The Use of Big Data to Help Your Compliance Program

SCCE Regional Compliance & Ethics Conference
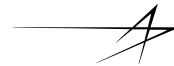
October 30, 2015

LOCKHEED MARTIN

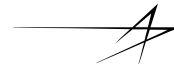Venyssa Brown
Douglas Dunham
Jeff Willingham

Agenda

- **Audit Data Analytics Strategy and Approach**
- **Big Data, Analytics and Enterprise Risk Management**
- **Data Analytics to Evaluate Worksite Ethics Risk**
- **Case Study: Anti-Corruption Compliance Monitoring**
- **Lessons Learned and Keys to Success**

Data Analytics Strategy

Data Analytics Vision

- **Develop a standardized secure data and technology architecture**
- **Integrate Advanced Analytics into the Audit function**
  - **Identify Key Performance Indicators (PKIs)**
  - **Self service dashboard reporting**
  - **On-going schedule compliance testing**
- **Implementing an automated control and process testing in line with International Standards for the Professional Practice of Internal Auditing to ensure robust coverage of key business risk.**

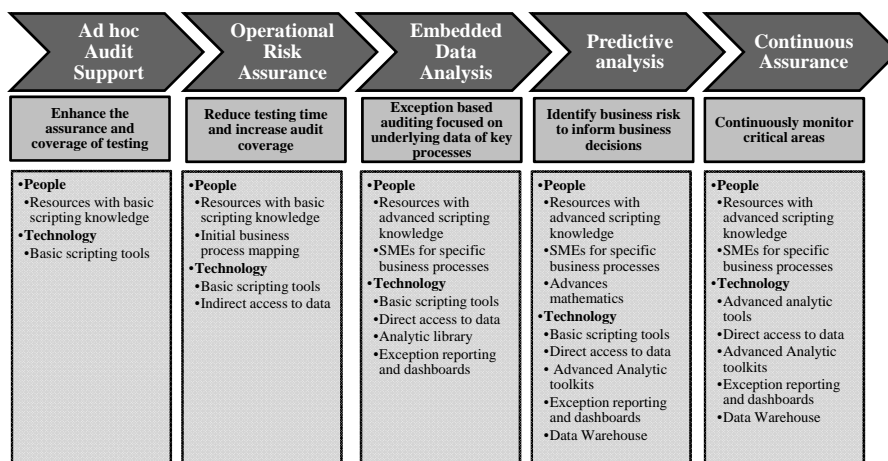**Increase the Strategic Value to the Corporation**

Data Analytic Strategic Tenants

- *Optimized Workforce:*
  - **Leveraging Business Intelligence analytic solutions to allow users access to the right data at the right time in the right format. Utilize employee skills to solve business challenges through innovation and collaboration.**
- *Risk Reduction and Compliance:*
  - **Implementing an automated control and process testing in line with International Standards for the Professional Practice of Internal Auditing to ensure robust coverage of key business risk.**
- *Agility:*
  - **Maintaining a flexible infrastructure and workforce model to quickly adapt to a dynamic business environment. Aggressively positioning technology and resources to support the business strategy.**
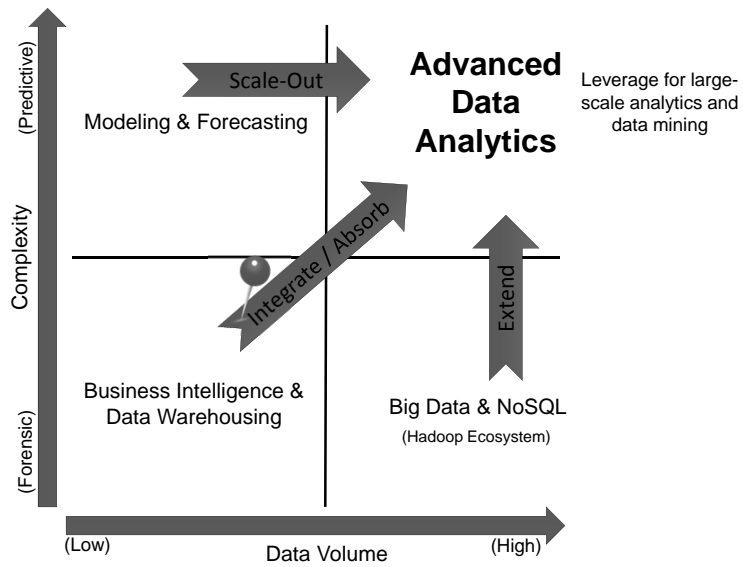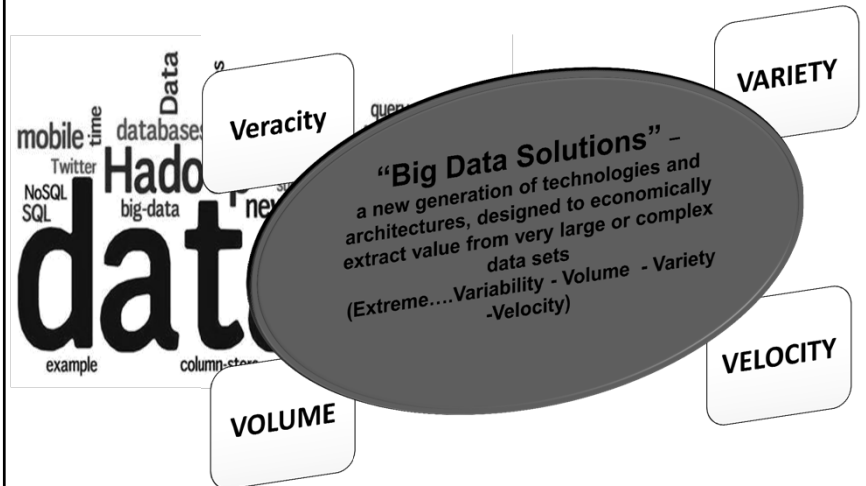
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Continuous Audit Roadmap

Ad hoc Audit Support	Operational Risk Assurance	Embedded Data Analysis	Predictive analysis	Continuous Assurance
Enhance the assurance and coverage of testing	Reduce testing time and increase audit coverage	Exception based auditing focused on underlying data of key processes	Identify business risk to inform business decisions	Continuously monitor critical areas
•**People** •Resources with basic scripting knowledge •**Technology** •Basic scripting tools	•**People** •Resources with basic scripting knowledge •Initial business process mapping •**Technology** •Basic scripting tools •Indirect access to data	•**People** •Resources with advanced scripting knowledge •SMEs for specific business processes •**Technology** •Basic scripting tools •Direct access to data •Analytic library •Exception reporting and dashboards	•**People** •Resources with advanced scripting knowledge •SMEs for specific business processes •Advances mathematics •**Technology** •Basic scripting tools •Direct access to data • Advanced Analytic toolkits •Exception reporting and dashboards •Data Warehouse	•**People** •Resources with advanced scripting knowledge •SMEs for specific business processes •**Technology** •Advanced analytic tools •Direct access to data •Advanced Analytic toolkits •Exception reporting and dashboards •Data Warehouse

Tactical results, strategic vision

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Big Data and Advanced Analytics

Addressing the Analytics Gap

(Predictive)

(Forensic)

Complexity

Scale-Out

Modeling & Forecasting

Advanced Data Analytics

Leverage for large-scale analytics and data mining

Integrate / Absorb

Extend

Business Intelligence & Data Warehousing

Big Data & NoSQL

(Hadoop Ecosystem)

(Low)   Data Volume   (High)

What's New?

VARIETY

Veracity

"Big Data Solutions" –
a new generation of technologies and
architectures, designed to economically
extract value from very large or complex
data sets
(Extreme….Variability - Volume - Variety
-Velocity)

VELOCITY

VOLUME

Big Data Workflow

Data Analytics Lifecycle

1 Discovery

Do I have enough information to draft an analytic plan and share for peer review?

6 Operationalize

2 Data Prep

Do I have enough good quality data to start building the model?

5 Communicate Results

3 Model Planning

4 Model Building

Is the model robust enough? Have we failed for sure?

Do I have a good idea about the type of model to try? Can I refine the analytic plan?

ESH Process Improvement (then vs. now)

Now, assig...

LMCIA DATA ANALYTICS
ADMINISTRATION ~ DOCUMENTATION

HOME   ANALYTICS MAINTENANCE

Site Information Database | Travel Metrics

Step 1: Exclude All Questions to be Omitted fro...

Step 2: Address All Rating Options Highlighted in Yellow

Save Excludes   Survey Year: 2015   ● Show Included Questions   ○ Show Excluded Questions

	Question

6.1 - Does Lockheed Martin at this facility hold air per (Air Quality Regulations)

☐ Exclude   # Key Words: 2   Key Word: Yes   No   APPLY
Risk Score: ▼ 0 ▲   ▼ 0 ▲

6.2 - Provide the number of any air permits excluding Ti (Air Quality Regulations)

☐ Exclude   # Ranges: 5   Range: ≤ [ ] ≥≤ [ ] ≥≤ [ ] ≥≤ [ ] ≥ [ ]   APPLY
Risk Score: ▼ 0 ▲ ▼ 0 ▲ ▼ 0 ▲ ▼ 0 ▲ ▼ 0 ▲

6.4 - Does Lockheed Martin at this facility hold a synth (Air Quality Regulations)

☐ Exclude   # Key Words: 3   Key Word: Hold synthetic   Synthetic minor   No synthetic mi   APPLY
Risk Score: ▼ 0 ▲ ▼ 0 ▲ ▼ 3 ▲

4.1 - Are the following materials present or used in any (Chemical, Biological, and Physical Exposure Contro)

> 1. ESH receives notification when new questions need to be assigned Risk Ratings, updated via Audit Analytic Maintenance tool
>
> AUTOMATED

3. An...
use ri...

ED

Mostly automated process, easy to use entry form, increased insight via Data Visualization

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Enterprise Risk Management

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Timely Risk Insight

1. **Assess Risk**
2. **Define Questions**
3. **Data**
4. **Analytic Approach**
    1. **Text Mining**
    2. **Visualization**
    3. **Exception Testing**
5. **Right Tools**
    1. **Analytics**
    2. **Query Tools**
    3. **Dashboarding**
    4. **Big Data - Hadoop**

Sun Tzu, in The Art of War, said "Strategy without tactics is the slowest route to victory. Tactics without strategy is the noise before defeat."
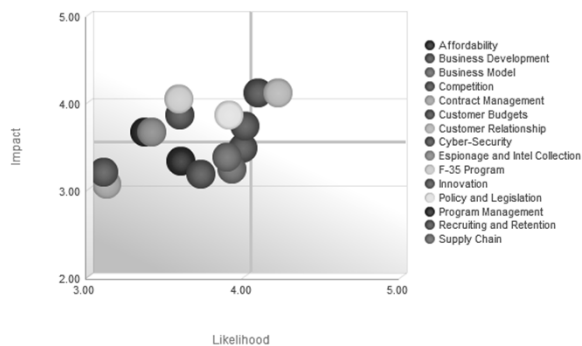
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Enterprise Risk Managment Dashboard

Heat Map Reporting

Year Quarter 2012 Q3

Enterprise Risk Management Heat Map

- Affordability
- Business Development
- Business Model
- Competition
- Contract Management
- Customer Budgets
- Customer Relationship
- Cyber-Security
- Espionage and Intel Collection
- F-35 Program
- Innovation
- Policy and Legislation
- Program Management
- Recruiting and Retention
- Supply Chain

Optional Filters:

Risk Areas: (All Column Va ▾)
Years: 2012.00 ▾
Quarters: Q3 ▾

Apply   Reset ▾

Impact

Likelihood

14

Best Practices and Lessons Learned

- **A solid infrastructure and foundation are key to managing a dynamic risk environment.**
    - **Diverse staffing profile**
        - **Technical – systems / software / database**
        - **Statistical – data modeling / statistical analysis**
    - **Solid training program**
    - **Mature tools and process**
- **Research and Testing**
- **Scalability (hardware, tools, storage)**
    - **Plan for evolving requirements & data growth**
- **Challenging to plan for future while living in the present.**
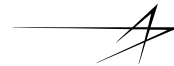
Anti-Corruption Project

Project Description
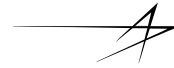
Purpose

To develop a technology enabled Anti-Corruption Compliance Monitoring program that focuses on 27 FCPA Red Flags to reduce manual reporting efforts across the Corporation.

Project Champion/Client

Corporate & Business Area Legal

Methodology

- 27 FCPA Red Flags identified by Corporate Legal
- Data analytics created by Internal Audit to test compliance with the Anti-Bribery and Accounting Provisions of FCPA
- Analytical Tools used: ACL Audit Exchange, AX Link, AX Exception

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Data Complexity

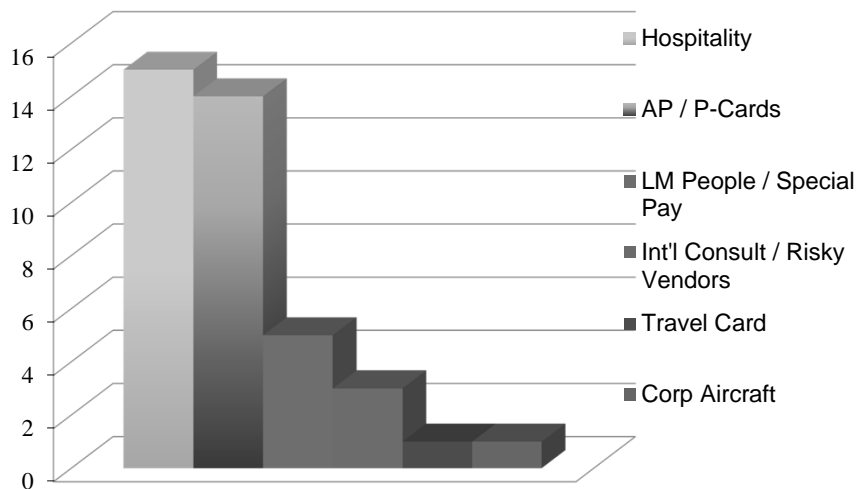|	Category	Hospitality	Accounts Payable	Expense Reporting	Compensation
Data Sources	Accounts Payable Systems				
	WebFocus Reporting	●	●		
	VisiFlow Reporting	●	●	●	
	Corporate Credit Card	●	●	●	
	Travel Reservation Systems	●			
	Security Visitor Logs	●		●	
	Corporate Aircraft Logs	●			
	Consultant Database	●			
	Vendor Invoice Systems		●		
	Human Resources Info Systems		●		
Client Interface	Business Unit Accounting				●
	Security	●	●	●	
	Legal	●			
	Human Resources	●	●		
	Information Technology	●			●
	Government Compliance	●			
	Travel Accounting	●		●	

RED FLAG - Example
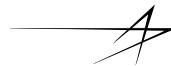
- **Hospitality (meals, gifts, entertainment) for foreign officials above Guideline limits or above a specified frequency level (12 events in a calendar year).**

  - **Test 1-A (1): Summarize all person's events into 1 day; identify foreign officials with 5 or more events since beginning of year (5 is warning only, 12 is Max per year).**
  - **Test 1-B (2): Join Hospitality to Country Matrix to identify meals above thresholds.**
  - **Test 1-C (3): Join Hospitality to Country Matrix to identify entertainment above thresholds.**
  - **Excludes attendees from US and "Refreshments/ Snacks"**
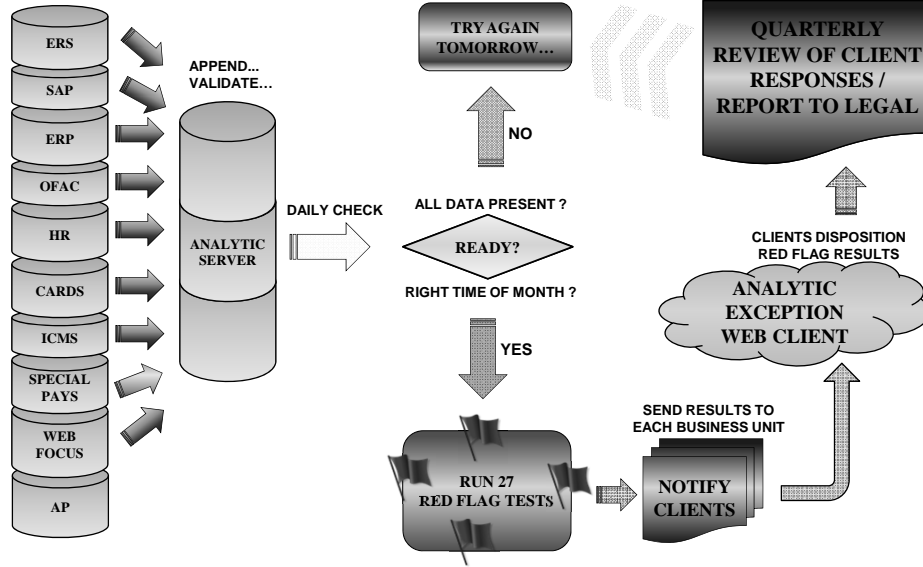 - **Gifts being tested in RF 22.**
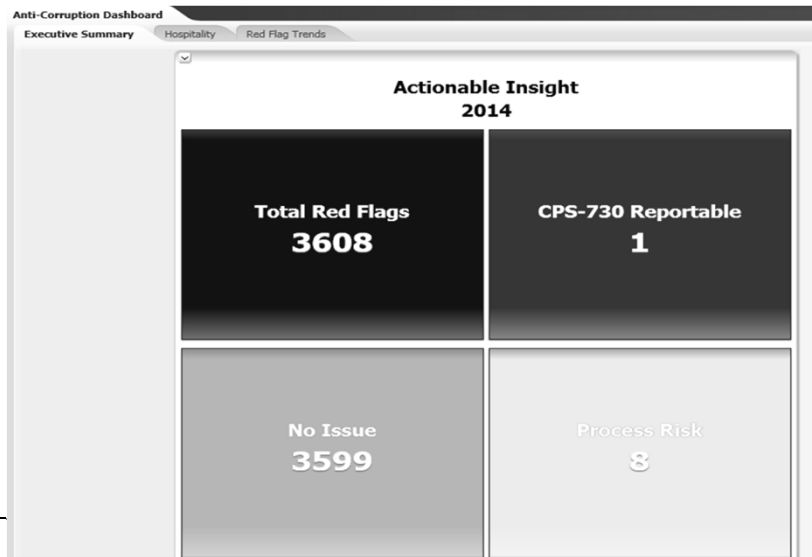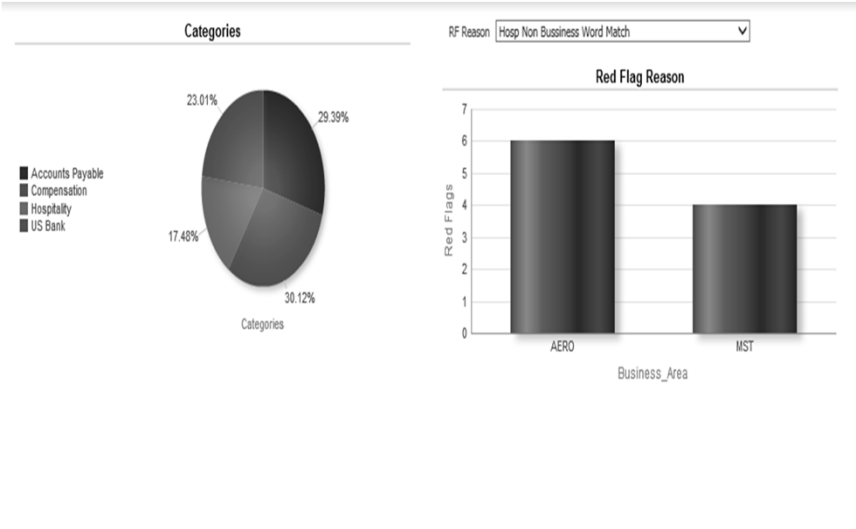
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27 Red Flags Tests

Breakout by Category

Legend:
- Hospitality
- AP / P-Cards
- LM People / Special Pay
- Int'l Consult / Risky Vendors
- Travel Card
- Corp Aircraft

Exception Management Workflow

ERS

SAP

ERP

OFAC

HR

CARDS

ICMS

SPECIAL PAYS

WEB FOCUS

AP

APPEND...
VALIDATE...

ANALYTIC SERVER

DAILY CHECK

TRY AGAIN TOMORROW...

NO

ALL DATA PRESENT ?

READY?

RIGHT TIME OF MONTH ?

YES

RUN 27 RED FLAG TESTS

SEND RESULTS TO EACH BUSINESS UNIT

NOTIFY CLIENTS

CLIENTS DISPOSITION RED FLAG RESULTS

ANALYTIC EXCEPTION WEB CLIENT

QUARTERLY REVIEW OF CLIENT RESPONSES / REPORT TO LEGAL

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Visualization – Automated Monitoring

Anti-Corruption Dashboard

Executive Summary | Hospitality | Red Flag Trends

**Actionable Insight
2014**

**Total Red Flags
3608**

**CPS-730 Reportable
1**

No Issue
3599

Process Risk
8

22

Visualization – Automated Monitoring

Using Data Analytics to Evaluate Worksite Ethics Risk
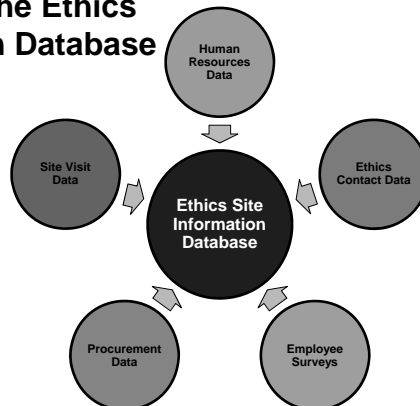
Doug Dunham
Ethics Director

The Problem

- **Over 800 worksites in 50 states and more than 20 countries**
- **Many sites/employees without connectivity to the company intranet**
- **An Ethics team of 6 Ethics Officers primarily engaged in responding to employee questions & concerns**

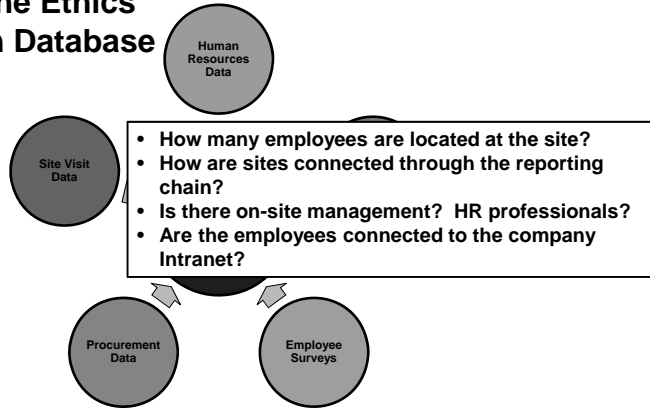**How do we know where to focus our constrained outreach efforts?**
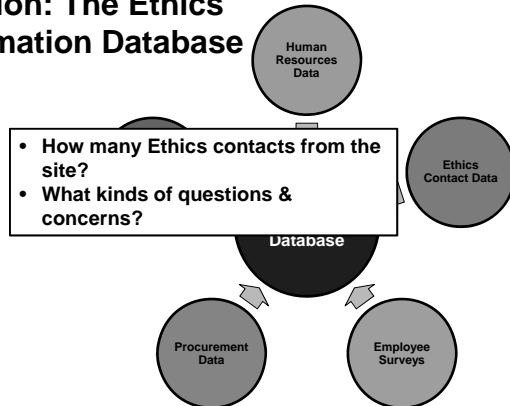

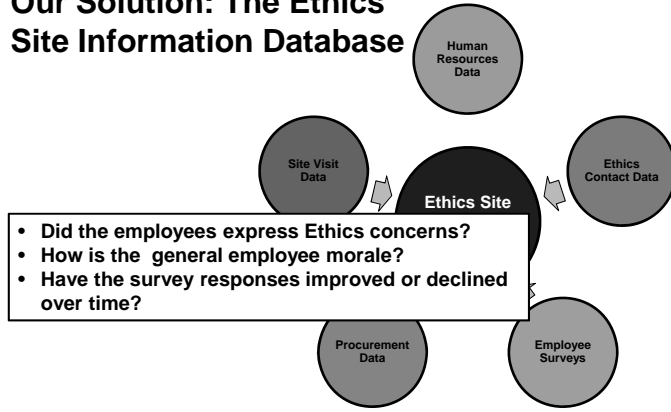
Our Solution: The Ethics Site Information Database

Human Resources Data

Site Visit Data

Ethics Contact Data

Ethics Site Information Database

Procurement Data

Employee Surveys

**Our Solution: The Ethics
Site Information Database**

- How many employees are located at the site?
- How are sites connected through the reporting chain?
- Is there on-site management? HR professionals?
- Are the employees connected to the company Intranet?

Human Resources Data

Site Visit Data

Procurement Data

Employee Surveys

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**Our Solution: The Ethics
Site Information Database**

- How many Ethics contacts from the site?
- What kinds of questions & concerns?

Human Resources Data

Ethics Contact Data

Database

Procurement Data

Employee Surveys

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Our Solution: The Ethics Site Information Database

Human Resources Data

Site Visit Data

Ethics Contact Data
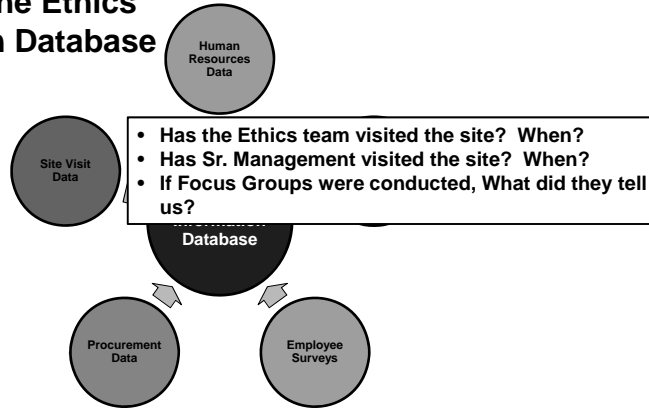
Ethics Site

- **Did the employees express Ethics concerns?**
- **How is the general employee morale?**
- **Have the survey responses improved or declined over time?**

Procurement Data

Employee Surveys

Our Solution: The Ethics Site Information Database

Human Resources Data

Site Visit Data

Ethics Contact Data

Ethics Site Information Database
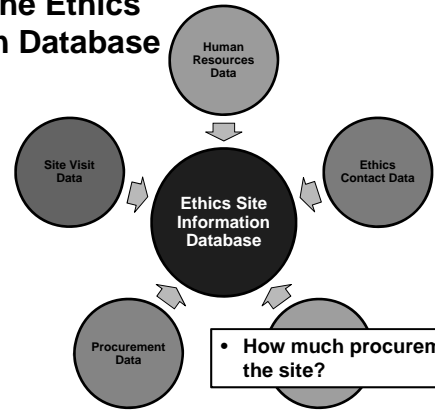
Procurement Data

- **How much procurement is being done at the site?**

Our Solution: The Ethics Site Information Database

Human Resources Data

- Has the Ethics team visited the site? When?
- Has Sr. Management visited the site? When?
- If Focus Groups were conducted, What did they tell us?

Site Visit Data

Information Database

Procurement Data

Employee Surveys

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Our Solution: The Ethics Site Information Database

Human Resources Data

Site Visit Data

Ethics Contact Data

Ethics Site Information Database

Procurement Data

Employee Surveys
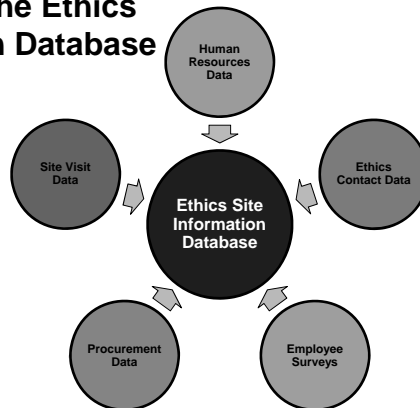
Our Ethics Site Information Database brings together data from various sources, allowing us to algorithmically assign a Risk Score to each of our sites

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Our Risk Algorithm

Factors Increasing Risk:
- **Smaller site**
- **Less/No connectivity to company intranet**
- **Less Ethics Office contacts**
- **Less/No visits by Ethics Officers & Senior Management**
- **No onsite Human Resources presence**
- **More onsite procurement**
- **Less offsite reporting chain connections**
- **Low survey scores**
- **Declining survey scores**

We want to connect to worksites that are less likely to be inculcated into our ethical business culture

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How we use the Database

- **The database helps us focus our outreach on higher risk sites**
- **The outreach may be of various forms, including**
  - **An Ethics Officer site visit with employee focus groups, presentations & office hours**
  - **An Ethics Office CD Mailer sent to the employee's home, with a video introduction to their Ethics Officer and information about our Ethics Program**
  - **An Ethics Officer check-in with responsible management to further evaluate risk and forward plan**

Our Ethics Site Information Database has helped us focus our outreach efforts to maximize risk mitigation