



## THE EPISTEMOLOGICAL ANALYSIS OF THE CONCEPT “RISK” IN PROJECT RISK MANAGEMENT

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### Abstract

The aim of the current research series is to examine the risk registers of real projects to find correlations between the project management theory, especially project risk management, and practical results of the risk management of real projects – the risk registers publicly available in the Internet.

In the current research the author analysed the concept “*event*” that defines the content of the concept “*risk*”. The use of the concept “*event*” was analysed in 9 different sources to find out how to use the concept “*event*”. Epistemological analysis of the concepts “*event*” in the “*risk*” definition was used to answer the question what the risk in project management means.

In the previous studies the author concluded that the methods used for the analysis of the definitions of the concept are insufficient because the theoretical risk registers do not coincide with the risk registers of real projects. However, we can conclude that the risk registers of real projects are not sufficiently substantiated theoretically if we assume that the risk registers of real projects comply with the documents governing project management.

**Key words:** *project, risk, concept, event, epistemological analysis.*

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

### Introduction

Project management history is a relatively new science characterized by dynamic development. Defining precise, unanimous and generally accepted concepts is important for any branch of science. In project management as a new branch of science many concepts are under construction, many concepts differ both in the content and scope. One of such project management concepts is “*risk*”. The genius concepts of the risk definitions are different. The most common concepts are “*event*” and “*uncertainty*”. The concept “*event*” is widely used in different areas, in philosophy, mathematics, and physics or away from the scientific definition. The same is true in the case of the concept “*uncertainty*”. The content of the concepts “*event*” and “*uncertainty*” is very different and maybe the analysis of the ontological, epistemological and methodological and real project risk register of the definitions of “*event*” and “*uncertainty*” will provide the analysis, which reveals relationships, which could not be identified by the methods used in previous studies.

### Methodology of Research

The research was conducted in two stages. The goal of the first stage was to find out if the selected methods of research can be used to carry out the ontological, epistemological and methodological analysis of the concept “*risk*”. The author assumed that the selection of at least three sources in each kind of sources will be sufficient for the assessment of the validity of the selected methods. In the second stage of the research a wider use of the sources is intended. It is also planned to compare the results of the theoretical analysis of the sources with the results of the project risk analysis. The article deals with the results of the first stage which analysed how to use the concept “*event*” in 9 different sources, 3 project management guidelines of



international project management institutions, 3 project risk management guidelines, and 3 author books.

One of the definitions of the term “epistemology” in the Merriam-Webster dictionary 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 epistemology it reads “the part of philosophy that is about the study of how we know things” and in the Collins dictionary epistemology there the definition: “the theory of knowledge, esp the critical study of its validity, methods, and scope”. Stanford Encyclopedia of Philosophy states that “Defined narrowly, epistemology is the study of knowledge and justified belief” and lists several questions: “As the study of knowledge, epistemology is concerned with the following questions: What are the necessary and sufficient conditions of knowledge? What are its sources? What is its structure, and what are its limits? As the study of justified belief, epistemology aims to answer questions such as: How we are to understand the concept of justification? What makes justified beliefs justified? Is justification internal or external to one's own mind?”.

The definitions of epistemology differ, each of them stressing some of the epistemology aspects. The author offers the following formulation of the research question: is the concept “*event*” chosen to determine the scope of the risk definitions in the selected sources described and used in the text in the way that lets conclude that the knowledge about risk in the selected sources is well-grounded, truthful and reliable.

In the “*risk*” definitions selected by the author, the concept determining the scope of the concept “*risk*” is the “*event*”, in 2 definitions of 9 the scope of “*event*” was limited by another concept. In two of the selected sources there are definitions of “*event*” – “A point in time when an activity(s) is started or completed. It does not consume time” (Larson, Gray, 2011) or “A point in the progress of the project after total completion of all preceding activities” (Young, 2007). The author believes that both definitions of “*event*” do not relate to the concept “*risk*” and that let the author assume that in the selected sources a generally accepted meaning of “*event*” is used that corresponds to the definitions of “*event*” in the dictionaries of the English language.

In the selected 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 Cambridge Dictionary one of the “*event*” definitions is “anything that happens, especially something important or unusual”. In Macmillan Dictionary “*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 English Oxford Living Dictionaries “*event*” is “a thing that happens or takes place, especially one of importance”. In Merriam-Webster dictionary “*event*” is “a postulated outcome, condition, or *eventuality*”, “something that happens” and “a noteworthy happening” as well as “a subset of the possible outcomes of an experiment”. Collins English Dictionary “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”, “anything that takes place or happens, esp something important; happening; incident” “the actual or final outcome; result”, and American English “a happening or occurrence, esp. when important”.

When analysing definitions it can be found that there are two kinds of definitions. Table 1 summarizes the terms featuring in definitions and their relationship.



Table 1

**The terms featuring in definitions and their relationship**

Concept	Relation to other concepts
Definitions of the first kind	
Anything, something,	Happen, happening
Thing, combination of things	Happen, takes place
Noteworthy	Happening
Anything, something,	Important, unusual, involves several people, incident
Thing	Importance
Thing	Particular situation
Definitions of the second kind	
Outcome	Postulated, actual, final
Outcomes	Possible, set

*Source: author's calculations based on "event" vocabulary definitions*

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 identification of risks must be started from 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.

In the research the author has used quantitative methods of research: analysis of the concept frequency, connection of the concept with other concepts or terms; and qualitative research methods: the way of using the concept "event" by finding out how "event" is used together with the concept "risk" and the kinds of events, properties of "event" and actions in relation to "event".

**The sources used in the research**

In the research the author used the same 9 sources: 3 project management guidelines, 3 project risk management guidelines, and 3 author books which were used in the ontological analysis. The criteria for selecting the sources were the definition of the concept "risk" and the application of the concept "event" in defining the concept "risk".

The three project management guidelines are "A Guide to the Project Management Body of Knowledge. Fifth Edition", or PMBOK® Guide, "The New York State Project Management Guidebook, Release 2", and "Practice Guide to Project Management for IT Projects under an Outsourced Environment, Government of the Hong Kong Special Administrative Region". PMBOK® Guide is not publicly available online. In the electronic edition, pdf file format, there are 616 pages, in the manual there are 13 chapters, 4 appendices, references, glossary and index. In the Index section there is no "event". The definition of "event" is not. PMBOK® Guide describes 10 areas of project management; one area is the risk management. The concept "risk" is mentioned in the descriptions of all areas of project management. "The New York State Project Management Guidebook, Release 2" is publicly available online as an electronic edition



in 19 pdf format files, the manual has 3 parts and 3 appendices, in the so-called glossary, there is no definition of “*event*”. In the first part there are 5 chapters, 298 pages, in chapter 2 there are 6 chapters, 67 pages, in part 3 there are 6 chapters, 192 pages, appendices consist of 144 pages. “Practice Guide to Project Management for IT Projects under an Outsourced Environment” is publicly available online as a pdf file, there are 616 pages, the manual contains 123 pages, 2 parts, in part 1 there is one chapter, in part 2 there are 5 chapters, in the so-called glossary, there is no definition of “*event*”.

The three project risk management guidelines are “Project Risk Management Handbook. Threats and Opportunities, Second Edition”, “North Dakota Project Management Guidebook – Risk Management Supplement”, and “Risk Management Guidelines. Managing project costs through identification and management of risks”. The sources are publicly available online. “Project Risk Management Handbook. Threats and Opportunities” as a pdf file contains 65 pages, 3 chapters, 3 appendices, the so-called Index, in the Index section “*event*” does not appear, neither there is a definition of it in the Glossary. “North Dakota Project Management Guidebook – Risk Management Supplement” as a pdf file contains 93 pages, 7 chapters, 13 appendices, in section Risk-Related Definitions there is no definition of “*event*”. “Risk Management Guidelines. Managing project costs through identification and management of risks” as a pdf file contains 68 pages, 6 chapters, 3 appendices and the list of individual terms with definitions, there is no definition of “*event*”.

The three author books are “Identifying and Managing Project Risk”, Tom Kendrick, “Project Management: The Managerial Process”, Erik W. Larson, Clifford F. Gray, and “The Handbook of Project Management”, Trevor L Young. “Identifying and Managing Project Risk” by Tom Kendrick (third edition) and “The Handbook of Project Management” by Trevor L Young are publicly available online through Google Books, the availability extent of the content is 10-15% of the total size. “Identifying and Managing Project Risk”, Tom Kendrick has 369 pages as a pdf file, 13 chapters, an appendix and index. There is no mention of “*event*” in the Index section. “Project Management: The Managerial Process”, Erik W. Larson, Clifford F. Gray in the pdf format there are 691 pages, 18 chapters, 2 appendices and a glossary. In the glossary there is a definition of “*event*”, however, it cannot be referred to risk management. In the Index there is one mention of “*event*” and one mention “*event node*” (Larson, Gray, 2011). “The Handbook of Project Management”, Trevor L Young in the pdf format contains 303 pages, 12 chapters, 2 appendices, one of them is a glossary which contains the definition of “*event*”, in the Index section there is no mention of “*event*”.

### **Findings/Results**

In the 6 chosen sources the concept defining the scope of the concept “risk” is “*event*”, in 3 definitions there is a different concept that determines the scope that is connected with the concept “*event*”. The author believes that the inclusion of different definitions of “risk” will provide for the opportunity to compare the application of the concept “*event*” in the selected sources. Table 2 summarizes the definitions of “risk”. Definitions D3, D6 and D9 are the ones with an additional concept.



Table 2

**The definitions of “risk”**

Definition	Source
1. Project management guidelines	
D1. An uncertain event or condition that, if it occurs, has a positive or negative effect on one or more project objectives.	A Guide to the Project Management Body of Knowledge.
D2. An anticipated event with the potential to positively or negatively affect the project.	The New York State Project Management Guidebook.
D3. One of the dimensions of the project management methodology which is the possibility of an event occurring that will have a negative impact on the achievement of objectives. Risk is measured in terms of impact and likelihood.	Practice Guide to Project Management for IT Projects under an Outsourced Environment.
2. Project risk management guidelines	
D4. An uncertain event or condition that, if it occurs, has a positive or negative impact on at least one project objective. A risk may have one or more causes and, if it occurs, one or more impacts (“project risk” definition).	Project Risk Management Handbook. Threats and Opportunities.
D5. An uncertain event or condition that, if it occurs, has a positive or negative effect on a project’s objectives. Risk is often a measure of the inability to achieve overall project objectives within defined project requirements and constraints and has three components: (1) the probability of occurrence, (2) the impact of the risk on the program, and (3) the time horizon during which the consequences will occur if the risk is not mitigated.	Risk Management Guidelines. Managing project costs through identification and management of risks.
D6. The combination of the probability of an uncertain event and its consequences. A positive consequence presents an opportunity; a negative consequence poses a threat.	North Dakota Project Management Guidebook – Risk Management Supplement.
3. Author books	
D7. In projects, a risk can be almost any undesirable event associated with the work.	Kendrick T., Identifying and Managing Project Risk.
D8A. An event that has been identified as potentially threatening the project’s integrity if it actually happens. D8B. A risk is any uncertain event that, if it occurs, could prevent the project realizing the expectations of the stakeholders as stated in the agreed business case, project brief or agreed definition. A risk that becomes a reality is treated as an issue.	Young, Trevor L. The Handbook of Project Management.
D9. The chance that an undesirable project event will	Larson, Erik W., Gray, Clifford, F.



occur and the consequences of all its possible outcomes.	Project Management: The Managerial Process.
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*Source: author's calculations based on sources definitions*

Table 3 provides the comparison of the dictionary definitions of “event” with the use of the concept “event” in “risk” definitions.

Table 3

The comparison of the “event” uses

Definition	Analysis
D1	Compared to the dictionary, the first kind of “event” definitions have correspondences and an addition about significant consequences of the event, which have an influence regarding the project. The difference is that the “event” has a property or kind – <i>uncertain</i> and the “risk” has one or several causes.
D2	Analogous to D1, the property or kind is <i>anticipated</i> .
D3	One of the different definitions when the defining concept is the <i>event</i> “possibility”, the rest is similar, “event occurring” and the influence that is connected with the project.
D4	Analogous to D1.
D5	Analogous to D1.
D6	Partly analogous to D3, the defining concept is <i>event</i> “probability and consequences” and in addition to the <i>event</i> , there is a property or kind – <i>uncertain</i> .
D7	Specific definition, as it does not mention the happening of “event” and has a specific kind of influence – associated with the work, besides, the event has a property or kind – <i>undesirable</i> .
D8	D8A Analogous to D1, difference: the influence is <i>potentially</i> . D8B Analogous to D1, with a wider description of the event consequences.
D9	Partly analogous to D3, the defining concepts are “ <i>chance</i> ” and “ <i>consequences</i> ”, “event” has the property “undesirable” and a limited scope “ <i>project event</i> ”. In the definition provided by the source there is the second kind dictionary definition as there are “all possible outcomes”.

*Source: author's calculations based on sources definitions*

It can be assumed that by not defining the concept “event” the authors of the sources used a generally accepted definition of the concept. In the “risk” definitions of the sources the authors used a generally accepted definition of the concept. In the “risk” definitions of the sources there are no contradictions between the dictionary definitions of “event” and the meaning of “event” in the risk definitions of the sources, an “event” takes place, “event” has consequences, and consequently the use of “event” corresponds to dictionary definitions and is reliable.

To assess if the concept “event” is substantiated, the application of “event” in the selected sources was analysed. The results are summarized in table 4.





Table 4

**The application of “event”**

Source	Frequency of terms “event” and “events”			Distribution of application
	Total number <sup>22</sup>	The application is connected with risk management	Application has no connection with risk management	
A Guide to the Project Management Body of Knowledge.	46	Event – 10 Events – 14	Event – 7 Events – 15	In the chapter on risk management “event” is used 4, or 8.7% and “events” is used 10 or 21.7%. All together 30.4% of the total number are used in the section on risk management. In 52% “event” and ”events” are used in connection with risk management and in 48% are not connected with risk management.
The New York State Project Management Guidebook.	64	Event – 13 Events – 18	Event – 24 Events – 9	Non-applicable as in the manual there are chapters about the project processes rather than areas of activity. “Event” and ”events” in 48% are used in connection with risk management and in 52% are not connected with risk management.
Practice Guide to Project Management for IT Projects under an Outsourced Environment.	17	Event – 1 Events – 5	Event – 4 Events – 7	Non-applicable as in the manual there are chapters on the project management processes rather than the domains of activity, “event” and “events” 35% are used in connection with risk management and 65% are not related to risk management.
Project Risk Management Handbook. Threats and Opportunities.	14	Event – 10 Events – 3	Event – 1 Events – 0	Non-applicable as the manual is on risk management, “event” and ”events” 93% are used in connection with risk management and 7% are not connected with risk

<sup>22</sup> The search was conducted by using application Adobe Acrobat Reader DC Advanced Search by searching “event” and “events”, case sensitive was not selected. Other forms of “event” were not identified and therefore were not searched.



				management.
Risk Management Guidelines. Managing project costs through identification and management of risks.	89	Event – 40 Events – 49	Event – 0 Events – 0	Non-applicable as the manual is on risk management, “event” and “events” 100% are used in connection with risk management.
North Dakota Project Management Guidebook – Risk Management Supplement.	70	Event – 48 Events – 17	Event – 0 Events – 0	Non-applicable as the manual is on risk management, “event” and “events” 100% are used in connection with risk management.
Kedrick, T. Identifying and Managing Project Risk	49	Event – 26 Events – 12	Event – 6 Event – 5	Non-applicable because the book is on risk management, in 78% “event” and ”events” are connected with risk management and in 22% are not connected with risk management.
Young, Trevor L. The Handbook of Project Management.	52	Event – 2 Events – 1	Event – 25 Events – 24	Non-applicable as in the manual there are chapters on the project management processes rather than the domains of activity, “event” and “events” 6% are used in connection with risk management and 94% are not connected with risk management.
Larson, Erik W., Gray, Clifford F. Project Management: The Managerial Process.	255	Event – 58 Events – 35	Event – 115 Events – 47	In the chapter on risk management “event” is used in 49, or 19% and “events” is used in 33 or 13%. In total 32% of the total number are used in the chapter on risk management and 64% are not connected with risk management.

*Source: author’s calculations based on sources definitions*

The application of the concept “risk” in relation to risk management and without the connection with risk management. By selecting four cases – three when the application of the “event” is 100% or near to 100% related to risk management and one where the application of the “event” only in 6% of cases is connected with risk management, it can be found that there





are several differences from the definition of “*event*” in dictionaries. The differences are summarized in table 5.

Table 5

**Differences from the definition of “*event*” in dictionaries**

Term	Comments
Project Risk Management Handbook. Threats and Opportunities	
uncertain event	Used in the definition of “ <i>risk</i> ”. Additional information about the “ <i>event</i> ” as there is a kind of event called “ <i>uncertain</i> ” and in the additional definition there is information that an “ <i>event</i> ” can have one or more causes and one or more impacts, according to the definition that “ <i>risk</i> ” is an “ <i>event</i> ”.
near-certain event	Used in the definition of triggers and represents symptoms and warning signs, which indicate changes leading to the alternations in the properties of “ <i>event</i> ”. Symptoms and warning signs are not defined.
trigger event	A new kind of “ <i>event</i> ”, is used in “trigger event indicates that the risk” (18). As in the risk definition “ <i>risk</i> ” represents an “ <i>event</i> ”, it can be concluded that there are two connected events one of which influences the other.
real event	Used only once, the need for application is not clear.
risk event	Used twice, the need for application is not clear.
positive events, adverse events	It is established that there are only two kinds of events in accordance with the consequences of the event, corresponds to the “ <i>risk</i> ” definition.
Risk Management Guidelines. Managing project costs through identification and management of risks	
potential risk event	The need for application is not clear.
risk event, risk events	The need for application is not clear.
adverse risk event	Used only once, the need for application is not clear.
unforeseen risk events	Used only once, the need for application is not clear.
potential risk evens	The need for application is not clear.
individual and combined risk events, individual risk events	The need for application is not clear.
cumulative and related risk events	The need for application is not clear.
North Dakota Project Management Guidebook – Risk Management Supplement	
uncertain event, uncertain events	Used in the definition of “ <i>risk</i> ”. Additional information about the “ <i>event</i> ”, as there is a kind of event named “ <i>uncertain</i> ” and there is information in the additional definition that an event can have one or more causes and one or more impacts, according to the definition that “ <i>risk</i> ” is an “ <i>event</i> ”.



risk event, risk events	The need for application is not clear.
particular risk event	Used only once, the need for application is not clear.
adverse events	The need for application is not clear.
negative events, positive events	It is established that there are 2 kinds of events by the consequences of the event, it complies with the definitions of the concept “risk”.
The Handbook of Project Management, Trevor L Young	
uncertain event	Is used for defining the concept “risk”. Additional information about the “event” as there is a kind of event named “uncertain”.
unforeseen event, unforeseen events	Is used for defining the term “issue”.
unpredictable events	The need for application is not clear.

*Source: author’s calculations based on sources definitions*

### Conclusion

In the three sources that are comparable because the sources are regulatory documents of risk management in analogous organizations and contain similar definitions of “risk”, the use of “event” is different. When analysing each of the sources separately, it can be stated that knowledge about the concept “event” in risk management is not consistent, well-grounded, and reliable regarding the definitions of “event” in dictionaries because the sources do not offer the definition of “event” with the exception of one source where the definition of “event” is not connected with risk management. However, the analysis of the application of “event” in the sources suggests that the assertion about the correspondence “consistent, well-grounded, and reliable” is not that well substantiated as “event” is applied differently. For example, the collocation “risk event” is used. The author did not gain the confidence that the application of “risk event” is substantiated in accordance with the definitions of “risk” in the sources. If “risk” is an “event”, then it is not clear what a “risk event” is. The use of “event” enlarges the scope of “event” with regard to the scope of “event” in the dictionary definitions. Moreover, the author has found that the application of “event” within one source cannot be considered compliant with the criteria.

However, it can also be found that the selected research methodology is insufficient for acquiring substantiated conclusions about the compliance or lack of compliance with the selected criteria: inconsistent, well-grounded, and reliable and for designing recommendations for designing risk registers. There might be a need for an in-depth analysis of the different kinds of the applications of “event” in the sources by analysing the sentence and paragraph with “event” and selection of more definition of “event”, not only the definitions from the English language dictionaries. Possibly, by following this approach it will be possible to find out the need for using the collocation “risk event”, for example, in the tables of “North Dakota Project Management Guidebook – Risk Management Supplement” where both “event” and “risk event” are used.

It has also been found that epistemological analysis is a method that can be used for analysing the experience of the authors of the sources. The analysis of the experience plays an important role in project management as an applicable science.



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