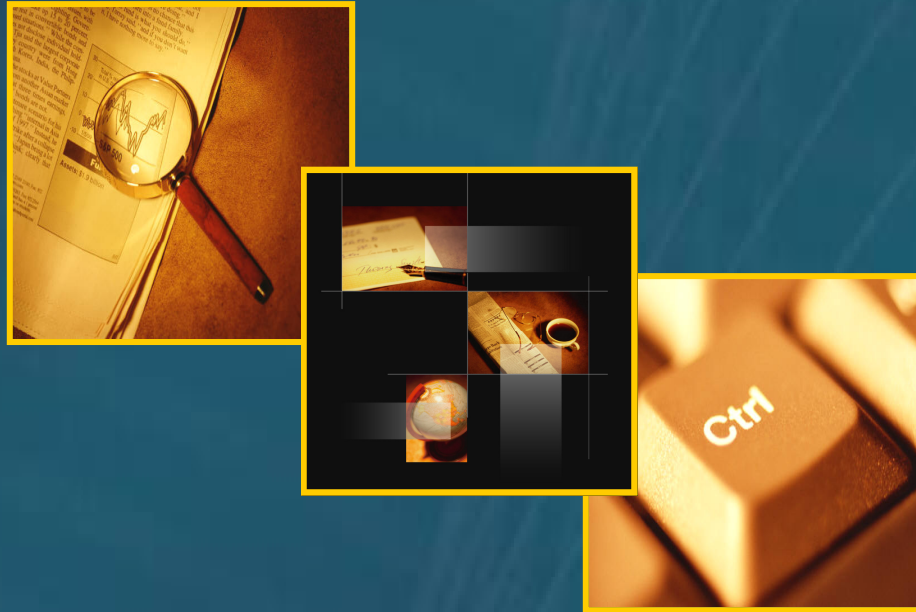# ENTERPRISE RISK MANAGEMENT (ERM)

ARE WE THERE YET?

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Abacus Solutions Inc

EUCI Energy Trading, Transaction and Risk Management (ETRM) Conference
Houston, Texas

September 2008

FOCUS

- **ERM PILLARS**
  - **People**
  - **Processes**
  - **Systems**

- **PRESENTATION FOCUS: SYSTEMS (ETRM)**

The Development of ETRM Systems .....

1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008

TRIAL & ERROR	BOOM	RETRENCHMENT	RECOVERY

15 Years later .....

| 10-30% of Corporate Data is Inaccurate ... Bad Data Can Cost 15-20% of Operating Revenue	➡	Need for **DATA QUALITY**
Integration Saves Significant Costs ... 30% Cost Reduction (CISCO)	➡	Need for **INTEGRATION**
One Risk Simulation Can Create 30GB of Data ... A Person Can Process 4GB of Information in a Lifetime!	➡	Need for **INSIGHTS**
ETRM Systems Have a 60% Replacement Rate ... Legacy Systems Fail to Meet User Needs	➡	Need for **BETTER SYSTEMS**
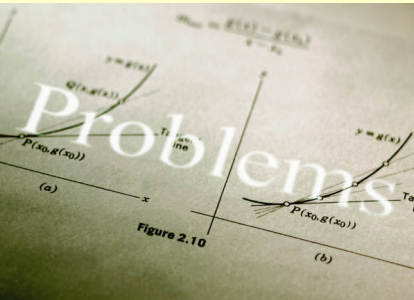
- ANALYTICS

- IT

- BREADTH

- DEPTH

- EVOLUTION

- DEPLOYMENT

- INTEGRATION

Toward fully integrated ETRM .....

1. FOOTPRINT

- Markets
- Generation
- Trades
- Loads
- Finance
- Credit
- ISO

1. **FOOTPRINT**

2. **DATA ACQUISITION**

- **Alternatives**
    - ❑ **UI**
    - ❑ **Databases**
    - ❑ **EXCEL Files**
    - ❑ **Web**
    - ❑ **Other**
- **Features**
    - ❑ **Ease of Use**
    - ❑ **Data Validation**
    - ❑ **Automation**
    - ❑ **Speed**

1. **FOOTPRINT**
2. **DATA ACQUISITION**
3. **DATA MINING**

- **Areas**
  - ❑ **Markets**
  - ❑ **Generation**
  - ❑ **Load**
- **Features**
  - ❑ **Ease of Use**
  - ❑ **Breadth**
  - ❑ **Flexibility**
  - ❑ **Automation**
  - ❑ **Speed**
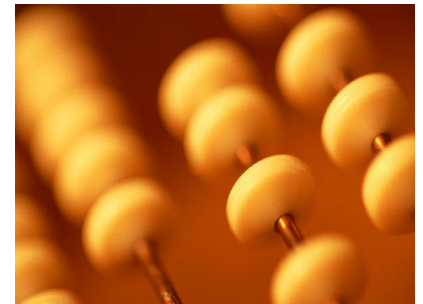
1. **FOOTPRINT**
2. **DATA ACQUISITION**
3. **DATA MINING**
4. **DATA ANALYSIS**

- **Markets Simulation**
  - Spot and Forward
  - Stochastic Process
  - Granularity
  - Rigor
  - Flexibility
  - Setup
- **Generation Optimization**
  - Unit Commitment
  - Economic Dispatch
  - Thermal, Storage, Renewable
  - Operating Characteristics
  - Limits
- **Loads**
- **Trades**
- **Credit**
- **Portfolio Management**
  - Efficient Frontier
  - KPI

1. FOOTPRINT
2. DATA ACQUISITION
3. DATA MINING
4. DATA ANALYSIS
5. DATA MANAGEMENT

- Architecture
- Storage
- Organization
- Cleaning
- Retrieval
- Missing Data
- Defaults

1. FOOTPRINT	
2. DATA ACQUISITION	
3. DATA MINING	
4. DATA ANALYSIS	
5. DATA MANAGEMENT	
6. TRANSACTION MANAGEMENT	

- Deal Capture
- Templates
- Contracts
- Agreements
- Confirmation
- Limits
- Controls
- Scheduling
- Nomination
- Settlement
- Billing

ENTERPRISE RISK MANAGEMENT (ERM): DATA SECURITY & INTEGRITY

1. FOOTPRINT
2. DATA ACQUISITION
3. DATA MINING
4. DATA ANALYSIS
5. DATA MANAGEMENT
6. TRANSACTION MANAGEMENT
7. DATA SECURITY & INTEGRITY

- Authentication
- Authorization
  - Read
  - Write
  - Setup (User, Job Title, Category)
- Audit Trail (Changes)
  - Old/New
  - Author
  - Date/Time
- Data Validation
  - Warning Messages
  - Error Messages
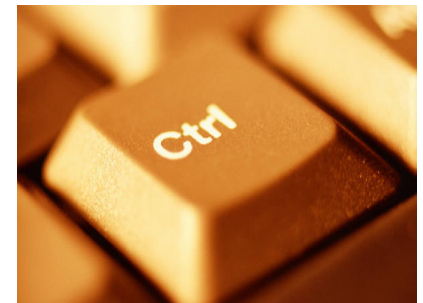
1. **FOOTPRINT**
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6. **TRANSACTION MANAGEMENT**
7. **DATA SECURITY & INTEGRITY**
8. **REPORTING & PRESENTATION**

- **Case/Run Management**
  - ❏ **Multiple Cases/Runs**
  - ❏ **Comparative Analysis**
- **Reporting**
  - ❏ **Details**
  - ❏ **Standardization**
  - ❏ **UI & Exports**
  - ❏ **Tables & Charts**
  - ❏ **Filters**
  - ❏ **Drilldowns**
- **Dashboards**
- **Flexibility**
- **Access**
- **Sharing & Collaboration**
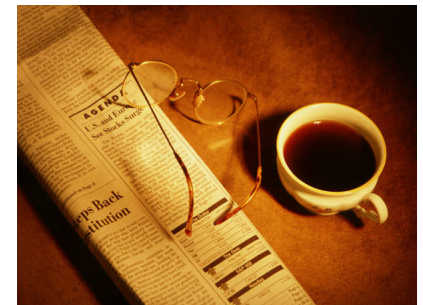
ENTERPRISE RISK MANAGEMENT (ERM): DECISION SUPPORT

1. **FOOTPRINT**
2. **DATA ACQUISITION**
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4. **DATA ANALYSIS**
5. **DATA MANAGEMENT**
6. **TRANSACTION MANAGEMENT**
7. **DATA SECURITY & INTEGRITY**
8. **REPORTING & PRESENTATION**
9. **DECISION SUPPORT**

- **Trading**
- **Asset Management**
  - ❑ **Operations**
  - ❑ **Planning**
  - ❑ **Valuation**
- **Load Management**
- **ISO**
  - ❑ **Load Bids**
  - ❑ **Generation Offers**
- **Risk Management**
- **Financial Management**
- **Credit Management**
- **Portfolio Management**
  - ❑ **Asset Acquisition**
  - ❑ **Asset Disposition**
- **Corporate Management**
  - ❑ **Regulatory Compliance**
  - ❑ **Corporate Governance**

ENTERPRISE RISK MANAGEMENT (ERM): APPLICATION & USE

1. **FOOTPRINT**

2. **DATA ACQUISITION**

3. **DATA MINING**

4. **DATA ANALYSIS**

5. **DATA MANAGEMENT**

6. **TRANSACTION MANAGEMENT**

7. **DATA SECURITY & INTEGRITY**

8. **REPORTING & PRESENTATION**

9. **DECISION SUPPORT**

10. **APPLICATIONS & USE**

- **Applications**
  - ❑ **Markets Analysis**
  - ❑ **Generation Management**
  - ❑ **Trading**
  - ❑ **Loads Analysis**
  - ❑ **Financial Planning**
  - ❑ **Credit Management**
  - ❑ **Investment Management**
  - ❑ **Business Planning**
  - ❑ **Operations Planning**
  - ❑ **Risk Management**
- **Users**
  - ❑ **Traders**
  - ❑ **Analysts**
  - ❑ **Managers**
  - ❑ **Executives**
- **Deployment**
  - ❑ **Customization**
  - ❑ **Training**
- **Usage**
  - ❑ **Ease of Use**
  - ❑ **Access**
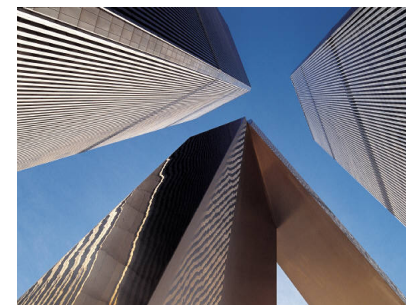
ENTERPRISE RISK MANAGEMENT (ERM): ARCHITECTURE

1. **FOOTPRINT**

2. **DATA ACQUISITION**

3. **DATA MINING**

4. **DATA ANALYSIS**

5. **DATA MANAGEMENT**

6. **TRANSACTION MANAGEMENT**

7. **DATA SECURITY & INTEGRITY**

8. **REPORTING & PRESENTATION**

9. **DECISION SUPPORT**

10. **APPLICATIONS & USE**

11. **ARCHITECTURE**

- **Processing**
  - ❑ **Serial/Parallel**
  - ❑ **32-Bit/64-Bit**
- **Multi-Threading**
  - ❑ **Spawning**
  - ❑ **Distribution**
- **Data Storage & Retrieval**
  - ❑ **Disk**
  - ❑ **Memory**
- **Hardware Configuration**
  - ❑ **Static**
  - ❑ **Optimized**
- **Hardware Utilization**
  - ❑ **Memory**
  - ❑ **CPUs**
- **Scalability**
  - ❑ **Vertical/Horizontal**
  - ❑ **Stochastic Simulations**
  - ❑ **Markets**
  - ❑ **Analysis Time Frame**
  - ❑ **Granularity**
  - ❑ **Geography**
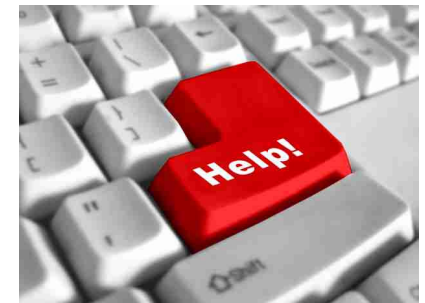
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8. **REPORTING & PRESENTATION**

9. **DECISION SUPPORT**

10. **APPLICATIONS & USE**

11. **ARCHITECTURE**

12. **ENTERPRISE SERVICES**

- **Portal Collaboration**
- **Corporate Data Warehouse**
- **Users Forum**
- **Messaging**
- **Document Management**
- **Usage Analysis**

ENTERPRISE RISK MANAGEMENT (ERM): CHECKLIST

	Data Acquisition	Data Mining	Data Analysis	Data Management	Decision Support	Reporting & Presentation	Enterprise Services
Markets	✓	✓	✓	✓	✓	✓	✓
Generation	✓	✓	✓	✓	✓	✓	✓
Loads	✓	✓	✓	✓	✓	✓	✓
Trades	✓	✓	✓	✓	✓	✓	✓
Finance	✓	✓	✓	✓	✓	✓	✓
Credit	✓	✓	✓	✓	✓	✓	✓
ISO	✓	✓	✓	✓	✓	✓	✓

FOR MORE INFORMATION

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