



## Implementation of a Risk Management Model in Teams of Engineering Students

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**Abstract.** Risk management has become a complex but increasingly necessary activity within organizations. In this context, as in organizations, student projects deal with several variables that may interfere with the achievement of objectives. Due to this factor, risk management is indispensable to ensure that delays and planning failures are avoided. In this sense, the main objective of the present work is to implement a risk management model for student competition teams. The research was based on a literature review of the subject, seeking information and discussions in the theory on risk management. Data were collected with the help of a questionnaire to assess the risk management maturity of the team where the studies of this paper were conducted. Further, the data was analyzed, improvements were proposed, and the methodology was applied to the team. Finally, the results were analyzed, and it was possible to achieve the goal of forming a more effective risk management through this work.

**Keywords:** Risk Management, Risk Management Maturity Level, Student Projects.

### 1 Introduction

The Industrial Revolution enabled humanity's technological leap and this fact made organizations increasingly exposed to more and more risks. In this sense, the evolution of risks occurs along with society, and controlling these risks is essential for organizations to achieve better results and become more and more competitive [1]. Just as in the corporate environment, the need for project management is evident in engineering student competition teams. In most cases, students are not used to the responsibilities that exist in the project life cycle and therefore it is observed that delays due to a lack of planning of activities can lead to failure and cause the teams' objectives not to be achieved [2]. In this context, risk management research aims to obtain processes and techniques to improve process safety by predicting unsafe conditions through risk identification, analysis, and assessment techniques so that better results are achieved and project objectives are met [3]. To define a risk management model focused on student teams, this work was carried out, using data survey techniques by risk maturity level survey and defining based on the theoretical referential the best methodology to be used, so that better results were achieved.



## **2 Research Methodology**

This work is characterized as a case study, following the guidelines set by Miguel (2012) [4]. The object of study is a student team in the Engineering area of UFSJ, Formula del-Racing UFSJ. A risk management model was developed to be used by the team so that it was possible to start the effective use of risk management and foresee risk situations that could cause the objectives of the realization of the project not to be achieved. To define which base model could be used, a comparative analysis with the main current risk management methodologies was performed, which resulted in the methodology defined by the PMBOK being the most like the processes developed by the team.

## **3 Results and Discussion**

After performing a risk management maturity diagnosis, the team obtained low maturity level results in all attributes evaluated in the maturity questionnaire: Team Experience, Processes and Policies, and Process Effectiveness. This fact evidenced that there was no clear vision about the right processes for applying effective risk management. With the result, a specific methodology was developed for use in student projects, based on the phases defined by the PMBOK. The actions were focused on phases and the implementation took place in this way: In the Risk Planning stage, a planning was developed through meetings to develop the complete step-by-step risk management plan for the annual project; During the Risk Identification phase, each of the coordinators met with their respective sectors to perform a brainstorming to find possible risks involved in the sector, using techniques such as SWOT analysis to perform the identification; Already during the Qualitative Risk Analysis phase a probability and impact matrix was made that would meet the needs of the identified risks, and the risks were classified; In the Risk Response phase, all identified and evaluated risks were analyzed, and actions and strategies were defined for each one of them through the realization of an action plan based on the 5W2H methodology; Finally during the Risk Monitoring phase, all risks found were monitored along with their actions, so that the management would be effective.

The implementation occurred with the use of a shared spreadsheet to organize all of the aforementioned phases and increased interactivity with team members. According to the implementation, new results were found regarding maturity after the implementation of the processes, and the comparison between before and after is represented in each of the attributes evaluated (see Fig. 1).



**Fig. 1.** Comparison between Maturity Levels.

## 4 Conclusion

In this paper we show a case study in which the objectives of the work were met, since after applying the model proposed in the research, the competition team, the object of study of this work, achieved significant results concerning the level of project maturity in risk management, increasing by an average of about 55% the results before the application of the methodology, concluding that the methodology applied proved to be effective in dealing with the identification and management of risks.

## References

1. Ruppenthal, Janis Elisa. Gerenciamento de riscos. Santa Maria: Universidade Federal de Santa Maria, Colégio Técnico Industrial de Santa Maria, 2013.
2. PMI - Project Management Institute. A Guide to the Project Management Body of Knowledge. USA, Project Management Institute Inc., 2017
3. Pereira, Matheus Rodrigues. O gerenciamento de riscos Empresariais como forma de agregar valor às organizações. 2014.
4. Miguel, Paulo A. C. et al. Metodologia de Pesquisa em Engenharia de Produção e Gestão de Operações. 2. ed. [S. l.]: Editora Elsevier., 2012.