

Individual Risk Management Paper

On

The Use of Risk Management Analysis Tools in the Information Technology

Industry

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Executive Summary:

The purpose of this paper is to examine why comprehensive software-based risk management analysis tools are not generally used in the typical Information Technology (IT) Industry project. For the purposes of this paper, the following comprehensive risk management analysis tools will be used for comparison purposes:

- 1) Palisades @ Risk Professional 4.1 for Microsoft Project
- 2) Active Risk Manager 2.07
- 3) Risk Radar Enterprise 3.3.
- 4) WelcomRisk 2.5

The paper will start with a description and comparison of four comprehensive risk management analysis tools (including costs, features, ease of use, etc). The author will then describe a typical Information Technology (IT) Industry project and typical risk management methodology used for an IT Industry project (both descriptions drawn from the author's extensive experience in the IT Industry). The paper will then examine the case for the use of the comprehensive, software-based risk management tools vs. the typical risk management matrix approach used in the IT Industry. The paper concludes with a summary analysis on the future of risk analysis in the IT Industry.

Description of Risk Management Software Tools

General: Software tools used in the project risk management process are generally focused in three areas. Those three areas are modeling, spreadsheet add-ins, and planning package add-ins. (Reference Husby, Brede, Tendal Article). In addition, software risk management tools tend to focus on deriving either quantitative or qualitative risk analysis results. This paper will focus on evaluating comprehensive standalone risk management and planning package add-ins. Three of the packages evaluated perform primarily qualitative risk analysis, with some options to integrate quantitative risk analysis within the software suite. The fourth package is planning package add-in designed primarily to be quantitative risk analysis tool.

Tools: The tools for analysis are Active Risk Manager (ARM) 2.07; Risk Radar Enterprise (RRE) 3.3.1; WelcomRisk 2.5; and Palisades’s @Risk Professional 4.1 for Microsoft Project. The following table describes and compares the system requirements, major features, price, major strengths, and weakness of the four systems (References Essex Article; Palisades @Risk Web Site):

<i>Product</i>	<i>System Requirements</i>	<i>Major Features</i>	<i>Price</i>	<i>Strengths</i>	<i>Weaknesses</i>
ARM	1 GHz Pentium III,1GB RAM 90MB Disk (Low Volume) Dual Pentium 2GHz,4GB RAM, 2 Servers (High Volume)	Runs on Oracle or SQL Server; Integrated quantitative risks tools; Strong reporting features (Crystal Reports); Strong audit features, Email alerts for critical events; Bi-directional integration with major project management applications	Between \$10K-\$1.8M	Integrated package (qualitative & quantitative analysis) ; Reporting features; Audit feature; Links to multiple major project management applications	Price; System requirements; Ease of use; Standalone product; Separate location for risk management

<p>RRE</p>	<p>Tomcat 5.0.3 J2EE-compliant Web Server; 1.6Ghz Pentium IV, 2 GB RAM, 40 GB Disk, Oracle 8i, MS SQL or MySQL DB 4.1, Access to W3C-compliant Browser (IE 6.1 or FireFox)</p>	<p>MS Access database programmable for detailed data entry; Ad hoc reporting on risk security classifications Sends Email alerts; Scalable hierarchical enterprise design</p>	<p>Price only available with direct quote from vendor</p>	<p>Programmable MS Access database feature; Ability to quickly view risks across categories(high to low); Scalable hierarchical enterprise design</p>	<p>Clunky Web design; System requirements; limited integration with other project Management software applications; Over-reliance on tables for data entry; Standalone product; Separate location for risk management</p>
<p>WelcomRisk</p>	<p>1.6 GHZ Pentium IV,MS .Net 1.1 for Application Server; IIS Sever %1 for Web Server: IE 6 Browser, Oracle or MS SQL server database</p>	<p>Tree hierarchy to manage risk; Risk mitigation links to Welcom family of project management applications</p>	<p>\$1500 full user; \$500 per additional team member; requires minimum \$15,000 order</p>	<p>Price; Ease of use; Integration with Welcom products</p>	<p>Standalone product; Separate location for risk management</p>
<p>Palisades @Risk Professional 4.1</p>	<p>IBM PC Pentium or higher; Windows 98 or higher; Project 2000 or higher; 64MB RAM or more (128MB recommended)</p>	<p>Fully integrated quantitative-focused risk analysis tool designed to work with MS Project; Links to Excel for reporting;</p>	<p>\$1595- for Full License Download Only Price -\$1570</p>	<p>Price; Ease of use; Links directly with MS Project-the world's most widely used scheduling tool; Reporting exports to Excel; Multiple quantitative analysis tools</p>	<p>Weak in qualitative analysis; Focuses at the project level vs. strategic enterprise level</p>

A summary review of the software-based risk analysis tools outlined above reveals that two of the standalone risk management tools (ARM and RRE) are focused on qualitative risk analysis and are expensive, standalone systems with limited or awkward interfaces to other project management software applications. WelcomRisk provides qualitative analysis and a clean interface to their own project management applications software but still must be operated as a standalone product.

Palisade’s @Risk Professional is designed to work with Microsoft (MS) Project but is weak in the area of qualitative risk analysis. To help understand the relative value of these applications for utilization in IT Industry projects, one needs to understand the project environment in the IT Industry. A basic description of IT Industry projects and risk management methodologies used on those projects follows.

Description of IT Industry Projects & Risk Management Methodology

Projects in the IT Industry tend to run the gamut of the full systems development life-cycle. Typical IT projects could be for software development, systems integration, hardware or software product roll-outs, or assumption of client IT functions in an outsourcing engagement. IT projects also tend to be labor intensive (IT equipment needed for the project is generally purchased separately by the client) and established with finite financial parameters (I.E. Individual projects are generally with shorter durations, have finite objectives broken into phases, and a relatively low dollar threshold). Project Managers for typical IT projects tend to manage small teams of technical specialists and perform the project management functions with little or no on-site direct support for the project management function. Thus, IT Project Managers typically perform all of the functions of a Project Management Office that would be present on a larger project.

Given the limits of resources in a typical IT Project Office, the risk management function must be largely performed and managed by the Project Manager. The IT Project Manager can draw input from their teams but tracking risks for the life of the project usually falls back on the Project Manager. One of the tools IT Project Managers use to get the initial Project Risk Management Plan developed is nominal group technique. In this process the Project Manager calls together his team and his project sponsor to help do risk identification. The Project Manager asks each team member to spend 15 minutes writing down all of the individual potential project risks on a series of Post-It notes. At the conclusion of the 15 minutes, the Project Manager asks each team member to go to a centralized White Board and post their risks in categories. The results of this exercise generally tend to lead to a fairly complete list of initial risks in general categories. An example of the end product of one of these risk exercises done in a recent project follows (Reference Lisa LaCourse Best Practices Clearing House Project (BPCh) Project Risk Management Plan -RMP):

<i>Best Practices Clearing</i>	
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<i>House Project (BPCh)</i>				
<i>RMP</i>				
<i>Risk Event</i>	<i>Probability</i>	<i>Potential Impact</i>	<i>Contingency Budget</i>	<i>Mitigation Strategy</i>
Lack of funding in FY06 will reduce ability to work risk areas and concerns	75%	High quality impact High schedule impact		Press forward on funding. Develop strong funding contingency plan—what will we do if we have different levels of budget shortfall.
Hurricane relief drains funds at the Federal level overall	10%	Low budget impact		
Lack of funding certainty long-term (FY07 and beyond)	10%			
Sponsors and stakeholder support is not focused on this effort due to diverse sponsoring organizations (lack of clear ownership and MDA)	75%	High quality impact High budget impact High schedule impact		Build success criteria for stakeholders and specifically address those items at quarterly reviews with them.
Lack of clarity, data, unbiased approach, and documentation on AoA will continue to surface overall concerns	50%	High		
Lack of understanding and documentation on unique capabilities and benefits of BPCh program				
That we won't tightly tie in functionality, networks and data on existing CoPs				
Lack of approval of written CDD and requirements, and ConOps	75%			
Lack of time to participate by Acquisition Workforce				
Lack of buy-in and specificity in ConOps	50%	High budget impact		Test and validate the ConOps regularly and with different audiences.
Inadequate attention to PR and training for all user groups will dilute level of participation and quantity (and quality) of data in BPCh				
Lack of time to participate by system support personnel	50%	High quality impact High schedule impact		Quantify expected time commitments more specifically. Communicate those time commitments to support personnel and

			management.
			Staff at least initial support personnel from directly-controlled DAU KM resources.
Insufficient set of experts and vetters to help execute Information Handling processes	60%	High quality impact	Maintain focused attention by Program Management staff on Information handling resources.
			Continuously revisit Information Handling processes and requirements to find efficiencies and to streamline the processes.
Not a lot of previous activity to build support around idea of and roles for PPN	50%	Moderate schedule impact Moderate quality impact	Initially, as an internal BPCh project team, document more details on PPN (charter, members, process to enlist new members, member role description, qualifications for members, scope of members and size, etc.)
Not enough practitioners participating; BPCh just tells users information that is already obvious	30%		
Change of personnel in Administration may cause shift in priorities without adequate system documentation and data	25%	Moderate budget impact	Build strong system documentation and written stakeholder support by mid-year FY2006.
Service and agency stovepipes (?)	10%		
Expectations of users and sponsors will not be in line with realistic, executable plans for program in short term and long term	40%		
Lack of urgency for program in wartime	30%	Moderate budget impact	Discuss specific budgeting priorities with funding organizations to identify key sticking points and answers we can provide to ensure our standing on the priority list.
Program team does not carefully select conferences in which to participate and the program does not interface with the right audiences and get sufficient data as a result	60%	Low quality impact Moderate quality impact Low budget impact	Develop decision criteria for conference participation and match each conference against those criteria prior to participation (i.e., conference size; area of expertise; cost; vendor or demonstration space available; timing; connections to DoD, KM, or key functional areas)
Inadequate user and usability testing reduces appeal of system to users	50%	High quality impact	Build strong user testing and usability testing steps into early TEMP. Document all test use cases and

<p>DAU Faculty will not have enough time in their “allocations” to adequately participate in BPCh (as Information Providers and Information Handlers)</p> <p>BPCh participation will “compete” with participation by faculty and other SMEs with other KM Systems</p> <p>Information Handling processes will be cumbersome and time-consuming, and not automated enough</p>	<p>50%</p>		<p>results and publish those results for validation with Core Team and even stakeholders.</p> <p>Work closely with the CDSC and eLTC leadership to understand these workforce allocations and to get KM and related systems into the mix.</p>
	<p>25%</p>	<p>High schedule impact</p> <p>Moderate quality impact</p>	<p>Build close (seamless) integration among all KS/KM systems into the ConOps and system architecture design.</p>
	<p>60%</p>	<p>High quality impact</p>	<p>Every team member must be committed to simplifying at all opportunities, and the systems designers must focus on automation and streamlining as well.</p>
<p>Users initial unpleasant experiences using BPCh due to slowness, usability issues, etc. will slow system acceptance</p>			<p>Add response time and other lag times to TEMP.</p>

The Project Manager used the input of the risk identification exercise and then completed the risk management matrix with their own view of probability of occurrence, potential impact, and potential mitigation strategy. A column is also planned to allow for contingency budget to be assigned to each identified risk. The risk matrix is then posted to the Project’s work space on the Web and project team members are asked for comments and input. What emerges, after the team members input is received and contingency budget column is completed is the Project’s Risk Management Plan. This Risk Management Plan is then used to manage risk for the remainder of the project.

Risk Management Software Tools vs. IT Industry Risk Matrix Approach

A review of current literature reveals a growing trend towards a more comprehensive risk management approach for all projects, regardless of Industry is required. Three examples to support this statement follow. One argument for integrated risk management states “Integrated, quantitative risk management has secondary tangential benefits that are substantial. These benefits may not be achieved with purely qualitative risk management techniques “(Roberts Article). Roberts continues to expand on this theme by proposing a Risk Based Decision Support System (RDBS) process to allow

the presentation of integrated results to the decision-makers. The theme of integrated results continues in the suggestion that “At project start-up, executives and team members must be assigned responsibility for managing and mitigating risk. A project passes its first test of viability when all affected business units sanction the project, accept accountability, agree on priority and understand and manage the risk areas”. (Pappas Article). Finally, the suggestion that established risk management processes can act as “first pass” in risk identification and evaluation in fixed-end projects. (Felstead Article). Felstead continues to expand on the need for a better up-front risk management process by outlining a six-step model to mitigate risks. The six-step model acts as a “second pass” to help examine particular project risks and adequately prepare contingencies. Taking an integrated approach to the risk management process presents a strong argument for a comprehensive, integrated software tool to manage the process. A fully integrated software tool would be capable of quantitative & qualitative risk analysis and be integrated into the other project management planning and scheduling applications.

To continue the case for the comprehensive, integrated risk management software tool approach, the following additional literature was examined. In a recent study done at AT&T (Ondov Article), Rhoda Ondov argues that in using a simple risk management approach, “real risks are not acknowledged and project team members are reluctant to bring up risks” for by doing so they would “appearing to whine.” Ondov further argues that some projects do risk assessment and even have established contingency plans. However, these same teams tend to establish unclear risk thresholds to trigger contingency plans. Another advocate for a more integrated approach comes from a Welcom White Paper, (Patterson Article). Dr. Patterson argues that a new generation of software risk management tools provides the much needed flexibility to improve project decision making and reduce risk exposure. Dr Patterson stresses that the effectiveness of the risk management process can be influenced by the presentation of an integrated view. Yet another vote for the integrated software tool approach comes from another White Paper (Trumper White Paper) by Michael Trumper. Mr. Trumper stresses in his White Paper the need for both qualitative and quantitative risk management processes. An integrated software risk management tool would reinforce the presentation of Mr. Trumper’s views. Yet another argument comes for the integrated view from an article in Project Management 2/96 (Ward and Chapman Article). Mr’s Ward and Chapman stress the need for an integrated approach to risk management with a stress on documentation which will display the risk rationale, capture corporate knowledge, and provide the clarity and need for risk management data.

Though a strong case exists for an integrated risk management tools, there are equally compelling arguments for the more simplified approach used in the IT Industry. Several examples to substantiate this statement follow. One argument for the more simplified approach comes from a recent benchmarking study of risk management practices focused in the software development and technology industry (Tzvi Raz and Erez Michael Article). The Benchmarking Study examined risk management and risk mitigation tools used most often in the Industry (Lansdowne Article). Lansdowne's study revealed that the following general management practices were more often used to manage and mitigate risks: prototyping, simulation, benchmarking, requirements management, subcontractor management, configuration control, quality control, quality management, training programs, and customer satisfaction surveys. A second study cites the use of a risk management matrix with the addition of the use of a rank ordering technique called the Borda method as highly effective risk management technique that is in active use in the Government Sector. The Borda method proposes that all risks be rank ordered in terms of importance to the project from 1-N. This technique allows all project risks to be rank ordered without any ties. A third study suggests the use of a qualitative risk management tool in use on medium sized projects in the Government Sector (Kindinger Article). This tool uses multiple steps to set up a model to measure risks in cost, budget, schedule, technical risk areas. The model proposes the use a relative risk ranking criteria and produces a table which measures risk categories and generic risk factors and rates and compares project risks against each other.

To continue the case for a simpler, non-tool based approach, the following additional literature was examined. In a PMI Symposium Paper (Patrick Article), Mr. Patrick argues for the use of critical chain buffers and buffer management. Mr. Patrick states that by establishing buffers between project events, the buffers will serve as a tool for risk management and protect the project's promises for the life-cycle of the project. Mr. Patrick concludes that the use of critical chain / buffer management is a more coherent and comprehensive approach that leads to better project management process and better risk management process. Yet another argument against tools comes from a PMI Symposium Article (Hillson Article). Dr. Hillson argues for establishing effective risk response criteria over any of the other risk management processes. The criteria recommended are to ensure risk responses are appropriate, affordable, actionable, assessed, agreed, allocated and accepted. These risk response criteria need to be established and approved by all of the project's stakeholders. Dr. Hillson concludes

that risk management process will never deliver the promised benefits if risk response planning is ineffective. Dr. Hillson’s view supports the use of a simpler risk management approach, as most risk management software tools focus on tracking simulations or developing “what-if” drills and fail to examine the analysis of responses to risks.

Another supporter for the simple approach comes from a PMI Symposium Paper (Watshull Paper). Mr. Watshull takes the approach that all Project Managers (PMs) have different approaches to risk taking. Mr. Watshull believes PMs will adopt a one of three risk taking approaches—risk adverse; risk-taking; or risk neutral. A PM’s approach to risk taking drives how the project will handle the risk management process. Most PMs must be willing to accept calculated risks to be able to progress in their respective organizations. PM’s willing to accept risks view the project budget as their personal money and are willing to take bigger risks to enlist the aid of senior management. However, Mr. Watshull stresses that the pitfall of this approach is often the PM is faced with too much information which causes the PM to delay, defer, or delegate risk management decisions. Once again, the information presented by a software tool may cause too much information to be available and cause the PM to make a bad decision based on their own personal risk-taking approaches and biases. Yet another Research Paper (Ward Article) stresses the use of influence diagrams as an effective tool that may be as important as any other project management tool.

A recent Project Management Journal Article (Datta & Mukherjee Article) argues for the use of a risk management matrix that relatively ranks across a table of risks segmented to rank External Project risks (Vertical Axis) vs. Intermediate Project risks (Horizontal) with a scale High-Medium-Low and consideration of 9 Segments of Risk. An example table template follows:

High	Segment I	Segment II	Segment III
Medium	Segment IV	Segment V	Segment VI
Low	Segment VII	Segment VIII	Segment IX
	High	Medium	Low

This technique is in use in Department of Defense (DoD) Contracts and serves as yet another alternative to the use of a risk management software planning tool. The author used this technique in a recent DoD project entitled Mounted Battle Command on the Move (MBCOTM) Project. In this project the key Project Management areas of funding, technical and schedule was rated in a table

similar to the template above. However, in this case, the ratings were color coded vs. High-Medium-Low. The Low was Green, the Medium was yellow, and the High was red. The Project Manager then colored each segment area in a color (Red-Yellow-Green). The Project Manager then provided his single assessment of the major areas with a color choice. This matrix was then placed into the Project's Acquisition Strategy as the Summary Risk Assessment.

Summary Analysis

This paper reviewed the case for risk management software analysis tools vs. the more simple approach used in the IT Industry. In addition, multiple additional risk identification and tracking systems were examined. There are compelling reasons for and against the pursuit and use of an integrated software risk management tool vs. a simpler risk matrix or alternative approach. The rationale and pro's and con's for each side are also presented above.

However, based on the author's experience in the IT Industry, I believe the use of a comprehensive risk management software tool, which features qualitative and quantitative risk management, will never be widely used in the IT Industry. The rationale for this statement follows. First, the IT Industry does small, short phase projects with low overhead. The costs identified above for the comprehensive risk management software packages would exceed the overhead budgets of most IT projects. Second, IT Project Managers have lean staffs and can not afford to maintain two major software applications in their Project Management Offices. The comprehensive risk management platforms like Active Risk Manager and Risk Radar Enterprise would require the Project manager to maintain two platforms (One for risk management & One for Scheduling Management) and may even require a separate network infrastructure to operate the Risk Management application.

Third, IT Project Managers have multiple other risk management tools that are simple to create and easy to maintain. Fourth and finally, in the case of Risk + for Microsoft Project or Welcom Risk, the risk management application could be kept within the same application as the Project's scheduling application (either Microsoft Project or Welcom Scheduling tool).

In the final analysis, the risk management software is a project management tool like any other tool used by a Project Manager. The importance of this tool, relative to any other project management tool should not be overstated. As stated by Preston G. Smith and Guy M. Merritt in Proactive Risk Management, "A project risk management process can make substantial improvements in your projects' predictability. But it should be clear by now it is not a cure-all. First, you will expend a significant amount of effort to implement project risk management. And each project will take

additional effort, although this should be more than offset by the time and money saved from averted risks”. Comprehensive risk management software tools will claim to enhance the risk management process for the Project Manager and presents as a way to minimize the initial work effort. However, continuing with Smith& Merritt, “...risk management is not a blissful existence of “no surprises”, only one of reduced surprises. You can not afford to eliminate all the risks you know about, and others are simply unknowable. Risk management is a constant game of improving your odds”. Thus the IT Project Manager uses the simple tools, risk matrix, add-on tools like Risk + and Welcom Risk in conjunction with their software scheduling applications to “improve their odds”.

One final note on software tools come from the conclusion of the Husby/ Brede/ Tendal article. The author’s conclusion is “software tools are very useful and time saving but success comes from the project’s team’s use of these tools and a commitment to the risk management process and not just from the tools”. Thus, whether the IT PM uses a comprehensive software tool, risk management software add-on to their scheduling tool, or a risk matrix approach, it is more important to commit the project to a risk management process than a risk management tool.

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