

Project Risk Register Analysis Based on the Theoretical Analysis of Project Management Notion of Risk

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

In the research, the author has analysed the compliance between the theories of the project risk management described in the “Aid Delivery Methods. Volume I. Project Cycle Management Guidelines” and “Caltrans Project Risk Management Handbook, Threats and Opportunities, Second Edition, Revision 0” and the project risk registers.

In the previous studies, the author concluded that after analysing just 30 risk registers significant differences could be found between the risk register described in the theory and risk registers of real projects. The results of the theoretical analysis of the notion “risk” provide information for deeper analysis of the risk registers publicly available on the Internet.

Keywords – Definition analysis, project, risk, risk register.

I. INTRODUCTION

Project management is a new science characterised by dynamic development in the second half of the 20th century. The first editions of the most popular project management guidelines “A Guide to the Project Body of Knowledge” were launched in 1996. The latest version of “A Guide to the Project Body of Knowledge”, the fifth one, was issued in 2013. Other project management manuals have seen similar updates, for example, the first edition of the “Tasmanian Government Project Management Guidelines” was published in 1996, however, the latest, 7th version, came out in 2011 (Uzulāns, 2015).

Although a new edition is issued in average every three years, the author considers that none of them contains references to research results; it can be assumed that the manuals represent theoretical reflection on the authors’ experience. However, the development of a science is impossible without research and research-based conclusions and recommendations (Uzulāns, 2015).

II. METHODOLOGY OF RESEARCH

The research comprised the analysis of 30 publicly available risk registers. A project risk register is a result of the risk management process (Larson & Gray, 2011; Chapman, 2006). The selection of the registers was made in November, 2013 using the Google search engine by requesting “project

risk register” and the first 10 web pages with the search results were examined.

All registers are designed as a table with columns about project risks. In several registers, at the beginning of the table or in a separate table there is additional information, for example, about the project, explanation about the register completion or about the column values. No supplementary information was used in the research.

In the previous research, the risk registers were described and it was concluded that by analysing just 30 risk registers significant differences could be found between the risk register described in “A Guide to the Project Management Body of Knowledge” by Project Management Institute, “Tasmanian Government Project Management Guidelines” and “Risk Management Guide for DoD Acquisition” and real risk registers (Uzulāns, 2014 and 2015).

In order to create theoretical risk registers, the analysis of the definitions of risk was conducted to establish its notions. The notions used in the analysis of the definition “risk” were used to create theoretical risk registers to be compared with 30 real risk registers.

Project risk registers were analysed in research and development project (Luppino, Hosseini & Rameezdeen, 2014). The authors summarised information on risk management frameworks for R&D projects (Luppino, Hosseini & Rameezdeen, 2014), emphasising that “the RFMEA technique was applied to the existing risk registers of South Australian R&D projects to determine if it provided increased effectiveness in identifying and managing critical project risks.” (Luppino, Hosseini & Rameezdeen, 2014). In construction projects (Dunović, Radujković & Vukomanović, 2013), the authors describe the risk register development methodology, “The first step in the risk register development methodology is to define expectations and current practice relating to the use of risk registers, and analyse perceptions about possible characteristics and capabilities of a risk register.” (Dunović, Radujković & Vukomanović, 2013). “The research project management is full of uncertainty and complexity. Research has elements of creativity and innovation and accurate prediction of the research outcome is therefore very difficult” (Bodea & Dascalu, 2009).

III. FINDINGS/RESULTS

The selection of the “Aid Delivery Methods. Volume I. Project Cycle Management Guidelines” and “Caltrans Project Risk Management Handbook, Threats and Opportunities, Second Edition, Revision 0” was determined by the presence of the risk definition in the glossary, analogous definitions of risk in other manuals and a larger volume comprised by both definitions. Purpose of the guidelines is “aim to support good management practices and effective decision making throughout the project management cycle – from programming, through to identification, formulation, implementation and evaluation.” (European Commission, EuropeAid Cooperation Office) and that “project cycle management is a complex and creative process – as much art as science – involving the negotiation of decisions acceptable to key stakeholder groups” (European Commission, EuropeAid Cooperation Office). Background of the “Caltrans Project Risk Management Handbook, Threats and Opportunities, Second Edition, Revision 0” is “the purpose of this handbook is to provide the districts with a complete and uniform approach to project risk management and to make the present policy/subject matter more useful and easier to understand” (OSPMI, 2007). “Risk management goes further than planning, and the risk response actions planned and incorporated in a risk management plan need to be executed effectively and monitored for their effectiveness.” (OSPMI, 2007).

“Aid Delivery Methods. Volume I. Project Cycle Management Guidelines” defines the “risk” notion as “the probability that an event or action may adversely affect the achievement of project objectives or activities. Risks are composed of factors internal and external to the project, although focus is generally given to those factors outside project management’s direct control” (European Commission, EuropeAid Cooperation Office). The defining notion here is

“probability”. The notion of “probability” is not defined in the manual, however; it is mentioned 4 times in the text of the manual, but it is impossible to derive the precise content of the notion from that.

In the “Caltrans Project Risk Management Handbook, Threats and Opportunities, Second Edition, Revision 0” the notion of “project risk” is defined as “an uncertain event or condition that, if it occurs, has a positive or negative impact on at least one project objective” (OSPMI, 2007). The defining notions here are “event” and “condition”, the notion limiting the contents of the “project risk” notion is “uncertain”. The notions “event”, “condition” and “uncertain” are not defined in the manual, the “event” notion is used 14 times, “condition” – 10 times and “uncertain” – 3 times. It is not possible to deduct the precise content of the notions, with the exception of the notion “event”. For this reason the definitions provided by the publicly available Oxford dictionary (www.oxforddictionaries.com) were used to explain the notion of risk in the manuals.

The former two theoretical risk registers were created in accordance with the definitions of the notion of risk without analysing the notions used in the definitions. The structure of the risk register can be simple or complex (Hillson, 2009), and the structure of the risk register is determined by many factors (Chapman, 2006). The columns of the risk register based on the “risk” definition in the “Aid Delivery Methods. Volume I. Project Cycle Management Guidelines” could be as follows: 1) event/action, 2) probability, 3) effect, 4) project objectives 5) activities, 6) external factors, and 7) internal factors. The columns of the risk register according to the “risk” definition in the “Caltrans Project Risk Management Handbook, Threats and Opportunities, Second Edition, Revision 0” could be the following: 1) uncertain event/condition, 2) occurrence, 3) impact, and 4) project objective. The results of the comparison of both theoretical risk registers with 30 publicly available risk registers are summarised in Table I.

TABLE I

THE RESULTS OF THE COMPARISON OF BOTH THEORETICAL RISK REGISTERS WITH 30 PUBLICLY AVAILABLE RISK REGISTERS

Theoretical risk register column names	Complete coincidence with column names of 30 risk registers	Analogous or comparable notion with column names of 30 risk registers
<i>Aid Delivery Methods. Volume I. Project Cycle Management Guidelines</i>		
event/action	1	2
probability	13	13
affect	0	0
project objectives	1	1
activities	0	0
external factors	0	0
internal factors	0	0
<i>Caltrans Project Risk Management Handbook, Threats and Opportunities, Second Edition, Revision 0</i>		
uncertain event/condition	0	0
occurrence	0	0
impact	8	16
project objective	1	1

Coincidence between the theoretical risk registers and 30 publicly available risk registers is irrelevant, exceptions are “probability” and “impact”; “probability” with “analogous” and “comparable” notions are 26, or 86 %, “impact” with “analogous” and “comparable” notions are 24, or 72 %.

In “Aid Delivery Methods. Volume I. Project Cycle Management Guidelines”, the notion “probability” is not defined and used five times and only one time in the context of risk management. In “Caltrans Project Risk Management Handbook, Threats and Opportunities, Second Edition, Revision 0”, “probability” is used 52 times and defined as “likelihood of the occurrence of any event” (OSPML, 2007).

In “Caltrans Project Risk Management Handbook, Threats and Opportunities, Second Edition, Revision 0”, notion “impact” is used 94 times, for example, to explain “impact” “...impacts to project scope, cost, and schedule (and quality, as a result).” (OSPML, 2007) For the threats and opportunities descriptions, a qualitative risk analysis, to explain quantitative risk analysis, for risk response planning, especially in the strategies for threats (OSPML, 2007). In the 30 publicly available risk registers, the content of column “Impact” matches to the notion “impact” in “Caltrans Project Risk Management Handbook, Threats and Opportunities, Second Edition, Revision 0”. It can be concluded that one column of the theoretical risk register coincides with the 72 % of 30 publicly available risk registers.

Notion “impact” is defined in “Aid Delivery Methods. Volume I. Project Cycle Management Guidelines”, but the definition does not use the notion “risk” (European Commission, Europe Aid Cooperation Office).

There are several causes of low coincidence, except “impact”. Theoretical risk register column with the name “event/action” matches in two cases. “Event” as a defining notion in “risk” definitions is widely used, for example, in

“A Guide to the Project Management Body of Knowledge”. The compliance can be explained by the wrong choice of research methodology. Coincidence or discrepancy of the names of a risk register column could not be used as justification for the existence of coincidence of a theoretical risk register and the risk registers publicly available on the Internet. It is necessary to perform deeper analysis of the content of the risk register columns publicly available on the Internet. The analysis of the content of the risk register columns is out of scope of the current research.

Unlike other notions used in “risk”, the notion of “event” is described in more detail in “Caltrans Project Risk Management Handbook, Threats and Opportunities, Second Edition, Revision 0” (OSPML, 2007) and, therefore, the author concludes that another theoretical risk register can be made with additional columns:

- probability of positive events,
- results of positive events,
- probability of adverse events,
- consequences of adverse events, where the latter two columns are related to project objectives of cost, time, scope and quality.

The results of the comparison of this theoretical risk register with 30 publicly available risk registers are summarised in Table II.

The results are similar to the previous comparison. Coincidence between the theoretical risk registers and 30 publicly available risk registers is irrelevant, exception is “probability”, 86 %. “Probability of positive events” and “probability of adverse events” may be regarded as concepts underlying a concept “probability”.

The analysis of the notions used for the definition of “risk” lets us create risk registers with a bigger number of columns. The notions have been summarised in Table III.

TABLE II

THE RESULTS OF THE COMPARISON OF THE THEORETICAL RISK REGISTER WITH 30 PUBLICLY AVAILABLE RISK REGISTERS

Theoretical risk register column names	Complete coincidence with column names of 30 risk registers	Analogous or comparable notion with column names of 30 risk registers
<i>Caltrans Project Risk Management Handbook, Threats and Opportunities, Second Edition, Revision 0</i>		
event/action	1	2
probability	13	13
affect	0	0
project objectives	1	1
activities	0	0
external factors	0	0
internal factors	0	0
probability of positive events	0	0
results of positive events	0	0
probability of adverse events	0	0
consequences of adverse events	0	0

TABLE III
THE ANALYSIS OF THE NOTIONS USED FOR THE DEFINITION OF “RISK”

Notions	Notions from “risk” definitions
<i>Aid Delivery Methods. Volume I. Project Cycle Management Guidelines</i>	
action	fact / process of doing
adversely	success, development
affect	effect, difference
factors	result, circumstance, fact, influence
<i>Caltrans Project Risk Management Handbook, Threats and Opportunities, Second Edition, Revision 0</i>	
condition	state, appearance, quality, order, factors, situation, influence, performance, outcome
impact	effect, influence

The comparison of the latter two theoretical risk registers with 30 publicly available risk registers is summarised in Table IV.

In “Aid Delivery Methods. Volume I. Project Cycle Management Guidelines” and “Caltrans Project Risk Management Handbook, Threats and Opportunities, Second Edition, Revision 0”, the coincidence of notion “effect” is 6, or 20 %. In “Aid Delivery Methods. Volume I. Project Cycle Management Guidelines”, the notion “effect” is used 25 times; in the context of risk management it is not in use. Notion “impact” is defined without risk management and is used 64 times and once in the column name “Potential adverse impact” in the table “Risk management matrix – example format” (European Commission, EuropeAid Cooperation Office). Notion “affect” is used 6 times; in the context of risk management it is not in use.

In “Caltrans Project Risk Management Handbook, Threats and Opportunities, Second Edition, Revision 0”, the notion “effect” is used 9 times, 2 times in the context of risk management. Notion “affect” is used twice, both in the context of the risk management. In “Caltrans Project Risk Management Handbook, Threats and Opportunities, Second Edition, Revision 0”, there is a more complex relationship between the notions. Therefore, it is not possible to reach a conclusion about the correlation between the theoretical risk register based on the notion “risk” from “Caltrans Project Risk Management Handbook, Threats and Opportunities, Second Edition, Revision 0” and 30 publicly available risk registers.

There is irrelevant coincidence between other notions, which are used in “Aid Delivery Methods. Volume I. Project Cycle Management Guidelines” and “Caltrans Project Risk Management Handbook, Threats and Opportunities, Second Edition, Revision 0”.

TABLE IV
THE COMPARISON OF THE LATTER TWO THEORETICAL RISK REGISTERS WITH 30 PUBLICLY AVAILABLE RISK REGISTERS

Theoretical risk register column names	Notions from “risk” definition	Complete coincidence of notions from “risk” definition with 30 risk register column names	Analogous or comparable notion from “risk” definition with 30 risk register column names
<i>Aid Delivery Methods. Volume I. Project Cycle Management Guidelines</i>			
action	fact / process of doing	0	0
adversely	success, development	0	0
affect	effect, difference	effect 6	0
factors	result, circumstance, fact, influence	influence 1	0
<i>Caltrans Project Risk Management Handbook, Threats and Opportunities, Second Edition, Revision 0</i>			
condition	state, appearance, quality, order, factors, situation, influence, performance, outcome	factors 2 influence 1 performance 1 outcome 1	0
impact	effect, influence	effect 6 influence 1	0

IV. CONCLUSION

Taking into account that the aim of the research was not to find regularities in the risk registers publicly available on the Internet, the general set of risk registers and the kind of the selection were not evaluated. The author believes that 30 risk registers constitute a sufficient number for comparing the selected registers with the notions of risk defined in "Aid Delivery Methods. Volume I. Project Cycle Management Guidelines" and "Caltrans Project Risk Management Handbook, Threats and Opportunities, Second Edition, Revision 0".

Similar results were seen in "A Guide to the Project Management Body of Knowledge" (Uzulāns, 2013, 2014), "Tasmanian Government Project Management Guidelines", and "Risk Management Guide for DoD Acquisition" (Uzulāns, 2015).

The analysis of the notion definitions is 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, for example, manuals. The definitions of risk used in the research are very common and it can be assumed that at least in part of the documents governing risk registers of real projects there are analogous risk definitions. Moreover, it can certainly be assumed that the risk registers of real projects have practical applicability. However, the practical applicability does not guarantee theoretical accuracy. If project management is a science or sub-branch of science then theoretical accuracy is of not less importance than practical applicability. As a result of the research, it is possible to conclude that an accurate definition of notions and the application of notions in compliance with the definition contents and volume are a necessary but insufficient pre-condition for the creation of risk registers. Obviously, there are other pre-conditions that must be considered when designing risk registers, such as the applicability factor, description of the risk management process or other still unknown factors.

The effectiveness of project risk management and the risk register as one of the components of effective risk management could be one of the criteria of the risk register accuracy. However, the theory of project management effectiveness has not been fully designed either. The research on risk registers could promote and facilitate the research on the effectiveness of project management (Uzulāns, 2014, 2015).

The methods of analysis are insufficient and require more in-depth definitions, notions and relationships between the notion analysis to explain the relationship between risk theory and risk management practice.

We cannot choose a theoretical source by one criterion. For example, in "Aid Delivery Methods. Volume I. Project Cycle Management Guidelines" "risk" definition and "risk" are used 32 times, but risk management is described on two pages (European Commission, Europe Aid Cooperation Office). Compliance with "risk" definitions cannot be the only assessment criterion for risk registers; other criteria are necessary.

In "Aid Delivery Methods. Volume I. Project Cycle Management Guidelines", the risk register is not defined and explained. In "Caltrans Project Risk Management Handbook, Threats and Opportunities, Second Edition, Revision 0", the risk register is defined as "the identified risks, the assessment of their root causes, areas of the project affected (WBS elements), the analysis of their likelihood of occurring and impact if they occur and the criteria used to make those assessments and the overall risk rating of each identified risk by objective (e.g., cost, time, scope and quality)." Described the process of creating of the risk register and the Annex contains a risk register sample (OSPMI, 2007). In "Project management. The Managerial Process. Fifth Edition", the "risk" is defined as "the chance that an undesirable project event will occur and the consequences of all its possible outcomes" (Larson & Gray, 2011), and a risk is described as "a risk register that details all identified risks, including descriptions, category, and probability of occurring, impact, responses, contingency plans, owners, and current status (Larson & Gray, 2011).

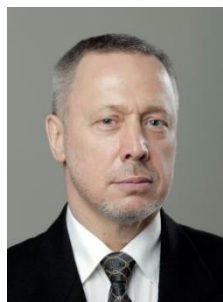
To conduct more accurate research, it is necessary to use "risk" definition, notion analysis results, risk register examples, risk register creation process, and requirements for project management documents from the theoretical perspective and risk register column content analysis from the practical perspective. The risk registers publicly available on the Internet are a good source of study.

In-depth analysis of "risk" definition includes ontological, epistemological and methodological analyses. Ontological analysis of project risk registers is used to answer a question of the risk in project management, to analyse project risk definitions and concepts used in the definitions. Epistemological analysis of project risk registers is used to verify compliance with criteria – well-grounded, truthful and reliable for the re-analysis of project risk definitions and concepts. Methodological analysis of project risk registers is used for the analysis of the principles of methods, rules, and postulates employed to create project risk definitions. It is possible that ontological, epistemological and methodological analyses discover closer links between theory and practice.

The ontological, epistemological and methodological analysis of concepts and relationships between concepts remove a project guidelines and risk registers author's chaos of use of a words, terms and notions

The genus notions of the risk definitions are different. The most common notions are “event” and “uncertainty”. The notion “event” is widely used in different areas, in philosophy, mathematics, and physics or away from the scientific definition. The same case is with the concept “uncertainty”. Content of the notions “event” and “uncertainty” is very different, and maybe “event” and “uncertainty” definitions of ontological, epistemological, methodological and real project risk register analyses provide the analysis, which reveals relationships that could not be identified using methods applied in recent studies.

Comparison of theoretically justified risk register with risk registers from real projects could strengthen both the theory and practice of project risk management.



Juris Uzulāns has more than 15 years of experience in theoretical and practical project management. It includes managing projects in the state governance, health care system, institutions of higher education and IBM Latvia. The author has designed and delivered courses in project management at BA School of Banking and Finance, Baltic Computer Academy as well as at commercial firms specialising in training. In science the author focuses on risk management, analysis of project processes and documentation. Juris is the author of 4 books on project management and 20 scientific

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