A Systematic Approach to Risk Management to Enhance Information Technology Project Success in a Dynamic Business Environment

[1]Basilio dos Santos da Silva, [2]Didit Darmawan, [3]Bayar Gardi

[1]*Instituto Boaventura De Timor Leste*
[2]*Sunan Giri University of Surabaya, Indonesia*
[3]*Knowledge University, Erbil, Iraq*

A R T I C L E I N F O

Article history:
Received 7 April 2022
Revised 11 May 2022
Accepted 14 June 2022

Key words:
Risk management,
Information technology project,
Project risk,
Risk identification,
Risk assessment,
Risk mitigation,
Project success.

A B S T R A C T

Risk management is an important element in enhancing the likelihood of success of Information Technology (IT) projects. Risks in IT projects come from various sources, such as technological uncertainties, policy changes, and other external factors. It is important for companies to have a structured approach to identifying, assessing, and management those risks. By using a clear framework and effective risk management tools, companies can mitigate potential issues that could disrupt the course of the project and enhance the chances of success. In this article, various methods that can be applied for more effective risk management in IT projects are discussed, as well as the importance of continuous evaluation to ensure project success. Success in management risks will have a positive impact on management IT projects more efficiently, which in turn increases stakeholder satisfaction and delivers maximum results. Companies need to ensure adequate support in terms of human resources, training, and technology that can support the success of risk management. Effective risk management is not just about avoiding problems, but also about creating opportunities for greater success.

INTRODUCTION

Rapid developments in the field of information technology have brought significant changes in the way companies carry out their projects. IT projects are now an integral part of business processes that aim to enhance operational efficiency and effectiveness (Sehele, 2015). With the increasing complexity of the technology used and the dynamic business environment, there are various kinds of risks that can affect the success of IT projects. Risk management in IT projects is very important to minimize potential failures that can occur during the project life cycle (Samimi, 2020). Effective risk management is one of the key factors that determine the success of IT projects (Kendrick, 2015).

The application of risk management in IT projects is also heavily influenced by the nature of the project itself, which often engages multiple stakeholders and evolving technologies. For example, IT projects can engage teams spread across multiple locations with different skill sets, as well as relying on external service providers or technology vendors. This adds complexity to the identification and mitigation of possible risks, ranging from technical, managerial, to human resource-related risks (Kerzner, 2017). In this case, it is important for project managers to have a systematic and structured approach to management of risks to ensure the project runs on schedule, budget, and desired quality.

Various risk management approaches and models have been developed to support more effective IT project execution. The models engage risk identification, assessment, and mitigation through various tools and techniques, such as SWOT analysis, cause-and-effect diagrams, and others (Yadav et al., 2014). The project team can get a clearer picture of potential threats and opportunities, and determine appropriate mitigation measures. While various models have been implemented, many IT projects still face difficulties in properly management of risks, which further risks the success of the project (Pa & Anthony, 2015). It is important to understand the various issues that arise in IT project risk management in order to find more effective solutions in its implementation (Hillson & Simon, 2012). With a better understanding of these challenges, more effective solutions can be found to ensure IT project success in the face of uncertainty and complexity.

* *Corresponding author, email address:* ***dr.diditdarmawan@gmail.com***

While risk management has become an important aspect of successful IT projects, many companies do not fully understand how to effectively identify and management the risks engaged. One of the main issues that often arises is the inability to properly identify risks in the early stages of a project. A sub-optimal identification process often results in these risks not being detected early enough, so no mitigation measures are taken in time. Without proper identification, these risks cannot be properly management, which can lead to delays, cost overruns, or even complete failure of the IT project. This undercooked risk identification often stems from a lack of understanding of the potential risks to the technology used in the project (Chapman & Ward, 2011). Many companies do not fully understand the complexities and dynamics of the risks associated with new or emerging technologies.

Another problem is the inability to objectively evaluate risks and prioritize the risks that are most critical to project continuity. An inaccurate evaluation process often leads to inappropriate risk management, where risks that should receive more attention are ignored, while risks that are actually less significant are over-treated. This improper risk management usually occurs due to lack of experience or skills in using proper risk assessment methods. Without an accurate assessment, project managers may not be able to take timely mitigation steps, allowing larger risks to develop and affect the success of the project. In fact, small risks that are ignored early on can accumulate and become major problems later on (Hillson, 2009). A more systematic approach to risk assessment can help prevent small issues from becoming bigger threats in the future.

Another problematic aspect is the lack of effective communication between project team members and stakeholders regarding the risks engaged. In IT projects, especially those that engage multiple parties, poor communication can worsen risk assessment and undermine mitigation efforts. This is often the case in projects with complex company structures or those with geographically dispersed teams. When communication about risks is unclear and poorly coordinated, the likelihood of errors in decision-making is enhanced, leading to a failure to manage risks as a whole (Pinto & Slevin, 2009). If communication regarding risks is not managed properly, project teams can miss out on critical information needed to properly assess and address risks, ultimately affecting project success. Clarity and coordination in communication is crucial to ensure that all parties involved understand the priorities and mitigation measures to be taken.

Companies should pay more attention to risk management in IT projects because poorly management risks can cause huge losses, both in terms of finance and reputation. In an increasingly connected and technology-dependent world, failures in IT projects can have a direct impact on business operations and customer confidence. The implementation of effective risk management is needed to ensure that every aspect of an IT project is carefully managed. Especially in large-scale projects or those involving new technologies, risks arising from technological uncertainty and reliance on third parties must be carefully management in order for companies to ensure project success and achieve their strategic goals.

The main objective of this research is to explore ways in which companies can more effectively identify, assess, and management risks in IT projects. The research aims to provide insights into a more systematic approach to management of IT project risks, as well as ways to enhance project success through proper risk mitigation and better communication between stakeholders.

RESEARCH METHOD

To answer the problems related to risk management in IT projects, a literature study approach can be used to collect and analyze various relevant sources regarding the theory and practice of risk management in IT projects. This method allows researchers to identify and review various models, techniques, and tools that have proven effective in the management of IT project risks. This literature study may also include previous research that identifies risk factors often encountered in IT projects, as well as ways to mitigate or avoid potential losses. By using literature studies, researchers can gain a deeper understanding of the best strategies implemented by other companies in dealing with challenges related to risk management (Kerzner, 2017; Turner, 2014).

This approach also makes it possible to conduct a comparative analysis between different risk management approaches used in IT projects across different industries. Literature drawn from various sources such as academic journals, books, and industry articles will provide great insight into how companies can better manage risks related to technology, human resources, budget, and time in IT projects. By integrating existing theories, this literature study provides a solid foundation for understanding the challenges and solutions that have proven effective in the management of risks in IT projects (Hillson, 2016; Crawford, 2015).

RESULT AND DISCUSSION

In an increasingly technology-dependent world, IT projects are key to improving company efficiency and competitiveness. IT projects are not only focused on achieving technical goals, but also play an important role in supporting overall business transformation. Success in IT projects is not only determined by innovation and technical skills, but also by the company's ability to manage risks that arise throughout the project lifecycle. Risk management is one of the integral components in every IT project, given the complexity and uncertainty that always accompany technological developments (Irfandhi, 2016). Understanding how companies can identify, assess, and manage risks in IT projects is crucial to ensure optimal results.

Over time, more and more companies have begun to realize the importance of a proactive approach to risk management. Management of risk prevents losses from occurring, and is a tool for creating new opportunities, especially in IT projects that often engage external factors that are difficult to predict, such as technology policy changes and shifting market trends. These factors can significantly affect the direction and success of a project if not addressed appropriately. Building an effective strategy to identify and management potential risks enables companies to maintain project continuity, reduce unnecessary costs, and avoid costly failures (Pimchangthong & Boonjing, 2017). By systematically understanding and managing potential risks, companies can improve project resilience, ensure continuity of execution, and create added value for stakeholders.

In the face of an increasingly dynamic and fast-changing business environment, companies must adopt a smarter approach to management of IT project risks. Proper application of risk management principles enables companies to face uncertainty with confidence, and to explore various innovative solutions that can increase the value of such projects (Teymouri & Ashoori, 2011). Instead of avoiding risk completely, resilient companies are able to actively manage risk and use it as a source of learning and innovation. Risk management is not just about mitigation, but can also serve as a tool that strengthens the overall strategy of running IT projects. When risks are managed proactively and strategically, companies not only prevent failure, but are also able to strengthen the project management structure and accelerate goal achievement. Effective risk management can improve an company's capability to manage future change and complexity.

Managing risk in IT projects is one of the key challenges for companies seeking to achieve success in project implementation. Rapidly evolving technologies, the need for constant innovation, and the enhancing complexity of every IT project make risk management a vital component of project planning and execution (Mohammad, 2020). Identifying, assessing, and management risks effectively allows companies to mitigate potential losses, optimize resources, and ensure that the project can run according to the budget and schedule that has been set (Hillson, 2016). Thus, proper risk management implementation can be the key to enhancing the likelihood of IT project success.

The first step a company should take is to identify the risks that may arise in an IT project. This risk identification process engages an understanding of the various factors that can affect the project, both from within and outside the company. Internal factors such as limited resources, errors in planning, or lack of technical skills can be risks that need to be considered (Iyamu & Sehlola, 2012). While external factors such as regulatory changes, disruptions in technological infrastructure, or even threats from competitors can be risks that threaten project continuity (Kerzner, 2017). Risk identification allows the project team to systematically compile a list of risks and provides a solid basis for the subsequent analysis and mitigation stages. Carefully identifying the sources of risk is a very important first step in risk management. Without a comprehensive identification process, important risks may be overlooked, increasing the likelihood of significant disruptions to project success.

Once the risks have been identified, the next step is to assess the impact and likelihood of the risk occurring. Risk assessment is usually done using a risk matrix that combines the likelihood of a risk occurring with its impact. The risk matrix allows project managers to classify risks in priority categories, ranging from low, medium, to high. For example, the risk of a delay in the delivery of critical hardware or software can have a major impact on the entire project. Conversely, risks associated with less vital aspects may not require the same attention (Turner, 2014). Through this assessment, companies can prioritize risks based on their severity and likelihood of occurrence, and plan mitigation measures accordingly. The results of the risk assessment process also form the basis for developing a more effective risk response plan. Risk assessments include analytical and strategic steps to ensure that IT projects run smoothly, stay on track, and are prepared for disruptions.

The importance of conducting these risk assessments is also based on the fact that risks in IT projects are not always static. They can evolve over time, depending on various changing conditions. Factors such as changes in company policy, shifting user needs, supply chain disruptions, and technological updates can create new risks or change the characteristics of existing risks. Companies should periodically re-evaluate the risks present in the project to ensure that the mitigation measures taken remain relevant and effective. If a risk that was previously considered insignificant suddenly develops into a major threat, then without re-evaluation, the company may lose control and experience unanticipated losses. Effective monitoring systems, such as the use of risk management software, can help companies to continuously identify and assess risks throughout the project lifecycle (Hillson & Murray-Webster, 2017).

Companies also need to implement various techniques to management the risks that have been identified. Once risks have been identified and prioritized, companies need to implement various mitigation techniques to effectively manage these risks. Companies should adopt a planned strategy so that responses to risks can be implemented quickly and appropriately. The most common risk mitigation techniques include risk avoidance, risk impact reduction, risk acceptance, and risk transfer. For example, if a company identifies that the risk associated with delays in hardware supply may affect the smooth running of the project, they can mitigate the risk by finding alternative providers or by creating a backup plan to ensure the smooth flow of materials (Crawford, 2015). It is important for companies to have a clear contingency plan, which includes procedures for responding if the risk occurs, so that the impact can be minimized.

It is also important to pay attention to the communication aspect of the management of risks. Poorly communicated risks can easily develop into major problems due to delays in detection and handling. The project team and stakeholders must have open and transparent communication channels regarding the risks engaged in the project. That way, all parties can respond quickly if a risk starts to occur or affect the course of the project. Regular updates on the status of existing risks allow project managers to take appropriate action and allocate resources more efficiently (Bourne, 2015). Effective communication also helps in strengthening risk awareness among the entire team and stakeholders, which can enhance preparedness to face challenges (Lin, 2018). A comprehensive risk communication strategy should be established at the project's outset, detailing reporting mechanisms, update frequency, and roles for conveying and addressing risk-related information.

In IT project risk management, technology also plays a very important role. With the help of technologies such as project management software and data-driven risk monitoring tools, companies can get a more accurate picture of the risks they face (Alseiari, 2015). These tools allow companies to visualize risks, monitor their changes in real time, and adjust mitigation actions based on more complete data. Technology also makes it easier for companies to access more and faster information, and makes it possible to identify risk patterns that may not be visible at first glance (Makarenko et al., 2019).

Risk management in IT projects also requires the active engagement of the entire project team. Management of risk is not the job of the project manager alone, but rather a collective responsibility of all team members (Hoffmann, 2022). Each team member needs to be engaged in risk identification and assessment, and given training to be able to identify potential risks they face in their respective tasks. By engaging the entire team, companies can identify more comprehensive risks and enhance readiness to respond to potential problems (Aubry & Kiviniemi, 2015). It is important to build a participatory culture where risk management is not just the responsibility of the project manager, but a shared responsibility of the entire team.

It is important to have a good understanding of the regulations and standards that apply to IT projects. Many countries and industries have regulations that govern how risks in IT projects should be managed, including in terms of data security, privacy, and quality standards. Without adequate understanding, companies risk ignoring legal obligations that can have serious implications, both financially and for the company's reputation. Ignoring these regulations can add unforeseen risks to IT projects, including legal and reputational risks (Anderson & Smith, 2018). For IT projects to be compliant, companies need to proactively integrate legal compliance into risk management plans. Companies need to ensure that they understand and comply with relevant regulations, and integrate them into their risk management plans.

IT project success also depends on understanding the stakeholders that are engaged. Each stakeholder, be it the client, users, or other related parties, may have different expectations of the end result of the project. It is important to identify these expectations early on and manage the risks arising from a mismatch of expectations. For example, if a technology company develops a software application for a large client, but does not meet the functional needs of that client, there can be a significant risk of project failure (Crawford, 2015).

Successful risk management in IT projects also depends on management of change. IT projects often require changes in various aspects, such as hardware, software or even human resources. Changes can occur due to new user requirements, technological developments, or market dynamics that require adjustments to the system being developed. Each of these changes carries risks that can affect the course of the project. Poorly managed changes can become a new source of risk that threatens the success of the project. Companies need to have a good change management process to minimize the risks posed by these changes (Kerzner, 2017). This process includes identifying changes, assessing the risks associated with those changes, and implementing and monitoring changes in a structured way. Good documentation is essential at this stage so that any changes can be traced and evaluated. Systematic change management can minimize the risks arising from change and increase project effectiveness and success.

Finally, post-project evaluation is an important step in understanding whether risk management has been effectively implemented. Evaluating the risks incurred, as well as the success or failure in management, helps companies to learn from the experience and implement enhancements for future projects. This evaluation also provides useful insights to refine the existing risk management system, so that it can be better prepared for more complex IT projects in the future (Bourne, 2015). In this way, the company is not only able to improve the effectiveness of project execution, but also build a strong risk management culture that is adaptive to changes in the fast-evolving technological environment.

IT project success cannot be achieved without an understanding of risk management. As IT projects often involve technical complexity, market uncertainty, and dependency on multiple stakeholders, risk identification and assessment is crucial first step. Properly identifying and assessing risks is a crucial first step to ensure the project can proceed as planned. The real challenge comes when the company must decide on appropriate mitigation measures. Risk management in IT projects requires the engagement of all parties in the company, from the project manager to the wider team members. With a collaborative and systematic approach, existing risks can be management more effectively, thus enhancing the chances of project success significantly (Pimchangthong & Boonjing, 2017). Companies can improve their adaptability to disruptions and significantly increase the chances of success of their IT projects.

Post-project evaluation is key in enhancing the existing risk management system. Through learning from previous project experiences, companies can continuously enhance the risk management process, adapt to the dynamics that occur in IT projects, and adjust the techniques and tools used. In the future, companies that are able to adapt well to change and are able to management risk wisely will be in a superior position in the face of increasingly fierce competition (Didraga, 2013). This is why, successful risk management is not just about avoiding failure, but also about optimizing the opportunities that exist in every risk faced.

By adopting a more mature risk management approach, companies mitigate threats to IT projects, and create an environment that is better equipped to face new challenges. Risks such as system integration failures, cyber-attacks, or user requirement mismatches can be minimized from the start, reducing potential disruptions to the smooth running of the project. Every IT project becomes more likely to succeed, with more opportunities to achieve the desired results. It is important for companies to place risk management as an integral part of every stage of a project, from planning to completion, to achieve continued success in this ever-changing world.

CONCLUSION

Overall, effective risk management is crucial in enhancing the likelihood of IT project success. Proactively identifying, assessing and management risks allows companies to reduce uncertainties that can disrupt the course of the project, while optimizing opportunities. Through a systematic approach to risk management, companies can anticipate potential problems that arise and minimize losses that may occur. Companies that are able to do this well will have a competitive advantage in the completion of IT projects, which are not only completed on time and within budget, but also provide maximum results for stakeholders.

To achieve such success, it is important for companies to have an organized framework for management of risks at every stage of an IT project. Well-trained human resources, the use of appropriate tools, and continuous evaluation of risk management effectiveness will enhance the likelihood of project success. Companies should ensure there is an ongoing training and development process to enhance the team's capacity to manage risk. In the long-term, well-managed risk management will be one of the key factors in achieving more consistent IT project success.

REFERENCES

Abdullah, M. H. A. B., B. Gardi, & D. Darmawan. (2021). Innovation in Human Resource Management to enhance Organizational Competitiveness in the Era of Globalization, *Journal of Social Science Studies*, 1(1), 51 – 58.

Alseiari, K. B. I. (2015). The Management of Risk Awareness in Relation to Information Technology (MERIT). *Theses*, University of Gloucestershire.

Anderson, R. & Smith, J. (2018). Risk Management in Information Technology Projects. *Journal of Project Management*, 15(3), 214-226.

Aubry, M., & Kiviniemi, A. (2015). Managing Project Risks: Insights and Practices from the Field. *International Journal of Project Management*, 33(2), 145-158.

Bourne, L. (2015). *Project Management: A Managerial Approach*. Wiley.

Chapman, C., & Ward, S. (2011). *Project Risk Management: Processes, Techniques and Insights (2nd ed.)*. Wiley.

Crawford, L. (2015). Project Management in the Information Systems Context. *Information Systems Management*, 32(2), 134-144.

Darmawan, D. (2021). Implementation of Agile Project Management in a Dynamic Business Environment, *Journal of Social Science Studies*, 1(1), 275 – 280.

Didraga, O. (2013). The Role and the Effects of Risk Management in IT Projects Success. *Informatica Economica*, 17(1), 86-98.

Hillson, D. (2009). *Managing Risk in Projects*. Gower Publishing.

Hillson, D. (2016). *The Risk Management Handbook: A Practical Guide to Managing the Multiple Dimensions of Risk*. Kogan Page.

Hillson, D., & Simon, P. (2012). *Practical Project Risk Management: The ATOM Methodology (2nd ed.)*. Management Concepts.

Hoffmann, C. H. (2022). Technology Assessments and Effective Risk Management. *International Journal of Technoethics*, 13(1), 1-10.

Irfandhi, K. S. K. (2016). Risk Management in Information Technology Project: An Empirical Study. *ComTech: Computer, Mathematics and Engineering Applications*, 7(3), 191-199.

Iyamu, T., & Sehlola, P. (2012). The Impact of Risk on Information Technology Projects. *International Conference on Management of Innovation and Technology*, 678-683.

Kendrick, T. (2015). *Identifying and Managing Project Risk: Essential Tools for Failure-Proofing Your Project*. AMACOM.

Kerzner, H. (2017). *Project Management: A Systems Approach to Planning, Scheduling, and Controlling (12th ed.)*. Wiley.

Lin, L. (2018). Risk Communication in Multi-Stakeholder Disaster Risk Management Systems : Insights and Recommendations from the Swedish System. *Theses*, Lund University.

Makarenko, Y. P., Tereshchenko, S. I., Metelenko, N. G., Mykolenko, I. H., & Oliinyk, A. S. (2019). Strategic Risks Management in Implementation of IT Projects. *Academy of Strategic Management Journal*, 18(4), 1-5.

Mohammad, S. M. (2020). Risk Management in Information Technology. *Social Science Research Networ*k, 2-21.

Pa, N., & Anthony, B. (2015). A Model of Mitigating Risk for IT Organisations. *International Conference on Software Engineering and Computer Systems*, 49-54.

Pimchangthong, D., & Boonjing, V. (2017). Effects of Risk Management Practice on the Success of IT Project. *Procedia Engineering*, 182, 579-586.

Pimchangthong, D., & Boonjing, V. (2017). Effects of Risk Management Practices on IT Project Success. *Management and Production Engineering Review*, 8(1), 30-37.

Pinto, J. K., & Slevin, D. P. (2009). *Project Management: Achieving Competitive Advantage*. Pearson.

Samimi, A. (2020). Risk Management in Information Technology. *Progress in Chemical and Biochemical Research*, 3(2), 130-134.

Sehele, A. A. A. (2015). Success Factors in Information Technology Projects. *Theses*, University of Bradford.

Teymouri, M., & Ashoori, M. (2011). The Impact of Information Technology on Risk Management. *Procedia Computer Science*, 3, 1602-1608.

Turner, J. R. (2014). *The Handbook of Project-Based Management: Leading Strategic Change in Organizations (4th ed.)*. McGraw-Hill.

Yadav, J. S., Yadav, M., & Jain, A. (2014). Risk Assessment Models and Methodologies. *International Journal of Scientific Research in Education*, 1(6), 135-142.

***da Silva, B. dos S., D. Darmawan, & B. Gardi. (2022). A Systematic Approach to Risk Management to Enhance Information Technology Project Success in a Dynamic Business Environment, *Journal of Social Science Studies*, 2(2), 213 – 218.**