RISK State-of-the-Art: Specific Industry Challenges and the Correlation Technology Solution

Make Sence Florida, Inc. has uncovered a wide range of issues faced by diverse enterprises when implementing and utilizing enterprise risk management (ERM) practices or ERM software solutions. The presence of even one of these issues can defeat the most painstakingly implemented ERM initiative. These problems will obstruct business functions, increase useless make-work, and restrict the flow of legitimate risk intelligence throughout an enterprise. The parade of high profile ERM failures provides ample evidence that serious and costly defects exist in critical ERM processes. The list that follows provides a brief description of some of the more significant challenges:

a. INABILITY TO HANDLE QUANTITY

Massive amounts of data are generated and consumed by enterprises daily for risk management practices. Manual efforts to truncate this data may be time consuming and labor-intensive. Manual processes may not be able to exhaustively review all raw enterprise-generated data to create a manageable risk database. Noise, or irrelevant data inadvertently included may prolong or complicate the ERM cycle increasing enterprise exposure to risk. Failure to produce a tractable scope of information related to internal and external risks may increase the magnitude of adverse events, even events that may have well known risk response procedures. Further, the manual production of such non- exhaustive, limited scope databases may constrict best risk management practices affecting the ability and efficiency of enterprise response to internal and external risks.

Current ERM software utilizes data that has been aggregated into a separate risk database, typically through a proprietary modular platform that is part of the ERM software suite. Some ERM software solutions require specialized aggregating or mining software to be created internally or purchased separately, increasing implementation costs.

A Correlation Technology Solution will only become more robust and have more utility as its corpus size grows. The only limitation to the scope of the enterprise risk domain is the selection of resources by each client. There are no limitations on how many resources can be deemed relevant. From this uncapped scope of resources, a Correlation Technology engine can automatically, completely and exhaustively capture all Company Information deemed relevant to facilitate comprehensive risk outputs, and decompose it into a risk database for system use. Regardless of how much Company Information is included in the risk database, a Correlation Technology engine ensures that only risk data pertinent to module outputs is utilized by the system. This omits all irrelevant risk data. Additionally, a Correlation Technology engine can automatically identify added, modified, or removed resources, keeping data stores current. Using a Correlation Technology System, Big Data issues, such as massive data quantity and noise, are resolved. Further, complete automation of these system functions ensures that erroneous and incomplete manual processes are completely eliminated from data discovery and parsing processes.

b. DEGRADED DATA QUALITY

Risk management silos compile risk data through enterprise-standard risk assessment protocols. However, risk teams may interpret organizational risk protocols differently,

introducing subjectivity and bias into the selection of key risk indicators (KRI). Subjective manual processes introduce inconsistencies and error in the data selection process, which are then propagated throughout the enterprise. These processes also introduce cognitive biases into the system, potentially shifting attention away from risks or KRI that may actually have greater impacts, to risks or KRI that may appear to have similarly great impacts. Further, the inability of manual processes to exhaustively discover all enterprise risks and the connections to enterprise operations degrades overall enterprise risk intelligence due to the exclusion or incompleteness of pertinent risk information.

Current industry software can be customized with company-specific KRI provided by internal risk management divisions. Industry software often has standardized KRI checklists that come pre-loaded for immediate implementation. Software utilizes an integrated database which is aggregated from existing data severs. The integrated database is made available to end-users via dashboard application modules or another graphical user interface (GUI) that can be accessed according to location, user access privileges, etc. However, subjectivity and biases related to manual processes is still integrated into risk databases. This may degrade the quality of data utilized by such software. Degraded data may expose an enterprise to dangerous unrewarded and rewarded risks.

Risk assessment software provides users with pre-fabricated lists that may contain specific risk and control options, attempting to minimize filtering difficulties. However, these lists are not based on unique raw company data. Lists feature options created by the risk assessment software company that can be applied universally or within specific industries. This may discard information on risks or controls considered to be "low probability," "low impact" or risks may not be listed. To combat this, users may manually identify unique risks and introduce control options and metrics into the system. Manual inputs of risks into these systems subject data to human error. Important risks may be entirely missed, while irrelevant data may be included. Incorrect or incomplete manual inputs into risk assessment software then propagate these errors throughout the system and enterprise.

Instead of uploading pre-fabricated universal industry-specific risks, a Correlation Technology System can ensure system comprehensiveness by discovering all enterprise risk on a per client basis. A Correlation Technology System can automatically and exhaustively discover all pertinent risk data. This includes unique company risk data, as well as "universal" industry risk data. KRI are automatically and exhaustively discovered and ranked according to enterprise risk appetites and protocols, enabling decision-makers to plan and act on quality risk knowledge. A Correlation Technology engine automatically iterates all functions "from scratch" to ensure that all risk data is collected and correlated every time the system detects a change to the corpus. The automation of all system functions eliminates manual processes and eliminates associated subjectivity, errors and biases.

c. POOR COMMUNICATION

Tracking and communicating risk data and knowledge across risk silos is difficult. These silos may have different software implementations and manual processes for data gathering, risk assessment, reporting and response. Information that may lead to important discoveries or knowledge may not be shared between silos that are impacted by the same risk. Risk personnel

may not even realize this information is pertinent to risk assessment processes in another silo. Silo-specific risk may not be effectively or efficiently communicated to upper management. This may devalue the benefits of holistic and risk-focused ERM objectives by decreasing the effectiveness and response of ERM hierarchy.

Although most existing ERM software has high ratings for data integration and availability, most clients experience poor silo integration and communication with little reduction in labor costs. Existing ERM software minimally aids in inter-silo communication by simply allowing access to the same wealth of information, but does not aid in discovering what information should be communicated.

Regardless of the silo, all enterprise information is available for Correlation Technology System outputs, while user access is limited according to authorization level. The automated reporting features of a Correlation Technology System ensure that all enterprise tiers and divisions receive expedient, silo-specific reports that are accurate, complete and actionable. Communication is enabled by automatically standardizing risk management processes enterprise-wide, and automating the delivery of pertinent risk knowledge to appropriate parties across silos.

d. POOR SILO INTEGRATION AND BUREAUCRATIC OVERSIGHT

The labor-intensive low-yield nature of isolated silos negatively impacts the time horizon in which risk analyses and response decision reviews are conducted. Fear, overworked employees, poor technical oversight and poor cooperation of risk silos affect the ability of an enterprise to effectively implement ERM. While silos are highly specialized to identify risks and respond in a given time frame, adverse risk events are not silo-specific until they have been analyzed. Root cause analyses are conducted to discover the source of adverse risk events. Disciplinary fallouts from these events may ingrain fear into silo culture making it difficult for any one silo to shoulder the blame of adverse risk events. This may increase the tendency for silos to isolate themselves from others, reducing cooperation. If management or other corporate branches do not have the technical expertise to effectively manage information from specialists within other silos, risks may not be comprehensively understood, dealt with and prepared for. Failure to utilize and facilitate silo risk information may cause silos to work independently of one another. These breakdowns in the bureaucratic structure may increase enterprise exposure to risk and adversely impact the ability to combat such heightened exposure.

Existing ERM software minimally aids in silo integration. Other than aggregating raw data and extracting KPI and KRI into risk databases, there is no oversight dashboard allowing management to pick up crucial risk information pertaining directly to the risk impact of decisions on silo integration and corporate structure.

The Correlation Technology System integrates all client-vetted Company Information from various third party and internal databases into a single risk database for use. Using a single system to integrate all information enables different silo-specific outputs to originate from the same sources of information and enables silos to track risk outputs back to their root resources. Management oversight is addressed by the automatic inclusion of governance, legal and compliance protocols into the Correlation Technology System. This ensures outcomes will fall within enterprise risk

appetites and corporate policies – if such appetites and policies are risk-centric and appropriate. A Correlation Technology System can automatically assign and track risk ownership through user interactions with the system and actionable outputs, and automatically report root cause analyses and associated risk owners to all necessary parties. Automated and actionable mitigation and response reports enable all silos to act precisely and in a timely fashion to reduce, transfer or eliminate risks or respond appropriately to risk events. A Correlation Technology System is the only system to automate and enable integration, transparency and oversight in this manner.

e. INAPPROPRIATELY APPLIED QUANTITATIVE METHODOLOGY

Quantitative risk assessment is typically sufficient for risks that have specific values to determine cost to the bottom line. Risks with uncertain values are better suited to qualitative techniques. However, industry software attempts to address qualitative risks through quantitative solutions that utilize Monte Carlo simulations. Monte Carlo simulations are not appropriate applications to discovering qualitative risk solutions and immediately introduce uncertainty and bias into algorithms for quantitative solutions.

Industry software utilizing Monte Carlo simulations are considered cutting-edge solutions for automated risk assessment and predictive risk modeling. However, Monte Carlo simulations only serve to propagate subjectivity and uncertainty in risk valuation from inputs to outputs. Value inputs by users are susceptible to subjective data, limited and uncertain domain modeling, and failure to provide proper statistical sampling. Subjective data introduces bias into the system. Values may vary from user to user, silo to silo, and tier to tier. Limited domain modeling may narrow the scope of risk inputs due to incomplete human perception of risk values. Uncertain domain modeling may inaccurately portray the domain space to be utilized by Monte Carlo simulations that may improperly reflect real-world probabilities. Lastly, Monte Carlo simulations require proper statistical practices for collecting sample data that may require statistical expertise. Without proper knowledge of these practices, inputs into a Monte Carlo system may be incomplete or incorrect due to human error and filtering.

A Correlation Technology System is the only software solution that does not enable the inappropriate transformation of qualitative information into quantitative values using subjective, and uncertain or limited domain solutions. Instead, a Correlation Technology System allows enterprise risk data to freely associate all qualitative and quantitative data to form an unstructured yet highly refined risk domain. Using only pertinent risk data to establish risk domains enables a Correlation Technology System to completely capture the full scope of risk inputs and accurately communicate the true risk landscape for prediction and modeling purposes.

f. INFFECTIVE AND INCORRECTLY APPLIED QUALITATIVE METHODOLOGY

Qualitative techniques are typically used to assess risks with uncertain values of probability and severity. Unlike quantitative techniques, it is difficult to prove the value of qualitative risk assessment to the bottom line. As a result, upper management typically does not view qualitative techniques as comprehensive solutions to risk assessment and ERM.

Qualitative techniques can only produce estimates of severity and probability values. Ambiguous metrics may hide or disguise risks that do not fall within a small percentage of reliable values

such techniques provide. Some qualitative risk assessment methods currently utilize risk or heat matrices to assign risk ratings. The non-quantitative values included in matrices are open to subjective interpretation typically based on enterprise risk appetite. This subjective interpretation may mean that two individuals may view the severity and probability of a given risk differently. Risks open to such interpretation may be assigned higher or lower values that may lead to poor decision-making based on incorrect information. Further, the subjective values found in matrices complicate the creation of mitigation and response procedures. Risk and heat matrices provide little or no information to enable enterprises to determine resources necessary to implement mitigation or response measures.

A Correlation Technology System is the only software system capable of precise qualitative assessment of risk. A Correlation Technology engine is uniquely suited to qualitative analyses of enterprise risk data. Using proprietary methodology, a Correlation Technology engine can extract the entire knowledge payload from a qualitative resource, correlate qualitative risk data to enterprise operations, and deliver precise and actionable intelligence to the appropriate parties. The automation of this function eliminates manual processes and all associated subjectivity, errors and biases. Only a Correlation Technology System can elicit the true impact of qualitative risks to enterprise operations without distorting enterprise risk intelligence.

g. DATA COERCION

Key risk data must be extracted from unstructured data into usable information. Subjective manual processes may coerce this data into standardized templates and methodologies. Data that cannot be easily categorized according to methodologies may be omitted or subjectively applied to such methodologies. If risk management silos do not understand the real risk hidden within the data, key risk data may be incorrectly inputted into methodologies. Data coercion may exclude, hide or pollute real risk metrics to an enterprise.

Existing industry software relies on subjective manual processes to select data for utilization. This only propagates the coercion of data by populating software framework with subjective data. Further, industry software utilizes solutions that coerce data into the framework provided by the software creators, increasing the subjective nature of the results.

Correlation Technology utilizes free association to enable framework and coercion-free data processing. All data is considered equally eligible for association, therefore no data can be omitted. The successful correlation of all data points becomes a flexible and comprehensive framework from which outputs are generated. The Correlation Technology System can discover all hidden and orthogonal risks through the exhaustive discovery of all successful relations between data points. The automation of system functions eliminates subjective, erroneous or incomplete manual processes.

h. INEFFECTIVE AND INEFFICIENT FILTERING PROCESSES

Manual processes are inefficient and ineffective at discovering risks comprehensively and exhaustively. Risk management teams discover risk by analyzing data gathered from research, observations, enterprise goals and procedural functions. Data is filtered through a variety of standardized and proprietary risk assessment methodologies for utilization in creating best risk

management and strategic management practices. The effective utilization of data is constrained by the limited scope of human understanding and knowledge of risk. This constraint may only lead to the discovery of obvious risks while leaving other meaningful risks undiscovered. Ineffective utilization of data may partially or fully omit valuable and pertinent risk data leading to an incomplete view of risks faced by an enterprise. Further, there is no way of knowing if all data has been included for risk discovery without reviewing all data generated and consumed by an enterprise. There is no way to do this efficiently through manual processes.

The Correlation Technology System is a completely automated system. Unlike manual processes and existing software systems, the Correlation Technology System can comprehensively and exhaustively discover and parse all enterprise risks gathered from a variety of resources without truncating, coercing or degrading risk data. The Correlation Technology System does not implement risk management according to corporate policies, or executive and compliance mandates. Instead, and in adherence to truly risk-centric operations, Correlation Technology utilizes risk data to automatically define risk appetites, executive and governance policies, while ensuring alignment with compliance mandates. By fully automating most risk management functions, especially those associated with identification, gathering, assessment and reporting, Correlation Technology will enable risk divisions and all enterprise personnel to focus on only the actionable outputs of risk management.

The Correlation Technology System delivers complete risk intelligence that can be acted on with confidence. Enterprises are often faced with the current reality that risk data is too expansive and complex to be made tractable and understandable. Manual processes and software solutions only address the superficial reporting needs of organizations and barely aid in addressing the core challenges facing truly risk-centric ERM implementation. As a result, few enterprises experience truly integrated and risk-centric operation. Even those few that do, the price for risk maturity is steep and the path is laden with costly errors, making true ERM integration a pipe dream for most enterprises. Correlation Technology is the only software solution tailored to specifically address the core challenges facing enterprise risk management, and streamlines ERM integration to optimize organizational benefits.