



FRANK SINATRA

in the wee small hours

BRIDGE RECORDS PRESENTS
RECORDED AT THE NEW YORK PHILHARMONIC

Project Portfolio Management and the Analytic Hierarchy Process

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(Some slide content originally by Dr. Ernest Forman)

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The George Washington University

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A Musical Analog

- “... ‘concept album,’ a program of songs designed to be heard in a particular sequence that sustains a mood and suggests a story”
 - <http://astore.amazon.com/decisi08-20/detail/B000006OHD> or (!)
http://album.lyricsfreak.com/f/frank+sinatra/in+the+wee+small+hours_20004182.html (accessed 20 Jan 08)
- “Concept album: Material recorded for an album intended to be an integrated set of statements on a theme.”
 - <http://www.musicweb-international.com/encyclopaedia/c/C211.HTM> (accessed 20 Jan 08)

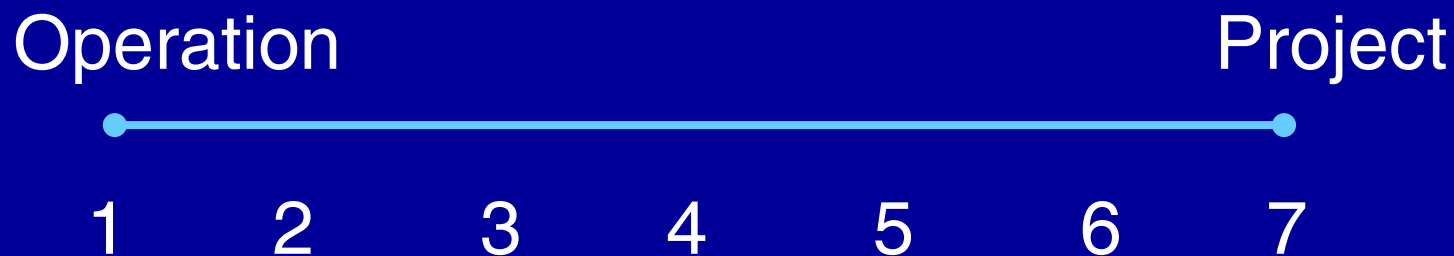
In the Wee Small Hours

Frank Sinatra (1954)

1. In The Wee Small Hours
Of The Morning
2. Mood Indigo
3. Glad To Be Unhappy
4. I Get Along Without You
Very Well
5. Deep In A Dream
6. I See Your Face Before
Me
7. Can't We Be Friends?
8. When Your Lover Has
Gone
9. What Is This Thing Called
Love
10. Last Night When We
Were Young
11. I'll Be Around
12. Ill Wind
13. It Never Entered My Mind
14. Dancing On The Ceiling
15. I'll Never Be The Same
16. This Love Of Mine

Projects: Risk and Change

- Clint Eastwood understands: “But playing it safe is what’s risky, because nothing new comes of it.”
 - “We All Have the Same Fears,” by Clint Eastwood, Parade magazine (*The Washington Post*), 15 October 2006, page 5.



Risk Versus Uncertainty (Did *Hand* Distinguish?) — Does it matter?

- Risk: the probability of each and every state of nature and thus each and every outcome is known. An expected value of each alternative action can be determined.
- Uncertainty: information is not complete and the expected value of each alternative cannot be determined.

» M&M, page 64 [6]

- (*What matters is an intellectual awareness.*)

Two Options For Dealing With Risk

- A. Set aside contingency funds, i.e., do nothing (except think and possibly plan).
- B. Mitigate the risk's probability of occurrence, P , or expected impact, I , or both.
- C. In the same project, can mitigate some, set contingency for others.

Projects in the Proper Context

- Title of first chapter of Meredith and Mantel's classic text: "Projects in Contemporary Organizations"
- Similarly, another book by Frame: *Managing Projects in Organizations*
 - not isolated
 - not personal
- "help organizations achieve their goals and objectives ..."
(M&M p. 38–39 [6])

Project Portfolio Management

[via Dr. Ernest Forman]

- Project Management
 - Doing things right
- Enterprise Management
 - Doing things right throughout the enterprise
- Project Portfolio Management
 - Doing the right things right!
 - i.e., selecting the right projects and the right mix of projects

A Top-Down View

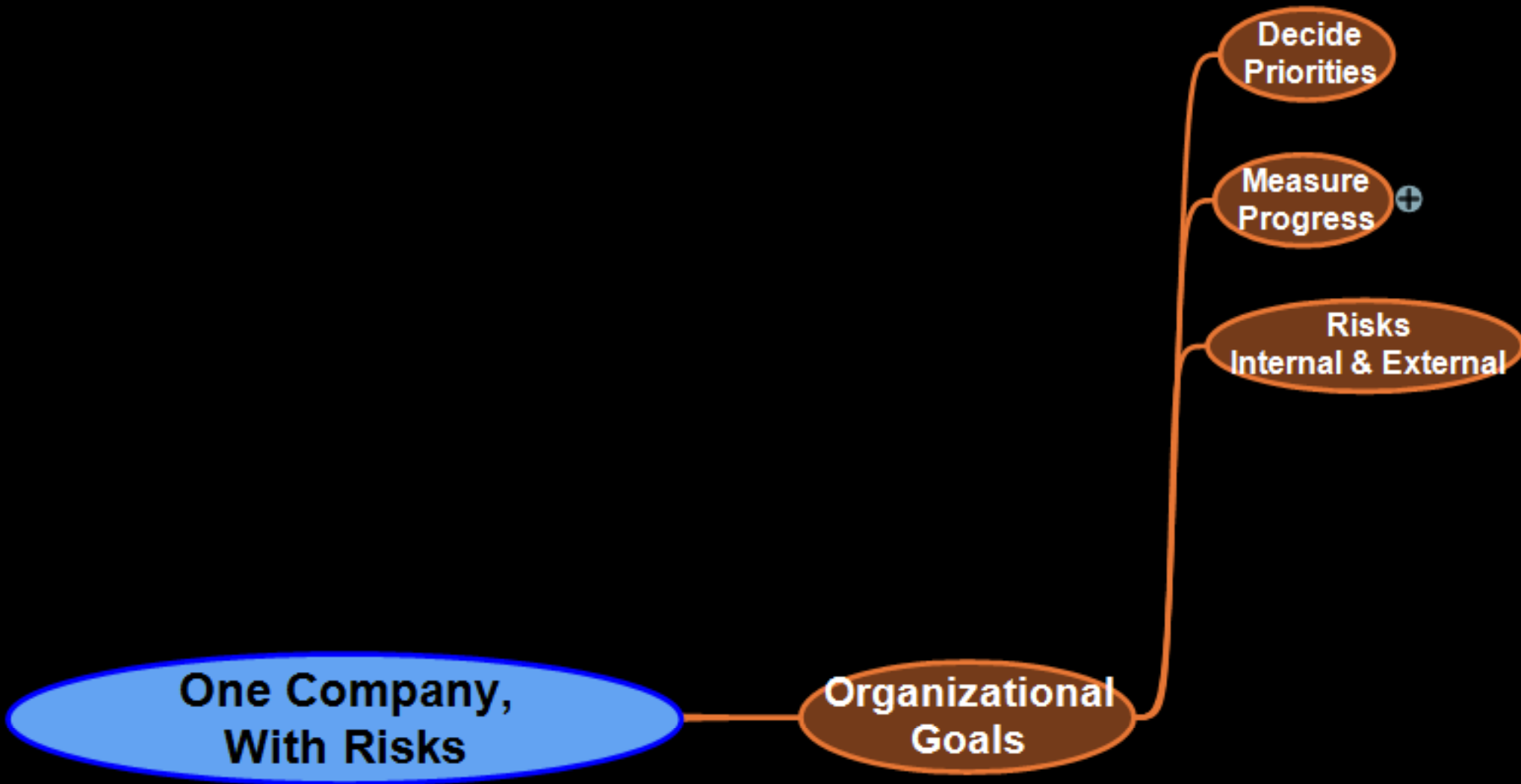


**One Company,
With Risks**

**Organizational
Goals** ⊕

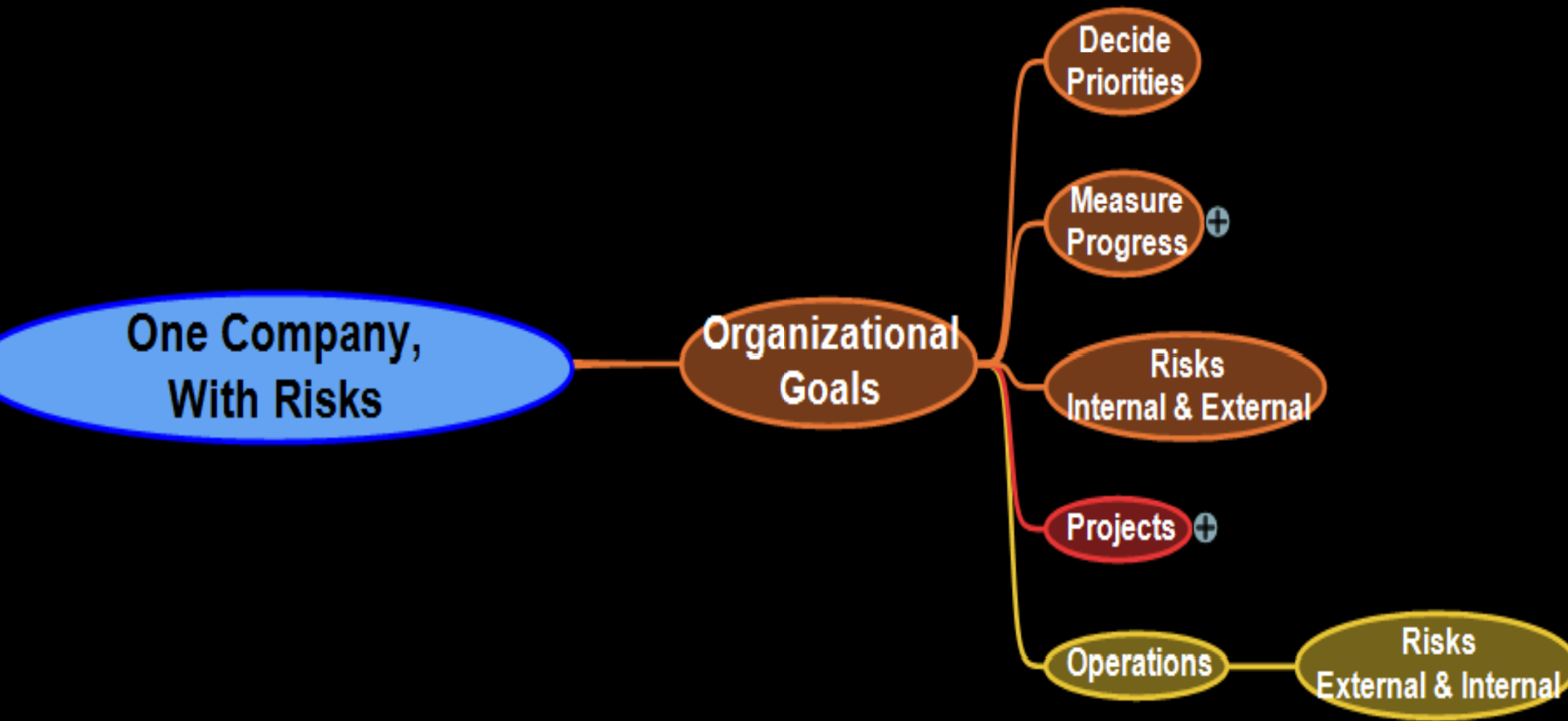
A Top-Down Perspective

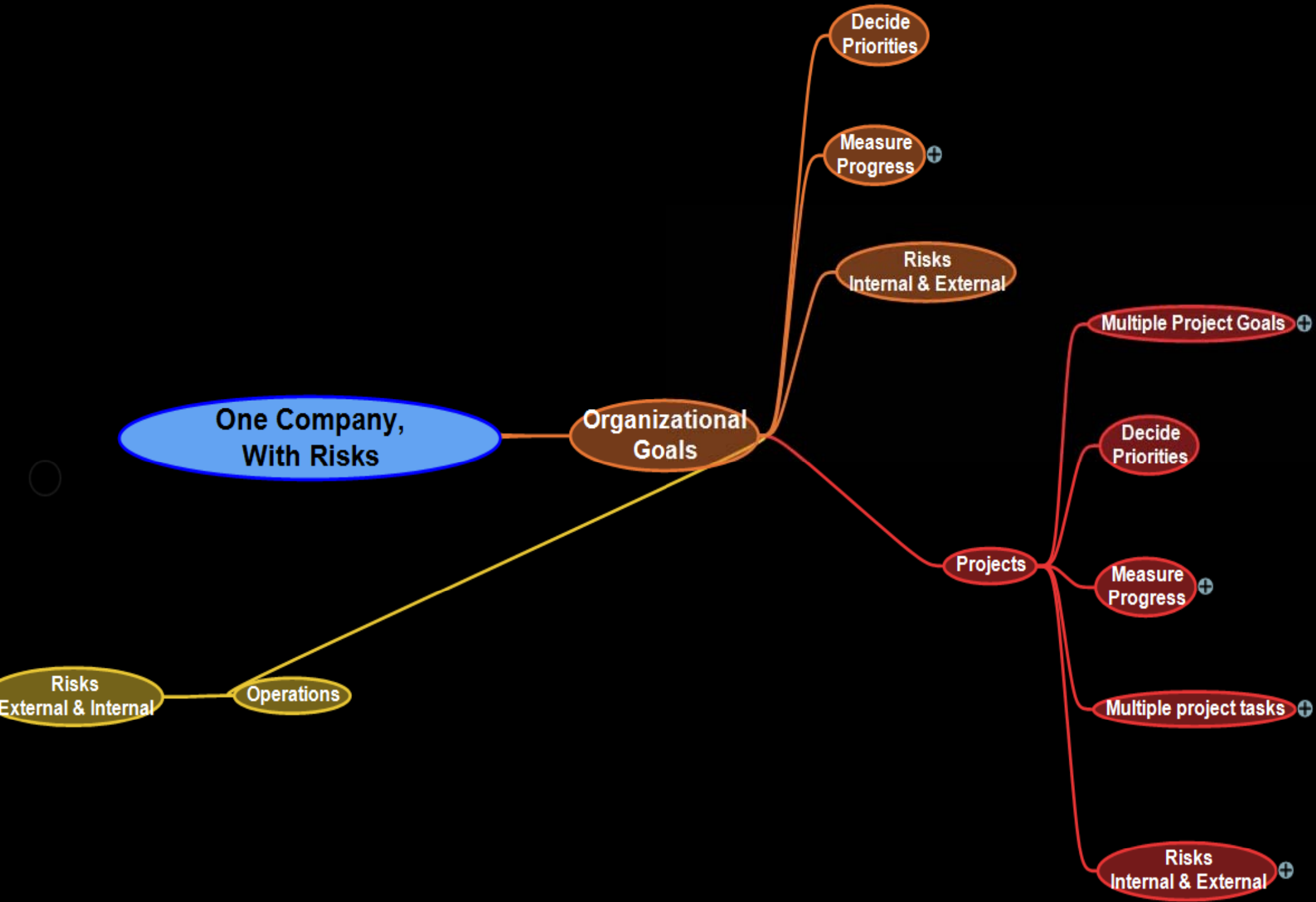


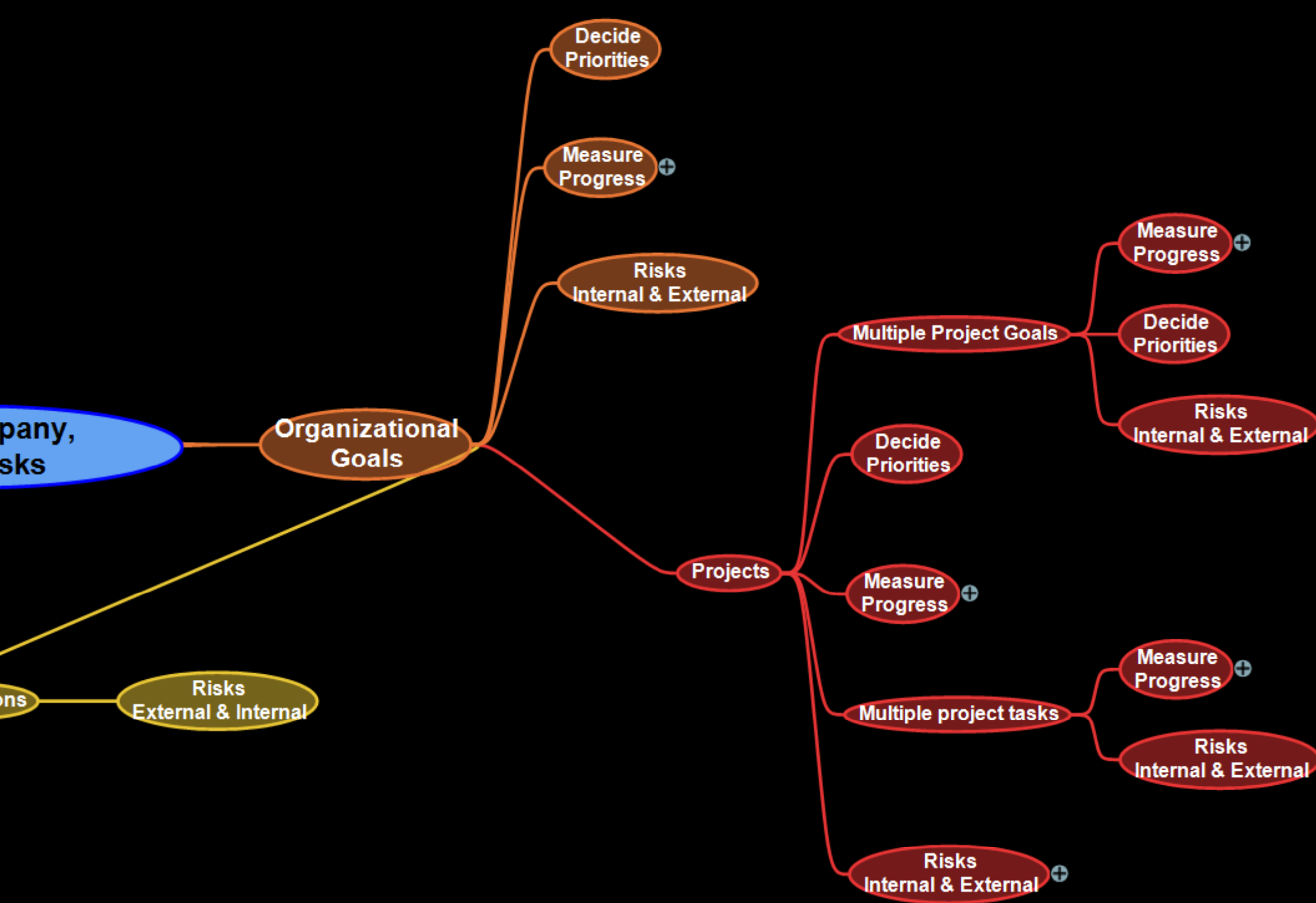


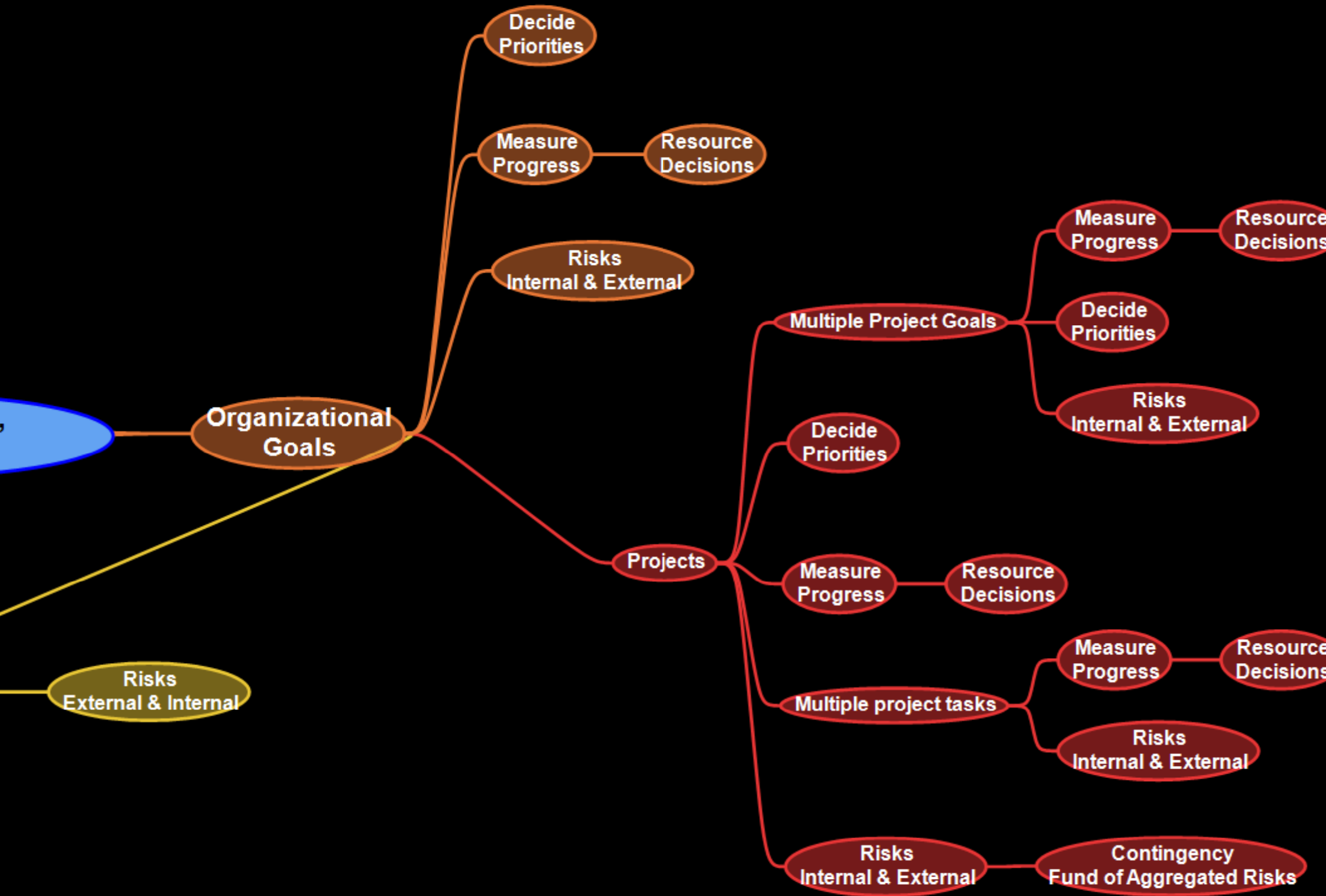
Measure!

Don't just count.





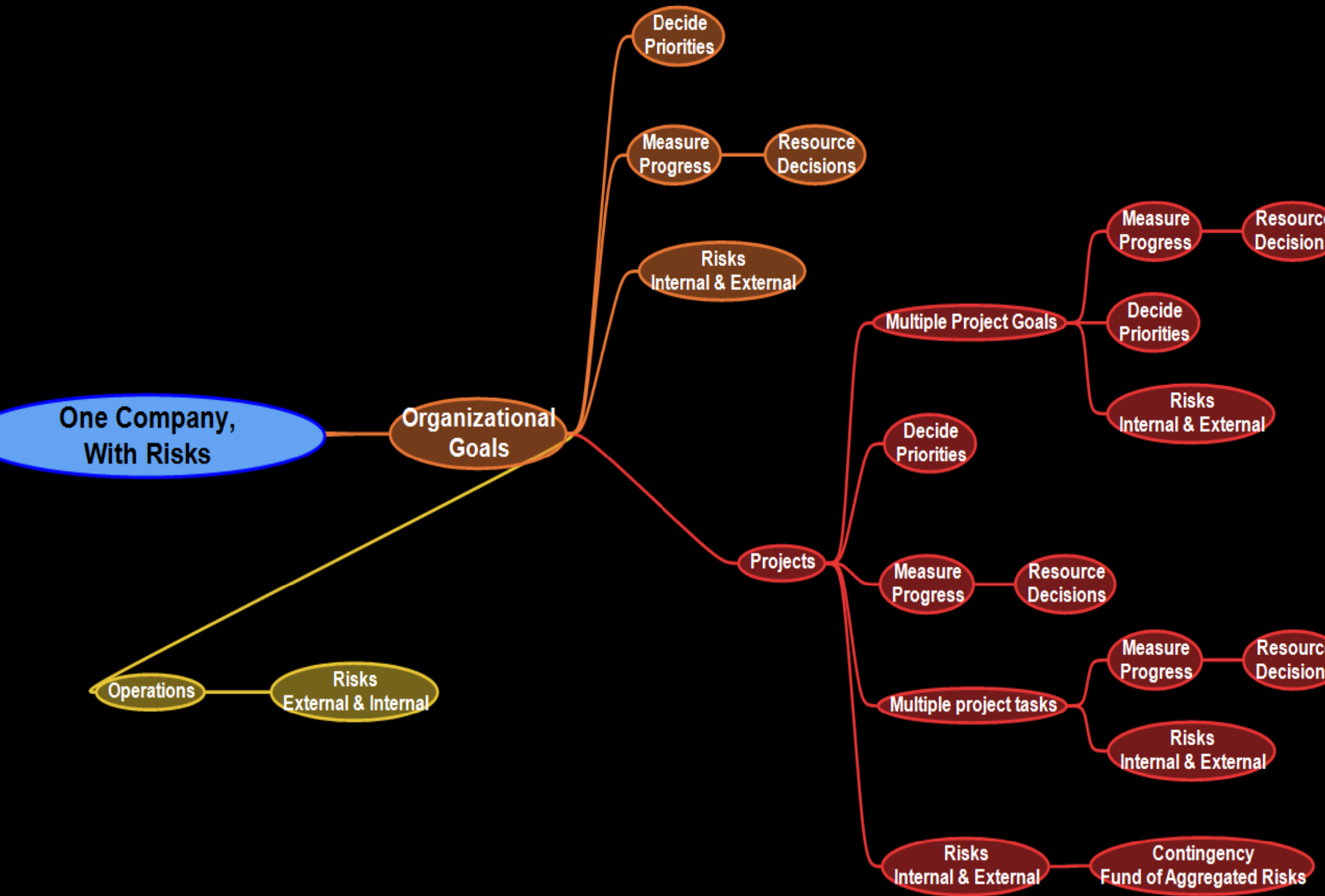




Information: the presentation form ...

- ▼ **One Company,
With Risks**
 - ▼ Organizational Goals
 - Decide
 - Priorities
 - ▼ Measure Progress
 - Resource
 - Decisions
 - Risks
 - Internal & External
 - ▼ Projects
 - ▼ Multiple Project Goals
 - ▼ Measure Progress
 - Resource
 - Decisions
 - Decide
 - Priorities
 - Risks
 - Internal & External
 - Decide
 - Priorities
 - ▼ Measure Progress
 - Resource
 - Decisions
 - ▼ Multiple project tasks
 - ▼ Measure Progress
 - Resource
 - Decisions
 - Risks
 - Internal & External
 - ▼ Risks
 - Internal & External
 - Contingency
 - Fund of Aggregated Risks
 - ▼ Operations
 - Risks
 - External & Internal

makes a
difference!



The Importance of Synthesis

- To see the big picture, rational decision making requires synthesis
- Synthesize to
 - Bring together parts into a meaningful whole
 - Help understand complexity
 - Integrate tangibles with intangibles
 - Integrate quantitative with qualitative and numerical with non-numerical
 - Integrate the judgments of different participants

Different Stakeholders

- Stakeholders of isolated individual project want to a) satisfy their business needs and b) control their costs and schedules
 - business owners & sponsors; end users (in iTunes age, now analogous to buyers of individual song)
- Portfolio stakeholders concerned with a) optimal investment of scarce organizational resources; b) return on investment; d) strategic alignment; and d) portfolio's risk profile
 - financial managers, senior business executives, and ultimately organization's stockholders

Integrate PM and PPM

- To satisfy both sets of stakeholders, organizations must
 - Define an integrated process that links project management and portfolio management practices (how?)
 - Tie executive decisions to resource allocation and day-to-day project execution.
- Project Selection = Future Commitment

Good PP Management

- Provides a structure for selecting the right projects and eliminating the wrong ones
 - (But which are right and which are wrong?)
- Allocates resources to the right projects, thus reducing wasteful spending
 - But as a combination or portfolio, not individually
- Aligns the portfolio with strategic business goals
- Involves staff at the right levels
- Helps project teams understand the value of their contributions to the organization

PPM is not just Enterprise PM!

- “A critical mistake is to think that PPM is fundamentally the management of multiple projects. This is not so. PPM is the management of the project portfolio so as to maximize the contribution of projects to the overall welfare and success of the enterprise.” (Levine, pg 23)
 - *Project Portfolio Management: A Practical Guide to Selecting Projects, Managing Portfolios, and Maximizing Benefits* (Jossey-Bass Business & Management) by Harvey A. Levine (2005)

Three Main Goals of PPM

(Levine)

1. Strategic alignment.
2. At a given spending level, maximize the value of the portfolio.
 1. But how to define “value”? (many ways)
 2. Optimize according to some constraints.
3. Have the right balance of projects.

Why is it so difficult? 1.

- “The portfolio decision process is characterized by uncertain and changing information, dynamic opportunities, multiple goals and strategic considerations, interdependence among projects, and multiple decision makers and locations.”
 - (Cooper, Edgett and Kleinschmidt, Portfolio Management for New Products, 2002)
- Decisions must be made among competing alternatives in resource-constrained environments.

Why is it so difficult? 2.

- It is a dynamic process; one needs to iterate all the factors.
 - New projects are proposed.
 - Old projects are completed --- or need to be terminated.
 - Goals change.
 - The external environment changes.
 - Organization personnel change.
- Through all the above, the portfolio should remain potent.

How can it be even more difficult?

- One project design or multiple?
 - Much easier to design a single project with specified costs, schedules, deliverables, risks, and anticipated benefits.
 - Can be much more effective to design several variations of a project with different combinations of costs, schedules, risks (and risk mitigation strategies) and even different anticipated benefits.

Some Measurement Theory

- What do numbers mean? How should they be compared?
 - e.g., weight; cost of house; car; land
- In the end, “measures must be either subjective or objective, quantitative or qualitative, but they must be numeric, reliable, and valid” (M&M p. 77 [6])
 - A problem with numeric measures (others?)
 - nominal, ordinal, interval, ratio

A Contrary View (An Aside on Terminology)

- “We will call a variable continuous if its values are real numbers, as are times, distances, temperatures, etc. (Social scientists sometimes distinguish between interval and ratio continuous variables, but we do not find that distinction very compelling.)”
 - Press, Teukolsky, Vetterling, Flannery, 1992, *Numerical Recipes In C: The Art Of Scientific Computing*

Scoring Models are Better Than ROI Models!

- Better at supporting good decision making.
- Better at creating a portfolio of projects that will yield high value.
- Better at producing a portfolio strategically aligned with the organization's strategies
 - that reflects the organization's spending priorities.

Analytic Hierarchy Process

- Developed in the early 1970s by Thomas Saaty
 - A pioneer of Operations Research
 - Wrote first Math Methods of Operations textbook
 - Wrote a first queueing textbook
 - A world-renowned mathematician
 - “His genius recognized that while mathematics could help people make better decisions, the answer was not in mathematics alone.” (Forman)
- AHP Builds on
 - Analysis (so that one can synthesize)
 - Hierarchy
 - Homogeneity
 - Process

AHP and Consistency

- Pairwise comparison yields measure of inconsistency
 - Redundancy produces more accurate priorities, but also a measure of inconsistency
- Inconsistency ratio
 - Calculated during paired comparisons
 - $<10\%$ is a rule of thumb
 - Inconsistent: $A > B$, and $B > C$, then $C > A$
 - Consistent: $A > B$ and $B > C$, then $A > C$
 - follows the transitive property
 - If $A = 2B$ and $B = 3C$, then $A = 6C$

Deriving Priorities in the AHP

- No arbitrary assignments of weights or priorities
- Accurate derivation of priorities with pairwise comparisons
- Redundancy improves accuracy
- Allows for but measures inconsistency
- Facilitates communication of feelings and values: decision makers can derive accurate (“ratio-scale”) priorities for numerical, non-numerical, quantitative, and qualitative factors through many paired comparisons.
 - (sometimes too many)

Which Drink is Consumed More in the U.S.?

Drink Consumption in the U.S.	Coffee	Wine	Tea	Beer	Sodas	Milk	Water
Coffee	1	9	5	2	1	1	1/2
Wine		1	1/3	1/9	1/9	1/9	1/9
Tea			1	1/3	1/4	1/3	1/9
Beer				1	1/2	1	1/3
Sodas					1	2	1/2
Milk						1	1/3
Water							1

- 1 Equal
- 2 between
- 3 Moderate
- 4 between
- 5 Strong
- 6 between
- 7 Very Strong
- 8 between
- 9 Extreme

The derived scale based on the judgments in the matrix is:

Coffee	Wine	Tea	Beer	Sodas	Milk	Water
.177	.019	.042	.116	.190	.129	.327

with a consistency ratio of .022.

The actual consumption (from statistical sources) is:

.180	.010	.040	.120	.180	.140	.330
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Use Models: Do Not Over-use Them and Do Not Let Them Use You

Models do not make decisions —

PEOPLE DO!

