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DAT-610: Optimization and Risk Assessment

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**Introduction**

Organizational risk is the risk of loss resulting from inadequate or failed processes, people, systems, or external events, including legal risk but excluding strategic and reputational risk (Girling, 2013). Operational risk analysis aims to identify and measure each risk source more accurately and enact better mitigation plans against each source. Data analytics leverages data in a particular functional process and enables context-specific, actionable insight. Implementing data analytics into a successful operational risk management strategy will mitigate risk within an organization.

**Organizational Background and Goals**

XYZ, a property and casualty insurer company, uses data analytics to manage market, credit, and insurance risks. A risk and control self-assessment identified greater than expected operating losses mainly from fraudulent automobile accident personal injury claims. Because of this, XYZ has decided to implement the necessary resources and techniques needed to bolster its operational risk program. The goal of XYZ is to have an operational risk management program that performs at the same high level as its other risk programs, all of which are to report to a single chief risk officer.

There is an industry-standard special investigations unit (SIU) already in place that is responsible for investigating potentially fraudulent claims. XYZ has decided that SIU is the appropriate operational risk function needed to bolster its operational risk management program. However, data analytics would better help to rank the order of the most suspicious claims.

**Recommended Techniques and Practices**

A robust operational risk framework would provide XYZ the transparency needed to identify and evaluate risks within the organization, resulting in better decision making. A key objective of an operational risk management framework (ORMF) is to identify, assess, monitor, and report the risks to which an organization may potentially be exposed. ORMF ensures that business actions and decisions are demonstrably influencing by risk management considerations and risk management information. This practice indicates that the integration of the framework itself is in alignment with business processes (The Institute of Operational Risk, 2021). A robust operational risk framework and the correct data analytic tools can help XYZ avoid risks and losses.

Data illuminate risks and opportunities, and the insight derived from this data allows organizations to manage operations more effectively and efficiently, creating value. According to the Association of Certified Fraud Examiners, when detecting frauds early, there is a 50% reduction in duration and a 60% reduction in losses when proactive data analytics are used (ACFE, 2016). The two main benefits that XYZ will receive from fully implementing a data analytic approach are increasing proactivity and anticipation of needs and an increased level of mitigating risk and fraud.

Data analytics is an essential working component of the fraud risk management process, including assessment, detection, investigation, prevention, and reporting. There are several reasons how data analytics is essential for an operational risk management program. These include (Galvanize, 2019):

1. The use of analytics can search for control weaknesses and anomalies that could be fraud indicators.
2. Data analysis supports fraud monitoring plans in identifying the five Ws of the analysis needed for high-risk areas: Who, What, When, Where, and Why.
3. Data analytics provide focus by knowing where to look and what exactly to look at for assessment areas.

Data analytic technology would provide a means to measure and rank the number of most suspicious claims. Performance levels would also be measured using data analytics to ensure that the operational risk management program meets its intended performance expectation in line with the level of other risk programs. Data visualization tools and dashboards provide a more transparent and concise way of interpreting internal loss data and integrating external loss data (that will be made available by subscription) to make more informed business decisions.

**Description of ERM Tools**

Enterprise risk management (ERM) identifies and addresses the potential events that represent risks to achieving strategic objects (CGMA, 2013). The fundamental components of ERM include the assessment of significant risks and the implementation of suitable risk responses. Some examples of risk responses are acceptance or tolerance of risk, avoidance or termination of risk, and risk mitigation by internal control procedures or other risk prevention strategies. Other concepts include risk strategy, risk culture, and risk appetite.

The implementation of ERM would provide Company XYZ the following benefits (MITRE, 2021):

* Greater awareness about the risks that the company faces and the ability to respond to market risk, credit risk, and insurance risk effectively
* Enhanced confidence about the achievement of having an operational risk management program that performs at the same level as its other risk programs
* Improved compliance with legal, regulatory, and reporting requirements
* Increased efficiency and effectiveness of company operations

**Recommendations**

Company XYZ will benefit from a risk management tool that:

* Offers the ability to address the high volume of auto accident and bodily injury claims
* Helps better rank the order of claims that are the most suspicious
* Consolidates risk data from the entire organization and,
* Integrates the SIU analytic output with the internal loss data reported by other business functions within the company

In risk management, it is essential to select a tool that supports the risk management process. Resolver Risk Management Software is the recommended risk management tool for Company XYZ.

Resolver’s Risk Management software offers an integrated view of risk management. Effective risk management connects all essential business functions to help the risk team protect the organization. Resolver makes the process of collecting and analyzing data less overwhelming, especially when a business has multiple business owners across various locations. Resolver Risk Management software enables risk managers to view all of their risks on a single platform, provides data-driven recommendations that can impact the bottom line, and focuses resources on the risks and controls that make the most significant impact on the organization. Resolvers would give Company XYZ a complete view of all its data in one place to create the reports required to make the correct information available to the right people at the right time. Workflow automation notifies risk owners when an evaluation is due or pending, and XYZ can link strategic risk to today’s operations and save weeks of report preparation. Other benefits include the ability for XYZ to update their risks and controls as soon as they see any changes without having to launch a full assessment. There are also trigger assessments as soon as Key Risk Indicators (KRI) or other indicators are out of tolerance, allowing XYZ to mitigate the risk before impacting business objectives proactively.

Resolver Risk Management is recommended for Company XYZ because the benefits are features aligned with the problems this company is facing. When choosing Enterprise Risk Management tools, it is essential to consider what problems the tools will fix. Resolver is a tool that will be an integral part of Company XYZ’s risk management program that performs at the same high level as its other risk programs.

**Visualization Recommendation**

A critical aspect of an organizational risk management strategy is implementing proper risk visualization techniques. Risk visualization is the systematic effort of using images to augment the quality of risk communication along the entire risk management cycle (Eppler and Aeschimann, 2008). Visualization eliminates all non-essential aspects of represented data, visualizes different information dimensions with numerous elements, and makes complex data analysis transparent and collaborative (Roth, 2012). Visual techniques can contribute to successful communication, including identifying the pitfalls and challenges of these techniques. Spatial relationships, color, and animations are three techniques used for risk visualization.

Risk visualization uses the power of graphics to help decision-makers and laypeople have a better ability to handle risks in business areas. According to (Eppler, Aeschimann, 2008), risk visualization designates the systematic effort of using (interactive) images to augment the quality of risk communication along the entire risk management cycle. Charts, conceptual diagrams, visual metaphors, and mapping techniques improve the understanding and subsequent management of risks. Visualizations must be simple, easily interpretable, and truthfully represent the data upon which they rest.

Recommendation

There are several guidelines for risk visualization. Company XYZ should consider an aspect with its risk visualization strategy: the power of visualization lies in its potential to surface implicit assumptions, capture different perspectives, and reveal the right insights. Suppose the visualization is used interactively by a group of managers and risk analysts. The process of creating and modifying a risk visualization is as necessary (if not more) as the final result (Eppler, Aeschimann, 2008).

**Color**

Company XYZ can utilize color to illustrate criticality in risk visualizations. Roth (2012) states that there are significant advantages of using color. One advantage is that the “viewer’s attention is directed to those risks with the highest scores, and this visual guidance is intuitively understood not only by experts but by laypeople.” There are, however, pitfalls to this diagram representation. The use of colors red, yellow, and green can lead to distorted visualizations, and the alarming effect of the color red works like an imperative. Roth states that since the visualization sets priorities based on the colors used, the diagram does not leave much room for independent exploration of the risk data. There is also a lack of an open dialogue on the acceptability of risk. The “line of acceptance” in the matrix is predefined by the matrix design.

**Animation**

Animation is a way to add another dimension to risk diagrams. This technique offers easy integration into public risk communication. An interactive risk diagram can include a time dimension to visualize data. With an interactive chart, users can investigate the data visually following their hypothesis. Animation is a valuable solution for people who are not information literate and lack the training to analyze large tables and charts. (Roth, 2012).

**PCA Visualization**

Principal Component Analysis (PCA) finds principal components as linear combinations of the existing features. It uses these components to represent the original data. PCA aims to capture a good portion of the variance in the data, to make it easy to recover the original features, and that each component adds information. Because it is hard to visualize and understand data in high dimensions, PCA transforms high dimensional data into low dimensional data (2 or 3 dimensions) that offers easy visualization. Projecting the original data into the principal component space reduces dimensionality (Jansen, 2021). Company XYZ would benefit from using PCA because it will identify the variables that are the best predictors of fraudulent claims.

**Presentation**

Text, letter

Description automatically generated

Table

Description automatically generated

Chart, funnel chart

Description automatically generated

Chart

Description automatically generated with low confidence

Table

Description automatically generated

Graphical user interface, application

Description automatically generated

**Articulation of Response**

A robust operational risk framework would provide XYZ the transparency needed to identify and evaluate risks within the organization, resulting in better decision making. A robust operational risk framework and the correct data analytic tools can help XYZ avoid risks and losses related to fraudulent auto and bodily injury claims. With an effective and efficient operational framework, data analytic tools/strategies and data visualization will aid XYZ in achieving its organizational goals.

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