

Micah Wieburg - Week 5 - Research Paper - Risk

Modeling

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1 Introduction

Preparedness for negatively impacting events serves as a key indicator of how well an organization will respond to incidents. Formulating the appropriate risk mitigation strategy is a process that organizations place at the forefront of their objectives. Leadership being risk-minded can have a heavy influence on the organization's culture, therefore, organizational leaders are required to keep staff informed and involved in risk mitigation decisions. Subscribing to an appropriate risk model will aid in establishing the foundation for risk mitigation efforts. Combining risk modeling with well-informed leadership can lead to improved decision-making practices which can help an organization maximize positive outcomes.

Contemporary businesses have the advantage of having access to massive data sets which contain critical information in regard to risky behaviors and threats. Any risk model being evaluated by an organization for implementation should be tailored to leverage big volumes of data. Due to the size of data involved in the risk modeling process for most organizations, assessments performed by risk models are able to provide a broader range of predictions. Outcomes of this nature serve as a contributing factor to the importance of risk modeling and the impact it can have on an organization performing the analysis.

2 What is risk modeling

Risk modeling, at its core, is a risk assessment strategy for calculating and identifying risks with the intention of establishing a holistic outlook on an organization's risk scenarios. Precise results from a risk model provide insight for other prediction models, which can have a major impact on the outcome of business decisions. These outcomes from risk modeling can foster

favorable results from operational to financial decisions. Risk models also inform users of cyber threats, infrastructure risks, and natural disaster probabilities and their impact. Benefits from risk modeling can be applied to organizations of any size or market, which makes it a highly adaptable practice that should be at the core of business practices.

3 Importance of risk models

Due to an ever-increasing risk associated with conducting business in modern times, the need for risk models has continued to grow in importance. This importance is often solidified in the literature concerning companies that have been impacted by cyber-attacks and other risks and suffered grave losses due to a lack of preparation. Companies are burdened by the vast amount of risks and threats in cyberspace as well as the decisions that they make. Producing favorable outcomes is rooted in how well leadership and decision-makers are informed on the risks associated with their ambitions. Risk models provide the opportunity for the unification of decision-makers across all sectors of an organization and bring risk management standardization to the enterprise.

Businesses seek to operate while minimizing the unknown as it relates to the probability of an unfavorable event (Grabowski et al., 2000). The identification of risks will serve companies with the necessary knowledge to direct their mitigation strategies. Making informed decisions involves eliminating gaps in knowledge which could provide the foundation for an unfavorable event to occur. The importance of risk models lies in their ability to fill these gaps and provide aid to identify the leading causes of incidents. Research has established the importance of organizations manufacturing internal risk models to better fit their operations and also the existence of governed, standardized risk models as an option during risk modeling (Algheriani et al., 2019).

A risk model presents a verified set of steps for an organization to follow when addressing concerns for risks that threaten business continuity. The importance of risk models is further exemplified in the approach that is required for implementors to take advantage of the model's benefits. Most risk models follow the Plan Do Check Act (PDCA) cycle which establishes an efficient workflow for managing risks (Algheriani et al., 2019). The Plan phase of the PDCA cycle is to establish a definition of risks based on the operations of the organization. Do, includes enacting any procedures needed to circumvent risk or minimize potential impact. Check, involves verifying the execution of procedures intended to eliminate and diminish risks, while the Act phase is the last phase of the PDCA and encompasses the details for taking action against events associated with the identified risks.

Risk models bestow strategies to protect against cyber attacks, a constantly evolving threat, to enterprises but natural disasters are also a significant risk. Coronavirus 2019 (COVID-19) pandemic presented a major impediment to all organizations' ability to conduct business and operations (Issa et al., 2021). Devastating health and economic conditions crippled society and organizations and the use of risk models is documented as assisting government bodies in containing the spread of the virus. As the pandemic continued, multiple risk models were constructed to identify strategies to mitigate the spread of the diseases. Risk models using fuzzy logic techniques were utilized in Saudi Arabia and played a significant role in reducing the effects of risks associated with the spread of COVID-19 (Issa et al., 2021).

The importance of risk management has garnered attention from numerous governing bodies and other standardization entities. Establishments such as the International Organization for Standardization (ISO) have placed ample dedication to establishing standardized risk models. ISO standards consist of certifications that are awarded to enterprises that met the requirements of the

standard. These standards established by ISO can serve as the gateway to establishing new and effective risk models for organizations. Aspects of standardization are also critical to risk models to demonstrate the importance of the risk modeling approach.

ISO created risk management standards with the goal of encouraging enterprises to confirm vetted standards when forming risk models. ISO standards are versatile, meaning several requirements from different standards can be pulled to create a tailored risk model when desired. (Algheriani et al., 2019) comprised a conceptual risk model which consisted of standards from ISO 9001:2015; ISO 14001:2015; ISO/IEC 27001:2013; ISO45001:2018 and ISO 22000:2005 standards. The motivation for conducting the research required to construct this risk model stemmed from the option that organizations struggled with implementing standards sequentially and requires the integration of several standards for a more achievable model (Algheriani et al., 2019). This proposed risk model's intention was to highlight the importance of risk models in integrated management systems and the need to adjust or create risk models based on company and stakeholder expectations.

4 Modeling Risks

Establishing the appropriate approach to risk modeling is the initial action that dictates the techniques used to aggregate, model, and benchmark risks. A model can be defined as a method or technique which pertains to calculating prospecting events and occurrences by applying economical, statistical, mathematical, and financial strategies and hypotheses (Sitnikov et al., 2017). Several main components make up a model, which includes, actions and techniques for refining gathered data, and information that depicts entries (Sitnikov et al., 2017). To model risks, organizations have the opportunity to follow standards such as ISO 9001:2015 to form a risk model.

Constructing a risk model based on total risk management is also an option when dealing with highly distributed systems.

Following ISO 9001:2015 standards for risk modeling provides enterprises with a foundation from which they are able to adjust their risk model to acclimate to their specific business needs. This standard is a sufficient guide to approaching modeling risks as it is not solely focused on risk mitigation, but also on the growth of an organization. Using this approach to measure risks includes the chance to discover opportunities within unfavorable risks, referred to as positive risks. Modeling risks in this manner of ISO 9001:2015 standards affords organizations a unique set of benefits by leveraging risks to the advantage of the organization. Creating an environment with risk thinking at the forefront of an enterprise is key to establishing a thorough evaluation process of risks, a technique that is provided by utilizing the ISO 9001:2015 standard.

Aspects of modeling risks should include incessant enhancements to the approach of identifying and mitigating risks. ISO 9001:2015 standards help an enterprise's risk modeling methods remain flexible by putting continuous improvement as the focus for risk management and modeling (Sitnikov et al., 2017). Risk modeling must include a holistic approach to the tasks of risk management procedures that are shared among the highest position within an organization. This strategy is bolstered by ISO 9001:2015 standards and allows for leadership to possess the same level of understanding requirements for circumventing and mitigating negative events from risks.

Total Risk Management (TRM) approach to modeling risks includes analyzing the key aspects of a risk to an enterprise. This approach includes risk identification, risk quantification and measurement, risk evaluation, and risk mitigation (Grabowski et al., 2000). Satisfying risk identification involves the creation of a risk framework to aid in fathoming the conditions in which incidents happen and the ramifications of the incident occurring. Risk frameworks help to demon-

strate an environment where modeling can occur, granting credibility to the suggestions provided by the process used to operate the modeling.

Organizations with distributed systems should take a more specific approach to modeling risks to accommodate their system configurations. An approach for large-scale, highly distributed systems recommends the use of dynamic risk models (Grabowski et al., 2000). Utilizing a dynamic risk model supports the flexibility required to properly identify constantly changing risks and seize the risk mitigation within an intricate system.

5 Conclusion

Enterprises see valuable benefits in the practice of risk modeling. These benefits are not limited to large organizations and can be harnessed by any entity committed to the practice of creating and maintaining effective risk modeling practices. Competitive advantages are fostered by organizations that are committed to developing risk models which help to eliminate uncertainties and minimize risks in their operations. The importance of effective risk modeling is demonstrated in the number of methods and techniques created to aid in constructing a risk model. Sufficient risk models can be derived from standards such as ISO 9001:2015, approaches involving TRM, and dynamic risk models.

References

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