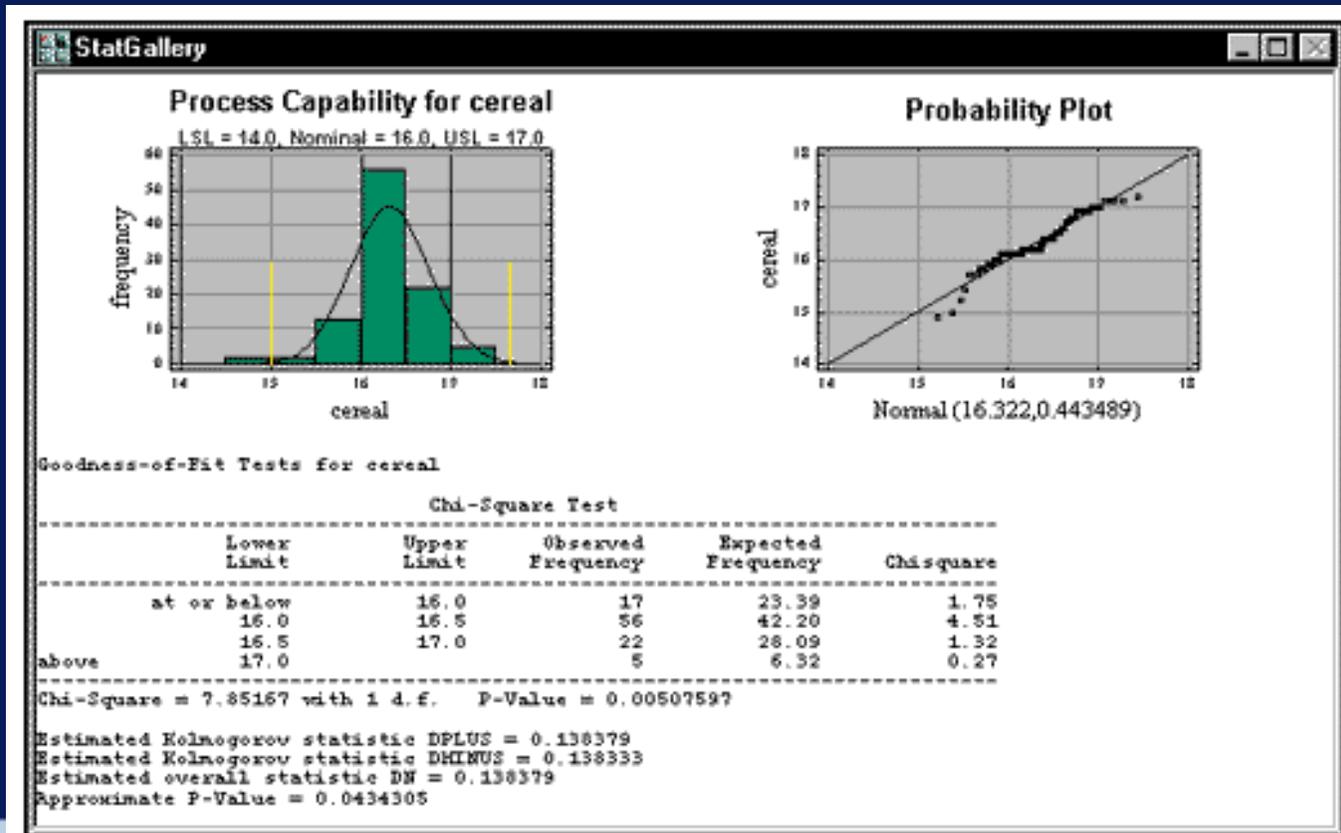
Descriptive Statistics and Trend Analysis

- Improvit Essentials (data simulated)



Descriptive Statistics and Trend Analysis

- StatGraphics



Root Cause Analysis

- What happened and why
- Persuade investigators to dig deeper
- Identify causal factors at multiple levels

Root Cause Analysis

- TapRoot

Incident: 051900 - Thater Fatality
Causal Factor: 03 - Controls not neutralized.

Management System

- ~~Standards, Policies, or Admin. Controls NI~~
 - no SPAC
 - not strict enough
 - confusing or incomplete
 - technical error
 - drawings / prints NI
- SPAC Not Used**
 - communication of SPAC NI
 - recently changed
 - enforcement NI
 - no way to implement
 - accountability NI
- ~~Oversight / Employee Relations~~
 - infrequent audits & evaluations
 - audits & evaluations lack depth
 - audits & evaluations not independent
 - employee communications NI
 - employee feedback NI
- ~~Corrective Action~~
 - corrective action NI
 - corrective action not yet implemented
 - trending NI

Click on a tree item to select it, cross it off, or clear its markings

Root Cause Analysis

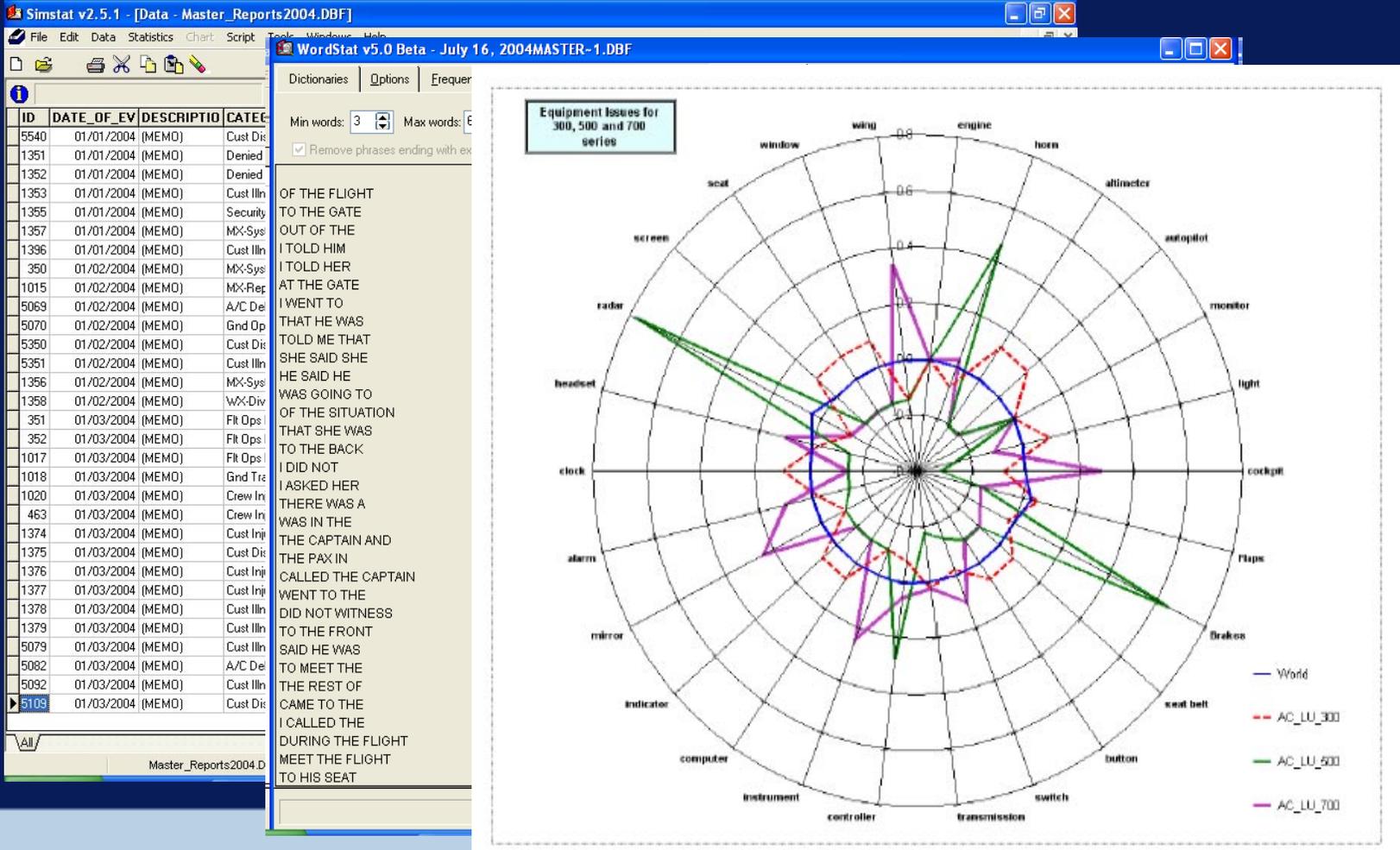
- REASON

The screenshot displays the REASON Pro software interface. The main window is titled "REASON Pro - C:\rsn\Oilfire.rsn" and shows a menu bar (File, Edit, Analysis, Document, Expert, Help) and a toolbar with icons for NEW, OPEN, SAVE, and COPY. A tree view on the left shows a hierarchical structure of nodes. A "Lessons Learned Search Criteria" dialog box is open, displaying the following criteria for REASON Pro:

- 1: Work-related injury or illness that results in permanent disability or loss of life
- 2: Damage to property/materials/hardware greater than \$20,000
- 3: "Near Misses" with a risk assessment score of 15 to 25

A "Case Assessment" dialog box is also open, with a "Confirm Case Assessment" sub-dialog box. The "Confirm Case Assessment" dialog box shows a "Recommended Tier:" dropdown menu set to "REASON Pro" and the text "You may select a MORE rigorous Tier if you wish." Below the dropdown are "OK" and "Cancel" buttons. The "Case Assessment" dialog box has "Select all statements from above that are true." and buttons for "<-Previous", "Next->", and "Exit".

Text / Data Mining



Text Mining

- Analyze freeform text with algorithms
- Speed up process in large sets of reports

Data Mining and Visualization

- Analyze data with algorithms
- Graphical displays
- Identify relationships not readily obvious

Text / Data Mining Tools

- Tools currently in use or previously used
 - SimStat
 - Insightful Miner
 - Megaputer
 - PolyAnalyst

How to Collect and Analyze Data

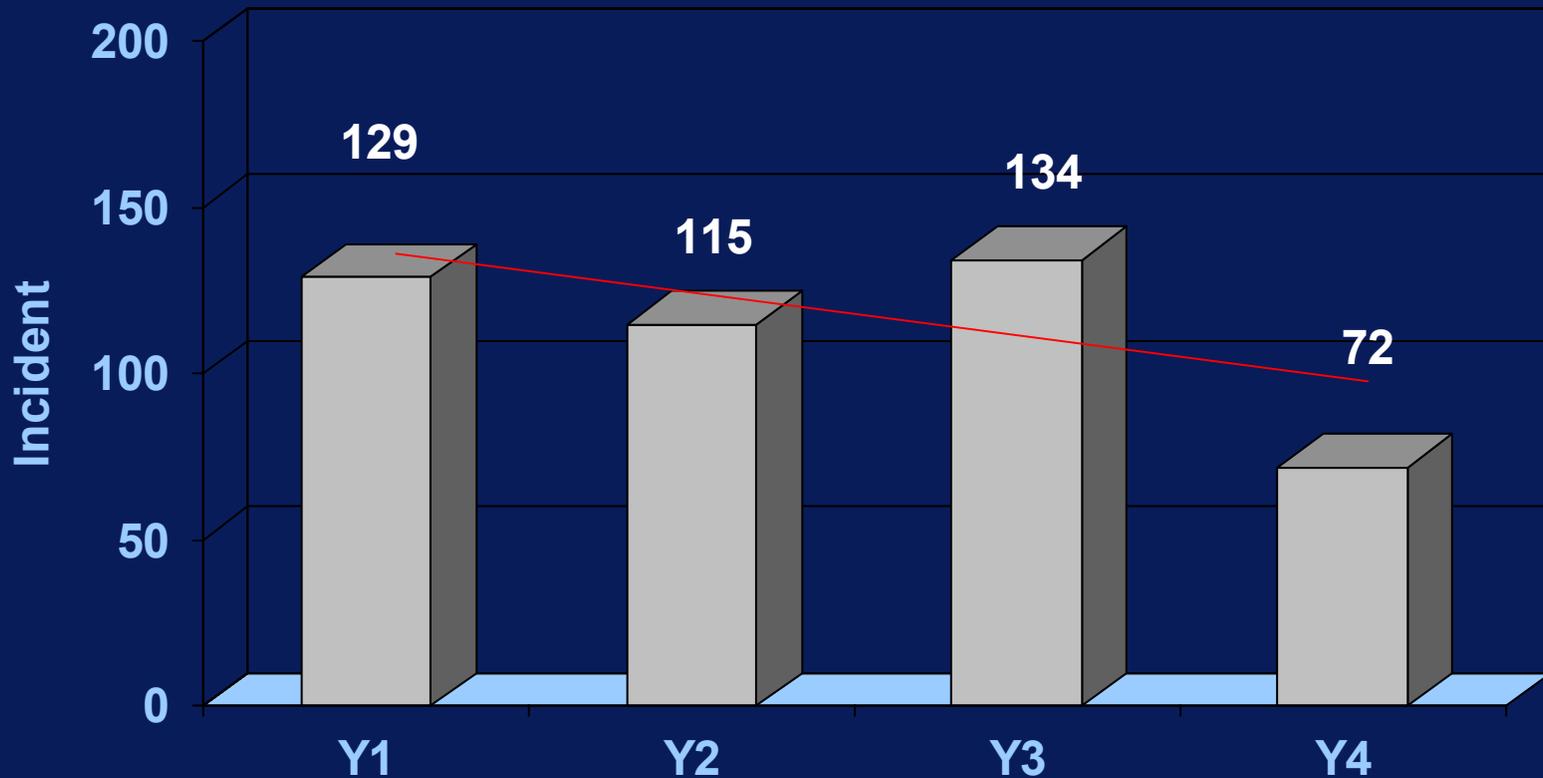
- Collecting
- Analyzing
- **Justification**

Collecting and Analyzing Justification

- Cost
 - The cost of safety
 - ROI
 - Prevention of one accident or major incident
 - Incident and cost reduction correlation

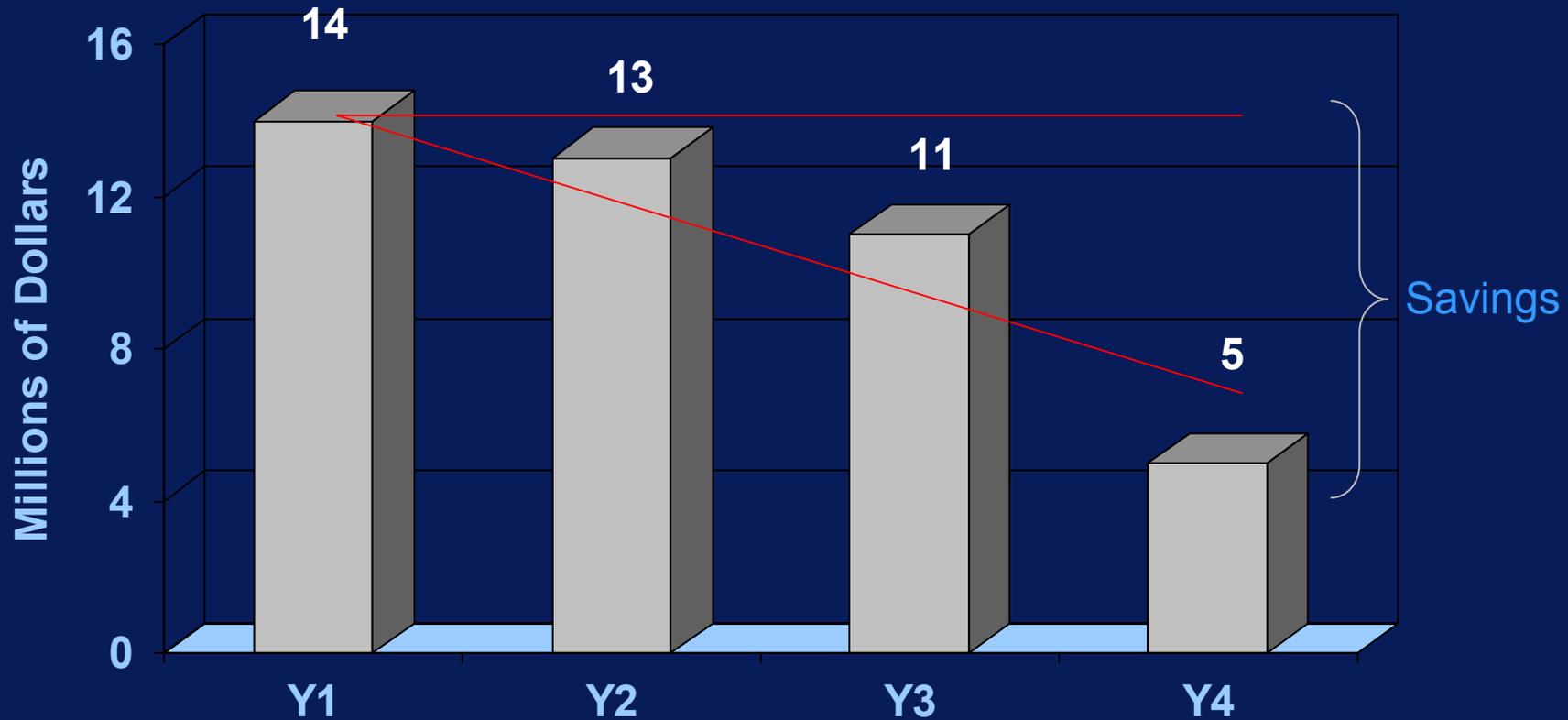
Collecting and Analyzing Justification

(data simulated)



Collecting and Analyzing Justification

(data simulated)



Collection and Analyzing Vision

- dB integration across the company
 - Advantages and disadvantages
- Data and information sharing
- What everyone else is doing
 - www.gainweb.org

Questions?

Enjoy the workshop and see you in the
breakout session