

Quantifying and Managing Your Risk with the Risk Register

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Risk Register

- One tool in the risk management toolbox
- Broadly applicable to a wide range of business scenarios
 - Company-wide operations ← example for today
 - A strategy
 - A project
 - **By yourself** to assess your risks on the project
 - **With your client** to assess broader project risks ★ add value!
 - Your health & safety program
 - A major investment
 - An acquisition
 - A new accounting system

Benefits

- Easy to understand (at least on the surface)
- Spreadsheet driven – you already have the tools
- Exceptional collaboration tool
- Very good at focusing attention on key issues

Part 1: Mechanics

Part 2: Application

The Basics

- Failure Modes and Effects Analysis
 - What can go wrong? **RISK LIST**
 - How likely is it to go wrong? **LIKELIHOOD**
 - What are the consequences if it does? **CONSEQUENCE**
- Using the answers to those questions...
 - Determine the risk level...
 - ...and an appropriate response

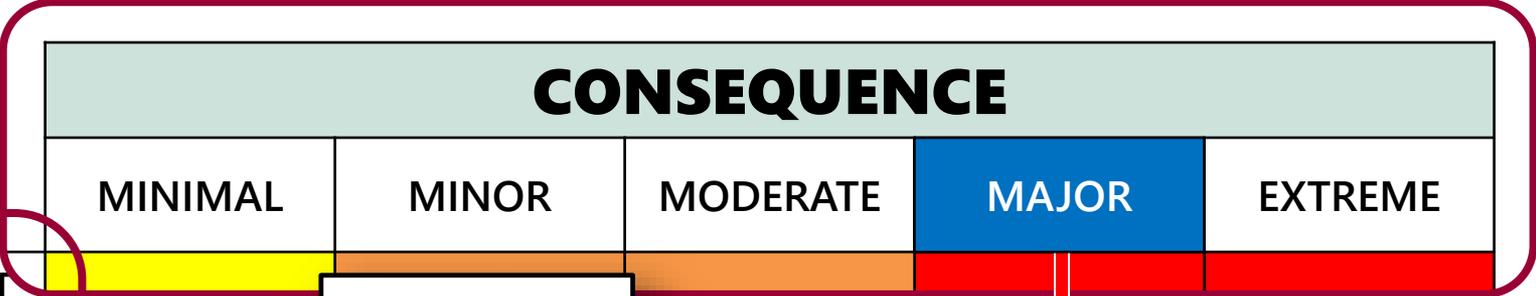
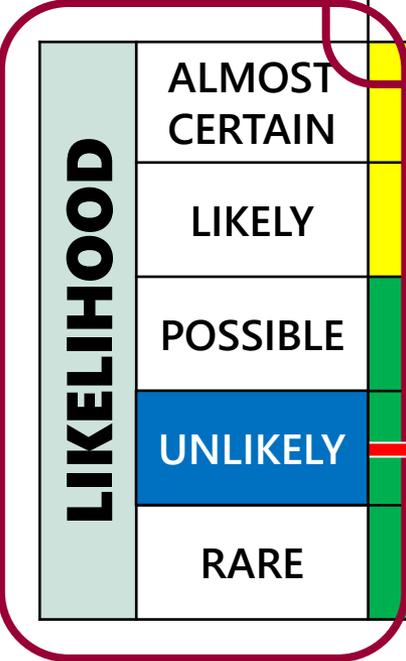
Rating Matrix

		CONSEQUENCE				
		MINIMAL	MINOR	MODERATE	MAJOR	EXTREME
LIKELIHOOD	ALMOST CERTAIN	MODERATE	HIGH	HIGH	EXTREME	EXTREME
	LIKELY	MODERATE	MODERATE	HIGH	HIGH	EXTREME
	POSSIBLE	LOW	MODERATE	MODERATE	HIGH	HIGH
	UNLIKELY	LOW	LOW	MODERATE	MODERATE	HIGH
	RARE	LOW	LOW	LOW	MODERATE	MODERATE

Rating Matrix

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	RARE	LOW	LOW	LOW	MODERATE	MODERATE

Action
Action
Action
Action



Definitions

		CONSEQUENCE				
		MINIMAL	MINOR	MODERATE	MAJOR	EXTREME
LIKELIHOOD	ALMOST CERTAIN	MODERATE	HIGH	HIGH	EXTREME	EXTREME
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	UNLIKELY	LOW	LOW	MODERATE	MODERATE	HIGH
	RARE	LOW	LOW	LOW	MODERATE	MODERATE

Likelihood Definition

■ Qualitative or quantitative?

	QUALITATIVE	PROBABILITY
ALMOST CERTAIN	Expected to occur in most circumstances	95% chance of occurring
LIKELY	Will probably occur in most circumstances	75% chance of occurring
POSSIBLE	Could occur at some time ?	50% chance of occurring
UNLIKELY	Might occur at some time	25% chance of occurring
? RARE	Occurs only in exceptional circumstances or is unlikely to occur	5% chance of occurring

PROBLEMS

- These scales need “domains”
- These scales work best for events that are repeated many times
- Humans estimate probabilities poorly

No better (worse actually) than the category descriptions themselves

Likelihood Definition

■ Qualitative or quantitative?

	QUALITATIVE	PROBABILITY	FREQUENCY
ALMOST CERTAIN	Expected to occur in most circumstances	95% chance of occurring	Expected to occur 4 or more times per year
LIKELY	PROBLEMS SOLVED <ul style="list-style-type: none"> ■ Frequency creates its own domain ■ Frequency (recurrence interval) works well for infrequent events ■ Humans estimate frequency well 		Expected to occur 1 or more times per year
POSSIBLE			Expected to occur one or more times in a 4 year period
UNLIKELY		time	occurring
RARE	Occurs only in exceptional circumstances or is unlikely to occur	5% chance of occurring	Expected to occur one or more times in a 40 year period

Likelihood Definition

ONE MORE THING...

- Qualitative or quantitative?

arithmetic scale

geometric scale

	QUALITATIVE	PROBABILITY	FREQUENCY
ALMOST CERTAIN	Expected to occur in most circumstances	95% chance of occurring	Expected to occur 4 or more times per year
LIKELY	Will probably occur in most circumstances	75% chance of occurring	Expected to occur 1 or more times per year
POSSIBLE	Could occur at some time	50% chance of occurring	Expected to occur one or more times in a 4 year period
UNLIKELY	Might occur at some time	25% chance of occurring	Expected to occur one or more times in a 10 year period
RARE	Occurs only in exceptional circumstances or is unlikely to occur	5% chance of occurring	Expected to occur one or more times in a 40 year period

Arithmetic Scale: 10...20...30...40...50 (+10)

Geometric Scale: 10...100...1,000...10,000...100,000 (x10)

Definitions

		CONSEQUENCE				
		MINIMAL	MINOR	MODERATE	MAJOR	EXTREME
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	LIKELY	MODERATE	MODERATE	HIGH	HIGH	EXTREME
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	UNLIKELY	LOW	LOW	MODERATE	MODERATE	HIGH
	RARE	LOW	LOW	LOW	MODERATE	MODERATE

Consequence Definition

CONSEQUENCE				
MINIMAL	MINOR	MODERATE	MAJOR	EXTREME
?	?	?	?	?

- Defining Consequence terms is **way** more difficult than Likelihood terms
- There are many types of consequences
 - Cost
 - Environmental
 - Technical
 - Reputation
 - Health & Safety
 - Schedule
 - Regulatory
 - Workforce
 - Etc.
- How do you evaluate all of these on the same scale?
qualitatively...very difficult

Consequence Definitions

Rating	Definition	Technical	Cost	Schedule
Extreme	A risk event that, if it occurs, will result in one or more critical outcome objectives not being achieved.	Performance unacceptable. Does not meet a KPP requirement.	Program budget impacted by greater than \$20 million.	Key program event or milestone delayed by more 3 months.
Major	A risk event that, if it occurs, will result in one or more stated outcome objectives falling below acceptable results.	Performance unacceptable. Does not meet a Threshold Requirement. Significant changes required.	Program budget impacted by greater than \$10 million but less that \$20 million.	Increases critical path schedule by 2-3 months.
Moderate	A risk event that, if it occurs, will result in one or more stated outcome objectives falling well below goals but above minimum acceptable levels.	Performance below goal. Does not meet a Threshold Requirement. Moderate changes required.	Program budget impacted by greater than \$2 million but less than \$10 million. Does not require significant use of program cost and/or schedule reserves.	Increases critical path schedule by 1-2 months.
Minor	A risk event that, if it occurs, will result in one or more stated outcome objectives falling well below goals but above minimum acceptable levels.	Performance below goal but within acceptable limits. Does not meet an objective requirement. No changes required.	Program budget impacted by less than \$2 million. Development or production cost goals exceeded by 1%-5%.	Non-critical path activities late. Impact to critical path up to 1 month slip.
Minimal	A risk event that, if it occurs, will have little or no impact on achieving outcome objectives.	Requires minor performance trades within the threshold-objective range. No impact on program success.	Program budget not affected. Cost increase can be managed within plan.	Schedule not affected. Schedule adjustments can be managed within plan.

Consequence Definitions



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Major	A risk event that, if it occurs, will result in one or more critical outcome objectives not being achieved.	Performance does not meet a KPP requirement. Significant changes required.	Program budget impacted by greater than \$10 million but less than \$20 million. Does not require significant use of cost and/or reserves.	Increases critical path schedule by 2-3 months.
Moderate	A risk event that, if it occurs, will result in one or more stated outcome objectives falling below acceptable levels.	Performance below goal but within acceptable limits. Does not meet an objective requirement. Moderate changes required.	Program budget impacted by less than \$10 million. Development or production cost goals exceeded by 1%-5%.	Increases critical path schedule by 1-2 months.
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...one or more critical outcome objectives not being achieved

cost impact > \$20 million

schedule impact > 3 months

...one or more stated outcome objectives falling below acceptable results

Consequence Definitions

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Moderate	A risk event that, if it occurs, will result in one or more stated outcome objectives falling well below goals but above minimum acceptable levels.	Performance below goal. Does not meet a Threshold Requirement. Moderate changes required.	Program budget impacted by greater than \$5 million but less than \$10 million. Does not require significant changes to program cost and schedule reserves.	Increases critical path schedule by more than 2 months.
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Consequence Definition

- Are there “units” that allow you to compare dissimilar consequences quantitatively?
 - Readily estimable...
 - ...by your rating team



- Cost
- Reputation
- Regulatory
- Environmental
- Health & Safety
- Workforce
- Technical
- Schedule
- Etc.

Bonus For Using \$ Consequences

$$\begin{array}{ccc} \text{Likelihood (events per year)} & & \\ & \times & \\ & & = \\ \text{Consequence (\$ per event)} & & \text{Expected Annual Cost} \end{array}$$

(real math)

Rating Matrix

		CONSEQUENCE				
		MINIMAL	MINOR	MODERATE	MAJOR	EXTREME
LIKELIHOOD	ALMOST CERTAIN	MOD \$ RATE	H \$ H	H \$ H	EXT \$ ME	EXT \$ ME
	LIKELY	MOD \$ RATE	MOD \$ RATE	H \$ H	H \$ H	EXT \$ ME
	POSSIBLE	L \$ V	MOD \$ RATE	MOD \$ RATE	H \$ H	H \$ H
	UNLIKELY	L \$ V	L \$ V	MOD \$ RATE	MOD \$ RATE	H \$ H
	RARE	L \$ V	L \$ V	L \$ V	MOD \$ RATE	MOD \$ RATE

Expected Annual Cost

Consequence Definition

CONSEQUENCE				
MINIMAL	MINOR	MODERATE	MAJOR	EXTREME
\$	\$\$	\$\$\$	\$\$\$\$	\$\$\$\$\$

- What are the numbers?
- **Scaling:**
 - \$200,000 hit to your bottom line < Threaten your firm's existence?
Really painful?
 - Depends on:
 - The size of your company
 - Your company's financial fitness
 - **Set your own numbers accordingly**

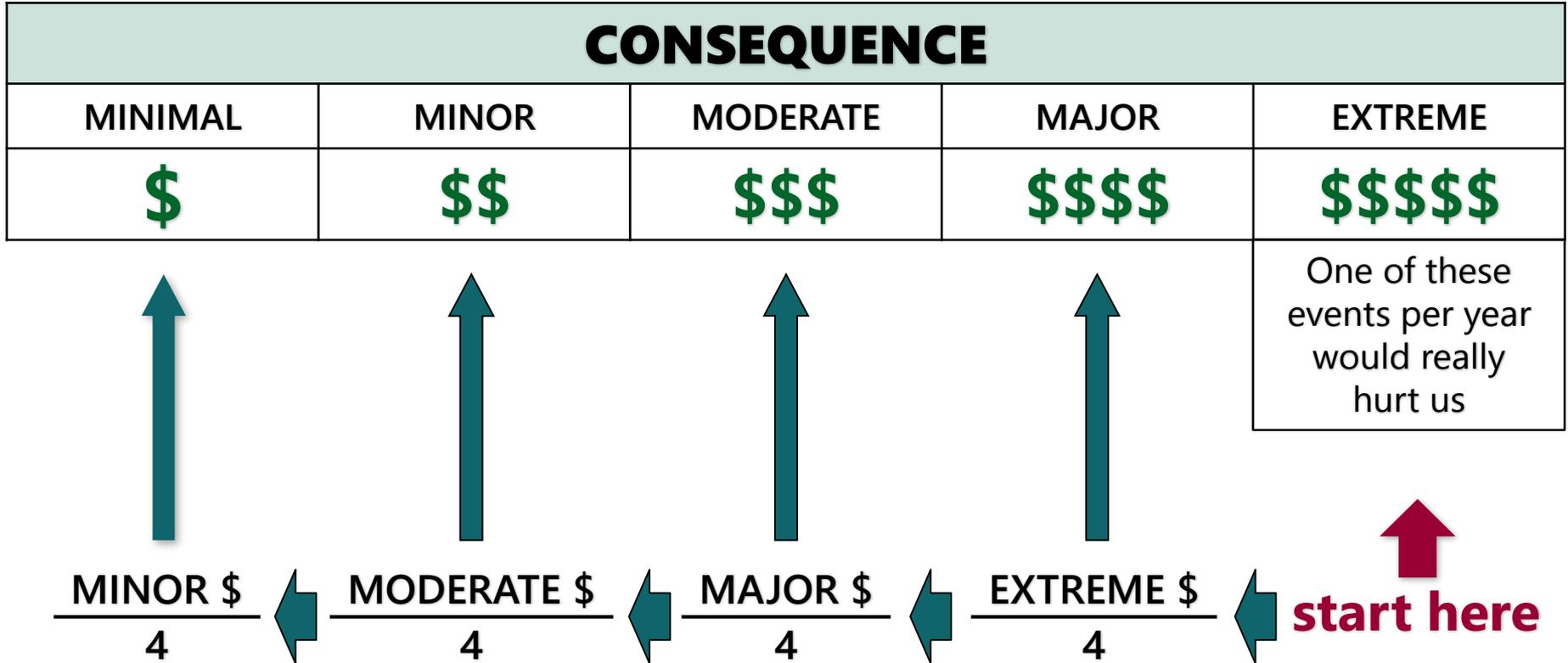
Consequence Definition

CONSEQUENCE				
MINIMAL	MINOR	MODERATE	MAJOR	EXTREME
\$	\$\$	\$\$\$	\$\$\$\$	\$\$\$\$\$
				One of these events per year would really hurt us

"Scaling Factor"


start here

Consequence Definition



Likelihood

ONE MORE THING...

- Qualitative or quantitative?

arithmetic scale

geometric scale

	QUALITATIVE	PROBABILITY	FREQUENCY
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If you use a geometric scale for Consequence you have to use a geometric scale for Likelihood

Extreme Event for Cautious Engineers

CONSEQUENCE				
MINIMAL	MINOR	MODERATE	MAJOR	EXTREME
\$	\$\$	\$\$\$	\$\$\$\$	\$\$\$\$\$
				One of these events per year would really hurt us

SINGLE HIT FOR AN EXTREME EVENT

Top Line Hit: 15% of Net Revenue ←
or
Bottom Line Hit: 30% of EBIBT ←

IN A GOOD SOLID YEAR

↑
start here

Part 1: Mechanics

Part 2: Application

Part 1: Mechanics
Part 2: Application

The Basics

- Failure Modes and Effects Analysis
 - What can go wrong? **RISK LIST** ←
 - How likely is it to go wrong? **LIKELIHOOD**
 - What are the consequences if it does? **CONSEQUENCE**
- Using the answers to those questions...
 - Determine the risk level...
 - ...and an appropriate response

How Do You Generate Your Risk List?

■ **Collaboration Tip #1:**

Recruit a group of people with a broad cross-section of perspectives to do this

Company wide operations

- Operations
- Sales
- Accounting
- Human Relations
- Health & Safety
- Legal
- IT
- **Your Consultants**

Open-Ended Approach

- Ask them questions like:

What are your biggest concerns?

What is our number one challenge?

Are we ready for the future?

What keeps you up at night?

What are the roadblocks to success?

What are our clients' top complaints?

What don't we have that we need to be more successful?

What are the elephants in the room that no one wants to talk about?

Structured Approach

EXTERNAL (Strategy Drivers)

- Societal/Demographic
- Technological
- Economic
- Environmental
- Political/Regulatory

INTERNAL (Strategy Deliverers)

- Workforce
- Technical Practice
- Marketing/Business Development
- Business Operations
- Health & Safety
- Business Systems/Technology
- Legal/Risk/Compliance
- Partners/Subcontractors
- Shareholder Relations

Digest the Results

- Compile and consolidate and **organize** the volumes of stream of consciousness responses
- Turn them into **good risk statements**
- If you haven't done this before...

Collaboration Tip #2:

- Recruit three patient people
- Face to face is best
- Make the investment to use knowledgeable people for this

The Art of Good Risk Statements

- Describe an **adverse event** and an **associated consequence**
- Clearly and consistently worded
- Complete the sentence:
 - “Our ability to execute our strategy will be hurt if...”
 - “The success of this project will be reduced if...”
 - “We will be unhappy if...”

Real Life Examples

“Business systems keeping pace of the growth”



“Our business systems do not keep pace with our growth...”

“Succession of senior people not being replaced”



“We fail to transfer **technical knowledge** to our next generation of consultants...”



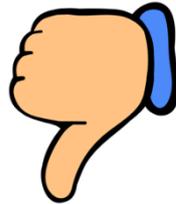
“We fail to transfer **client relationships** to our next generation of consultants...”



“We fail to do adequate **succession planning** for key business **leadership** positions...”

Sample Risk Statement

- We have a write-off on a project



- Complete the sentence structure ✓
- Adverse event ✓
- Associated consequence ✗

Sample Risk Statement

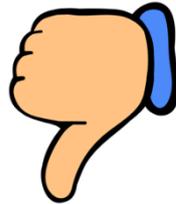
- We write off \$1,000 on a project



- Complete the sentence structure ✓
- Adverse event = project write-off ✓
- Consequence = \$1,000 hit to bottom line ✓

Sample Risk Statement

- We fail to hire and retain the talent needed to exploit our business opportunities



- There are two different risks here
 - We fail to **hire** the talent needed...
 - We fail to **retain** the talent needed...
- Why are they different? (the consequences are the same)
- Because the **mitigating measures** will be different
- Is there a consequence here...? (a bit squishy)

The Basics

- Failure Modes and Effects Analysis
 - What can go wrong? **RISK LIST** ✓
 - How likely is it to go wrong? **LIKELIHOOD** ←
 - What are the consequences if it does? **CONSEQUENCE** ←
- Using the answers to those questions...
 - Determine the risk level... ←
 - ...and an appropriate response

Rating Team

- Who?
 - 4 to 6 people
 - Strong grasp of the subject matter
 - At least some of whom will have primary responsibility for implementing the results
 - A facilitator / mediator

Company Operations



Top level operational management

Risk Rating

- How?

- Everyone does their own ratings and brings them to...

- ... a face to face meeting

- **Collaboration Tip #3:**



- **Negotiate a consensus rating for each risk**

Almost Certain + Rare

2

WRONG

Possible

- Two very different perspectives need to be reconciled

- That conversation is the most valuable part of the whole exercise

The Basics

- Failure Modes and Effects Analysis
 - What can go wrong? **RISK LIST** ✓
 - How likely is it to go wrong? **LIKELIHOOD** ✓
 - What are the consequences if it does? **CONSEQUENCE** ✓
- Using the answers to those questions...
 - Determine the risk level... ✓
 - ...and an appropriate response ←

Mitigation

		ACTION LEVEL
RISK LEVEL	EXTREME	Appropriate mitigation strategy to be devised immediately
	HIGH	Appropriate mitigation strategy to be devised within the next quarter
	MODERATE	Appropriate mitigation strategy to be devised as part of normal management processes
	LOW	Monitor risk, no further mitigation required

Mitigation

- Action Filters
 - Special effort **EXTREME HIGH**
 - Ordinary course of business **MODERATE**
 - Monitor only **LOW**
- Controls
 - What is **ALREADY** being done
 - What else **COULD** be done
 - What else **WILL** be done
 - Accountability – by whom, by when

Example

- **Risk Statement:** One of our employees is at fault in an on-the-job vehicle accident resulting in serious injury or death of a third party.
- **Likelihood:** **UNLIKELY** (one or more times in a 10 year period)
- **Consequence:** **EXTREME** (one of these events would really hurt us)
- **Risk Level:** **HIGH** - Appropriate mitigation strategy to be devised within the next quarter

Example

■ Existing Controls

- Pre-employment Motor Vehicle Record (MVR) checks for all new employees
- MVR checks every three years for all employees

■ Additional “Will Be Done” Controls

- Develop/procure driver training course **with relevant content** for all employees who drive company vehicles

■ Accountability

- Who: Corporate Health & Safety Officer
- When: By the end of Q4

Key Risk Register Takeaways

- It's easy to do this badly
- It's not that hard to do it well
- If you want to do this quantitatively:
 - Use Frequency for your LIKELIHOOD scale
 - Use \$ for your CONSEQUENCE scale
 - Make both scales geometric

Key Risk Register Takeaways

- This process is robust...
- ...even if you aren't rigorously quantitative
- It will get the most serious risks to the top of the list
- What will not be in the top 10:
 - A meteor hitting your Tampa office
- What will likely be manifest in some way in the top 10
 - You must take good care of your clients
 - You must take good care of your people
 - You must do good technical work

Collaboration Tips

- **Tip #1:** Involve a broad cross-section of perspectives in generating your risk list
- **Tip #2:** Invest in three people knowledgeable in the subject matter to digest the feedback from Tip #1 and turn it into good risk statements
- **Tip #3:** Have your rating team do their own ratings individually, then meet face to face to arrive at team consensus views 

Questions?

Thank You!



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