

Risk of Budgeting Revamp in a Non-Profit



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Introduction

The purpose of this project is to find a quicker, effortless, and accurate method to forecast monthly and annual budgets within a specific non-profit. In the current process used by the non-profit, blank templates are disseminated to every department head within the association for completion. The completed templates are then sent to the Finance Department for advisory and approval for the following fiscal year. Upon approval of the budget, the finance department submits the budget into the association's current accounting system. This process is tedious and results in budgeting inaccuracies. To mitigate the current process, a new budgeting procedure has been proposed. Through the Finance Department, budgets for the entire non-profit will be automated. Auto-populated departmental budgets will be formulated from historical data.

Project Structure

The group implemented the Analytic Hierarchy Process (AHP) to assess risks faced by the company due to implementing the budgeting revamp. We analyzed these risks within the scope of one year. Using the Riskion® software we structured a risk analysis model to determine risk events, and prioritized events that may jeopardize the outcome of the non-profit budgeting revamp. In our risk analysis we worked backwards to determine the threats the organization faced. We began with identifying the objectives of the organization, then pinpointed the risk events that would compromise previously stated objectives. From our risk events, we were able to identify threats that could trigger risk events, known as sources. After identifying these factors we were able to measure the risk in respect to risk events, sources, and objectives to calculate the value of total risk. To mitigate risk, we implemented several controls to reduce the risks involved with the new budgeting revamp.

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Identifying Elements of Risk Analysis

To begin our risk analysis, we must first define several terms, which are key to further understanding. The risk analysis method that we used to analyze our nonprofit is the Analytical Hierarchy Process (AHP), which is the process involving structuring objectives into a hierarchy of homogenous clusters so that the relative importance of the objectives can be derived based on judgments from multiple participants. There are 4 elements that constitute a proper risk analysis: Sources, Risk Events, Objectives, and Controls. Sources, or threats as they are commonly known, are certain events that do not necessarily constitute a loss, however they have the ability to cause a risk event. Risks events, also known as risks, or events, are uncertain events that result in a loss to the objectives of the organization. Risk events can be caused by one, more, or no sources. Objectives are the goals and objectives of the organization, project, or team. Controls are put into place to reduce the amount of loss incurred by risk events.

Within Riskion we identified elements of risk analysis by working backwards, starting with company objectives, then identifying risk events and sources. From a company standpoint, we identified three main objectives the company wanted to achieve by implementing the budgeting revamp. These objectives included: (1) enhancing financial stability, (2) adding value to the company's reputation, and (3) easing the transition of management. Under each umbrella for objectives, we included several sub-objectives, illustrated in Figure 1.

Objectives



Figure 1 Objectives of the Nonprofit Organization

Given the identified objectives we then brainstormed and identified 17 risk events we believed could jeopardize the implementation of company objectives, given in Figure 2.

Risks

Unique ID	Events
[01]	Nonprofit status revoked
[02]	Federal grant funds reduced
[03]	Other departmental funding cut
[04]	Automation dependency increases
[05]	Company morale decrease
[06]	Higher budget variance
[07]	Donor trust decline
[08]	Employee turnover increase
[09]	Special case budgets ignored
[10]	Inaccurate budgeting projections
[11]	Technological privacy breach
[12]	Technological system failure
[13]	Employee resistance
[14]	Biased fund distribution
[15]	Organizational hierarchical confusion
[16]	Grant deadlines missed
[18]	Deminished community partner relations

Figure 2 Risks Facing the Non-Profit Budget Revamp

The descriptions for the risk events due to the budgeting revamp are as follows:

1. Nonprofit status revoked- The nonprofit status of the company will be revoked by the federal government
2. Federal grant funds reduced- The federal government will sanction the organization and reduce the amount of grants given
3. Other departmental funding cut- The finance department will cut the budgets for the other departments in an effort to save, or to show bias
4. Automation dependency increases- Due to new budgeting procedures, there will be a loss of knowledge of how to manually budget
5. Company morale decreases- Due to increased automation, collaboration efforts are diminished thus negatively affecting relationships between employees
6. Higher budget variance- The change in budgeting processes will result in the opposite effect of higher budgeting variance
7. Donor trust decline- The results of the budgeting changes may create a trickle-down effect of organizational changes, thus resulting in a decline in donor trust of the organization

8. Employee turnover increase- Employees may feel slighted and their confidence in the company may decline, as such employees may leave
9. Special case budgets ignored- In the transition to a more automated system, the finance department may not be briefed on the special case budgets of each department, thus one-off situations may not be accounted for
10. Inaccurate budgeting projections- In regard to regular budgets there could be large under-budgeting
11. Technological Privacy Breach- In the change to a new technological system, without proper training and precaution there could be an increase probability of technological breach of sensitive information
12. Technological system failure- The new technological budgeting system may not run properly
13. Employee resistance- Employees may not be receptive to the change in budgeting systems. Power will be disproportionately distributed to the Finance department and as such employees will rebel
14. Biased fund distribution- The Finance department may reserve more money for themselves, while cutting budgeting for everyone else
15. Organizational hierarchical distribution- An increase in automation will cause a shift in need for certain levels of management thus impacting the number of analysts, managers, directors, and VPs necessary for each department
16. Grant deadlines missed- During the change in budgeting processes not all grant deadlines and prerequisites may be communicated, and as such the Finance department may miss deadlines
17. Diminished community partner relations- Due to changes in budgeting relationships between community partners and their contacts within the company may diminish

After identifying potential risk events, we began to brainstorm threats to the organization that would potentially trigger the listed risk events. We identified 4 potential threats, illustrated in Figure 3.

Sources

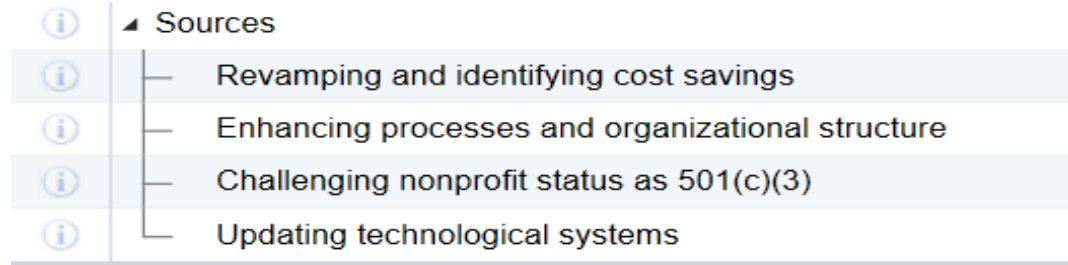


Figure 3 Sources of the Non-Profit Organization

Participants and Roles

Several stakeholders are involved with critical roles for the budget revamping project. We identified both the President/CEO and the CFO to assist us in evaluating the potential risks. We also relied on their subject matter expert judgment to identify events and sources as well as consequences. Based on their executive position in the organization, we assigned ourselves as project managers and kept their involvement to a high level as displayed below in Figure 4. Their insight became a critical basis for our risk measurements mentioned in a later section.

<input type="checkbox"/> Email Address	Participant Name	Permission	Has Data?
<input type="checkbox"/> hargrove_a@gwu.edu	Andrea Hargrove	Project Manager	Yes
<input type="checkbox"/> ceo@gwu.edu	George Smith CEO	Evaluator	No
<input type="checkbox"/> cfo@gwu.edu	Jane Doe CFO	Evaluator	No
<input type="checkbox"/> nstavarakakis@gwu.edu	Nicholas Stavarakakis	Project Manager	No
<input type="checkbox"/> priscillaluong@gwu.edu	Priscilla Luong	Project Manager	Yes
<input type="checkbox"/> forman@gwu.edu	Professor Forman	Project Manager	No

Figure 4 Participants and Roles

Measurement Methods

Utilizing Expert Choice Riskion software, we identified the most relevant method to add a metric for measuring relationships and likelihoods of events between our sources and objectives. This method is known as Pairwise Comparison, a relative measurement at the heart of the Analytic Hierarchy Process (AHP). A pairwise comparison shows how much more likely or important one element of a pair is than the other.¹

See in the figure below, based on the participants' judgements, inaccurate budgeting projections and automation dependency, 67.21% and 43.84% respectively, are the two events that are most likely to occur from the sources listed in Figure 5. However, because these two events are most likely to occur, does not mean that they contribute the most impact to the organization.

¹ Forman, E., Forman, H., Ludden, E., Risks-We-Face and Risks-We-Take Enterprise Risk Management

Source Name	Events	[All Participants] 2 with judgments
▲ Sources <ul style="list-style-type: none"> Revamping and identifying cost saving Enhancing processes and organizational Challenging nonprofit status as 501(c) Updating technological systems 		
	[01] Nonprofit status revoked	3.62%
	[02] Federal grant funds reduced	12.47%
	[03] Other departmental funding cut	16.52%
	[04] Automation dependency	43.84%
	[05] Company morale decrease	21.69%
	[06] Higher budget variance	23.59%
	[07] Donor trust decline	4.18%
	[08] Employee turnover increase	5.51%
	[09] Special case budgets ignored	26.57%
	[10] Inaccurate budgeting projections	67.21%
	[11] Technological privacy breach	12.58%
	[12] Technological system failure	17.71%
	[13] Employee resistance	38.74%
	[14] Biased fund distribution	25.95%
	[15] Organizational hierarchical confusion	13.68%
	[16] Grant deadlines missed	27.42%
	[18] Diminished community partner relations	3.82%

Figure 5 Measurement Results

When looking at the impact of events, pairwise comparisons communicate the significant impact of employee resistance, inaccurate budgeting projections, and nonprofit status being revoked on the project objectives. The pairwise comparison function allows project managers or evaluators to make judgments comparing an objective/event with another to determine the probability of it occurring. The next two figures exhibit the same information in different formats. Riskion has the ability to display data visually making analysis more efficient for its project managers.

Objectives

Objective Name

▲ Objectives

▲ Enhance financial stability

Increase dollar amount of revenues

Reduce management and general expenses

Decrease variance in budgeting

Balance revenue and program expense

▲ Add value to reputation

Increase donor count

Improve public charity rating

Add additional mission-driven programs

▲ Ease transition for management

Identify other employment opportunities for jobs that become automated

Develop a backup plan if technology fails

Gather input from all parties involved

Event Impacts

Events

[All Participants]
2 with judgments

[01] Nonprofit status revoked

4.51%

[02] Federal grant funds reduced

1.90%

[03] Other departmental funding cut

1.63%

[04] Automation dependency increases

0.51%

[05] Company morale decrease

0.87%

[06] Higher budget variance

3.59%

[07] Donor trust decline

2.16%

[08] Employee turnover increase

3.43%

[09] Special case budgets ignored

1.36%

[10] Inaccurate budgeting projections

5.21%

[11] Technological privacy breach

1.09%

[12] Technological system failure

1.52%

[13] Employee resistance

11.85%

[14] Biased fund distribution

0.00%

[15] Organizational hierarchical confusion

0.00%

[16] Grant deadlines missed

0.00%

[18] Diminished community partner relations

0.00%

Figure 6 Impact of Events

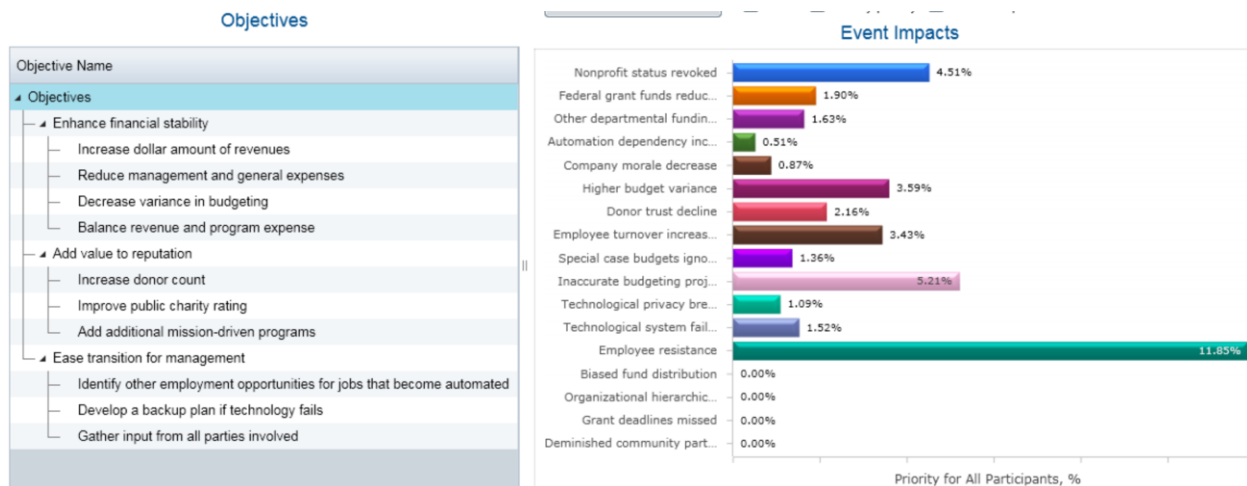


Figure 7 Comparison of Impact of Events

Since identifying and measuring the impact and likelihood for our events, we can now determine the risks our project faces. Risk, defined as an unexpected event or uncertainty that results in a loss, will be taken into consideration as well as the risk tolerance and risk appetite for our organization. Risk can be calculated by multiplying the likelihood of an event of the impact of an event. To further our analysis quantitatively, we attached dollar amounts as inputs and valued the enterprise at approximately \$800,000 for the purposes of this project.

For our organization, we found that although grant deadlines missed and biased fund distribution had a higher likelihood of occurring, they had little to no monetary impact on the organization, and as such, posed no monetary risk. Events such as employee resistance and inaccurate budgeting projects posed the highest risk to the organization with over \$250,000 in expected loss.

Overall Likelihoods, Impacts, and Risks for RM2019_AH_PL_Nonprofit Budget Revamp

No.	Event		All Participants		
			Likelihood Simulated	Impact, \$ Simulated	Risk, \$ Simulated ▼
[13]	Employee resistance	≡	35.00%	370,161	129,556
[10]	Inaccurate budgeting projections	≡	52.00%	226,519	117,789
[06]	Higher budget variance	≡	19.50%	130,505	25,448
[09]	Special case budgets ignored	≡	25.50%	47,110	12,013
[12]	Technological system failure	≡	17.90%	47,859	8,566
[04]	Automation dependency	≡	45.20%	18,877	8,532
[03]	Other departmental funding cut	≡	13.10%	57,265	7,501
[02]	Federal grant funds reduced	≡	11.10%	64,724	7,184
[01]	Nonprofit status revoked	≡	4.30%	151,418	6,511
[05]	Company morale decrease	≡	17.10%	31,139	5,324
[08]	Employee turnover increase	≡	4.00%	117,007	4,680
[11]	Technological privacy breach	≡	12.50%	32,525	4,065
[07]	Donor trust decline	≡	4.90%	77,280	3,786
[16]	Grant deadlines missed	≡	23.20%	0	0
[14]	Biased fund distribution	≡	21.60%	0	0
[15]	Organizational hierarchical confusion	≡	11.90%	0	0
[18]	Deminished community partner relations	≡	3.60%	0	0
Total Risk (Average Loss)					Simulated \$340,962

Figure 8 Calculated Likelihoods, Impacts, and Risks

A monetary value is attributed to the impact and risk for each event. Riskion produces a graph called the Loss Exceedance Curve in which the line represents the probability of loss exceeding the corresponding value. For example, the average or 'expected' loss is about \$171,000 with a 50% probability or there is about a 25% probability that the loss will exceed \$130,000.



Figure 9 Loss Exceedance Curve

Controls

Despite the amount of risk associated with the project so far, it may be worth presenting possible controls to minimize the likelihood of risk events. Controls can be applied to sources, events, or objectives. Below, we identified 12 controls with a total cost of \$326,600. After the identification of potential controls, we traced them to their respective source, vulnerability, or consequence. On the rightmost column, it lists the number of applications which is a good start as a metric for the effectiveness of the control leading into the next step.

Project managers, using the expertise of the executives, were asked to rate the effectiveness of each control for each measurement on a scale between 0 and 1 as a percentage. Once the judgments were collected, Riskion compiles the impact, and reports the expected risk and cost. For example, if implementing all the controls at a cost of \$326,600, the amount of risk reduced is less than half that at \$154,640.

Index		Control Name	Control for	Selected	Cost	Applications
01	<input type="checkbox"/>	Hire Relationship Manager	Consequence	Yes	110000	8
02	<input type="checkbox"/>	Hire an organizational leadership manager	Consequence	Yes	85000	8
03	<input type="checkbox"/>	Accuracy incentive	Vulnerability	Yes	50000	6
04	<input type="checkbox"/>	Internal Service Announcement	Vulnerability	Yes	500	6
05	<input type="checkbox"/>	System Access Restriction	Vulnerability	Yes	2000	6
06	<input type="checkbox"/>	Random Internal Audit	Source	Yes	40000	2
07	<input type="checkbox"/>	Department Leader Survey	Source	Yes	15000	1
08	<input type="checkbox"/>	Reporting Phish Incentive	Vulnerability	Yes	1000	3
09	<input type="checkbox"/>	Conduct What-If Analysis	Source	Yes	10000	2
10	<input type="checkbox"/>	Build a Back Up Plan for Processes	Source	Yes	2500	2
11	<input type="checkbox"/>	Post a Live Task Calendar	Consequence	Yes	600	5
12	<input type="checkbox"/>	Reduce Project and Ad-Hoc Work During Month-End Close	Source	Yes	10000	1

Figure 10 Assignment of Controls

# Controls	Cost of Controls	How Selected	Total Risk (Average Loss)	Simulated
12	\$326,600	Manually selected	Risk Reduction	\$171,451
			Residual Risk	\$154,640
			Investment Leverage	\$16,811
				0.47

Figure 11 Cost Savings with Controls

The risk maps below show both likelihoods with and without controls. We can see that when controls are implemented, the bubbles shift into the green safe zone meaning these are events that can be effectively managed with the correct investment as their likelihood is significantly reduced.

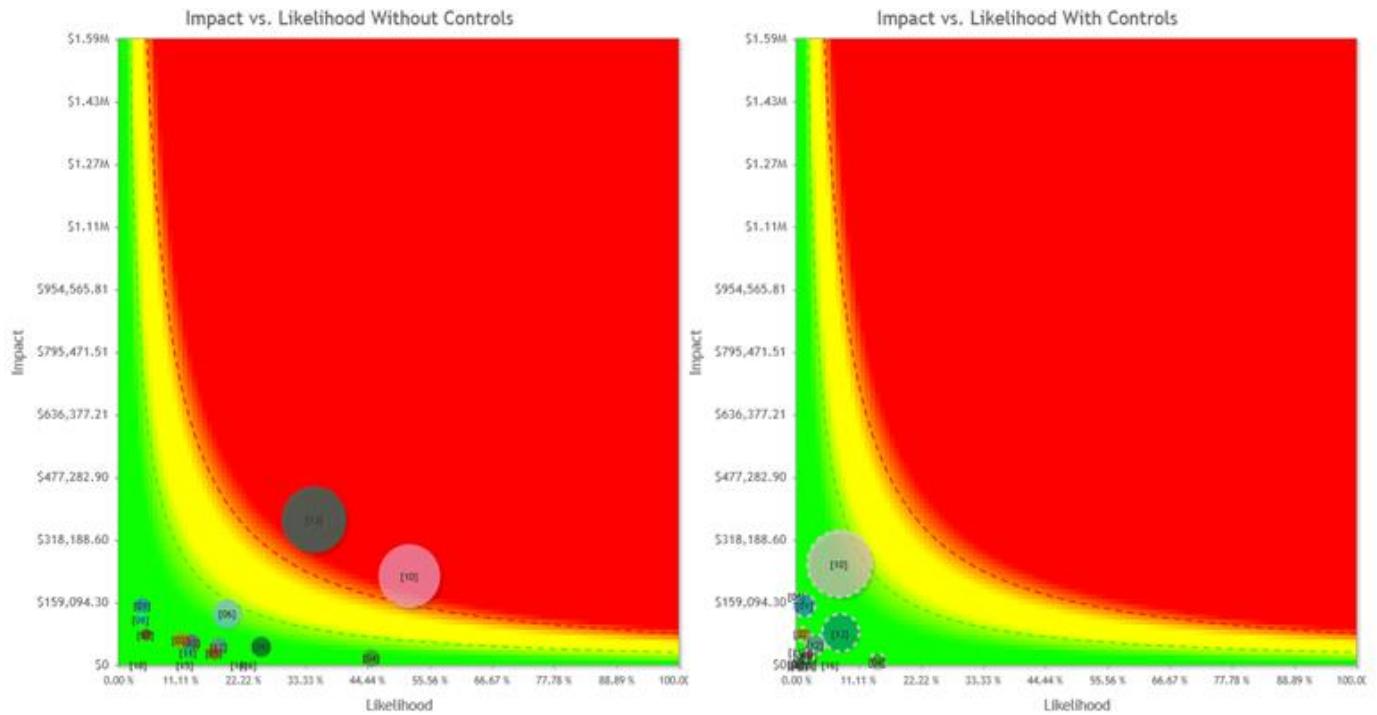


Figure 12 Heat Map Comparison of Risks with and without Controls

Pictured earlier was the Loss Exceedance Curve without controls. Here, we see great improvement in reduction of average loss as well as probability when controls are involved. The average loss decreases by \$154,640. With the implementation of controls, we have the potential to move the two biggest risks we face from the red to the green.

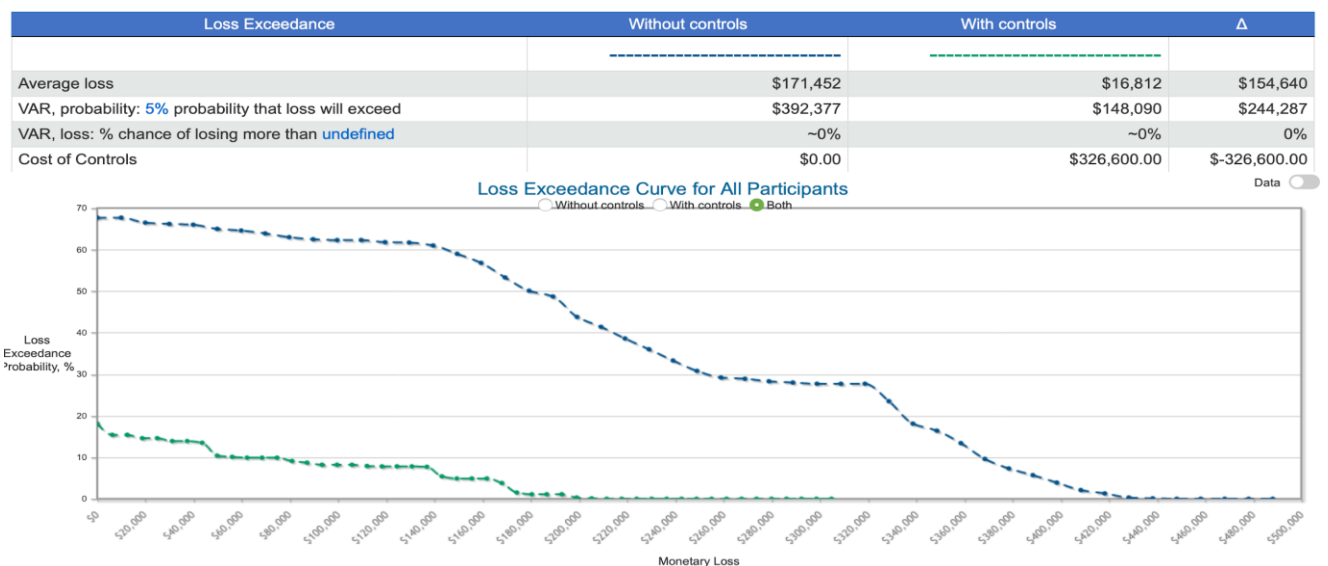
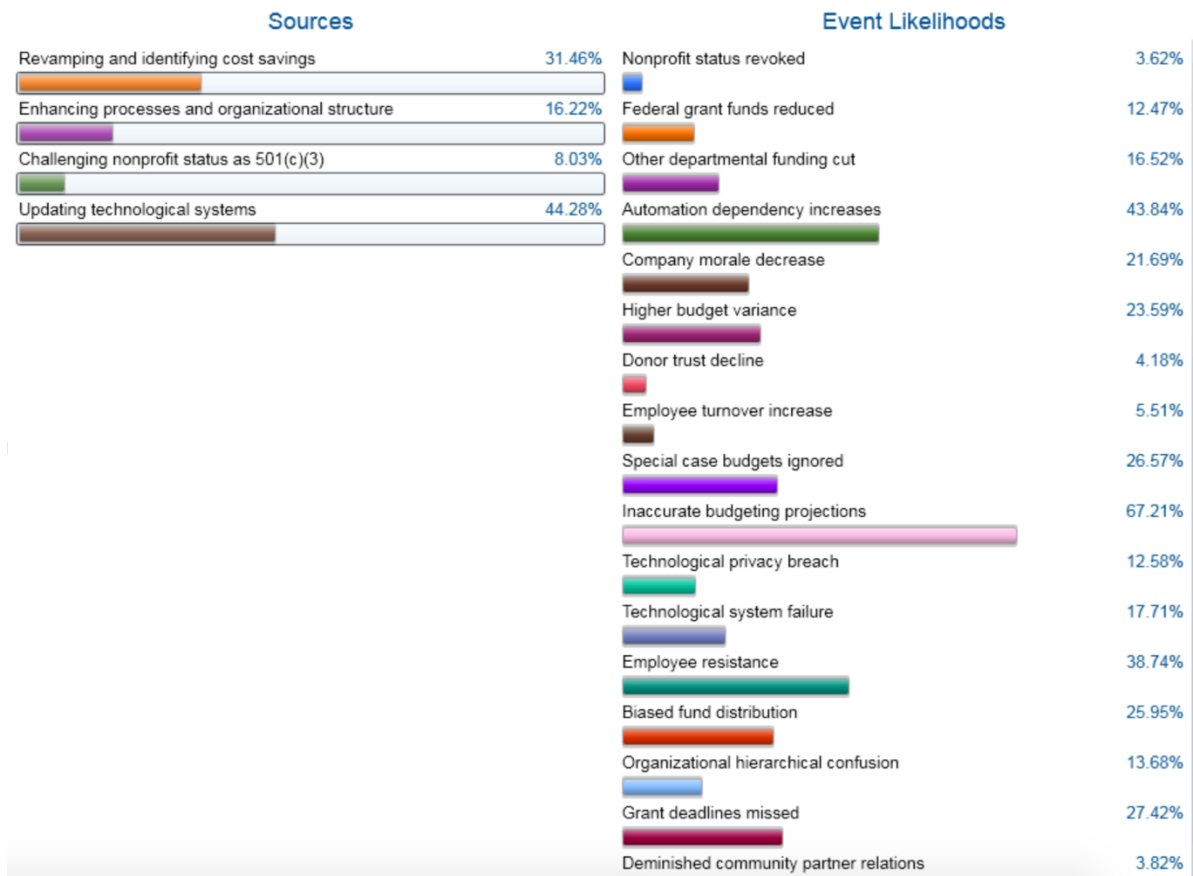


Figure 13 Loss Exceedance Curves with and without Controls

Summary, Conclusions, and Recommendations

From our risk analysis of the non-profit, we can conclude that the two threats that pose the largest impact to the budgeting revamp within the nonprofit are (1) updating technological systems and (2) revamping and identifying cost savings. These threats yield high likelihood in the risk events of automation dependency, inaccurate budgeting projections, employee resistance, and missed grant deadlines, as pictured in Figure 14.

Figure 14 Synthesis of Sources and Event Likelihoods



We recommend that the company uses its resources to control the risk events of employee resistance and inaccurate budgeting projections. Controlling these risks will require a cost of \$326,000, but over the course of the year the monetary risk of these events will decrease from \$171,451.71 to \$16,809.07, shown in Figure 15. This is a significant impact, however, it would still cost more to implement the controls at \$326,000 than to absorb the risk of \$171,451 associated with the threats. If looking at it from an investment perspective, management would view this as an opportunity to help the business in the long run as it could save the organization \$171K each year. After two years, it would already breakeven and we would begin seeing savings of \$171K each year.

In order to reduce the immediate upfront cost from \$326,000 as this may not seem ideal, we recommend taking a phased approach to implement each of the controls based on prioritization and impact effectiveness. For example, in Phase I, we would implement the top three controls that prove themselves to be most effective. This would be (1) hiring an organizational leadership manager, (2) posting a live task calendar, and (3) creating the departmental leader survey. These three controls alone cost a total of \$100,600 which could be taken on in the first 6 months to 1 year. The next three prioritized controls would cost \$122,500 in Phase II and so on. We identified a specific control (Random Internal Audit) that appeared to be the least effective yet still costly at \$40,000, therefore, we may suggest to leadership this is not worth pursuing if the budget does not allow for it.

Risk Register (Simulated)
RM2019_AH_PL_Nonprofit Budget Revamp

ID ▲	Event Name	Likelihood	Impact	Risk	Likelihood with controls	Impact with controls	Risk with controls
1	Nonprofit status revoked	4.30%	\$151,418.95	\$6,511.01	\$23,864.15	\$151,604.11	\$2,274.06
2	Federal grant funds reduced	11.10%	\$64,724.10	\$7,184.37	\$17,500.37	\$79,489.26	\$874.38
3	Other departmental funding cut	13.10%	\$57,265.22	\$7,501.74	\$0	\$0	\$0
4	Automation dependency increases	45.20%	\$18,877.48	\$8,532.62	\$230,686.74	\$8,079.81	\$1,171.57
5	Company morale decrease	17.10%	\$31,139.37	\$5,324.83	\$11,136.60	\$47.73	\$0.32
6	Higher budget variance	19.50%	\$130,505.01	\$25,448.48	\$1,590.94	\$174,578.76	\$174.58
7	Donor trust decline	4.90%	\$77,280.35	\$3,786.74	\$36,591.69	\$25,054.08	\$576.24
8	Employee turnover increase	4.00%	\$117,007.70	\$4,680.31	\$1,590.94	\$6,708.89	\$6.36
9	Special case budgets ignored	25.50%	\$47,110.21	\$12,013.10	\$15,909.43	\$23,306.23	\$233.06
10	Inaccurate budgeting projections	52.00%	\$226,519.17	\$117,789.97	\$122,502.61	\$257,249.41	\$19,808.20
11	Technological privacy breach	12.50%	\$32,525.77	\$4,065.72	\$3,181.89	\$34,224.31	\$63.64
12	Technological system failure	17.90%	\$47,859.51	\$8,566.85	\$54,092.06	\$53,237.82	\$1,810.09
13	Employee resistance	35.00%	\$370,161.70	\$129,556.59	\$125,684.50	\$81,460.07	\$6,435.35
14	Biased fund distribution	21.60%	\$0	\$0	\$9,545.66	\$0	\$0
15	Organizational hierarchical confusion	11.90%	\$0	\$0	\$35,000.75	\$0	\$0
16	Grant deadlines missed	23.20%	\$0	\$0	\$97,047.52	\$0	\$0
17	Deminshed community partner relations	3.60%	\$0	\$0	\$28,636.97	\$0	\$0

Figure 15 Summarized Risk Register

References

1. Forman, Ernest H., Forman, Harold S., and Ludden, Eileen A, Risks-We-Face and Risks-We-Take Enterprise Risk Management