

Risk Intelligence

ERM Symposium

May 2019



A 1980 hit song about Risk Intelligence

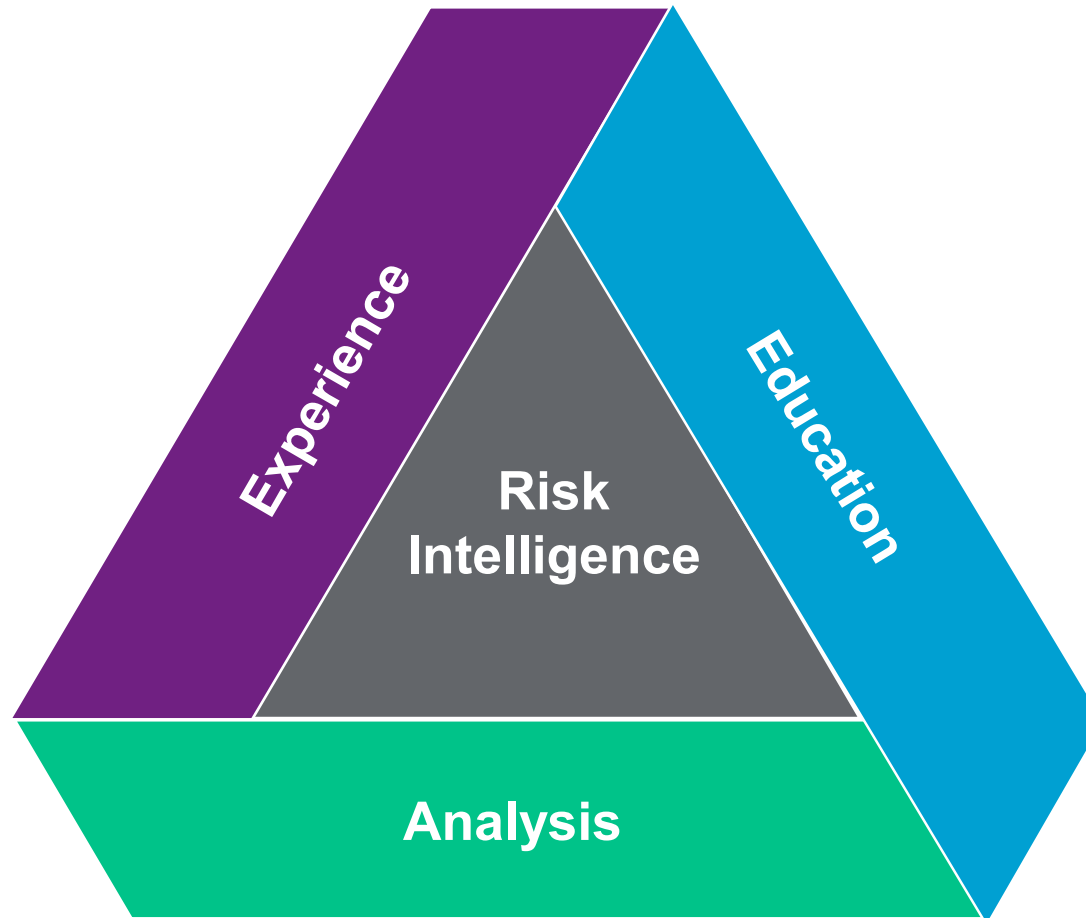
*“You’ve got to know when to hold ‘em,
know when to fold ‘em,
know when to walk away,
know when to run.”*

The Gambler, Kenny Rogers

Risk Intelligence

- Definition:
 - The ability to reason, plan, solve problems, think abstractly, comprehend complex ideas, learn quickly and learn from experience in matters involving risk and uncertainty.
 - It reflects a capability for comprehending risk and uncertainty in our surroundings—"catching on," "making sense" of things, or "figuring out" what to do in the face of both presenting and emerging risks.

Deconstruction of Risk Intelligence



ERM MBA Program Syllabus

Required Courses

- Fundamentals of Global Enterprise Risk Management
- Financial Management
- Quantitative and Qualitative Decision-Making
- Financial Risk Modeling
- Project Management
- Enterprise Risk Planning and Compliance
- Business Continuity Planning and Crisis Communication

Electives

- Cybersecurity and Cyberterrorism
- Emergency Management and Disaster Recovery
- Insurance Risk Management
- Company Failures
- Systemic Risk
- Cognitive Bias & ERM
- Operational Risk Management
- Strategic Risk Management

Nonformal ERM Education



Very Strong ERM – January 2019



Strategy and ERM – December 2018



Reserve Risk Measurement and Management – November 2018



Initial Findings from A.M. Best's New BCRM – April 2018



Cyber Risk Management – March 2018



Stress Testing – February 2018



Emerging Risks Update – October 2018



Risk Appetite – September 2018



Targets, Limits & Checkpoints – August 2018



Investment Risk Management – January 2018



Voluntary ORSA (VORSA) – December 2017



Concentration Risk – November 2017



Three Levels of ERM – July 2018



Economic Capital Benchmarking – June 2018



ERM Framework – May 2018



Determining Economic Capital – October 2017



Risk Analysis – September 2017



Stochastic BCAR and ERM – May 2017

Experience

- “You don't learn to walk by following rules. You learn by doing, and by falling over.”
 - Richard Branson
- “All men make mistakes, but only wise men learn from their mistakes.”
 - Winston Churchill

- “You must learn from the mistakes of others. You can't possibly live long enough to make them all yourself.”
 - Samuel Levenson
- “Fools say that they learn by experience. I prefer to profit by others experience.”
 - Otto von Bismarck

Assessment of Frequency and Severity

- Many companies do their assessment of risk frequency and severity by Gut Feel

Wisdom of Crowds (2004) J. Surowiecki

- A group of people can be smarter than any single person in the group

Requires four conditions to be reliably true:

1. Diversity of Information
2. Independence of opinion
3. Variety of Specialization
4. Aggregation method

My Favorite Biases

Anchoring

Availability
heuristic

Confirmation
bias

Endowment
effect

Framing effect

Gambler's fallacy

Hindsight bias

Illusion of control

Overconfidence
effect

Status quo bias

Survivorship bias

Ostrich Effect

Key to Getting the most from your Experience



I've missed more than nine thousand shots.

I've lost almost three hundred games.

Twenty-six times I've been trusted to take the game-winning shot and missed. I've failed over and over and over again in my life. And that is why I succeed.

- Michael Jordan

Risk Analysis

Using mathematical techniques to identify quantitative attributes of risk

Most common attributes:

- Average Loss
 - Pricing

- Loss at a particular probability (usually remote)

- Average loss for all events less likely than a particular probability

- Loss for a particular predefined event
 - Repeat of a historical event
 - New adverse event that has never happened before

Risk Analysis

Using mathematical techniques to identify quantitative attributes of risk

Average Loss

- Used for pricing and reserving
- Expected Value

Stress Test

- Loss for a particular predefined situation
- Could be repeat of a historical event
- Or new hypothetical adverse event
- Also used for risk control, capital Adequacy, risk mitigation

Value at Risk (VaR)

- Loss for a particular probability / likelihood
- Used for risk control, capital Adequacy, risk mitigation

Tail Value at Risk (TVaR)

- Average loss for events less likely than a particular probability / likelihood
- Used for risk control, capital Adequacy, risk mitigation

Three Types of Analysis

Newtonian Logic

Statistical
Big Data

Systems Thinking

All Together

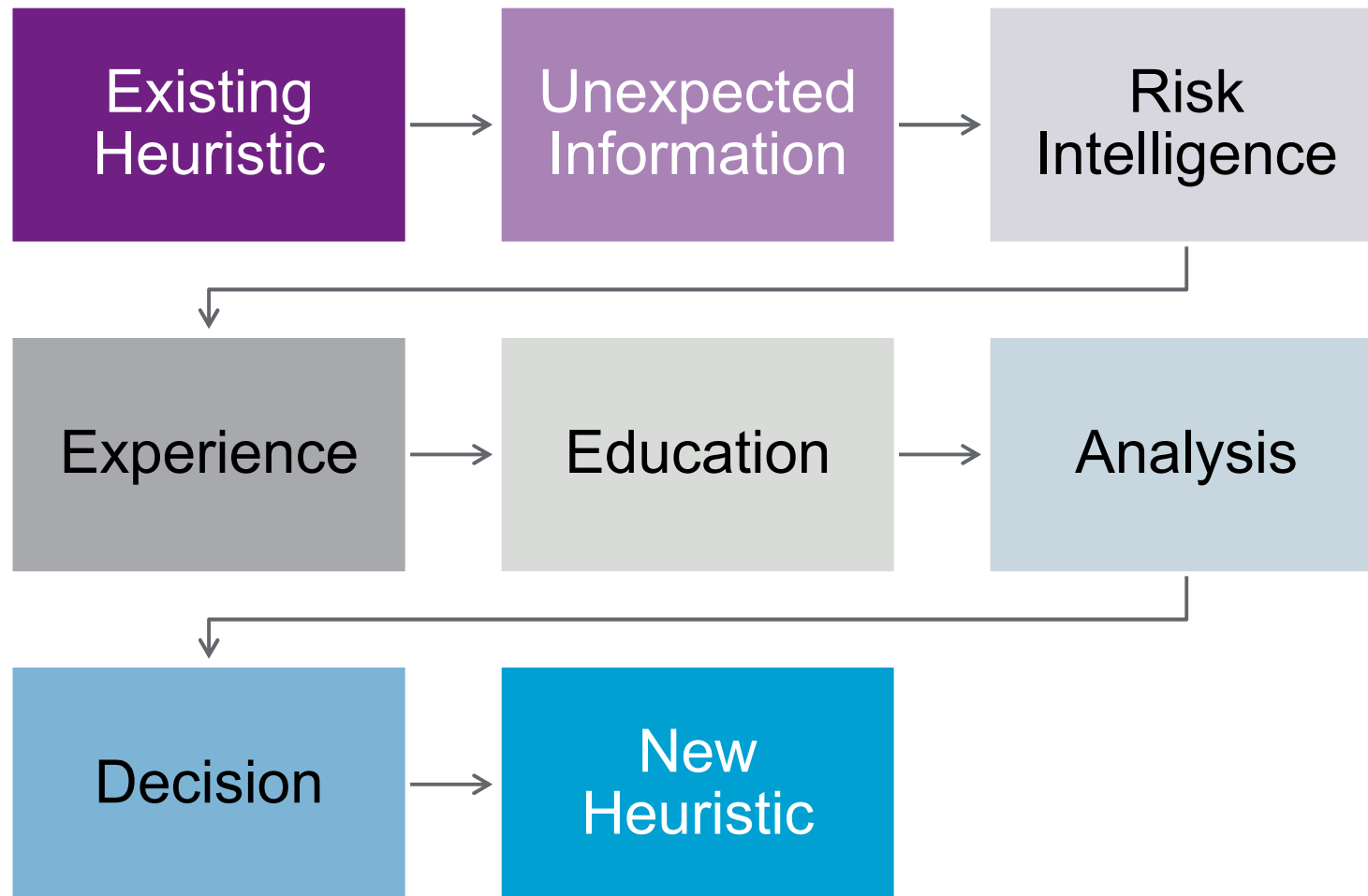
- Education can fill in gaps in Experience.
- Education of analytical processes can reduce excesses.

- Experience can fill in the gaps in education.
- Experience can tell you when your analysis conclusions do not make real world sense

- Analysis can tie your conclusions to actual observations rather than theories.
- Analysis can show when biases have overwhelmed the actual situation.

All Together

Intelligence



Today's Speakers

Dave Ingram, CERA
Willis Towers Watson

Ken Williams, FCAS
Casualty Actuarial Society

Nick Silitch, CRO
Prudential Insurance

Bob Wolf, CRO & Chief Actuary
Stonetrust Insurance

Questions

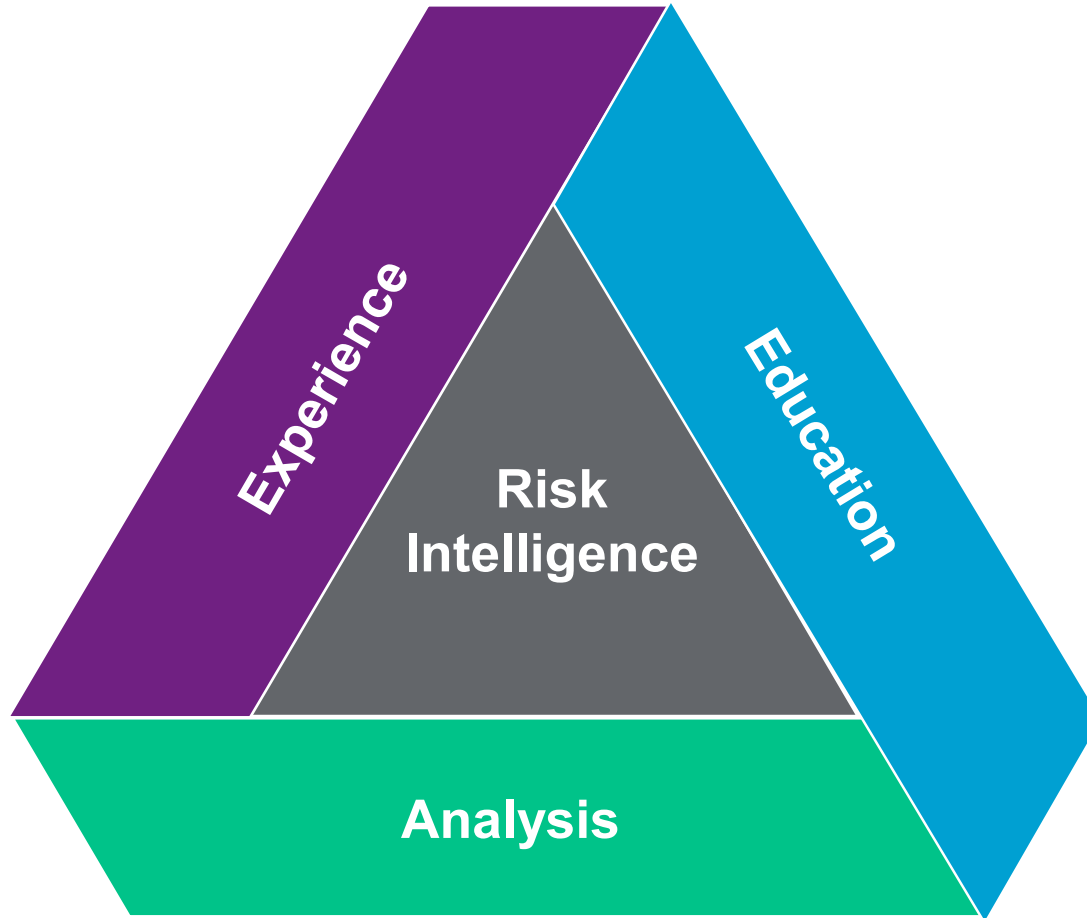
1. Please rank the three modes in importance to making risk related decisions in an insurer.
2. What topics would you put on a risk education syllabus?
3. Is it better to have experience of a company failure or to have avoiding having such an experience?
4. If you had to pick a person with only one of the three modes in their background which would you pick for:
 - Reviewing risk environment
 - Running risk controls
 - Measuring risk
 - Preparing risk reports for board
5. Describe the person you would favor to hire as assistant CRO in terms of the three modes.
6. You just bought a sizable company in a country where you have never operated. Your staff each have 2 of the three modes in their background. Pick two to send to do due diligence and create the integration plan for risk management.

Questions

7. Can you give an example of Risk Intelligence that you have seen?
 - Can you tell how that example related (or not) to these three themes
8. Can you give an example of a risk related decision that went wrong
 - Can you tell how Risk Intelligence would have helped

Risk Intelligence

Intelligence



Contact Us

- **Dave Ingram**
D +1 212 915 8039
E Dave.Ingram@WillisTowersWatson.com
- **Nicholas Silitch**
D +1 973-802-9116
E Nicholas.Silitch@Prudential.com
- **Bob Wolf**
D +1 225 201-8040
E Robert.Wolf@stonetrustinsurance.com
- **Ken Williams**
D +1 703 562 1739
E kwilliams@casact.org

Willis Re disclaimers

This analysis has been prepared by Willis Limited and/or Willis Re Inc. and/or the “Willis Towers Watson” entity with which you are dealing (“Willis Towers Watson” is defined as Willis Limited, Willis Re Inc., and each of their respective parent companies, sister companies, subsidiaries, affiliates, Willis Towers Watson PLC, and all member companies thereof) on condition that it shall be treated as strictly confidential and shall not be communicated in whole, in part, or in summary to any third party without prior written consent from the Willis Towers Watson entity with which you are dealing.

Willis Towers Watson has relied upon data from public and/or other sources when preparing this analysis. No attempt has been made to verify independently the accuracy of this data. Willis Towers Watson does not represent or otherwise guarantee the accuracy or completeness of such data nor assume responsibility for the result of any error or omission in the data or other materials gathered from any source in the preparation of this analysis. Willis Towers Watson shall have no liability in connection with any results, including, without limitation, those arising from based upon or in connection with errors, omissions, inaccuracies, or inadequacies associated with the data or arising from, based upon or in connection with any methodologies used or applied by Willis Towers Watson in producing this analysis or any results contained herein. Willis Towers Watson expressly disclaims any and all liability, based on any legal theory, arising from, based upon or in connection with this analysis. Willis Towers Watson assumes no duty in contract, tort or otherwise to any party arising from, based upon or in connection with this analysis, and no party should expect Willis Towers Watson to owe it any such duty.

There are many uncertainties inherent in this analysis including, but not limited to, issues such as limitations in the available data, reliance on client data and outside data sources, the underlying volatility of loss and other random processes, uncertainties that characterize the application of professional judgment in estimates and assumptions. Ultimate losses, liabilities and claims depend upon future contingent events, including but not limited to unanticipated changes in inflation, laws, and regulations. As a result of these uncertainties, the actual outcomes could vary significantly from Willis Towers Watson’s estimates in either direction. Willis Towers Watson makes no representation about and does not guarantee the outcome, results, success, or profitability of any insurance or reinsurance program or venture, whether or not the analyses or conclusions contained herein apply to such program or venture.

Willis Towers Watson does not recommend making decisions based solely on the information contained in this analysis. Rather, this analysis should be viewed as a supplement to other information, including specific business practice, claims experience, and financial situation. Independent professional advisors should be consulted with respect to the issues and conclusions presented herein and their possible application. Willis Towers Watson makes no representation or warranty as to the accuracy or completeness of this document and its contents.

This analysis is not intended to be a complete actuarial communication, and as such is not intended to be relied upon. A complete communication can be provided upon request. Subject to all terms of this Disclaimer, Willis Towers Watson actuaries are available to answer questions about this analysis.

Willis Towers Watson does not provide legal, accounting, or tax advice. This analysis does not constitute, is not intended to provide, and should not be construed as such advice. Qualified advisers should be consulted in these areas.

Willis Towers Watson makes no representation, does not guarantee and assumes no liability for the accuracy or completeness of, or any results obtained by application of, this analysis and conclusions provided herein.

Where data is supplied by way of CD or other electronic format, Willis Towers Watson accepts no liability for any loss or damage caused to the Recipient directly or indirectly through use of any such CD or other electronic format, even where caused by negligence. Without limitation, Willis Towers Watson shall not be liable for: loss or corruption of data, damage to any computer or communications system, indirect or consequential losses. The Recipient should take proper precautions to prevent loss or damage – including the use of a virus checker.

This limitation of liability does not apply to losses or damage caused by death, personal injury, dishonesty or any other liability which cannot be excluded by law.

This analysis is not intended to be a complete Financial Analysis communication. A complete communication can be provided upon request. Subject to all terms of this Disclaimer, Willis Towers Watson analysts are available to answer questions about this analysis.

Willis Towers Watson does not guarantee any specific financial result or outcome, level of profitability, valuation, or rating agency outcome with respect to A.M. Best or any other agency. Willis Towers Watson specifically disclaims any and all liability for any and all damages of any amount or any type, including without limitation, lost profits, unrealized profits, compensatory damages based on any legal theory, punitive, multiple or statutory damages or fines of any type, based upon, arising from, in connection with or in any manner related to the services provided hereunder.

Acceptance of this document shall be deemed agreement to the above.

Questions

Formal ERM Education

CERA Syllabus

ERM concept
and framework

ERM process

Risk categories
and identification

Risk modelling
and aggregation
of risks

Risk
measurement
and assessment

Risk
management
tools and
techniques

Capital
management