

“The importance of collaboration between the project team, end-users, and stakeholders in managing complex decisions and risks in project environments”

Dr. Sara Rye

Associate Professor in Project Management for Development

University of Bradford and APM Risk SIG committee

Johnny Danquah

PMO- Capemini

PhD Candidate – London South Bank University

"The importance of a collaborative approach between the project team, end-users, and stakeholders in managing complex decisions and risks in project environments has long been emphasized. The Porter model emphasizes the need to focus on client needs and competitive advantage. However, a lack of resources and capability development may hinder the project team's ability to provide appropriate services. Supervisors, team members, and end-users can play a supportive role in easing complexity in risk management and decision-making. It is important to understand standards as performance measures for decision-making and the need for detailed knowledge of the project brief. The value of group decision support systems and low-intensity involvements in decision-making would give rise to involving end-users in critical decision-making, the importance of focusing on organizational culture and strategic planning, and the need for a change of mindset to align individual perceptions with the norm. It is also important to gather and analyze information before making a decision. While some project teams see end-users as a threat to their judgment, the research emphasizes the duty to respond to end-users' needs and highlights the value they add to risk assessment.

Risk management in Agile Dynamic Systems Development Method (DSDM) can be used to propose a framework for end-users to identify, assess, and monitor risks. It compares traditional and agile software development methods and highlights the benefits of Agile methods in mitigating risks and managing projects. The emergence of DSDM, which is people-oriented and seen as critical to project success rather than the firm belief in a process-oriented approach, raises questions about whether DSDM can capture the end-users' voice for developing a business risk strategy and to what extent the traditional risk variables can be customized based on the end-users' voice.

Two primary steps of software Risk Management, Risk Assessment, and Risk Control can be followed. The process includes three subsidiary steps: Risk Identification, Risk Analysis, and Prioritization. However, software development organizations often ignore or abandon these steps due to the extra effort, time, and cost involved. Most researchers build on traditional risk management methods, but some have proposed new approaches, such as implementing a relevant metrics program or using software agent technology to support risk management. This signals a need for a more specific result that categorizes the risk management approach according to the size, cost of a software project, and organization. It also emphasizes the importance of managerial involvement in implementing risk management practices and cultural changes within the organization.

End-User Involvement in Risk Management - End-user involvement is a significant factor in the success of software projects, and this is especially true in the case of Agile methodologies. As such, end-users should be actively involved in risk management processes. End-users are the individuals who will ultimately be using the software developed, so they have a unique understanding of the risks that may arise during development and deployment. Their involvement can help identify potential risks, understand the impact of the risks, and develop mitigation strategies (McMahon and Tipper, 2004). Involving end-users in risk management aligns with the Agile manifesto, which emphasizes collaboration with customers, stakeholders, and end-users (Beck et al., 2001). This ensures that end-users have a sense of ownership in the project and that the developed software meets their requirements.

End-users can also provide valuable feedback on the usability and functionality of the software during the development process, leading to better quality software (Hoda et al., 2010). A study conducted by Masood et al. (2019) on Agile practices found that end-user involvement in the risk management process was important for the success of Agile projects. The study recommended that end-users should be involved in identifying, assessing, and managing risks throughout the project's lifecycle. Proofread version:

Furthermore, end-users should participate in regular project meetings and be consulted during the decision-making process. End-user involvement in risk management requires a change in traditional project management approaches that exclude end-users from the development process. End-users' participation should be encouraged and facilitated through open communication, training, and coaching. Moreover, an Agile team must understand that end-users are not passive participants in the development process but active collaborators who can contribute to the success of the project.

Technology Road Mapping (TRM) is a technique for supporting technology management and planning that enables organizations to describe the path to mainstream technology products and services. TRM is seen as a knowledge-based technique and involves integrating all levels of a company's structure to support initiatives and strategic decision tactics. TRM could address devising appropriate performance measures for business success and competitive advantage, the need for risk management to identify potential problems before they occur and mitigate organizations risk-bearing.

The traditional risk management process involves identifying, analyzing, planning, controlling, and tracking risks. However, this process is challenging to incorporate into an evolving world, and new risk management methods are needed. Researchers have identified specific risk management methods, analyzed their strengths and weaknesses, and adapted their characteristics to an evolving environment. For example, the DSRM-Concept was designed based on communication and continuous risk assessment, and the EBIOS Methodology focuses on information systems security risks. Agile methodologies, which focus on transparency and collaboration between teams, can also minimize risks in the application and inconsistencies in risk management approaches.

Continuous and agile risk management processes are valuable to cloud computing, as these environments have a multifaceted and distributed network of services that augment the attack surface. The Operational, Critical, Threat, Asset, and Vulnerability Evaluation (OCTAVE) methodology is an organizational and strategic approach to evaluating the security risk of information systems through various methods. It applies to medium and small organizations information systems and can assist in mitigating the risks of cyberattacks. OCTAVE consists of various phases and processes that are interrelated for mitigating risks. However, it is not a continuous process for risk mitigation but can be a risk evaluation activity. The OCTAVE framework has been used to identify risks in unique project management environments and can be used to evaluate vulnerabilities in organizations having a multi-layered hierarchy. Different frameworks can be opted for measuring and reducing risk based on the type of security risk. OCTAVE proposes a framework that prevents risks occurring from the unorganized processing of data and unauthorized access. The method proposes to train the users about the threats and technical errors that can lead to negative impacts. The OCTAVE has weaknesses and may fail to directly impact the threat, for example, technical errors, higher forces, network failure, human errors, and negligence when risk is identified.

The End-user Risk Framework (ERF) is introduced by the authors as part of a 3-year-long PhD study. ERF is a model that integrates end-users in the risk management phase of product development to ensure compliance with business needs and customer requirements. The ERF model helps to mitigate risks and increase the chances of success by integrating stakeholders, including end-users, in the planning, controlling, and delivery of the project. The ERF model also provides a structured risk management approach, enabling organizations to identify, analyze and manage different types of risks associated with the project. By implementing the ERF model in the DSDM life cycle, businesses can enhance the chances of success and reduce market risks associated with the project.

Combining OCTAVE with compliance theory was used as the basis of the theoretical ERF model, while stakeholder theory was used to improve the relationship between end-users and project managers. The ERF was aligned with the DSDM development process.

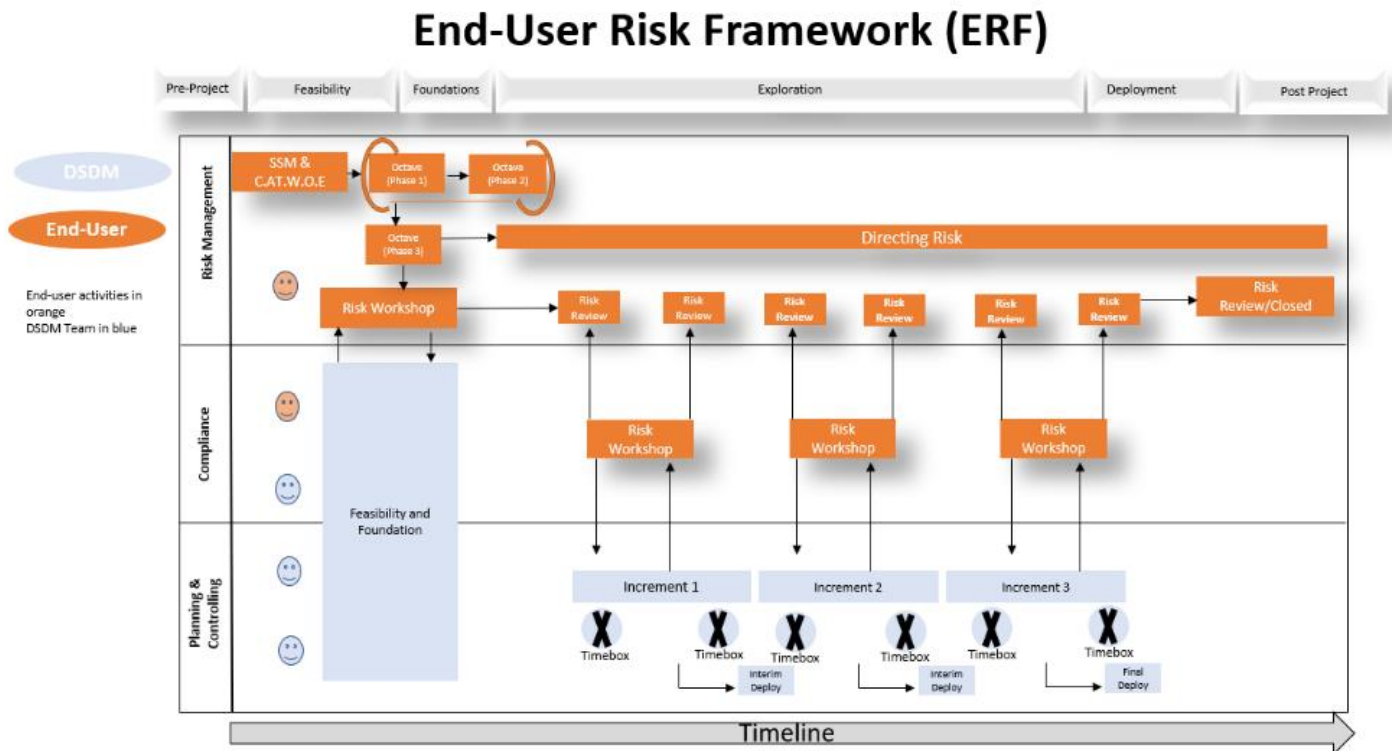


Figure: End-User Risk framework (ERF) (Source: Author, 2022)

ERF is a framework that provides the guidance needed to initiate risk management. Fundamentally, ERF supports the project team in decision-making by providing the flexibility required to achieve project objectives while aligning with existing DSDM methodology and risk management tools. This aids decision-makers and helps project teams identify faults during planning, design, and implementation phases. Therefore, ERF serves as a controlling tool, ensuring that internal and external stakeholders can collaborate to make more informed decisions. ERF does not replace risk management within DSDM but rather mitigates key responsibilities such as risks to end-users and contributes to the effectiveness and long-term durability of the project and the project team. The role of end-users in this process can be identified as informative, consultative, and participative, which can lead to product functional empowerment and an effective, efficient, and economical product (Kautz, 2009).

26 interviewees from IT Consultancy and Utility industries had a positive response to the ERF, noting its potential to provide reliability and simplicity in capturing, mitigating, monitoring, and controlling risk. The findings of the study suggest that DSDM is an imperative requirement for speed and quick fix projects and can aid in overcoming challenges to a great extent. Overall, ERF emphasizes the significance of user involvement, empowering teams in the decision-making process, focusing on recurrent project delivery, iterative development, and accommodating changes, all of which can aid in the successful completion of projects.

It is important that decision-making involves an adaptive and project-based approach, particularly for complex cases. We need to move away from standardized approaches towards gathering a fuller picture of all aspects of risk and considering the ways in which decisions are made to ensure efficient and responsive risk pathways. It is also noteworthy to consider the importance of adequate training for

project teams to interpret risk data accurately. Finally, the decision to involve end-users in risk management processes lies with the company board or CEO, and suggests that end-user involvement may be necessary when presented with complex projects.

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