Modelling, quantification, and optimal risk management practices for the key risks affecting entities in the Financial Services Industry

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With you today..

A manager at KPMG Advisory Services with over 9 years of experience in providing enterprise wide and financial risks advisory services and solutions. Providing executive and staff trainings, implementation of risk management frameworks, risk function transformation projects, risk management gap analysis, risk maturity assessments, development and implementation of risk strategies and appetite statements, risk assessment and quantification, stress and scenario analysis, risk monitoring and reporting.

Qualifications and associations:

- Accredited trainer, GARP, CPA (K), Actuarial science postgrad, PRINCE 2 Practitioner

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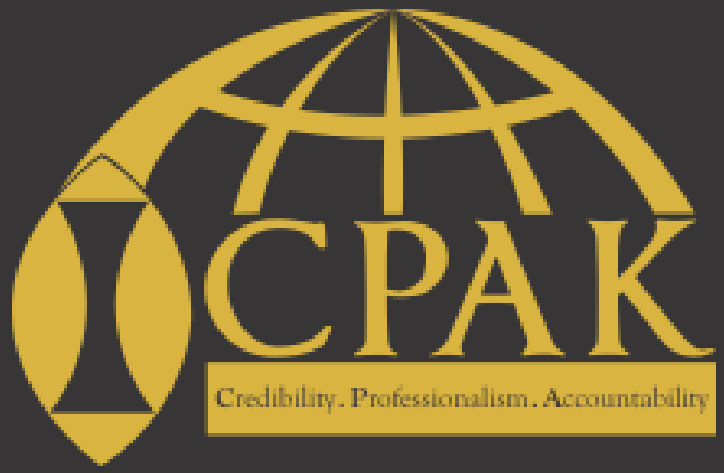
What we will cover in this session

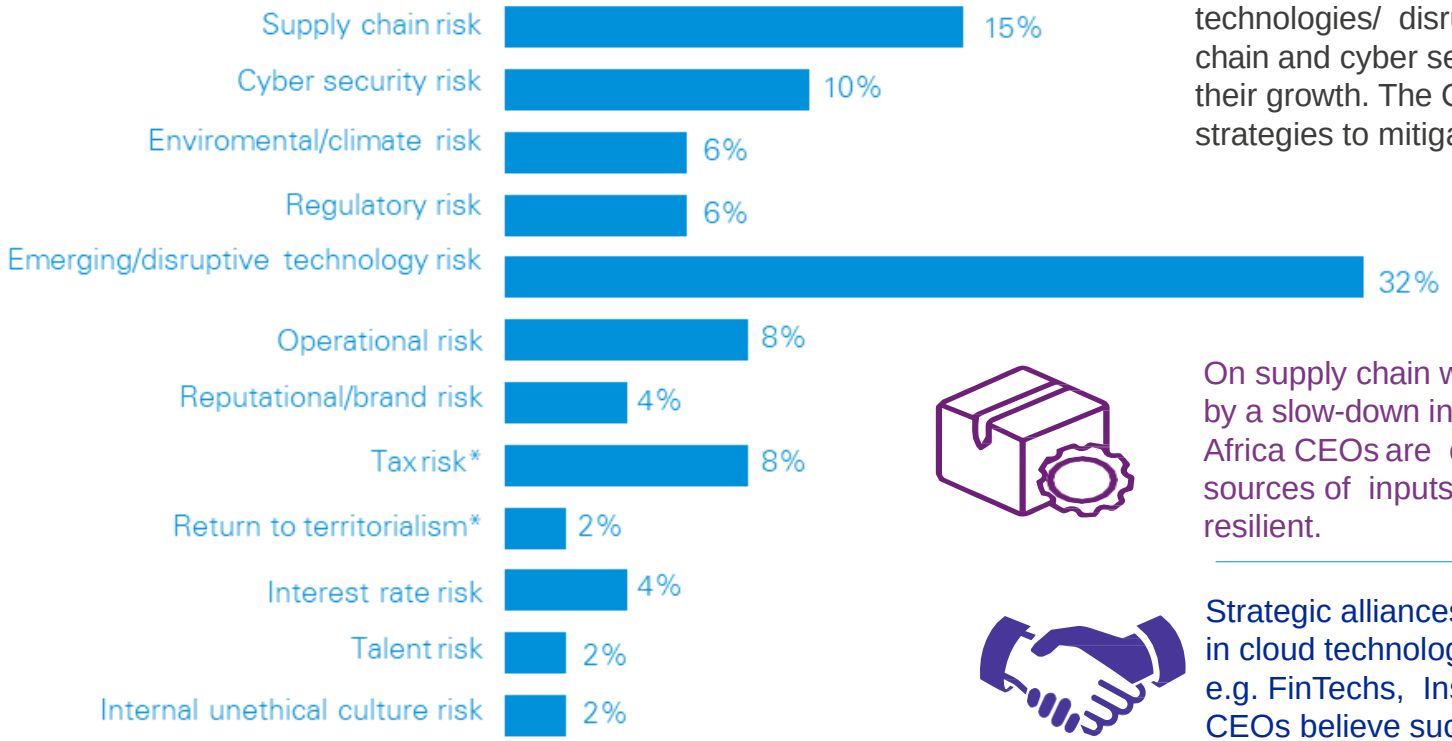
- A view of risks financial services are currently facing
- Focus on risk quantification (linking risk assessment, risk appetite, KPIs and KRIs)
- Model risk management and risk modelling



A view of risks financial services are currently facing

The risks identified by East Africa CEOs in achieving their growth.

Chart 4



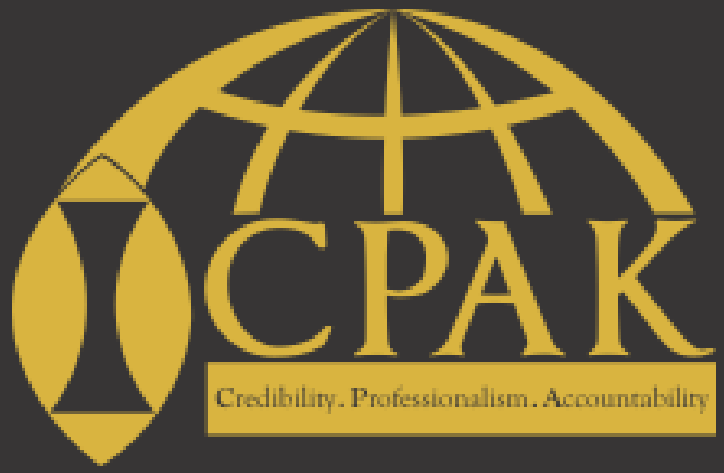
Out of 12 risks, East Africa CEOs rank emerging technologies/ disruptive technology risk, supply chain and cyber security as the top risks threatening their growth. The CEOs are exploring diverse strategies to mitigate these risks. They include:

On supply chain which has mainly been disrupted by a slow-down in global movement goods, East Africa CEOs are considering diversification of sources of inputs to make their supply chains more resilient.

Strategic alliances with third party data providers, in cloud technology and collaboration with start-ups e.g. FinTechs, InsurTech and other digital partners. CEOs believe such alliances for digital transformation will spur growth

Current risk focus for the financial sector

• **Credit Risk**	Increasing NPLs, moratoriums, increase in provisions,
• **Capital Risk**	Insufficient level/composition of capital to support normal business operations and the risk profile, meet regulatory capital requirements, sources of capital
• **Liquidity Risk**	Funding gaps, constrained funding sources, quality of liquid assets, realisable value of assets, asset and liability mismatches
• **Market Risk**	adverse changes in market prices, interest rates, foreign exchange rates, equity prices. Market risk exists in both trading and banking book.
• **Operational Risk**	Cyber security, the great resignation, redundant/legacy systems and processes, manual processes, Data privacy,
• **Strategic Risk**	Lack of agile strategies, response rate to industry, economic or technological changes, Poor decision, governance issues, adequacy of decisions and responses to implement strategies
• **Compliance Risk**	Regulatory compliance (finance, reporting, taxation, products etc), compliance to internal policies and procedures,
• **Legal and reputation Risk**	Potential litigations, branding, potential negative publicity, customer complaints
• **Sustainability risk**	ESG risk (environmental, social and governance), sustainable products, sustainable strategies, reputation



Focus on risk quantification (linking risk assessment, risk appetite, KPIs and KRIs)

Risk appetite

1

Capacity

The maximum amount of risk that an organization can bear before it is damaged beyond repair or will at least not be able to continue with business in a similar fashion as before

2

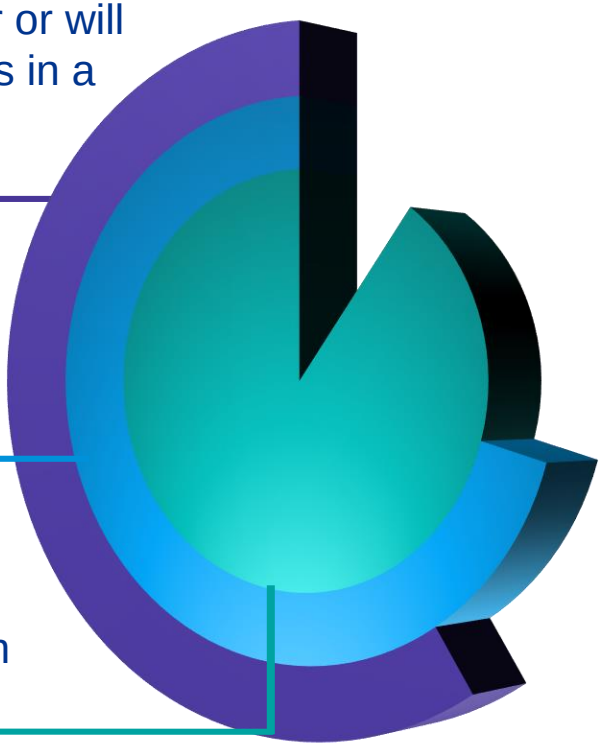
Appetite

Risk appetite is the amount of risk that an organization is willing to take in pursuit of its goals and objectives

3

Tolerance

Tolerance is defined as the variability in results that an organization is prepared to accept in support of its stated strategy within defined appetite levels



Setting tolerance thresholds

Risk Tolerance is measured by:

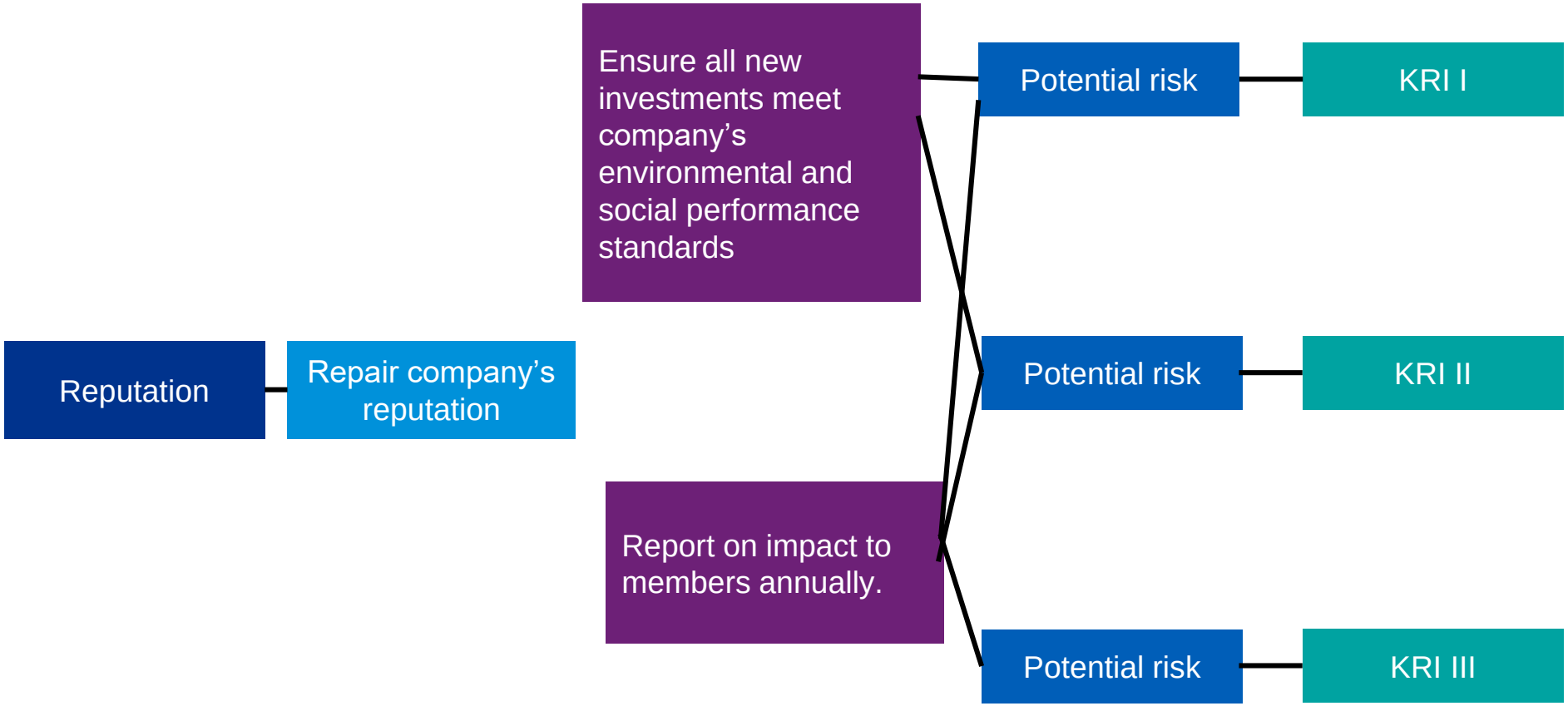
- setting **qualitative**
- **quantitative** (less subjective) thresholds,
- **aligned to the approved appetite levels**, in order to determine whether the organization is operating within approved appetite

Thresholds should be established to enable prompt and proactive management decisions to ensure that risk management objectives are achieved in the ordinary course of business.

Two types of thresholds can be set:

- **Target :** This is the level of risk or performance that management aims to achieve
- **Tolerance Limits / Threshold:** Defined as the “acceptable variation around the targeted performance level”.

Risk appetite, KRIs and loss data for quantification



Approaches and tools for risk assessment

Risk assessment…

- is the identification and analysis of risks to the achievement of business objectives
- forms a basis for determining how risks should be managed
- allows an entity to understand the extent to which potential events might impact objectives
- entails classifying risks from two perspectives
  - ✓ likelihood of an event occurring (including the number of times)
  - ✓ consequences or impact of the events occurring (including the cost).

Risk Quantification

Quantification is used in the risk management cycle to assess the significance of the identified risks and helps in their subsequent prioritisation.

Impact rating table

The Impact or consequence is the outcome of an event; being a loss, injury, disadvantage or gain should the risk actually occur.

E.g. In determining the consequences of a particular risk, consider both the number of people involved and the possible cost to the organisation (both in terms of the financial liability and damage to reputation and the cost of mitigation).

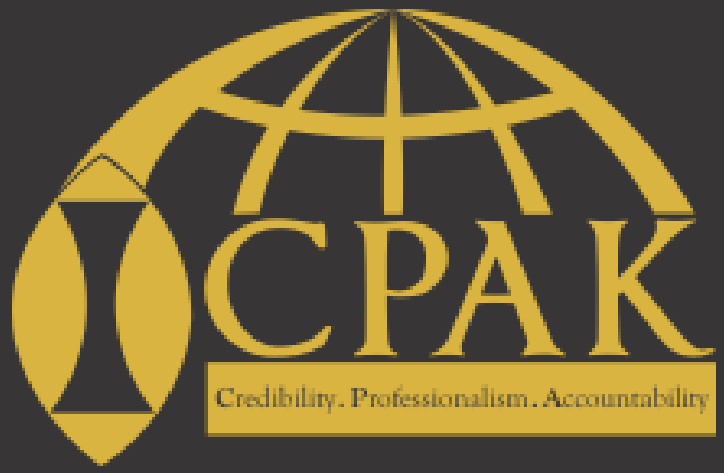
Impact category and brief summative description
Catastrophic Disaster with the potential to lead to the collapse of the business and are fundamental to the achievement of strategic objectives
Major Critical events which can be endured but which may have prolonged negative impact and extensive consequences
Moderate Major events, which can be managed but requires additional resources and management effort
Minor Event which can be managed under normal operating conditions
Insignificant Events that should be monitored but no immediate action is required

Risk Quantification

Likelihood rating table

This is the likelihood that the identified risk will occur within a specific period of time (between 18 months and three years).

Likelihood	Qualification Criteria
Almost certain	The event is expected to occur in most circumstances.
Likely	The event will probably occur in most circumstances.
Moderate	The event should occur sometime.
Unlikely	The event could occur at some time.
Rare	The event may occur only in exceptional circumstances.



Model risk management and risk modelling

Model definition: What is a model?

A model is a **system, approach or quantitative method** that applies statistical, economic, financial or mathematical theories and assumptions to process input data into quantitative estimators.

A model consists of three components:

- **Input** of information, which incorporates assumptions and data in the model.
- **Processing**, which transforms the entries into estimates and incorporates a degree of uncertainty that must be managed.
- **Outputs & reporting**, which translates estimates into useful business information.

The definition includes models with inputs that are qualitative or based on expert judgement, provided output is quantitative in nature.

Model definition: Example benefits

- To calculate capital requirements (Pillar 1 and Pillar 2) for each risk type.
- To project under different scenarios the current liquidity position of the company as well as the projection of the balance sheet and the income statement and using stress test models.
- To model key elements for planning and business development elements.
- To make decisions in their admission processes, monitoring and recovery of credit that allow the automation of the viability of the same.
- To observe the evolution of client´s / creditor´s credit quality and anticipate the credit deterioration models through automatic alerts, classifying customers and setting their credit limits.
- Other: use of Algos, pricing models, IFRS 9, 17 provisions calculations etc.

Types of model risk

Model risk arises from decisions made based on incorrect, misused, or misinterpreted model outputs.

Wrong Model

- Inapplicability of model
- Incorrect model specification

Model Implementation

- Programming errors
- Technical errors
- Use of inaccurate approximations

Model Usage

- Implementation risk
- Calibration errors
- Inappropriate use for unintended purpose

Model risk: negative effects

	Type	Examples
1	**Financial losses**	— Financial products are sold or bought at wrong price. — Incorrect internal transfer prices (such as funding curve) give wrong incentives to business units. — Hedging strategies are not effective and/or too expensive. — Flawed creditworthiness assessment causes loans granted at incorrect interest rate.
2	**Risk exposure not in line with risk appetite**	— Underestimation of market, credit or other risk leads to high unexpected losses in the future. — Flawed creditworthiness assessment causes higher than intended credit risk exposure. — Risk limits are too low (or too high).
3	**Capital shortage or misallocation**	— Underestimated risk exposure might lead to capital shortages once the risks materialize. — Incorrect economic capital allocation leads to sub-optimal business portfolio from risk / return perspective.
4	**Liquidity shortage**	— Weaknesses in liquidity models cause incorrect decisions in liquidity risk management leading to high funding costs or liquidity shortages.
5	**Loss of consumers**	— Inadequate creditworthiness assessment causes lost of creditworthy customers — Overstatement of sell prices lead to customers outflow..
6	**Flaws in regulatory and/or financial statements**	— Financial assets and liabilities are stated at incorrect book values in the balance sheet. — Loan loss provisions are misstated. — Valuation adjustments (such as CVA) are incorrect.
7	**Regulatory penalties**	— Regulator might impose restrictions to business that rely on flawed model.

Risk modelling

Risk modeling is a mathematical representation of risk and its causative factors in a statistical relationship. Helps to model various scenarios determined during the risk analytics stage to bring life to this scenarios and the real context for the business.

Risk modeling helps organizations to identify, analyze, and mitigate risks so they are prepared to deal with them should they occur

Important factors while performing RM & Analytics

Effective risk modelling and analytics should consider at least the following

1. **Targeted modelling:** – Specific to the needs of a company and not off the shelf solutions
2. **Sustainability** : independent on a person and flexible for future improvement
3. **Governance**: Robust accountability on model performance and results
4. **Analytics and insights**: Produce insights for decision making
5. **Data:** Amount and availability of data informs complexity of models

How to get started

Don't be a jack of all trades .....

Ask the right questions

Which areas are critical? People, Clients?

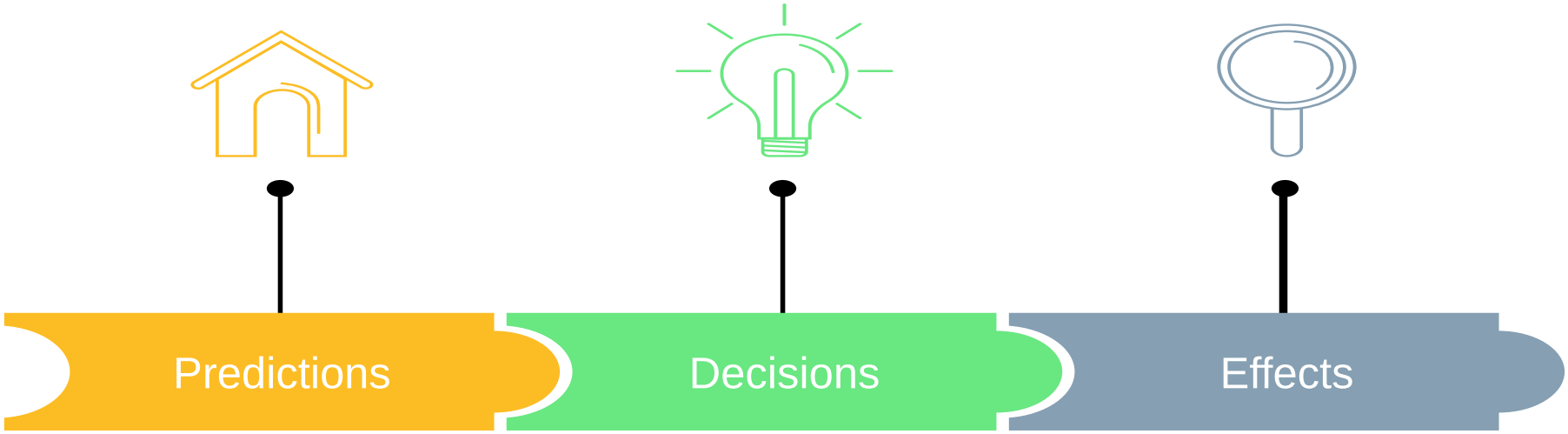
Independencies

Understand cross functional insights

Establish effective programs

Use risk information to make informed decisions / take actions

Maturity should look like this



Risk analytics should answer the following:

- What will happen?
- When will it happen?
- Why would it happen?

How do we benefit from these insights?
What should change?

How will these decisions impact everything else?

PREDICTIVE ANALYTICS

PRESCRIPTIVE ANALYTICS

Importance of risk modeling and analytics

Importance of risk modeling and analytics

1. Takes guesswork out of risk
2. Limits overreliance on ‘opinions and views’ of leaders which may be biased
3. Establishes consistency in risk measurement
4. Offers clarity in identifying, viewing, understanding, and managing risk
5. Incorporation of visualisation provides concrete impression on risk information
6. Creates efficiency and reduces bureaucracy / number of people involved

Risk modelling for effective risk quantification

Have the requisite risk management framework, a robust data management system for an effective data analysis process, a working risk governance system, the outcome of modelling done by the right team enhances results of risk quantification:

Promotes a cost effective RM process, cost and resource optimization, reduced time wastage in planning and action plans, optimal allocation of resources during planning and budgeting and implementation of controls…etc

Heat Map						
Catastrophic	5	Moderate	High	High (1)	Extreme	Extreme
Critical	4	Low	Moderate	High (2)	High (3)	Extreme (4)
Serious	3	Low	Moderate	Moderate	High (5)	High
Significant	2	Insignificant	Low	Low	Moderate	Moderate
Minor	1	Insignificant	Insignificant	Insignificant	Low	Low
		1	2	3	4	5
		Rare	Unlikely	Possible	Likely	Almost Certain

Wrap up

Thank you