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It is a known fact that activity happening in the organization has a degree of uncertainty which implies risk as well. Risk is normally related to bad stuff which is an offshoot of some unanticipated events unfolding contrary to the plan. The main function of risk management is to deal with this negative aspect of uncertainty. A book by Douglas Hubbard entitled, “The Failure of Risk Management – Why it’s Broken and How to Fix it”, discusses why many commonly used risk management practices are flawed and what needs to be done to fix them.

In order to ensure continuity and to hold the attention of the readers from starting till end, the writer has divided the book into three parts: the first part introduces the crisis in risk management; the second deals with why some popular risk management practices are flawed; the third discusses what needs to be done to fix these crises and flaws.

Part I-The crisis in risk management

The writer unfolds the first section of his book by asking questions like, Do these risk management methods work?, Would any organization that uses these techniques know if they didn’t work?. What would be the consequences if they didn’t work. According to the author, answers to first two questions are negative for most organizations. To answer the third question, he narrated a crash of United Flight 232 that happened in 1989. The crash was attributed to the simultaneous failure main along with two redundant hydraulic systems. This happened because all three systems were located at the rear of the plane and debris from a damaged turbine cut lines to all them. This is an example of common mode failure – a single event causing multiple systems to fail. The probability of such an event occurring was estimated to be less than one in a billion. However, the reason the turbine broke up was that it hadn’t been inspected properly (i.e. human error). The probability estimate hadn’t considered human oversight, which is way more likely than one-in-billion. Hubbard uses this example to make the point that a weak risk management methodology can have huge consequences. Hubbard in this section explained very briefly the history of risk management from historical times to the present and indicated a list of common methods of risk management. These are:

a. Expert intuition which is mainly based on gut feeling.
b. Expert audit, based on expert intuition of independent consultants. Typically involves the development of checklists and also uses stratification methods.

c. Simple stratification methods include risk matrices which are the canonical example of stratification methods.

d. Weighted scores are the assigned scores for different criteria, followed by weighting based on perceived importance of each criterion.

e. Non-probabilistic financial analysis techniques such as computing the financial consequences of best and worst case scenarios.

f. Calculus of preferences includes structured decision analysis techniques. These techniques are based on expert judgments. However, in cases where multiple judgments are involved these techniques ensure that the judgments are logically consistent and do not contradict the principles of logic.

g. Probabilistic models involve building probabilistic models of risk events. Probabilities can be based on historical data, empirical observation or even intuition. The book essentially builds a case for evaluating risks using probabilistic models, and provides advice on how these should be built.

The book also discusses the state of risk management practice in the backdrop of the 2008 crisis in US through surveys carried out by various agencies. Hubbard highlights that surveys are based largely on self-assessments of risk management effectiveness. One cannot place much confidence in these because self-assessments of risk are subject to flawed perceptions (cognitive biases) and Dunning Kruger effect i.e. overconfidence in one’s abilities. The acid test for any assessment is whether or not it uses sound quantitative measures. Many firms surveyed failed because of inability to quantify claimed risks. Assigning weighted scores to qualitative judgments also does not count as a sound quantitative technique. Therefore, Hubbard lists some good ways of measuring the effectiveness of risk management as follows:

a. Direct evidence is the risk management technique that actually finds some problem which would not have been found otherwise. For example, an audit that unearths dubious financial practices.

b. Component testing provides the flexibility if end-to-end testing of method is not possible; it may be possible to test specific components that make up the method. For example, if the method uses computer simulations, it may be possible to validate the simulations by applying them to known situations.

c. Check of completeness warrants organizations to ensure that their risk management methods cover the entire spectrum of risks; otherwise there is a danger that mitigating one risk may increase the probability of another. Further, as Hubbard states, “A risk that is not even on the radar cannot be managed at all.” As far as completeness is concerned, four perspectives that needs to be accounted are as follows:

(1) Internal completeness covers all parts of the organization.

(2) External completeness covers all external entities that interact with organization.

(3) Historical completeness covers worst case scenarios through historical data.

(4) Combinatorial completeness considers combinations of events that may occur together.
Part II-Why it’s broken

Hubbard begins this section by identifying the four major players in the risk management game which are as follows:

a. **Actuaries**: These are perhaps the first modern professional risk managers. They use quantitative methods to manage risks in the insurance and pension industry. Although the methods actuaries use are generally sound, however, actuaries typically do not cover the entire spectrum of organizational risks.

b. **Physicists and mathematicians**: Many rigorous risk management techniques came out of statistical research done during the Second World War. Hubbard, therefore, calls this group as War Quants. One of the notable techniques to come out of this effort is the Monte Carlo Method. Hubbard believes that Monte Carlo simulations offer a sound, general technique for quantitative risk analysis.

c. **Economists**: Risk analysts in investment firms often use quantitative techniques from economics. Popular techniques include modern portfolio theory and models from options theory. The problem is that these models are often based on questionable assumptions. For example, the Black-Scholes model assumes that the rate of return on a stock is normally distributed; an assumption that’s demonstrably incorrect. Further, Hubbard suggests that the role of cognitive biases in risk management has been consistently overlooked.

d. **Management consultants**: In author’s view, management consultants and standards institutes are largely responsible for many of the ad-hoc approaches to risk management. One of the example given by the writer is an ad-hoc scoring methods that involve ordering of risks based on subjective criteria. The scores assigned to risks are thus subject to cognitive bias. Even worse, some of the tools used in scoring can end up ordering risks incorrectly. Bottom line: many of the risk analysis techniques used by consultants and standards have no justification.

In this section, Hubbard also discusses the confusion associated with the definition of risk. There are copious definitions of risk, most of which originated in academia. Hubbard shows how some of these contradict each other. In doing so, he clarifies some of the academic and professional terminology around risk. The PMI definition views risk as “an uncertain event or condition, if occurs, has a positive or negative effect on project objectives.” This definition contradicts dictionary usage of term risk which generally includes only bad stuff. Another problem of over confidence has been very correctly highlighted in the book. To overcome the problem of overconfidence, Hubbard suggested the use of calibrated probability assessments to quantify analysts’ abilities to make estimates. Calibration assessments involve getting analysts to answer trivial questions and draw confidence intervals for each answer. The confidence intervals are then checked against the proportion of correct answers. Essentially, this assesses experts’ abilities to estimates by tracking how often they are right. It has been found that people can improve their ability to make subjective estimates through calibration training i.e. repeated calibration testing followed by feedback.

Next Hubbard tackles several arguments that are commonly offered as reasons not to manage risks using rigorous quantitative methods. According to the author quantitative risk analysis is impossible because unexpected events cannot be predicted and risks cannot be measured accurately. Hubbard states that the first objection is invalid because although some events may have been overlooked by models, it doesn’t prove that quantitative risk as a whole is flawed. As he discusses later in the book, many models go wrong by assuming Gaussian probability distributions where fat-tailed are more appropriate, particularly in the presence of limited data it is difficult to figure out
which distribution is correct. Further, Hubbard believes that Monte Carlo simulation is very effective in managing risk however the technique is being used with following deficiencies:

a. The technique is often used without empirical data or validation i.e. inputs and results are not tested through observation.
b. The method generally used as piecemeal i.e. used in some parts of an organization only, and often to manage low-level, operational risks.
c. Un-important variables are frequently focused as these are easier to measure rather those that are important but considered as too uncertain.
d. Use of inappropriate probability distributions as normal distribution is not always appropriate.
e. Techniques do not account for correlations between variables, which undermine risk, because correlations can cause feedback effects and common mode failures.

Part III-How to Fix it

The last part of the book outlines Hubbard’s recommendations for improving the practice of risk management which mainly includes following:

a. Use of calibrated probabilities to express uncertainties and estimates used in models should also be calibrated.
b. To model risks quantitative modeling like Monte Carlo methods should be used. According to the author risk modeling forces the analysts to decompose systems of interest and understand the relationships between their components.
c. Develop an understanding for basic rules of probability including independent events, conditional probabilities and Bayes’ Theorem. He gives examples of situations in which these rules can help analysts extrapolate.
d. Build, validate and test models using reality as the ultimate authority. Models should be built iteratively, testing each assumption against observation. Further, models need to incorporate mechanisms, not just raw observations. This is often hard to do, but at the very least models should incorporate correlations between variables. Note that correlations are often indicative of an underlying mechanism.
e. Lobbying for risk management to be given appropriate visibility in organizations.

9. In last chapters, Hubbard reiterates that risk analysis is an empirical science and it comes by experience. Since analytical and mathematical aspects of risk are important but an analyst must believe that knowledge about risks can only come from observation of reality. Unfortunately while testing models analyst do measure the performance of their risk models. Hubbard offers some excellent suggestions on how analysts can refine and improve their models via observation. Finally, Hubbard emphasizes the importance of creating an organization-wide approach to manage risks. This ensures that organizations will tackle the most important risks first and optimizes risk management budgets. Tools suggested in the book are most effective if they are used in a consistent way across the entire organization. However, in reality, risk management is given the last priority by senior executives. Even those who claim to understanding the importance of managing risks in a rigorous way, rarely offer risk managers the organizational visibility and support they need to do their jobs.