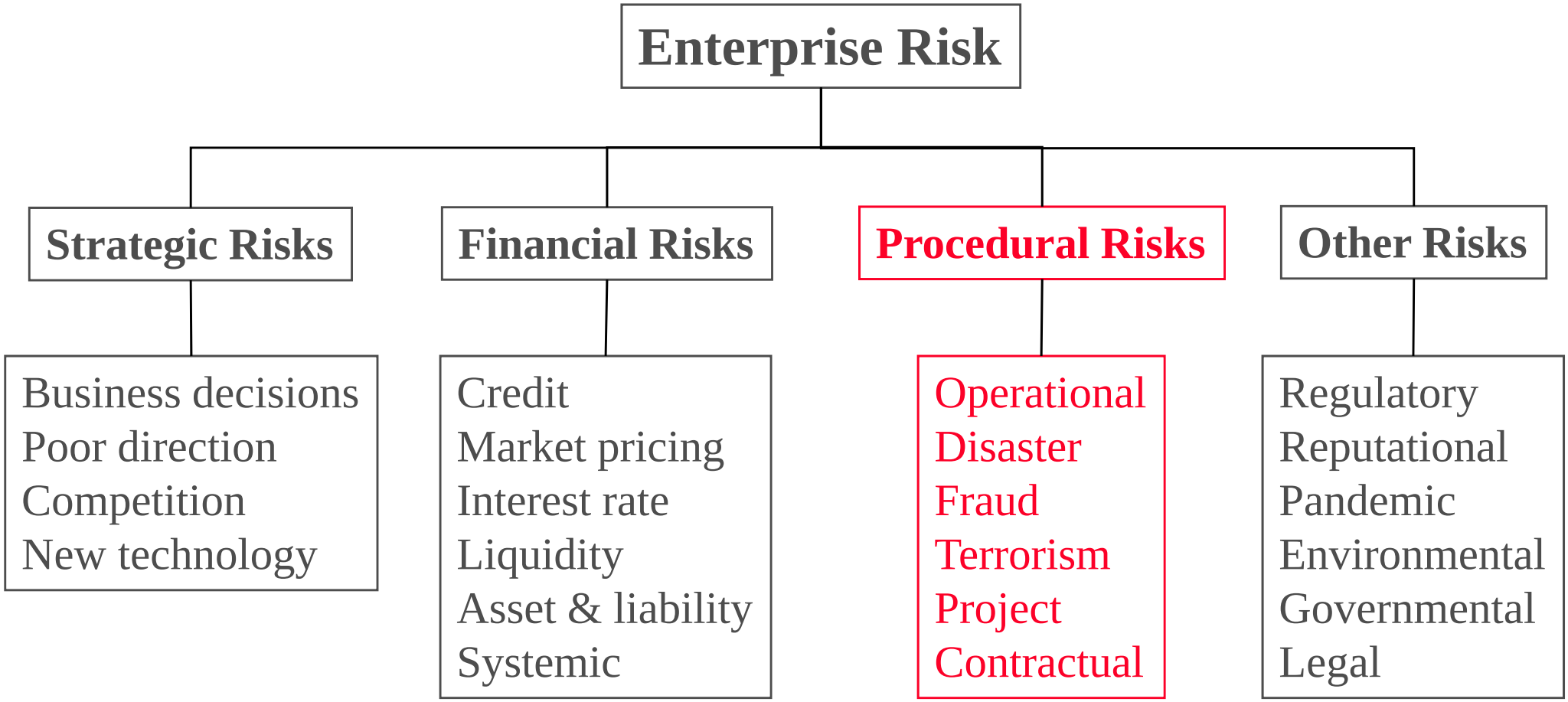
Procedural Risk Management and Risk Rating

X (domain): Probabilistic Risk Identification, Mapping and Evaluation Resolver

GRafP Technologies

Risk categorization



[2007, David Millar, COO, PRMIA, Professional Risk Managers' International Association]

Procedural risks are characterized by…

- Irregular access to information sources
- Manual input, many users
- Relatively small amounts of complex data, when such data exist
  - *More frequently available in the form of information and observations gathered by people as part of their activities*
- Kept for a very long time (at least five years)
- A need for new data collection and processing systems

Why a risk rating?

- To demonstrate that due diligence has been applied before the decision to undertake an initiative is made
- To avoid assuming excessive cost and resource expenditures without some guarantee that the initiative can be completed successfully
- To prevent embarrassing failures that needlessly tarnish the reputation of both client organizations and providers of products and services

What information does a risk rating provide?

- **Summarizes the global risk associated with an initiative using a financial-like rating**
  - ***Identifies and assesses risks to which an initiative is exposed, as a function of the envisioned or currently applied controls and procedures***
  - ***Identifies corrective actions that should be implemented on a priority basis***
    - **Focuses on a conclusive outcome**
  - ***Potential financial losses resulting from identified risks***
    - **Helps determine the "Willing To Pay" value to prevent those risks from materializing**

What is risk rating based on?

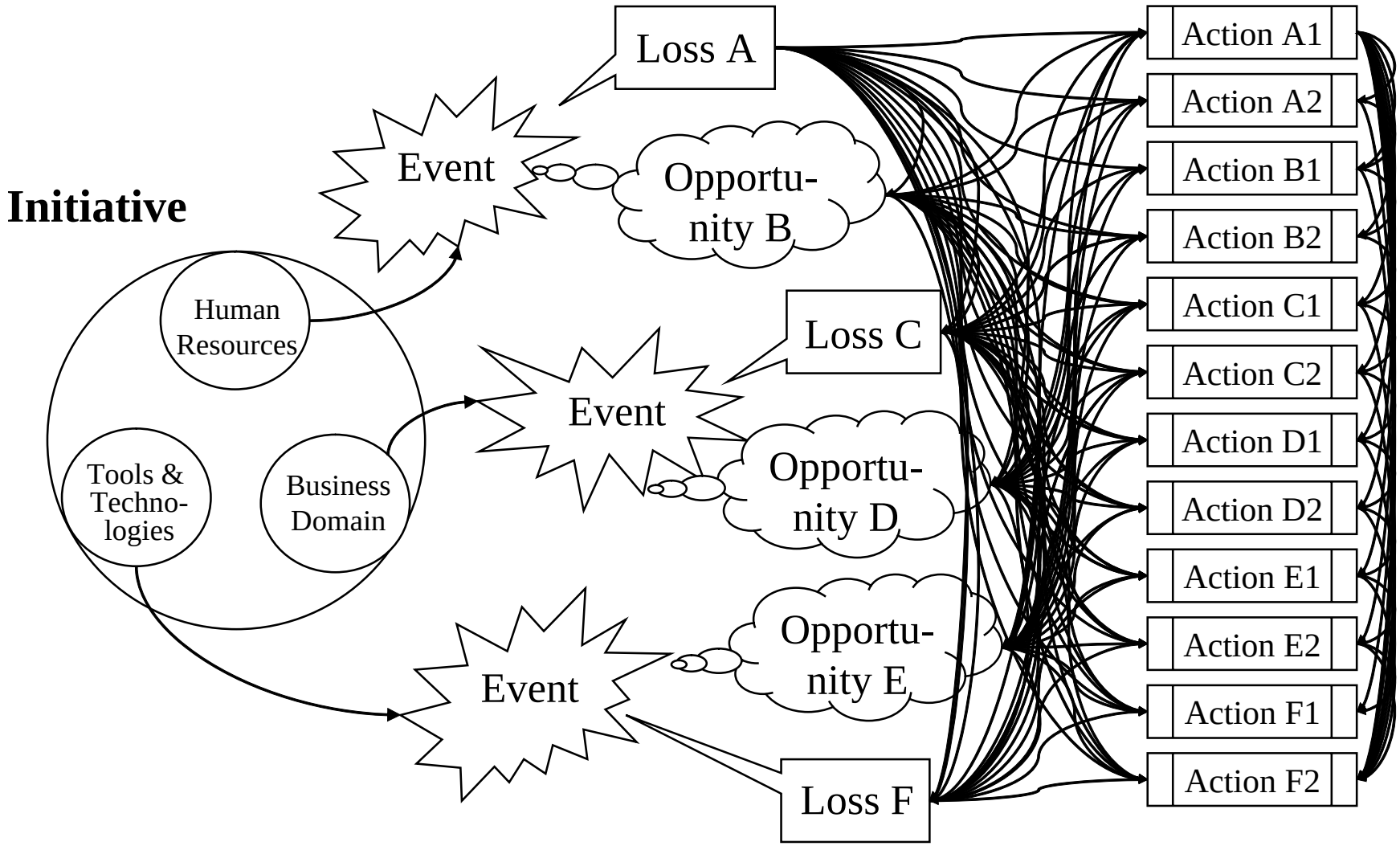
- Recognized models and standards tailored to domains under consideration
- Custom problem/risk and problem/risk mitigation information repositories specific to domains under consideration

What is risk rating based on? (cont'd)

- **Data Fusion**
  - ***Defined as the use of techniques that combine data from multiple sources and gather that information in order to achieve inferences, which will be more efficient than if they were achieved by means of a single source***
  - ***In the context of a Risk Rating, relies on the vast quantity of information acquired and processed by stakeholders as part of their regular activities***
    - **Pro: Intimate knowledge on the part of stakeholders of the environment in which the initiative takes place**
    - **Con: Need of bias removal algorithms**

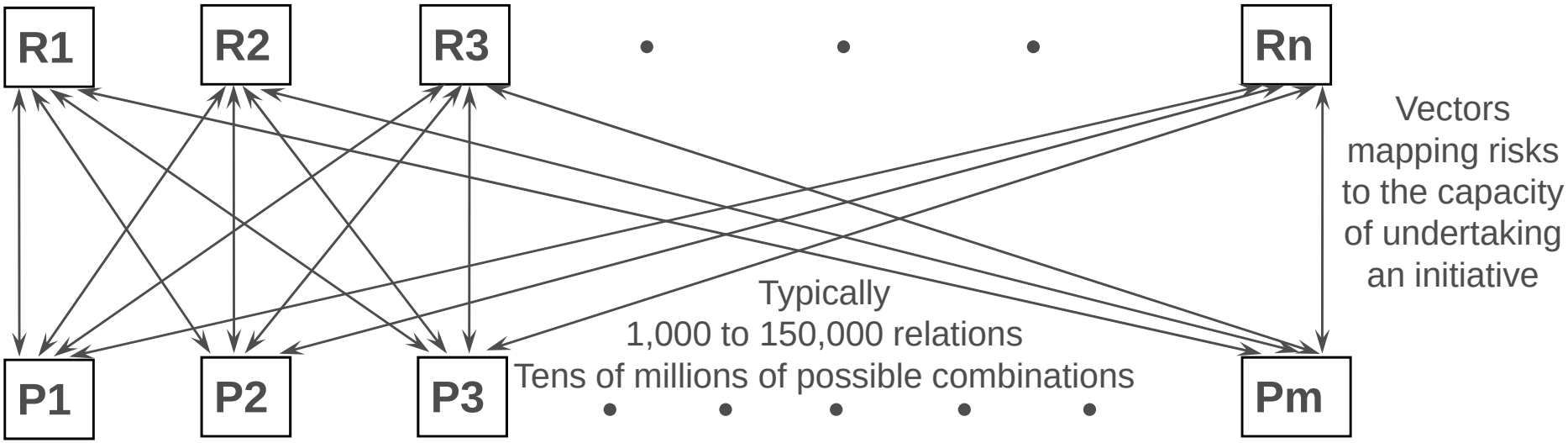
What is risk rating based on? (cont'd)

- **Probability theory**



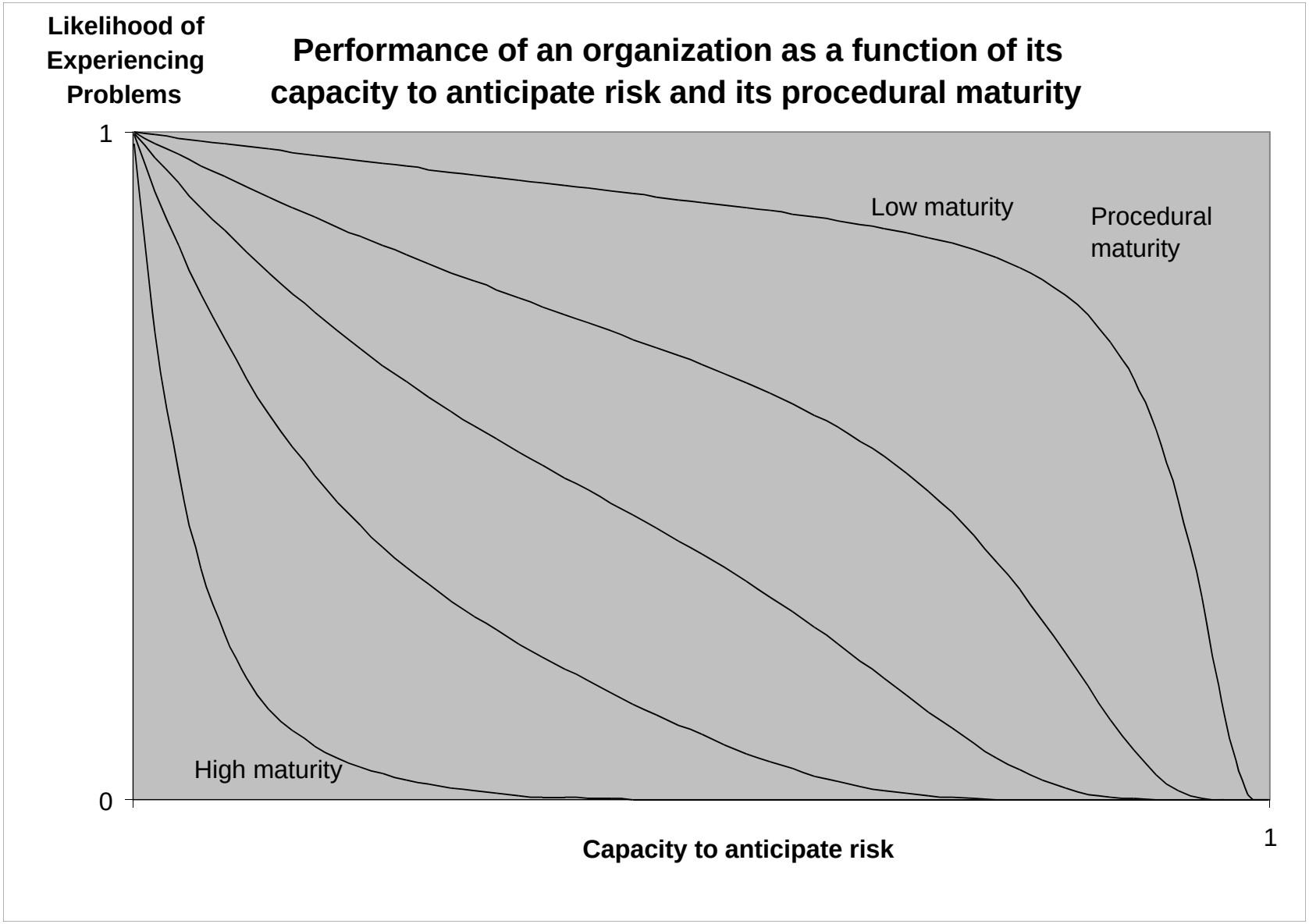
How is it conducted?
Characterizing the environment

Risks: Information and data characterizing each situation liable to deteriorate, for each of « n » risk categories



Operational Capacity: Information and data characterizing each action susceptible to mitigate the likelihood or the impact of an undesirable situation liable to occur or of a desirable situation liable not to occur, for each of « m » operational categories

How is it conducted?
Likelihood of Experiencing Problems



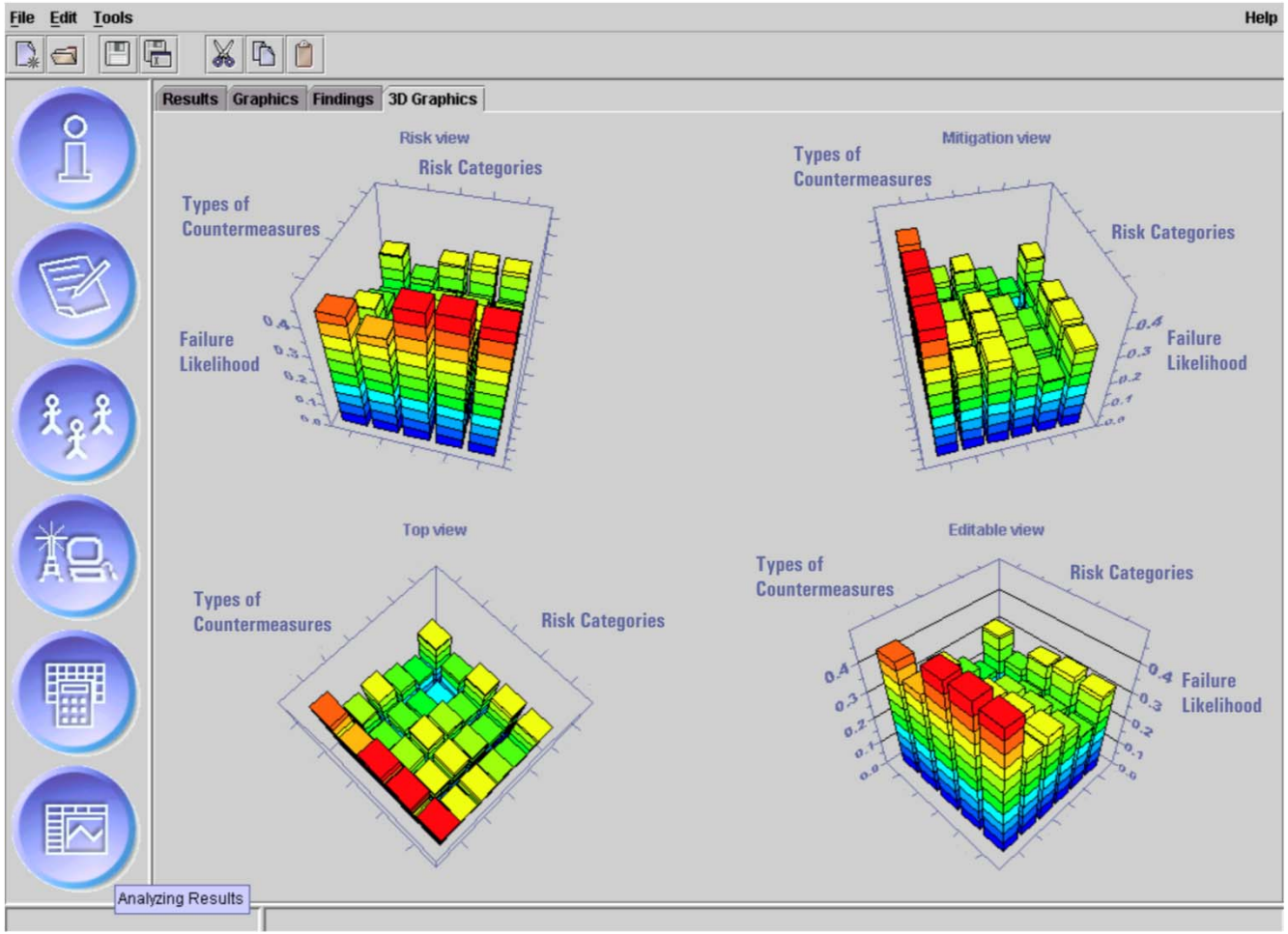
Generalization of Information Theory

- Derivation of the Global risk and empirical results suggest the applicability of Shannon's theorem to performance

"For any organization, there exists at least one course of action that will allow the organization to maximize its business opportunities and to minimize difficulties in doing so, as long as this course of action does not exceed the organization's inherent capacity"

How is it conducted?
Risk Rating Scale

Risk Profile



Relative strength within a rating category: High, Medium or Low

Rating Outlook: Progressive, Stable or Negative

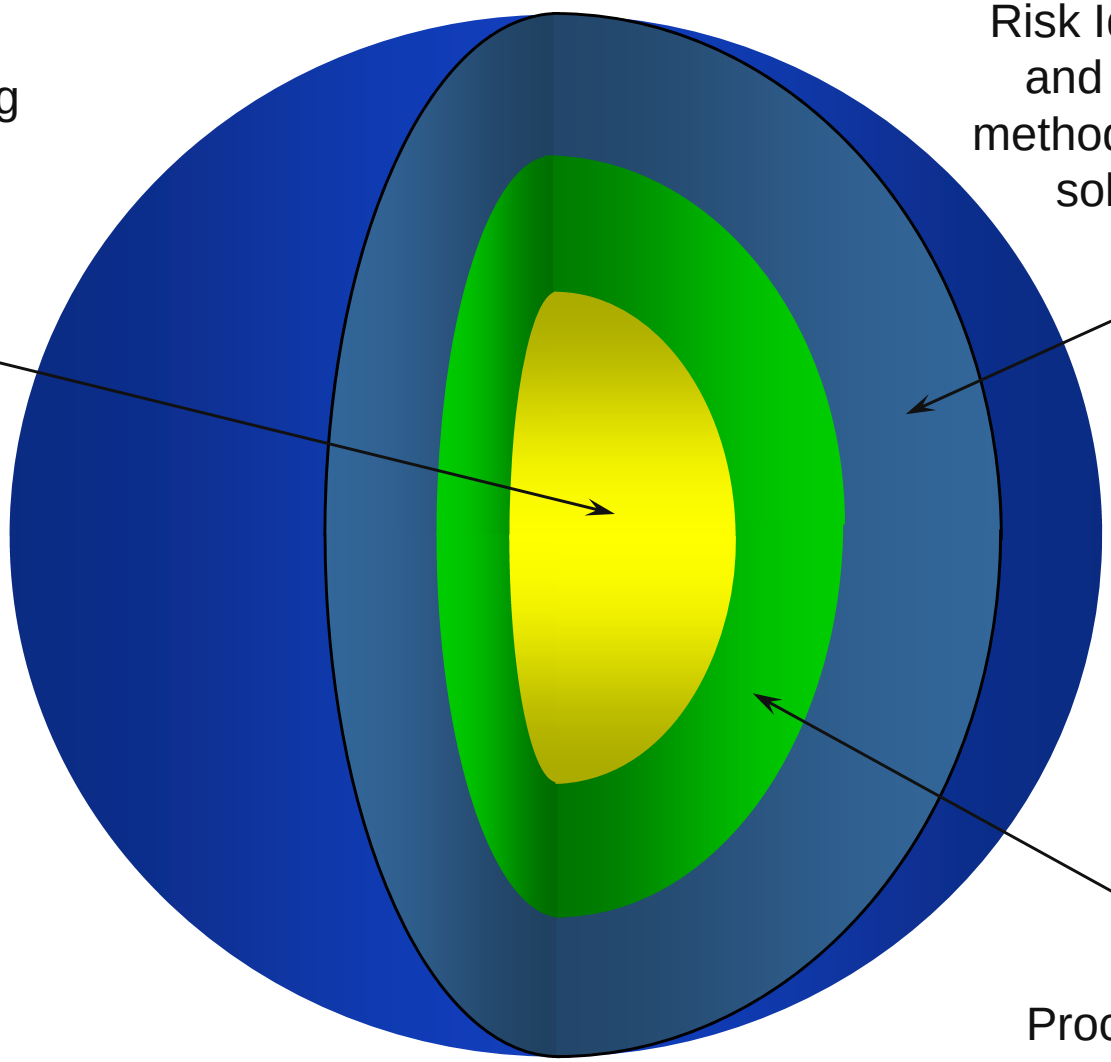
Rating Scale

AAA (Excellent)
AA (Very Good)
A (Good)
BBB (Average)
BB (Mediocre)
B (Poor)
C (Speculative)

X:PRIMER structure

X:Probabilistic Risk Identification, Mapping and Evaluation (X:PRIME) methodology core

Probabilistic Risk Identification, Mapping and Evaluation (PRIME) method and PRIME Resolver solution for domain X



Risk and Procedural models for domain X

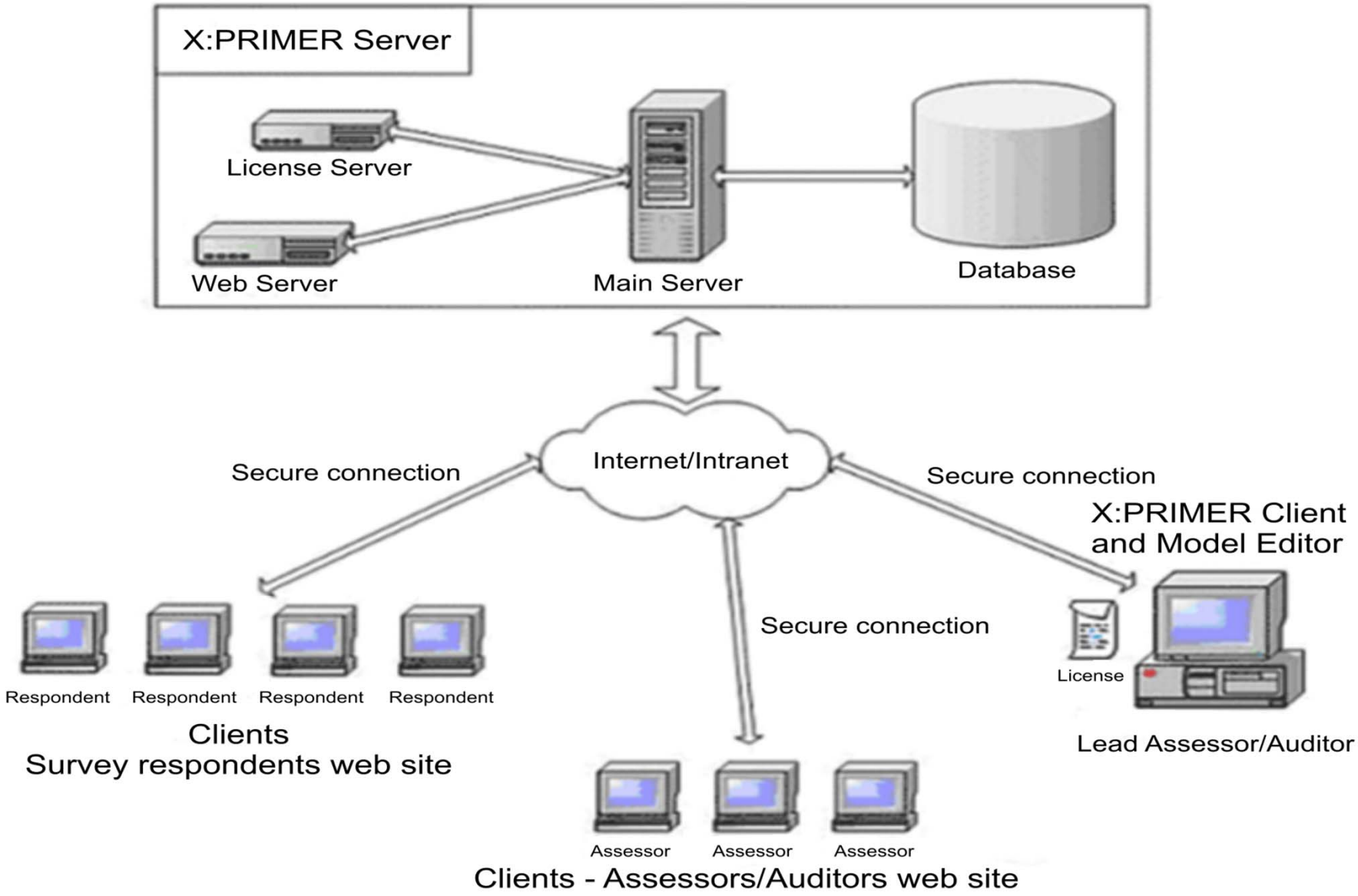
Modeling

- **Risk assessments and ratings cannot be performed without appropriate models**
- **Many models exist and can be leveraged, actualized and tailored**
  - ***"Sun Tzu's Art of War" was developed by a Chinese military strategist 2,400 years ago and is still being taught in military schools around the world***
  - ***"The Prince", from Nicolo Machiavelli, after having been banned from publication in the 16th century, is a 500-year old model still widely used in politics***

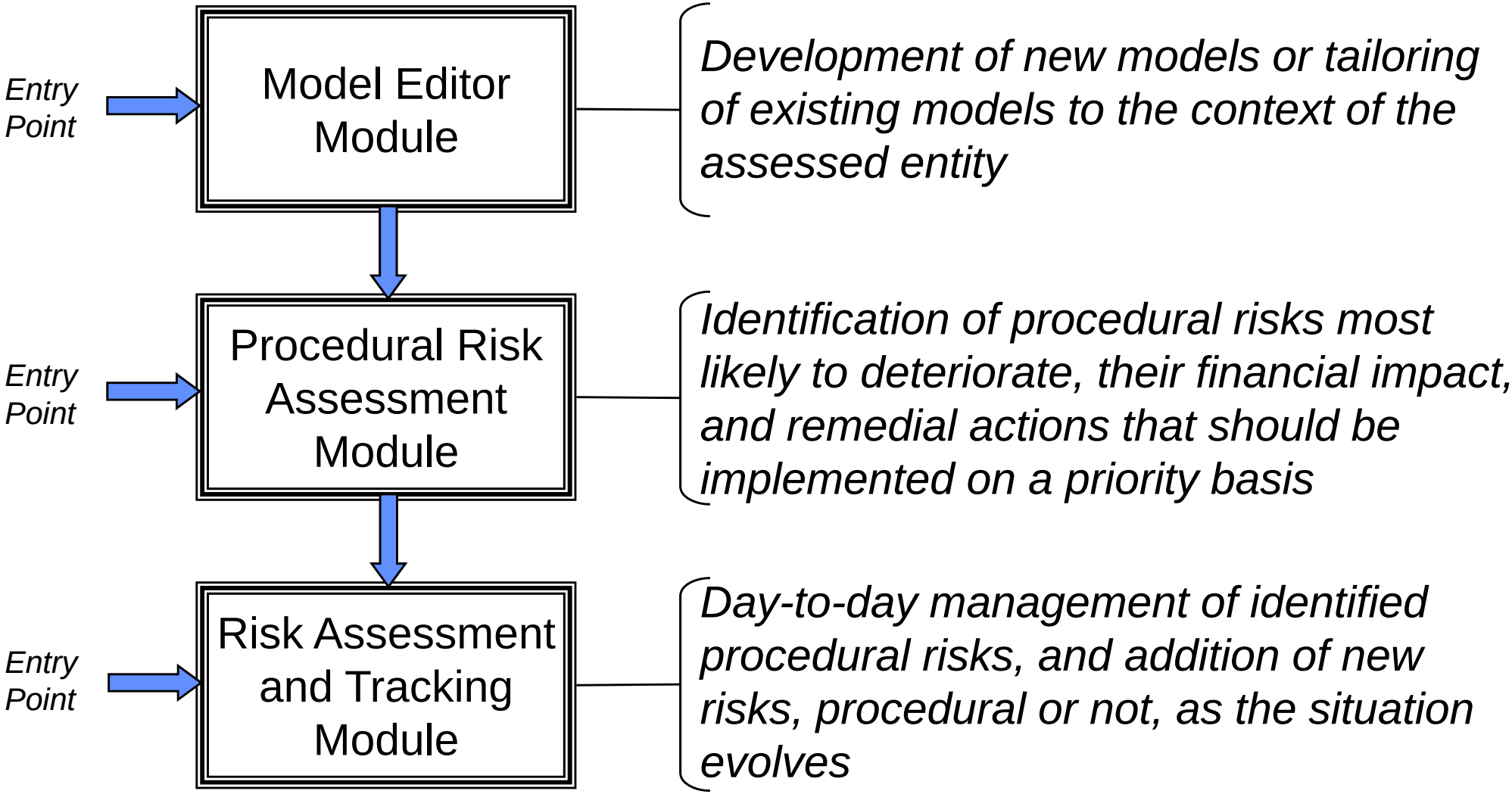
Modeling (Cont'd)

- **Consists of**
  - ***Making an inventory of undesirable situations liable to occur or desirable situations liable not to occur, and their consequences***
  - ***Making an inventory of actions that should be taken to exploit potential opportunities or avoided to prevent potential losses, and the benefit of doing so***
  - ***Parameterizing individual risks and actions***
  - ***Compiling the models***
- **Risk and procedural models should be developed by different parties to ensure that there is no inherent bias in the process**

X:PRIMER Architecture



X:PRIMER Modules



Characteristics of the methodology

- **Approach based on common sense**
  - ***Reducing the likelihood of problems will increase the chances of success along with efficiency and productivity***
  - ***Combines process improvement with a forward-looking problem prevention approach***
  - ***Relies on the assumption that the worst problems occur when undesirable situations are not anticipated, and no means are available to deal with them when they materialize***

Overview of the methodology

- **Use of two complementary surveys adapted to the context of specific initiatives or the entire organization**
  - ***Identification and analysis of procedural risks as perceived by task leaders and managers***
  - ***Identification and analysis of the procedures governing operations as applied by practitioners***
  - ***Modulation of the perceived risks by the operational capacity***
  - ***Identification of the areas where the risks remain high***
    - **Likelihood of experiencing problems, as a result of deficiencies observed in each key operational area**
    - **Identification of vulnerable areas**
    - **List of recommended actions**
  - ***Optional formal team verification of survey results for increased reliability and accuracy***
  - ***Preparation of a risk management plan based on the identified risks***

Diagnosis flow diagram

1

Selection of representative sample and participants

Awareness sessions and documentation reviews

Tailoring of the risk and operational surveys

2

Risk survey

Interviews and surveys on the risks being incurred

3

Operational survey

Interviews and surveys on the procedures governing operations

Modulation of the perceived risks by the operational capacity

4

Data analysis and consolidation

5

Findings validation and mitigation planning

Case Study

- Large initiative undertaken to re-engineer a service impacting a large number of stakeholders in many departments and organizations physically spread out over a large territory
- Allocated budget: 80M$
- Level of participation of personnel in surveys used to collect information: 90%

Case Study (cont'd)

- **Global risk**
  - ***Likelihood of experiencing significant difficulties in terms of cost overruns, schedule slippages, and deployment of an inadequate solution: 25%***
  - ***The critical threshold is 40%***
- **Assigned rating: BB**
  - ***The chances that the initiative will be successful assessed as low***

Case Study (cont'd)

- As a comparison

Country	S&P Rating	S&P Outlook
Canada	AAA	STA
France	AA+	NEG
Belgium	AA	NEG
China	AA-	STA
Israel	A+	STA
Slovakia	A	STA
Poland	A-	STA
Italy	BBB+	NEG
Russia	BBB	STA
Spain	BBB-	NEG
Indonesia	BB+	POS
Portugal	BB	NEG
Bolivia	BB-	STA
Venezuela	B+	STA
Lebanon	B	NEG
Greece	B-	STA

As of March 1, 2013

Case Study (cont'd)

- **Rating vs. Global risk**
  - ***Rating represents the capacity to achieve a conclusive outcome***
  - ***Global risk represents the difficulties that will be encountered during work execution***
    - **Too many and/or severe difficulties will affect the capacity to obtain the desired outcome**
    - **A high global risk and a low rating is a recipe for disaster i.e. a large number of problems and an inability to deal with them can be expected**

Case Study (cont'd)

- **Capacity to anticipate risk: 46%**
  - ***Degree to which situations liable to negatively affect operations and the capacity to achieve a conclusive outcome are perceived***
  - ***The difference between Capacity to anticipate risk and Global risk represents the reserve available to deal with unexpected events***
    - **A difference around 10% is usually desirable**
    - **However, a very large difference may be an indication that personnel are carrying out their activities in an atmosphere of impending disaster**

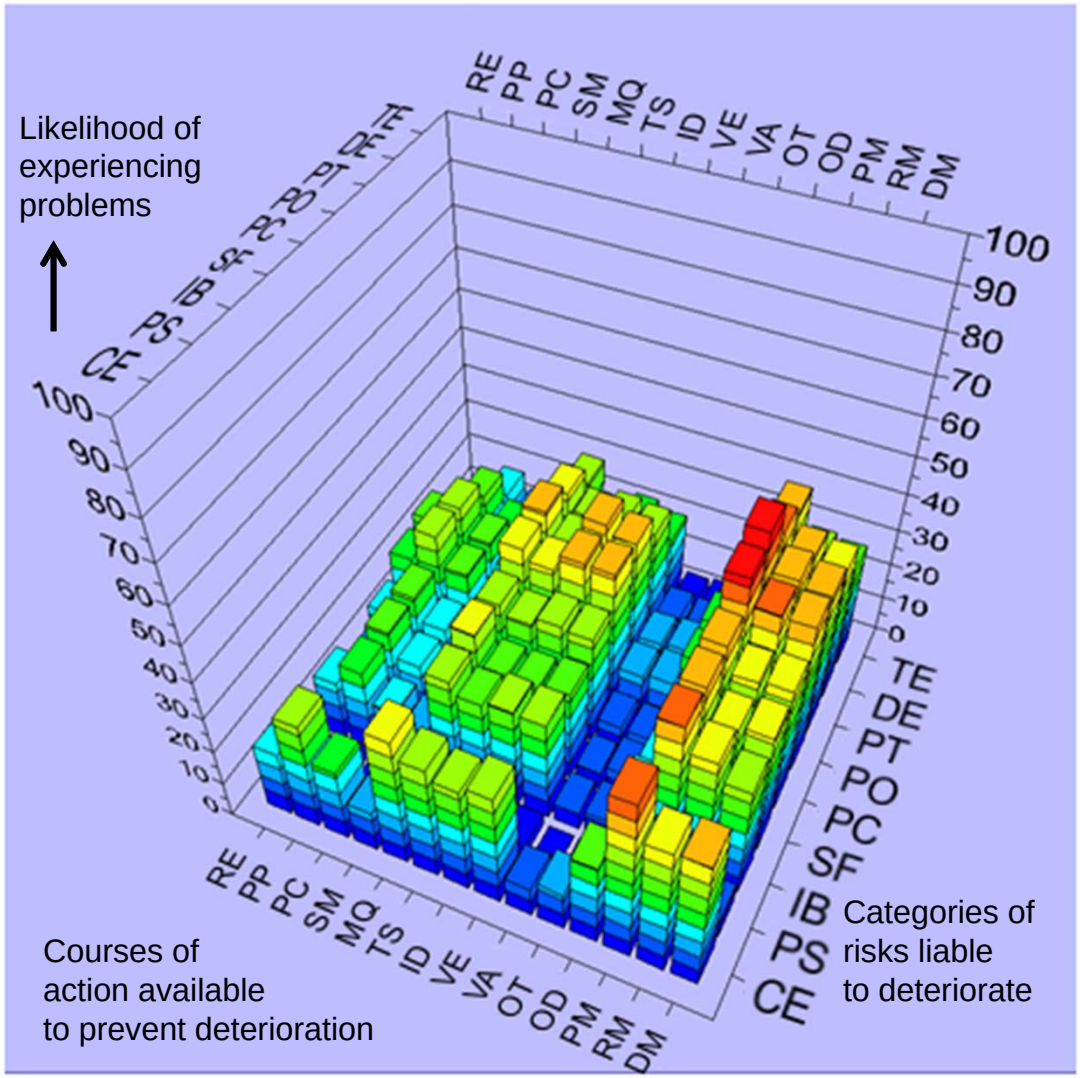
Case Study (cont'd)

- **Operational capacity: 61%**
  - ***Degree to which existing processes and procedures governing operations prevent situations from deteriorating***
- **Vulnerability: 50%**
  - ***Degree to which conditions make it more or less probable that identified risks will materialize***

Case Study (cont'd)

Risk Categories
CE: Client environment
PS: Project scope
IB: Impact on current business
SF: Solution functionality
PC: Project characteristics
PO: Project organization
PT: Project team
DE: Development environment
TE: Technology

Operational categories
RE: Scope and requirements
PP: Project planning
PC: Project control
SM: Suppliers management
MQ: Measurements and quality management
TS: Technical solution
ID: Integration and deployment
VE: Verification
VA: Validation
OT: Change management (development)
OD: Change management (deployment)
PM: Project management
RM: Risk management
DM: Decision-making

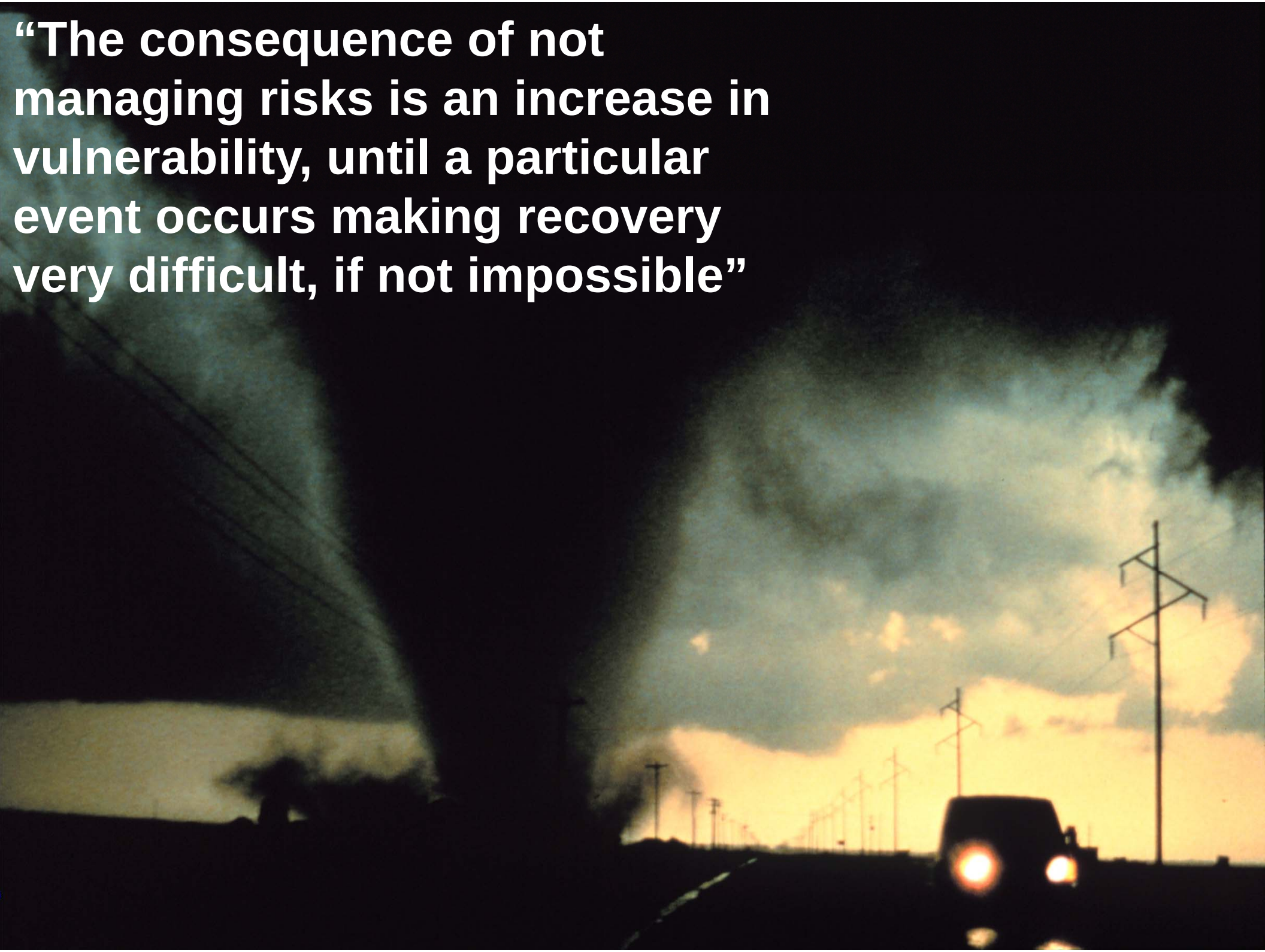


Case Study (cont'd)

- The risk assessment concluded that the initiative would cost 2.8 times the allocated budget if the identified risks were not adequately addressed

Case Study (cont'd)

- **Post-mortem conducted three years after predictions from the risk analysis had forecasted a 143M$ cost overrun**
  - ***94% (75M$) of the allocated budget was consumed***
  - ***30% of the originally planned work was completed***
  - ***The project was suspended, which for all practical purposes, meant that it had been cancelled***


“The consequence of not managing risks is an increase in vulnerability, until a particular event occurs making recovery very difficult, if not impossible”