



## Defining the Set of Criteria for Establishing and Evaluating a Project Risk Register

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### Abstract

The project risk register is an important part of project management and one of risk management documents. Among the project risk registers used in practice, there are ones of various size and content. Procedures for the establishment of registers and criteria for the evaluation of registers in project management theory does not have well-established or logically correct criteria for establishing or evaluation risk registers. The most commonly used criteria represent maturity, practical application and compliance with a group of criteria chosen by owners. However, the author cannot conclude that these criteria are sufficient.

The author has used the results of his previous studies to create a set of the criteria and to analyse the definitions of 'risk' and similar concepts and the process of project risk management. The results of both studies and the results of studies on specific projects have served as the basis for defining a set of criteria for establishing and evaluating the project risk register.

A set of criteria can then ensure a better quality of risk registers and their evaluation in the management process.

**Key words:** *project, risk, risk register, set of criteria.*

**JEL code:** M00, M10, M190

### Introduction

The aim of the study is to develop criteria for establishing and evaluating the project risk register. In the previous studies on the criteria for risk register evaluation the author concluded that the criteria chosen as a result of the studies were not sufficient to assess project risk registers. In order to establish a more complete set of criteria the author used the results of the previous analysis of the 'risk' concept and project risk management process.

### Purpose and limitations of the study

In order to achieve the aim of the study, the author did not select the criteria of one type or origin, but rather combined several types and origins in the set of criteria, selected according to the same principles for the purpose of evaluation or use for development. In a set of criteria, the criteria may be of equal or different weights or otherwise ranked or in relationship.

The risk register is a project risk management document. The size and structure of the risk register may vary from small to large. The number of risk register columns selected in the study is from 5 to 40.

The amount of information in the risk register columns may vary from a few words up to several paragraphs of text for one kind of risk, the register may contain one risk register table and several other tables, information may be organized in a table or tables and a table structure grouping or merging columns or rows in a table.

The author breaks the information on the risk register into 2 groups: the content of the risk register, such as the content of columns, and the size of the risk register, such as the number of columns. This study will not analyse the structure of risk records or the content of documents with a risk register as part of annex, neither will it deal with the relevance of risk records to the project for which the relevant risk register.



To create the set of criteria, the author chose the notion 'risk' decisive concept 'event' and project risk management process.

### **Results of previous research**

Previous studies dealt with the notion 'risk' by examining it through ontological, epistemological and methodological analysis.

In the Cambridge Dictionary ([dictionary.cambridge.org](http://dictionary.cambridge.org)) ontology is “the part of philosophy that studies what it means to exist” and in the English Oxford Living Dictionaries ([en.oxforddictionaries.com](http://en.oxforddictionaries.com)) as “The branch of metaphysics dealing with the nature of being.” In the ontological analysis, the concepts determining the definitions of the concept 'risk' in 24 definitions were examined by determining the decisive concept or concepts, limiter/limiters of the decisive concept volume and the ranking of the limiter/limiters of the decisive concept volume by ontological category and definitions and uses of the notion 'event' in the sources.

In dictionaries, 'event' has several meanings. The author chose one or several definitions where it can be concluded that their meaning is close to the one in the dictionary definitions. In the Cambridge Dictionary one of the 'event' definitions is “anything that happens, especially something important or unusual”, in the Macmillan Dictionary ([www.macmillandictionary.com](http://www.macmillandictionary.com)) 'event' is “something that happens, especially something that involves several people” or “used in a general way to talk about a combination of things that happen”, in the English Oxford Living Dictionaries 'event' is “a thing that happens or takes place, especially one of importance”, in the Merriam-Webster dictionary ([www.merriam-webster.com](http://www.merriam-webster.com)) 'event' is “a postulated outcome, condition, or eventuality” or “something that happens” or “a noteworthy happening”, or “a subset of the possible outcomes of an experiment”, and in the Collins English Dictionary ([www.collinsdictionary.com](http://www.collinsdictionary.com)) “an event is something that happens, especially when it is unusual or important. You can use events to describe all the things that are happening in a particular situation” or “anything that takes place or happens, esp something important; happening; incident” or “the actual or final outcome; result”, and in the American English “a happening or occurrence, esp. when important”. The definitions of the 'risk' concept include information about the decisive concept or concepts and about limiters of the decisive concept that facilitates risk identification and analysis. Correct use of the concepts and limiters that are used in the definitions of the 'risk' concept can promote development of project risk management documents, which might be an applicable register for all participants of the project risk management process.

The term 'ontology' is defined in the English Oxford Living Dictionaries as “The branch of metaphysics dealing with the nature of being”, in the Cambridge Dictionary : “the part of philosophy that studies what it means to exist”, in the Macmillan Dictionaries: “the type of philosophy that deals with the study of existence” and in the Merriam-Webster dictionary the first meaning is “a branch of metaphysics concerned with the nature and relations of being”, the second “a particular theory about the nature of being or the kinds of things that have existence”. The author believes, the content of the 'risk' concept is determined by several decisive concepts, which either specify, narrow down or widen the content of the concepts. It can be assumed that the authors of the definitions believe that this is the way, how to define the concept of 'risk' better or more precisely. However, considering that science requires precise definition of the basic concepts, the listing of several decisive concepts cannot provide for a more complete and precise definition, if the source does not contain the definitions of the decisive concepts or the decisive concepts are not used in the source text or are not used frequently enough to make conclusions about the content of the concepts [Uzulans, 2017].



In the Collins English Dictionary epistemology is “the theory of knowledge, esp the critical study of its validity, methods, and scope”, while in the Merriam-Webster Dictionary it is “the study or a theory of the nature and grounds of knowledge especially with reference to its limits and validity”, in the Cambridge Dictionary (dictionary.cambridge.org) epistemology it reads “the part of philosophy that is about the study of how we know things”. The author concluded that “The first kind of definitions does not have preconditions, anything can be an event, the main aspect is the act of happening and its consequences. The second kind of definitions has preconditions, after the identification of which it is possible to identify the result. The second kind of definitions can be considered similar to the definition of “event” in the probability theory, similar to Merriam-Webster definition “a subset of the possible outcomes of an experiment”. It can be concluded that according to the definitions of the first kind the identification of risks must be started by identifying the influence as only after that it can be assessed which events have an effect on the project as anything can be an event.” [Uzulans, 2017].

The term ‘methodology’ has different definitions. The term ‘methodology’ is defined in the English Oxford Living Dictionaries as “A system of methods used in a particular area of study or activity”, in the Cambridge Dictionary “a system of ways of doing, teaching, or studying something”, in the Macmillan Dictionaries “the methods and principles used for doing a particular kind of work, especially scientific or academic research”, in the Merriam-Webster dictionary (www.merriam-webster.com): “a body of methods, rules, and postulates employed by a discipline” or “a particular procedure or set of procedures” or “the analysis of the principles or procedures of inquiry in a particular field”, and in the Collins English Dictionary “A methodology is a system of methods and principles for doing something, for example for teaching or for carrying out research” with differences between British English “the system of methods and principles used in a particular discipline” and American English “the science of method, or orderly arrangement; specif., the branch of logic concerned with the application of the principles of reasoning to scientific and philosophical inquiry”. The author concluded that “The definitions in the sources are of different lengths and structures. To determine what should be included in the risk register we can use the information from the definition of the concept ‘risk’. The length and structure of the definitions is not a factor in determining the amount of information to be used for the risk register.” [Uzulans, 2018]. However, this conclusion needs to be clarified, as the author's conclusion on the structure of the definition should be confirmed or rejected by additional research.

The results of three studies have been summarized in Table 1.

Table 1.

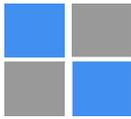
**Concepts used in the definitions of the notion ‘risk’**

Decisive concept or concepts	Concepts used in the definitions
factors, events	external, affect, progress, success, project, likelihood, assumption, probable, unlikely, analysis of importance, assumptions
event, condition	occurs, positive impact, negative impact, project objective
event, condition	uncertain, occurs, positive effect, negative effect, project’s objectives

*Source: Compiled by the author*

**Project risk management process**

The project risk management process is similar in different sources for project management literature. In the ISO 21500:2012 standard there are the following groups of the



risk management process: to identify risks, assess risks, treat risks, and control risks. Each group of the process has primary inputs and primary outputs, see Table 2.

Table 2.

**ISO 21500:2012 risk management process**

Criteria symbol	Risk management process groups	Primary outputs
ISO1	identify risks	Risk register
ISO2	assess risks	Prioritized risks
ISO3	treat risks	Risk responses Change requests
ISO4	control risks	Change requests Corrective actions

*Source: Compiled by the author from ISO 21500:2012*

A Guide to the Project Management Body of Knowledge risk management process provides for the following: to plan risk management, identify risks, perform qualitative risk analysis, perform quantitative risk analysis, plan risk response, and control risks. Each group has primary inputs and primary outputs, see Table 3.

Table 3.

**A Guide to the Project Management Body of Knowledge risk management process**

Criteria symbol	Risk management process	Primary outputs
Not used	Plan risk management	Risk management plan
PMI1	Identify risks	Risk register
PMI2A	Perform Qualitative Risk Analysis	Project documents updates
PMI2B	Perform Quantitative Risk Analysis	Project documents updates
PMI3	Plan Risk Responses	Project management plan updates Project documents updates
PMI4	Control Risks	Work performance information Change requests Project management plan updates Project documents updates Organizational process assets updates

*Source: Compiled by the author from A Guide to the Project Management Body of Knowledge*

### Set of Criteria

According to the analysis of the ‘risk’ concept in the project risk management process and the division of the tables into 2 categories, the content of the register and the size of the register criteria set was created, see Table 4.

Table 4.

**Criteria for evaluation**

Criteria category	Risk register information	Criteria description	Criteria subcategory
RRC	Risk register content	The risk descriptions correspond to the definition of ‘event’	RRC D
		The notion ‘risk’ complies with the limits set out in the risk	RRC L



		definition	
RRV	Risk register volume	The risk register columns contain information for the project risk management process	RRV_ISO_... RRV_PMI_...
		The risk register contains references to other project management documents which contain the relevant information about project risk management	RRV_D

*Source: The author's compilation*

### **Analysis of the risk registers according to the set of criteria**

For the analysis, the author selected 10 risk registers that were publicly available on the Internet in March 2020. The search was performed on [www.google.com](http://www.google.com) with queries ““project risk register” site:org”, ““project risk register” site:gov” and ““project risk register” site:edu”. The author assumed that 10 registers are sufficient to evaluate the possibility of using the set of criteria.

The author selected only those lists that contained at least one column with a description of risks, for the results of the risk analysis and columns with information on risk responses or risk control, see Table 5.

Table 5.

### **Risk register characteristics**

Source no.	Risk register name	Short description
1.	Risk register EAA Storage Reservoir, document Appendix B Cost Estimates and Risk Analysis	The risk register is part of a document that contains information about the project. There are 16 columns in the register, the risks are arranged according to the risk categories and there is a short explanation of the left of the categories. The risk register is also containing risk matrix, overall project scope, cost value ranges, and footnotes. An explanation of the column names is given in the footnotes.
2.	Table 3 – Condensed Risk Register – Construction un Table 4 – Condensed Risk Register – O&M document Appendix N Cost and Schedule Risk Analysis	The risk register is part of a document that contains information about the project. There are 16 columns in the risk register and footnotes. The risks are arranged according to risk categories.
3.	Without title	There are 18 columns in the risk register, the columns are arranged according to the stages of the risk management process.
4.	Border Patrol Facilities and Tactical Infrastructure Risk Register	There are 12 columns in the risk register, part of the information is hidden. The risk register contains a table with project information and a summary of risk management.
5.	Table C5-2. Risk Register, document Risk Analysis Methodologies and Procedures	The risk register is part of a document that contains information about the project. There are 5 columns in the risk register and footnotes.
6.	Project Name: Minnesota Health Insurance Exchange Project Risk Register	There are 14 columns in the risk register.
7.	Attachment A Risk Register, document Attachment B AECOM, Amended Risk Management Plan (July 2019)	The risk register is part of a document that contains information about the project. There are 5 columns in the risk register and 8 columns contain a list of information to be entered.



8.	LIGO M060045-00-M, document Advanced LIGO Risk Management Plan	The risk register is part of a document that contains information about the project. There are 18 columns in the risk register, 2 separate tables with risk value, 12 columns are grouped according to the stages of the risk management process.
9.	Appendix B: Example risk registers, document RICS professional guidance, UK Management of risk 1st edition	The risk register is part of a document that contains information about the project with 2 risk registers. In the first one, there are 40 columns, 26 columns are grouped according to the stages of the risk management process. In the second one, there are 16 columns, columns are grouped according to the stages of the risk management process.
10.	Project Risk Register Triangle Transit - Durham-Orange County Corridor	There are 14 columns in the risk register and 1 separate table with risk value.

*Source: The author's valuation*

The registers were evaluated according to the selected criteria, see Table 6.

Table 6.

**The risk register's compliance with criteria**

Source no.	Compliance with criteria
1.	RRC_D, RRC_L ISO1, ISO2, ISO3; PMI1, PMI2A, PMI2B, PMI3
2.	RRC_D, RRC_L ISO1, ISO2, ISO3; PMI1, PMI2A, PMI2B, PMI3
3.	Only for selected risks RRC_D, RRC_L ISO1, ISO2, ISO3, ISO4; PMI1, PMI2A, PMI2B, PMI3, PMI4
4.	RRC_D, RRC_L ISO1, ISO2, ISO3; PMI1, PMI2A, PMI2B, PMI3, PMI4
5.	RRC_D, RRC_L ISO1, ISO2; PMI1, PMI2A, PMI2B
6.	RRC_D, RRC_L ISO1, ISO2, ISO3, ISO4; PMI1, PMI2A, PMI2B, PMI3, PMI4
7.	RRC_D, RRC_L ISO1, ISO2, ISO3, ISO4; PMI1, PMI2A, PMI2B, PMI3, PMI4
8.	RRC_D, RRC_L ISO1, ISO2, ISO3; PMI1, PMI2A, PMI2B, PMI3
9.	For the first table RRC_D, RRC_L ISO1, ISO2, ISO3, ISO4; PMI1, PMI2A, PMI2B, PMI3, PMI4 For the second table RRC_D, RRC_L ISO1, ISO2, ISO3, ISO4; PMI1, PMI2A, PMI2B, PMI3, PMI4
10.	RRC_D, RRC_L ISO1, ISO2, ISO3; PMI1, PMI2A, PMI2B, PMI3

*Source: The author's valuation*



## Conclusions

The author is aware that the number of risk registers selected for analysis is insufficient to assess the correctness, number and relationship of the selected criteria. However, it can be concluded that the development and use of a set of criteria for the analysis of risk registers was a correct approach. On the other hand, it was not possible to apply the established set of criteria to the recommendations for the development of risk registers, because the selected set of criteria did not contain a enough criteria and the relationship among the criteria was incompletely determined. In order to be able to use the research result for the development of reasonable recommendations for the establishing risk registers, a study is required, in which additional criteria will be selected in addition to the 2 existing criteria – the definition of the ‘risk’ notion and project risk management process.

While planning the study, the author had intended to use the weight measurement of the criteria, the study process revealed that the weight of the selected criteria could not be determined without additional studies on the selected criteria.

All registers met the criteria RRC\_D and RRC\_L. However, the conformity assessment criterion cannot be considered as reliable, as the presence of columns in the risk registers only partially confirms compliance. It would therefore be necessary to identify other features that confirm the register compliance with the criteria, incl. evaluating the conformity of the column contents.

The 5 risk registers examined in the study complied with all groups in the project management process SO1, ISO2, ISO3, ISO4; PMI1, PMI2A, PMI2B, PMI3, PMI4, one risk register with 2 tables, one of which covered the entire process group.

Also, for the criteria SO1, ISO2, ISO3, ISO4; PMI1, PMI2A, PMI2B, PMI3, PMI4 the conformity assessment criterion cannot be considered as reliable, as the presence of columns in the risk registers only partially confirms compliance. In addition, an analysis of the project risk management process is required because the process groups or steps are the same, however, the content of the groups or steps is not the same.

The main conclusion of the study is that the developed set of criteria ensures the development of better, but still insufficiently substantiated recommendations for the establishment and evaluation of registers. The third group of evaluation criteria could be a project analysis corresponding to the risk register.

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