Why Current Risk Categorization Systems Fail to Capture Risk Characteristics?
Developing a Flexible, Multi-level Risk Classification System

By

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Executive Summary

With the BP Gulf oil spill still fresh in the news, risk activities has again become a scramble to do what should have been done all along – adequate, proactive risk analysis and management. Waiting for a risk event to trigger and become reality before planning for its eventuality appears to be the current accepted method for project risk management. Some of the United States Government executive departments and agencies are cancelling risk assessment programs instead of expanding them thinking that risk can be handled "in real time" fashion.

Regardless of the new project management styles being touted, and how dealing with risk is done by ensuring that what is the highest priority is done first, risk still plagues most projects in ways that simply cannot be ignored nor should be. A project manager or team leader or whatever the new name for the project responsible party has become, risk management must be given its rightful place with both adequate support and funding, or more BP gulf oil spill events may be in our futures.

We live in a risky world, and risk is not mitigated by ignoring it until it becomes a reality. Risk is any future event that if triggered has a negative impact on the successful outcome of an organization's project. While there are popular definitions that include both positive and negative risks due to their impact, this white paper chooses to define risk as future negative impactful events while opportunities are future positive impactful events. The attempt to reorient thinking towards positive and negative risk has not been entirely successful; thus, using definitions that more closely reveal their dispositions just simply makes sense.

What will the reader learn from this paper? The following goals are listed in order of presentation:

1. Discussing a workable risk work process flow for any type of project,
2. Illustrating how to implement a true risk classification system, and
3. What data should be gathered on project risks to support adequate risk planning?

If you have any comments or questions on this white paper, please feel free to contact the authors at your convenience.

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Defining Risk Process Flows?

Adequate risk work process has been both debated and discussed for many years with respect to the appropriate amount and content of risk work needed for a particular project. The authors suggest that this process flow contain two important characteristics:

1. The risk analysis and management (RAM) activities should begin very early in the project life cycle. To be specific, RAM activities should begin with the accumulation of the stakeholders (SH) into the SH register (SHR). While it may seem misplaced that the risk manager be involved or even accomplish the creation of the SHR, understand that all identified risks must come from discussions and/or interviews with key stakeholders; therefore, to start the risk processes correctly, a complete and accurate SHR must be compiled without which certain risk potentials may be missed or under reported.
2. The risk process should begin with the creation of an appropriate risk classification system (RCS) into which risk potentials can be identified, categorized, and analyzed for accuracy, completeness, and further monitoring and control.

The necessity of these characteristics need to ensure that the risk process is managed by either an appropriately trained project manager, or if the project is sufficiently complex enough, a specialist trained in the intricacies of RAM activities such as a PMI certified RMP (risk management professional). The project risk manager (PRM) is directly responsible for the risk work process flow, its efficacy, and its positive impact on the project's successful outcome. Thus, it is necessary as risk management becomes more important to project stakeholders given the recent public project disasters, to begin the RAM activities early enough in the life cycle of a project in order to ensure it becomes and maintains a proactive and not a reactive 'modus operandi'.

The source of most risk potentials is from the interviews, discussions, meetings, and surveys of key stakeholders, the review of initial project documents with additional sources gleamed from the organization's organizational process assets (OPA) [1] as the PMI PMBOK®[1] refers to historical archived information from previous completed projects within or by the organization. Thus it becomes almost a necessity that the project risk manager be intimately involved in the identification of the project stakeholders or may even be assigned the task in its entirety as a prelude to the risk work processes for the project.

Work that can be completed prior to or even as a part of an organizational risk management office (RMO) which was developed by the authors for utilization by their own consultancy clientele, includes the following:

1. The development of an adequate and complete risk classification system (RCS),
2. Development or acquisition of RAM tools, templates, forms, and common work documents,
3. Statement of support and inclusion of RAM activities within the organization's projects by project managers and sponsors,
4. Development of standard risk procedures for use within an organization's projects,
5. Training of team members on the importance of recognizing risk potentials and triggers,
6. Development of common risk potential mitigation plans, best practices, and
7. Review of historical archives on risk activities for similar projects.

The authors' subsequent paper on the design and deployment of a RMO explains in more detail these issues and how they can be accomplished to improve the positive impact of RAM activities on an organization's projects.

Once a project has been 'chartered' into existence, the risk work processes can be accelerated to immediately accomplish those tasks which put the RAM processes on a stable, and productive footing. Risks begin almost immediately with the signing of the project charter and the project risk manager must be ready to step out with the project manager in obtaining a preliminary understanding of the initialization process risks that confront the project from its earliest moments.

As an aside, the authors seek to clarify the differences between risk potentials that have not triggered, and those that have reached a state of existence, now called an *issue*. All risks begin as potential sources of impact to a project; how they progress in their life cycle will determine the need for RAM activities expended in their resolution or due to their particular risk expected value (REV). For purposes of this paper, a risk potential's REV can be calculated from the following equation:

[1]

$$REV_n = RCI_n * RPO_n$$

where (RCI_n)is the risk cost of impact for any particular risk potential (n), and
(RPO_n) is the risk probability of occurrence for any particular risk potential (n).

these values, RCI and RPO, can be calculated using standard, accepted risk quantitative analysis methods currently in practice throughout the project management discipline. These calculations and analysis methods can be found in any solid risk management or quantitative analysis textbook or by using a Google search on the following search criteria:

- quantitative analysis methods
- qualitative and quantitative analysis methods
- quantitative risk analysis
- qualitative risk analysis

Suggested Risk Analysis and Management Work Process Flows

Readers not familiar with risk analysis and management (RAM) processes or steps needed to substantiate an effective risk program for single or multiple projects, the following list of steps is provided to assist with the codifying of risk potentials for any project. Be aware that as all projects are unique, all risk programs within and supporting one or more projects will also necessitate some fine tuning in order to align the risk activities with the needs of the particular project. Begin with this list as an initial foray into implementing effective RAM activities for an assigned project. The authors have used this list as it is detailed for many of their clientele with suitable positive impact for the contracted projects. The suggested risk work process tasks are:

1. Develop the stakeholder register for use in discovering project risk potentials:

    a. Identifying key stakeholders with information about project risk potentials, and
    b. Classify key stakeholders according to their influence, power, interest, and knowledge.
2. Design an effective risk management plan as part of the project management plan,
3. Identify appropriate risk potentials that could impact the project,
4. Quantify risk potentials,
5. Qualify risk potentials,
6. Develop risk mitigation plans for significant risk potentials,
7. Implement and execute risk mitigation plans for triggered risk potentials (issues),
8. Monitor and control active risk mitigation plans to resolution,
9. Provide continuous surveillance for risk potential triggers, and finally
10. Archive and review lessons learned from risk mitigation plans.

The authors will be writing additional discussion papers that deal with each of the listed process steps to assist project managers with the implementation of adequate risk control operations.

What Priority Should Risk Planning Receive?

Risk should be managed throughout the life cycle of a project as an ongoing process: initiated early and implemented proactively. Every meeting should have risk analysis and management (RAM) activities on the agenda. It should be given the same amount of priority as other important topics impacting the success of a project. However, since risk is a future potential that may or not materialize, many Project Managers do not place a high enough priority on RAM topics. The amount of allocated time to RAM activities should be driven by the project's complexity; however, regardless of project size or budget, the necessary RAM process work flow remains a critical component of any project.

As an analogy towards understanding the priority of risk planning, risk is different than most project activities in that it can be viewed as smoke while it is in its non-triggered phase: invisible, tough to contain and discuss, tougher even to put a finger on its exact nature. Risk potentials seem to lack the substance that commands respect from the project manager or sponsors until it materializes and becomes an issue analogous to a liquid: fluid, dynamic, and ever changing its form and shape to fit its surroundings. Once a risk potential triggers into physical form of becoming an issue, many project team members are surprised by the rapidity that the issue begins to overwhelm the project budget and schedule. Without proactive RAM activities, which include the definition and development of an appropriate response plan, an issue can become Orwellian in its disastrous impact and sphere of influence. For example, until the Deep Horizon drilling platform exploded in April 2010, the project managers probably had no idea that the shearing of a blow-out preventer on a well head located over 5000 feet below the surface of the Gulf of Mexico could bring their company and its partner, BP, to the brink of bankruptcy.

However, once a risk potential has triggered into existence and has been dealt with through the effective management of the response plan, a risk potential takes on the analogous shape of a solid. The details of the risk potential are discovered, listed, analyzed, and tested in many different ways. The best use of this form of a risk potential is its inclusion in the Lessons Learned archive of the organization's organizational process assets (OPA) [1] database and its review by project and risk managers.

Beginning Step: Developing a True Risk Classification System (RCS)

With the argument for risk analysis and management (RAM) activities to be given a sufficient priority in both effort and budget support, the project risk manager (PRM) needs to develop or acquire an appropriate risk classification system (RCS) as a tool for elicitation, categorization, identification, and storage of risk potentials that may impact the assigned project. Without such a tool, the PRM is limited in his/her ability to ensure accuracy, completeness, and appropriateness in the classifying of those risk potentials that could cause project cancellation or over-runs in either the schedule or budget.

The need for an RCS begins with the completion of the project's stakeholder register (SHR) containing the key players with the ability and knowledge of project risk potentials. The RCS can aid the project team members in their quest to identify risk potentials that need immediate attention while the rest of the project management plan is being developed. Waiting for the completion of the project plan may put the project in the crosshairs of a yet to be identified risk potential. The RCS can assist the risk manager in early completion of a risk mitigation plan to risk potentials that has shown a higher than average probability of existence early in a project's life cycle.

Understanding the need for an RCS supports the next discussion of just what is an appropriate risk classification system? In direct terms, a RCS is a tool that supports the placement of risk potentials in a common structure whereby similar characteristics simplify the development, application, execution, and control of risk potential mitigation plans thus eliminating the need for every risk to demand its own unique mitigation activity. The RCS in similarity to the classification of biological and/or zoological life forms on planet Earth provides the placement of risk potentials in close proximity to common potentials whereby standardized response plans can be utilized as a starting point to address the response needs of a triggered risk potential. This reduces the cost of planning risk mitigations to only that portion of the plan that uniquely addresses the uncommon characteristics of the risk potential from its RCS neighbors.

For example, in biology classification systems, mammals have common characteristics that lend any identified mammal to similar instinctive habits or actions. These similarities are used by biologist in understanding how mammals react to certain conditions so that each new species is not a totally unique discovery or control activity. In similar fashion, a risk classification system can place risk potentials in close proximity to other risk potentials that exhibit common, controllable characteristics. Simplification of risk potential classification eases the categorization of risk potentials and associated mitigation plans to only developing non-unique, focused risk-equivalent reduction strategies.

The characteristics of such a risk classification system (RCS) are discovered by understanding that risk potentials do not just exist in a single point or place within a project. Thus a risk of losing a lead developer on a software project possesses common factors with the loss of a lead requirements analyst on the same project; however, single dimensional risk categorization system in use today seem to indicate that a risk potential has a single and unique ancestry like the unique path of a leaf on a tree (a banyan tree not withstanding – the reader is left to his/her own curiosity as to the interesting nature of banyan trees). These characteristics are that:

1. Each risk potential can be classified as belonging to multiple classification labels as given by weighting factors assigned by the RCS structure,
2. The RCS is more than a simple, inverted tree structure with only a single path to each risk category,
3. Each classification stub is identified by a unique ID that can be used to label the weights that each risk potential exhibits in its profile,
4. Each classification label associates the common characteristics of the identified risk potential with its neighbors in the RCS, and
5. The RCS can be significantly reused across different project types and industries reducing the need for unique risk categorization systems currently being used.

Our RCS is basically a multi-dimensional categorization system that allows the reuse of a significant portion of the classification system between different projects, and different industries. The basis for this reuse is the manner in which the classification system is both tiered and anchored in the project management current best practices areas of knowledge suggested by the PMI's PMBOK® 4th Edition Guide[1].

The RCS is based on three assumptions that the authors have made concerning both their approach to risk management, and the RCS itself. These assumptions are:

1. The primary purpose of proactive risk analysis and management (RAM) is the modification of behavior whereby the risk potential's impact is significantly mitigated,
2. All risk potentials must be tied to project deliverables since without deliverables no project exists, and
3. Risk potentials can impact a project with different effects, at different times, and with different outcomes.

These assumptions were the driving motivation to seek a different risk classification solution than those currently being used such as the Risk Breakdown Structure (RBS)[2] format. In the authors' opinion, the RBS[2] does not provide sufficient flexibility in capturing the nature of risk potentials, and how they may impact a project.

The authors' risk classification system (RCS) is based the delineation of thirteen top level risk potential classes which most project managers will recognize:

1. Systemic risk potentials: risk potentials external or outside control of project
2. General or organizational risk potentials
3. Project management risk potentials
4. Integration risk potentials
5. Scope risk potentials
6. Schedule risk potentials
7. Cost or budget risk potentials
8. Quality risk potentials
9. HR risk potentials
10. Communications risk potentials
11. RAM risk potentials
12. Procurement risk potentials, and
13. Other or unknown risk potentials

Within each of these top levels of risk potentials there can be any number of sub-levels similar to the biological life form classification system used by biologist to place common life forms in close proximity to those life forms exhibiting similar or somewhat similar characteristics. In the RCS the purpose for grouping or clustering common risk potentials using this form of a classification is to advantage the project by allowing similar mitigation plans to align with risk potentials exhibiting common characteristics.

The authors use a multi-level outline of this basic classification system in categorizing the risk potentials of their clientele's projects by combining both a proprietary numbering scheme (not a part of the RCS, but can be developed by project teams as they desire) that supports both multiple applications of each risk classes to multiple risk potentials for the same project.

A RCS Application Example

For example, a recent manufacturing project risk analysis and management (RAM) activity developed several risks that shared common features and characteristics for which the risk classification system (RCS) was able to show that a single risk mitigation plan could cover without having to expend effort and costs for the development of individual risk mitigation plans which was previously accomplished. This project identified the following risk classes and potentials:

Risk Classes from the RCS:

5.2.2 5 is a scope risk,
2 is a requirements definition component, and
2 is incomplete definition reason, 3 is a faulty definition reason.

6.3.1 6 is a schedule or time risk,
3 is a resource component, and
1 is not-available reason

7.3.5 7 is a cost risk,
3 is a resource component, and
5 is external skill set required reason.

8.3.4 8 is a quality risk,
3 is a resource component, and
4 is insufficient experience reason.

Please be aware that these are examples only and not intended for production use or implementation. The RCS is layered to a level that meets the needs of both the project and the project risk manager in their attempt to affect the main purpose of behavior modification. By allowing the grouping of common risk potentials, a common solution is more likely to be discovered then when a single-vectored categorization system is applied to the project risk potentials.

Risk potentials from the Risk Definition Base (RDB)™:

A risk definition base (RDB)™ is the authors' implementation of a multi-layered, multi-dimensional risk register that combines the features and functionality of the currently used risk register, risk matrix, and risk dictionary. By using a universal project component numbering system (a topic covered in a subsequent discussion paper), the RDB™ can be used to store, retrieve, manipulate, report, and archive a project's complete risk environment in an browser-formatted user interface.

R2 – a risk potential for deliverable, D1, due to lack of key employee available (resource not available)

5%	RC_5.2.2	[A risk of Class 5: Scope, definition, and incomplete]
60%	RC_6.3.1	[A risk of Class 6: Schedule, resource, and not-available]
35%	RC_8.3.4	[A risk of Class 8: Quality, resource, insufficient experience]

R3 – a risk potential for deliverable, D1, due to lack of key material available (wrong materials ordered)

20%	RC_5.2.3	[A risk of Class 5: Scope, definition, and faulty]
80%	RC_6.3.1	[A risk of Class 6: Schedule, resource, and not-available]

R7 – a risk potential for deliverable, D1, due to internal QC personnel lacking required certification

10%	RC_6.3.1	[A risk of Class 6: Schedule, resource, and not-available]
70%	RC_7.3.5	[A risk of Class 7: Cost, resource, and external skill set required]
20%	RC_8.3.4	[A risk of Class 8: Quality, resource, insufficient experience]

This example, while somewhat detailed, illustrates that risk potentials can and do impact projects in both common directions as well as in different areas of the project all at the same time. The interesting point to be taken from this example is that all three risks (R2, R3, and R7) were handled by the same standard risk mitigation plan for the project that detailed how the project would proactively deal with the loss of key resources such key personnel, key material, and key skills. The risk mitigation plan indicated that when identifying risk potentials such as these, lead personnel should take care in planning for the project's successful outcome:

1. Key personnel (R2, and R7) and skill sets should be identified and cross-trained in order to deal with the loss or demand for their applicability, and
2. Key materials (R3) should be identified and checked against requirements for validity and accuracy.

The percentages preceding each risk class in the definition of the preceding risk potentials indicate the weight to which this particular risk potential will impact the project if it triggers. For example, in R2, the analyzed impact of this risk potential to the deliverable D1 would be 60% from schedule disruption, only 5% scope redefinition, but 35% quality oriented (waste, rework). Thus, each risk potential can exhibit common characteristics for which similar mitigation plans apply, but with the true impact nature of the risk understood and tracked. Risk potential's true impact to a project can now be fine-tuned to show different weights, different components, and different reasons without causing a "Gordian knot" in definitions and relationships that a single-level categorization breakdown structure would present.

The suggested mitigation strategy steps show how the RCS clearly supports the authors' contention that the purpose of modern, proactive RAM activities is the modification of behavior in order to mitigate the impact of a triggered risk potential.

Benefits of Using a Flexible Risk Classification System (RCS)

From the examples detailed in the previous section, the benefits of using a flexible, multi-level risk classification system (RCS) are several, and can be achieved through the implementation of the suggested methods for categorizing risk potentials:

1. Ability to reuse significant portions of the classification system between projects regardless of the industry or complexity,
2. Ability to identify common characteristics between risk potentials from different parts of the project to allow the use of common or standardized risk mitigation plans,
3. Use of commonly accepted risk potential classes,
4. Ability to identify the true nature of a risk potential to a project's goals and objectives, and
5. Support for a common project component identification system for simplified tracking and reporting.

Conclusions and Summary

The authors of this paper discussed how risk and analysis management (RAM) does not need to be complicated or time consuming to be effective, but to be effective the right steps done early and proactively need to be the priority of the project risk manager. This paper introduced the concept of a risk classification system (RCS) to manage project risks as a best practice. It discussed a workable risk work process flow for any type of project illustrating how to implement a flexible risk classification system (RCS), and then provided a detailed example of how a RCS can support the premise of behavior modification as the best method for mitigating project risk. Finally, the benefits of using a RCS showed the advantages that can be derived from its implementation.

By using the RCS to identify and track the true nature of project risk potentials, the science and art of risk analysis and management (RAM) can progress towards the horizon where project sponsors and key stakeholders will not think of reasons for rejecting RAM activities, but will demand their use on every project as a means of defending against project rebaselining and/or possible project failure.

References

[1] PMI. Project Management's Body of Knowledge (PMBOK©). 4th Edition. 2008.
[2] Hillson, DA. *The Risk Breakdown Structure (RBS) as an Aid to Effective Risk Management*. Proceedings of the 5th European Project Management Conference (PMI Europe 2002), Cannes, France. Presented June 19-20, 2002.

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RDB: as 'risk definition base'

Authors' Biographies

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Paul H. Lohnes has been active in project management for over 25 years beginning soon after he left the US Navy in 1981. After obtaining his BS (CS) and teaching as an adjunct at the UC Berkeley's Extension University for 6 years during which time he completed his MBA (Finance/Op Mgmt) at Golden Gate University, San Francisco, Paul started up a private consulting practice in project management of technical and computing projects. His clients over the years have included Fortune 100 companies in telecommunications, computing, networking, and finance in addition to developing and delivering over 500 technical and management seminars to over 10,000 attendees around the world.

Mr. Lohnes holds the PMI PMP certification, and is currently beginning the application process for the PMI's new risk management certification, the RMP. Mr. Lohnes is completing projects in the upstate New York area and returning to the MD/VA/WDC area for the purpose of starting a new company offering advanced project and risk management services to clients needing such components to their business management endeavors. Mr. Lohnes has developed several proprietary risk management and indexing tools that he uses in service of his clients and customers.

Finally, Mr. Lohnes is actively involved in the PMI's new community of practice endeavors with both blogging on troubled projects/project rescuing, and risk management topics and the mentoring of new project management practitioners. He merged his project/risk management operations with Ms. Wilson to form MCLMG, LLC.

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Ms. Wilson has an impressive resume and work history both in and around the Washington, DC area. She is a USAF veteran and a graduate of the University of Maryland with a Bachelor of Arts. Ms. Wilson is also a holder of a Masters Degree in Management Information Systems from Strayer University.

Being one of the first women to obtain the Risk Management Professional certification from the Project Management Institute, Ms. Wilson is in high demand both as a project risk consultant and risk analysis team leader. She has held several, high-profile project management and business analyst positions at firms contracting with the US Government.

In 2010, Ms. Wilson formed her own management consulting firm, CWP Management Group, in support of her clients in providing risk analysis and management services for sophisticated organizations realizing the value of proactive risk profiling activities. Ms. Wilson and Mr. Lohnes have merged their operation into MCLMG, LLC.