How Risk Analysis Streamlines Decision Making for Major IT Initiatives

Quantify the emotional and financial impact of risk to drive timely, informed decisions

VMWARE WHITE PAPER

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Table of Contents

Overview

Most mid-size and large enterprises today are either planning or implementing some form of cloud-based services—in fact, many are doing both at the same time. As cloud initiatives move into the mainstream of corporate strategic planning, executives are facing decisions that will strongly impact their organizations—and their own careers. Working with hundreds of customers of all sizes on cloud initiatives, VMware has identified a key yet often overlooked hurdle to making these decisions: the inability to accurately analyze and assess the risks involved.

This white paper is intended to show that VMware offers corporate decision makers a powerful, long-overdue tool for risk analysis. It is divided into two major sections:

- **Section 1, Overview of Risk Analysis**—makes the case for risk analysis, discusses why doing nothing is not as safe as it may seem, and demonstrates typical actionable results of the risk analysis methodology.
- **Section 2, Risk Analysis Methodology**—goes deeper into the specifics of the process and parameters of risk analysis.

Section 1: Overview of Risk Analysis

Why Risk Analysis Matters

When IT executives are facing a major decision, they must assess both tangible and intangible factors. Take a common example: Enterprises are considering the best approach to hosting applications—private cloud, public cloud, or private/public hybrid solution. Experienced decision makers understand how to weigh the relative business value of competing solutions based on tangible factors such as startup costs, operating expense, security, service levels, and support. Complex spreadsheets efficiently tally up the numbers and compare the competing solutions in minute detail.

At the same time, the decision maker must also consider possible negative implications of each choice—they must evaluate the risks. Projected cost savings are of little value if they come at the price of lost productivity due to bottlenecks, outages, or security breaches, just to name a few potential pitfalls. IT managers need concrete answers to questions such as:

- How confident am I that my IT group/public cloud vendor can actually implement the solution?
- What happens if they can't? How will it impact the organization? How will it impact my credibility with key stakeholders?
- What if the project turns out to cost more and take longer than projected?
- What is the likelihood that "something bad" (never well-defined) will happen? And how catastrophic would "it" be?

Assessing risk is integral to the decision-making process for strategic initiatives and major IT procurements. Until now, executives have been forced to evaluate risk based on experience, vendor claims, hearsay, and intuition. It's not uncommon for an anxious decision maker to rely on instinct to postpone a promising initiative with substantial upside potential in the mistaken belief that doing nothing is safer. (The following section discusses this common fallacy.)

IT decision makers need a structured approach to evaluate risk and reward in a way that allows them to translate their emotional responses into tangible data. Understanding and quantifying risk empowers IT executives to make better, more defensible decisions on major IT initiatives. This paper describes a methodology for identifying, measuring, and applying risk factors against the value opportunity and the cost of failure to deliver unique insight into the decision making process.

The Fallacy of Safety in Doing Nothing

Most IT professionals would characterize their decision-making process as a rational evaluation that enables an objective decision based on all the relevant and available data. However, social psychology research suggests otherwise—in fact, human decision making is a complex phenomenon involving a range of social and emotional factors that are often easy to overlook, especially in the executive suite[1].

Risk generates an emotional response that impacts the decision process. While the detailed spreadsheet analysis might support the adoption of a new and unproven technology, the decision maker may also be aware of instances when a similar move turned out to be disastrous—both for the organization and the individual.

Furthermore, the higher the stakes, the stronger the emotional response. It's one thing to upgrade to the next version of an operating system in test development—after all, you can always roll back to the previous version if the new one turns out to be unstable. It's a different case with a major refresh of a critical subsystem such as the data center network or enterprise servers. If it proves to be a bad decision, there's no easy way to recover.

1 Lizárraga, María L. Sanz de Acedo et al. Factors that affect decision making. International Journal of Psychology and Psychological Therapy, 2007, 7, 3, 381-391.

Compounding the problem is the fact that most organizations have no way to accurately assess the risks of proposed technology initiatives such as hybrid cloud. Faced with this reality, IT executives often instinctively delay acting—so-called "decision paralysis." The mindset is to postpone making a decision that could lead to negative consequences, especially when it involves emerging technologies and new architectural approaches.

In fact, a non-decision is actually an implicit decision to "do nothing" as a way of avoiding the risks of taking action. However, every decision—including the decision to do nothing—involves risk. In particular, the current state of the IT infrastructure often has unmitigated risks that are not fully recognized. Doing nothing leaves those risk factors in place.

Doing nothing can in fact be the right decision, but it should be based on data rather than luck or fear. What's needed is a way to unblock the decision process and move decision makers from a default position of doing nothing to a conscious decision to do the right thing at the right time with the right information.

What is Risk Analysis?

Risk analysis offers a way forward. Through a quantitative comparison of operational risk and financial impact for the current and proposed solution states, risk analysis helps decision makers arrive at confident choices informed by data.

Risk analysis is particularly relevant when IT executives face a major decision with substantial impact on the enterprise's operations and revenue, for example, deciding whether to augment an internally hosted (private) cloud with services from a cloud service provider in a hybrid architecture. Making the best decision requires an accurate and reliable assessment of all relevant factors, including risk.

The major components of risk are exposure, tolerance, confidence and trust, probability and chance, and the size of the risk or decision. The VMware Accelerate™ Advisory Services risk analysis model establishes a framework for identifying, measuring, evaluating, and objectively comparing these factors. While the Accelerate Advisory Services hybrid cloud risk analysis model was initially created for cloud hosting decisions, the methodology can be applied to any technology initiative.

The Rules of Risk-Based Decision Making

#1 The size of the stakes drives the emotional response.

#2 The level of risk tolerance must exceed the potential exposure of failure.

#3 The upside opportunity value must exceed the downside cost of failure.

Actionable Results

Before examining the VMware Accelerate Advisory Services hybrid cloud risk analysis methodology, let's look at the output of a typical risk analysis (Figure 1). This example compares the relative risk/reward for an internally hosted solution (current state) versus a public cloud solution (proposed state). In this case, the public cloud solution is rated **Average Risk, But Promising,** while the hosted solution is rated **Average Risk**. The public cloud solution therefore delivers a higher degree of value opportunity consistent with the customer's acceptable risk level.

From the decision maker's point of view, the intangible risk factors for the two solutions depicted on left of the summary bar have been quantified and compared to generate an overall risk assessment. The overall risk assessment constitutes easy-to-understand, actionable information that can be evaluated and compared to other quantitative factors to inform the ultimate decision. The following section describes the risk analysis methodology used by Accelerate Advisory Services to show how these actionable results are generated.

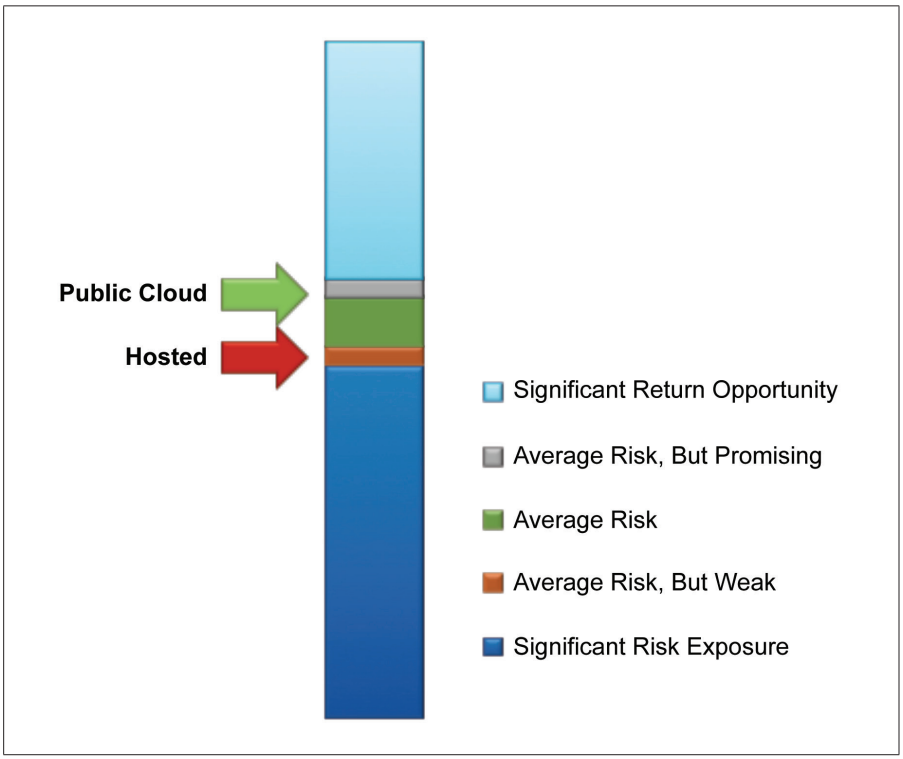

Figure 1. Overall Risk Analysis

Section 2. Risk Analysis Methodology

This section describes the VMware Accelerate Advisory Services risk analysis methodology by showing the analysis process for a typical use case. The CIO of Acme, Inc., must make the choice about hosting Rapid2Ship[2], a key business application. Rapid2Ship currently runs in an on-premises private cloud, but the CIO is considering migrating to a public cloud provider. To better understand this decision, Acme will use the VMware Accelerate Advisory Services risk analysis tool to assess the impact of risk.

Risk Analysis Inputs

The inputs to the risk analysis algorithm fall into four categories: financial basis, risk, return, and risk accelerators.

Financial Basis

As noted earlier, the size of the decision influences the emotional response to risk. Therefore, the first step in the risk analysis methodology is to calculate the scope by determining how much revenue is directly impacted or driven by the application (Table 1).

Table 1. Financial Basis Assessment for Acme, Inc.

Risk Assessment Results	Hosted/On-Premise Solution	Public/Hybrid Cloud
Annual Revenue (USD) for Acme, Inc.	600,000,000	600,000,000
Percentage of Revenue Impacted by Rapid2Ship	1.00%	1.00%
Estimated Revenue (USD) at Risk from Rapid2Ship	6,000,000	6,000,000
Estimated Annual TCO (USD)	19,737	33,612
Annual TCO as a Percentage of Revenue	0.33%	0.56%

To drive the financial basis assessment, Acme's CIO provides these inputs:

- Annual revenue for the entire enterprise
- Percentage of annual revenue impacted by the application
- Estimated total cost of ownership (TCO) for current and proposed solutions

Using these parameters, the risk analysis algorithm calculates the amount of revenue that is potentially at risk in this decision as well as the annual TCO as a percentage of revenue. These two derived values quantify the scope of the decision in terms of its potential impact—and thus the magnitude of the emotional response of the decision maker. The ability to quantify decision factors that were previously subjective is one of the strengths of the Accelerate risk analysis.

2 Rapid2Ship is a hypothetical application and does not represent any particular product offering.

Risk

Once the financial basis has been determined, the analysis moves to an assessment of risk. While it is impossible to identify and quantify every source of risk, the categories in this assessment represent the vast majority of the risk in a typical IT infrastructure decision. Risk is assessed in four event categories:

- **Availability** risk events include reduced employee productivity, failure to meet customer service level agreements (SLA), lost revenue, and regulatory fines.
- **Governance and compliance** risk events include legal sanctions due to non-compliance, regulatory fines, and geographical data restrictions
- **Security and privacy** risk events include failure to meet SLAs, lost revenue, regulatory fines, loss of goodwill, and theft of intellectual capital.
- **Business relationship management** risk events include service term changes, data end of life, technology lock-in, contractual lock-in, and vendor non-performance.

For each risk event listed above, Acme's CIO rates the following four parameters using a simplified scale ranging from none to high (Table 2):

- Potential exposure impact
- Acceptable risk level
- Probability of occurrence for current solution
- Probability of occurrence for proposed solution

Table 2. Risk Assessment Matrix for Acme, Inc.

Risk Factors	Areas of Potential Loss	Importance	Acceptable Risk Level	With Hosted/ On-Premise Solution	With Public/Hybrid Cloud
Availability	Employee Productivity Customer Productivity (SLA) Revenue Legal & Regulatory (Fines)	None High Low Medium	None Low Low Low	None Medium Low Medium	None Low Low Low
Governance and Compliance	Legal Regulatory (Fines) Geographical Data Restrictions Compliance with Standards (ITIL, ISO, SAS-70, etc.)	Medium None High	Low None Medium	Medium None Low	Low None Low
Security and Privacy	Customer Productivity (SLA) Revenue Legal & Regulatory (Fines) Goodwill (Perception) Intellectual Capital	High Low Medium High High	Low Low Low High Low	Medium Low Medium Medium Medium	Low Low Low Low Low
Business Relationship Management	Service Term Changes Data End-of-Life Process Technology Fungibility Contractual Fungibility Cloud Vendor Performance	Medium Low High Medium High	Medium High Low Medium Low	None Low Above Average Above Average None	Medium Medium None None Low

As an example, consider the event Availability: Customer Productivity (SLA). Acme's CIO is keenly aware that outages or other kinds of unplanned downtime make it difficult or impossible for her customers to access their applications and data and thus reduce customer productivity. Here's how Acme's CIO assesses this risk:

- HIGH importance—Acme puts a high priority on preventing outages that could impact customer productivity.
- LOW risk tolerance—Acme has a low tolerance for lost customer productivity.
- MEDIUM likelihood of occurrence with private cloud solution—Acme believes that its current solution is somewhat likely to incur downtime.
- LOW likelihood of occurrence with public cloud solution—Acme judges the proposed public cloud solution to have a low probability of downtime that would impact productivity.

The first two responses are characteristic of enterprises that provide online services to customers—they cannot tolerate downtime that impacts revenue as well as their corporate brand. Therefore, virtually any level of risk in this key category will be considered unacceptable.

The responses to the last two questions show that Acme's CIO considers the public cloud solution to be inherently more reliable that the company's current on-premises solution—a politically sensitive conclusion in many organizations. By quantifying the CIO's responses, the Accelerate risk analysis tool allows this assessment to influence the decision process in an objective way, potentially avoiding contentious internal discussions. Put another way, risk analysis transforms subjective judgments into quantitative data that can be processed algorithmically.

Return

To complete the analysis, Acme's CIO needs a clear picture of the upside to the IT organization, that is, the potential return on this investment. The risk analysis tool categorizes the potential return in four areas: accessibility, business responsiveness/agility, scalability, and cost/resource accounting.

- **Accessibility** drivers include improved access and redundant hosting
- **Business responsiveness/agility** drivers include rapid deployment and reduced time to market.
- **Scalability** drivers include on-demand capacity scaling, tier offloading, and business continuity/disaster recovery support.
- **Cost/resource accounting** drivers include reduced asset tracking, decreased support labor requirements, and reduced physical device management.

Similar to the process used for risk, Acme's CIO rates each productivity event according to four criteria:

- Potential value
- Acceptable risk level
- Probability of achievement for current solution
- Probability of achievement for proposed solution

Table 3 shows the potential return assessment for Acme.

Table 3. Overall Risk Calculation for Acme, Inc.

Productivity Factors	Potential Value Drivers	Potential Value	Acceptable Risk Level	Likelihood of Value Achievement	
				With Hosted/ On-Premise Solution	With Public/Hybrid Cloud
Accessiblity	Access anywhere, anytime, any device	High	Medium	High	High
	Multi geosite redundant hosting	High	Medium	None	High
Business Responsiveness	Ability to deploy IaaS, PaaS, and SaaS rapidly	None	None	None	None
	Reducing applications Time to Market (TTM)	Medium	Medium	Medium	Above Average
Scalability	Ability to scale capacity on demand	High	High	Low	Above Average
	Ability to offload Test/Dev to less critical tier on demand	None	None	None	None
	Ability to enhance or support BCDR	None	None	None	None
Cost and Resource Accounting	Reduction of book asset tracking	None	None	None	None
	Reduction in support labor requirements	None	None	None	None
	Reduction in physical device management	None	None	None	None

Risk Accelerators

In addition to the specific named risks, there are other decision-related risks that influence the overall decision process. Higher levels of risk acceleration drive risk higher while lower level reduce overall risk. These risks include:

- **Environmental Complexity** – Considers how complex the implementation of the private or public cloud would be in relation to the organization's average project complexity. Is this project more or less complex than an average implementation?
- **Commitment Level** – Describes the level of commitment each solution will require. For example, is there a way to roll the system back to a previous state, or, once started there's no going back?
- **Implementation/Transition Time** – Evaluates the time required to implement a public or private cloud solution and describes how long the implementation of the solution is expected to take. The longer the project takes to complete, the greater the risk of failure. Is it longer or shorter than the average project?
- **Time Pressure** – Considers how much pressure the decision maker is under to make a decision. Pressure to make quick decisions can increase risk, although long delays in the decision process can also lead to negative results. Is the decision window longer or shorter than normal? Is there enough time to effectively evaluate the options?
- **Vendor Execution Ability** – Describes the solution vendor's ability to set vision and execute on that vision. Is the vendor innovating technology or falling behind?

Assessing Overall Risk

Based on the inputs provided by the user—in this case, Acme's CIO—the risk analysis algorithm determines the overall risk. The results are displayed as a summary (Figure 1). The summary bar provides an overall comparison of the two alternatives. In this example, the risk analysis shows that the public cloud solution is rated as Average Risk, But Promising to Significant Return on Investment while the on-premises private cloud solution is rated as Average Risk, But Promising. Based on this analysis alone, the public cloud solution is the better choice. However, risk analysis is not intended to be a definitive decision tool, so this result should be included with other objective data to reach a final conclusion.

In addition to the overall rating, the Accelerate risk accelerator analysis presents a written summary that explains the most critical risks and most significant opportunities (Table 4). It also delivers quantitative results—net return on risk and potential revenue impact upside/downside. Taken together, the results of risk analysis allow executives to communicate the implications of risk to the IT organization and stakeholders throughout the enterprise.

Table 4. Overall Risk Calculation for Acme, Inc.

Risk Assessment Results	Hosted/On-Premise Solution	Public/Hybrid Cloud
Inherent Cloud Risk/Return Factor (0% is Balanced Risk, + is Acceptable, - is Unacceptable)	-3%	17%
Net Risk Adjusted Cloud TCO Reduction (USD) (negative indicates risk mitigation expense)	(510)	4,600
Annual cloud TCO (Risk Adjusted in USD)	**20,247**	**29,012**
Upside Opportunity (USD)	(510)	(9,300)
Estimated Downside Revenue at Risk (USD)	7,000	6,000
Value Opportunity (USD) (Upside less Risk Impact)	(7,510)	(15,300)
Financial Risk Coefficient	0.12%	0.10%
Net Cloud Return on Risk	**-3%**	**17%**
Potential Revenue Impact Upside (Downside) in USD	(162,000)	800,000
CLOUD RISK IS:	**"AVERAGE RISK"**	**"AVERAGE RISK, BUT PROMISING"**

Return on Risk

The return on risk is calculated as ratio of the upside value opportunity over the downside and the inherent risk. If the ratio of the TCO investment to the value delivered (in terms of revenue impact) is very small, then the financial risk component of the decision trends toward relative insignificance. In the Acme example, the major driver of return on risk will be the inherent risk results. Conversely, a higher ratio causes the financial component of the decision to carry more weight in the return on risk.

The return on risk is generated as the net positive value opportunity over the potential revenue being placed at risk. A negative Return on Risk suggests there are red flags and the solution should not be considered without completely evaluating the risk exposure and probability of occurrence. A positive Return on Risk is favorable toward achieving the goals of the solution while keeping risk exposure low and should be more closely considered.

Potential Revenue Impact

The potential impact on revenue is estimated by taking the risk-adjusted TCO impact multiplied by the ratio of the revenue by the TCO. This value is driven primarily by the risk-adjusted TCO and estimates the revenue impact that could be achieved with each of the solutions. A positive result indicates additional value opportunity, while a negative result would estimate the potential revenue exposure from unmitigated risk.

Summary

VMware Accelerate Advisory Services risk analysis methodology transforms the emotional aspects of decision making into actionable, objective information that can be used in conjunction with other methods of analysis to offer a more complete picture of the alternatives under consideration.

The analysis of risk uncovers hidden exposure and opportunity to more confidently move projects from “do nothing” to “go.” While there are times when doing nothing is the best approach, taking action is the preferred strategy—but only if the relative merits of the proposed solution can be properly assessed and factored into the decision.

The Accelerate risk analysis methodology described here is straight-forward to use and delivers results that are relevant, accurate, and easy to understand. The results are provided in a format that can be readily shared throughout the enterprise as needed. Applying risk analysis to the public/hybrid cloud decision process and other major IT initiatives will help executives gain insight into the risk factors involved for each alternative, quantify the real value of the risk and opportunity, and increase their confidence in the decision.

For more information about the full range of VMware Accelerate Advisory Services, contact your VMware sales representative or visit www.vmware.com/go/Accelerate.

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