

Health and Safety Metrics

Providing New Insights in a Complex World

Airmic Academy, October 2020



There are four learning objectives for the session today

- Moving on from traditional 'rearward looking' metrics
- Overview of the Three Lines of Defence
- Difference between 'complicated' and 'complex' environment and challenges of managing HSE
- Developing a 'sense and respond' approach to managing risk using data



Moving on from rearward looking metrics



As a leader you receive three monthly reports from different groups

Where should you focus and with what priority?

Group A	Group B	Group C
■ Performance ●	■ Performance ●	■ Performance ●
■ Staff competence ●	■ Staff competence ●	■ Staff competence ●
■ Control systems ●	■ Control systems ●	■ Control systems ●
■ ... ●	■ ... ●	■ ... ●
■ ... ●	■ ... ●	■ ... ●
■ ... ●	■ ... ●	■ ... ●

Major Shipping Company



Situation



Maersk understands first hand how a cyber attack can disrupt a business and have significant financial implications

- Maersk is the largest container ship and supply vessel operator in the world and in 2017 suffered a NotPetya attack that compromised Maersk's reliability leading to a drop of 20% volume and losses of \$300M
- Disrupted operations (10 days) across all business groups
 - 4,000 new servers
 - 45,000 new PCs
 - 2,500 applications
- The Group has since spent circa \$200M to improve its internal IT environment and related platforms

Complication



Cyber related risks to business through third parties are becoming increasingly complex and difficult to quantify and control

- With 60-70% of vulnerabilities and related attacks originating from the third environment, Maersk were concerned that a robust risk assessment of third party entities has not been undertaken
- The Company had been monitoring indicators to provide early warning of potential cyber breaches

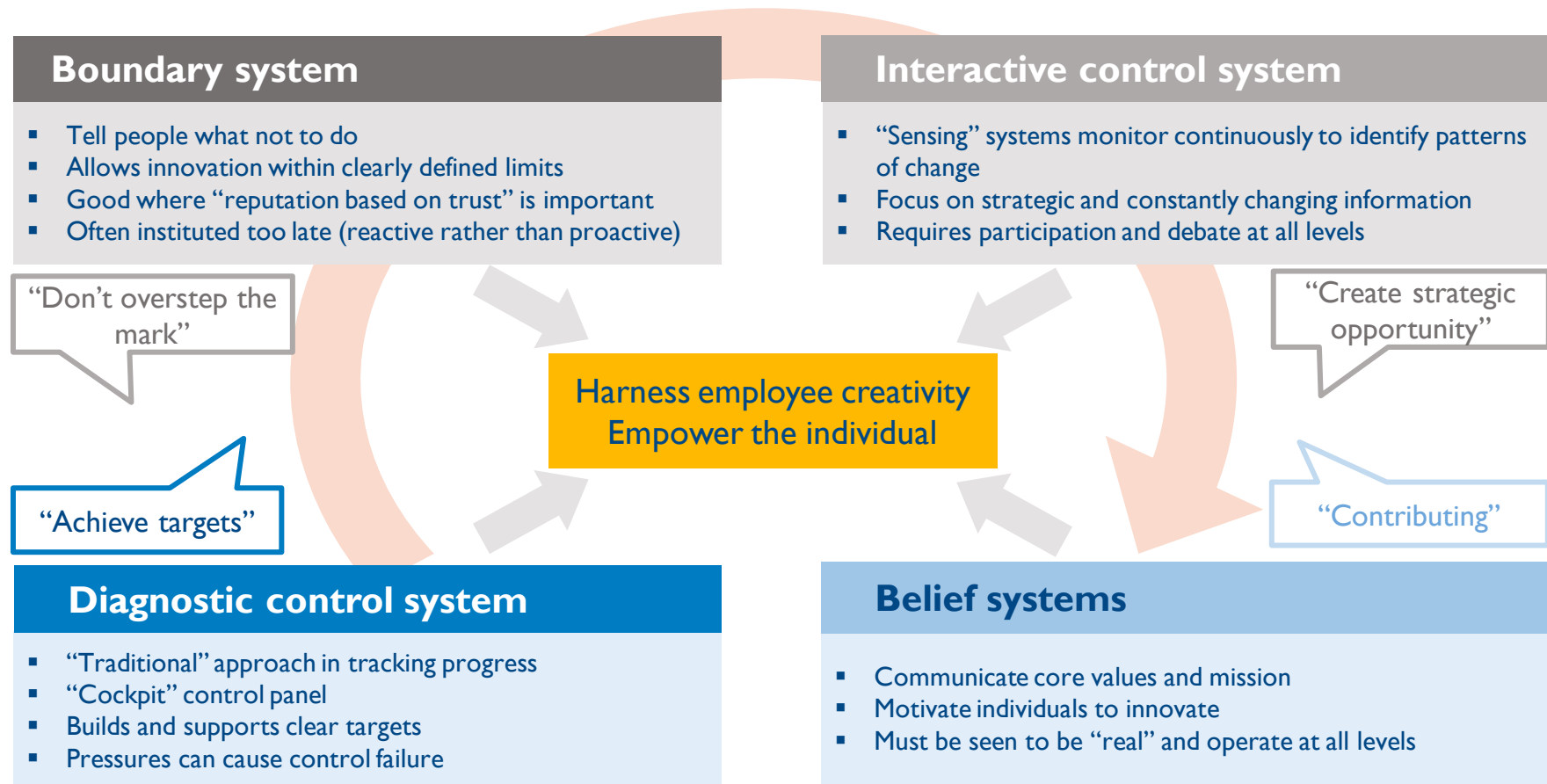
Questions



Can a metrics lead approach provide sufficient early warnings of imminent breaches?

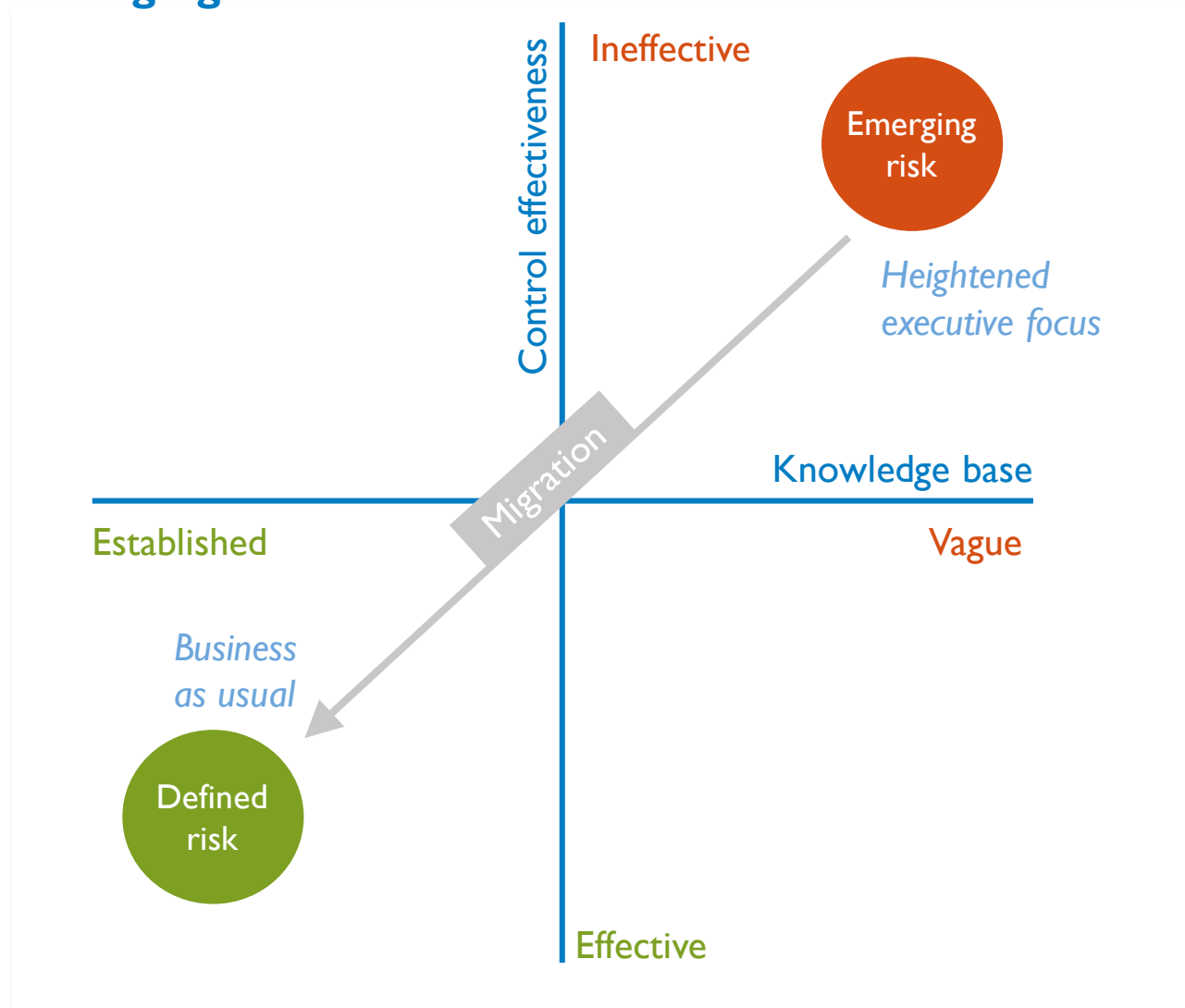
- Was Maersk monitoring the right type of forward looking indicators?
- Did Maersk understand the overall financial impact of losses originating from the breaches?
- In terms of causation and limit, was there an understanding of the key drivers that could lead to a breach?
- How can a better balance be achieved between transferring risk through insurance, reducing risk through technology and managing the residual risk through best practice?

But how do we get control? There are a number of ways



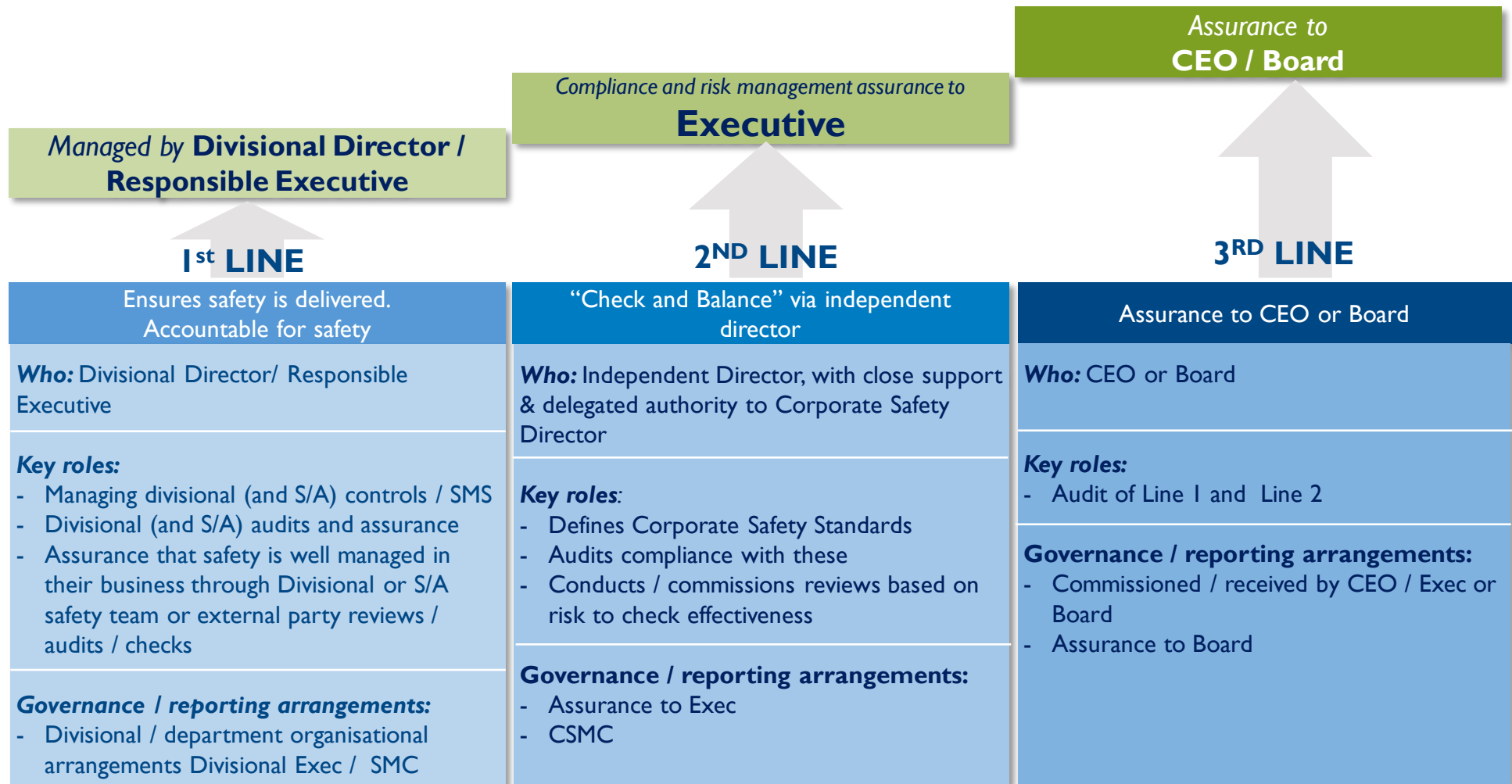
Source: Harvard Business Review

Need to focus on the ability to create effective 'horizon scanning' for detecting and understanding **emerging risk**



Three Lines of Defence

Three Lines of Defence isn't new, but we are seeing a resurgence relating to Board's seeking assurance that defences are robust and effective



Some recent Executive insights about applying the three Lines of Defence

The 2nd LoD should be small and agile

The 2nd LoD can't just be a policeman. They should be a trusted advisor

Must avoid man-marking everything the 1st LoD do

Has to be risk-based. We don't want to cover everything

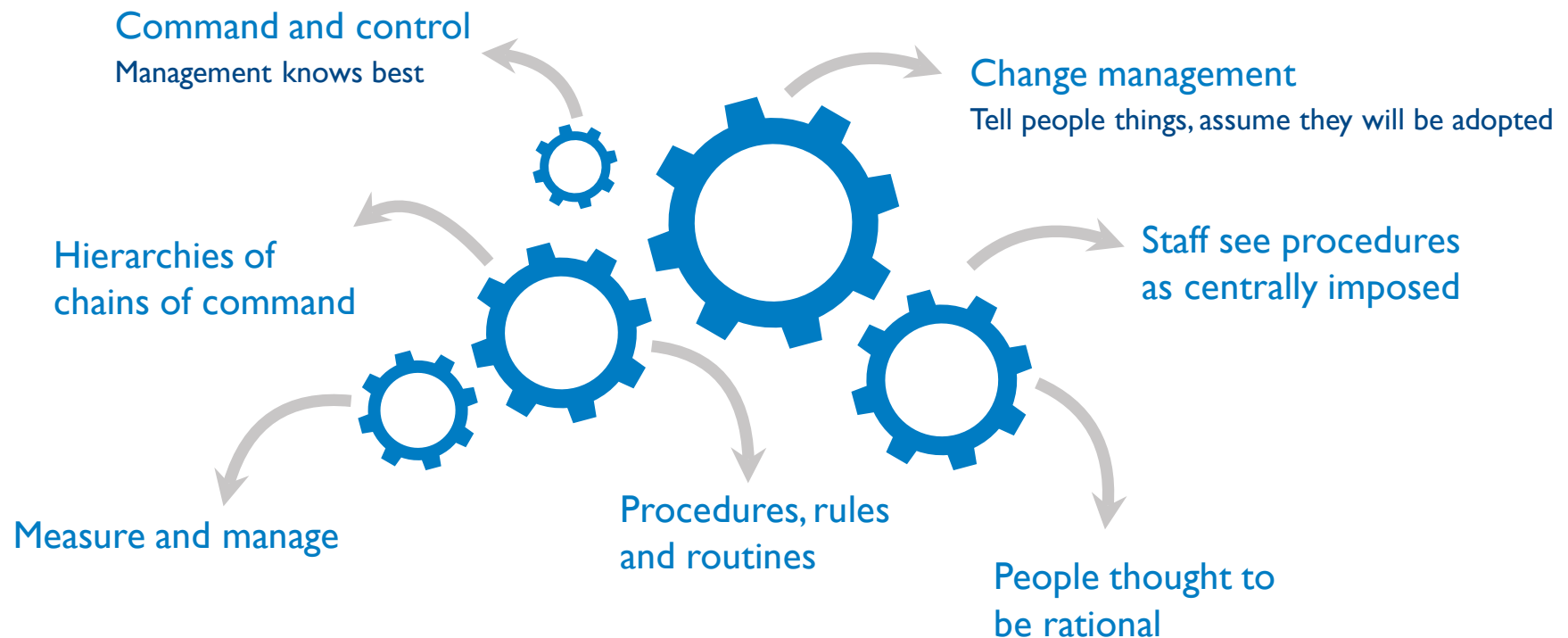
The 2nd LoD should have access to all data and reports

Focus the 2nd LoD on critical processes and decision points

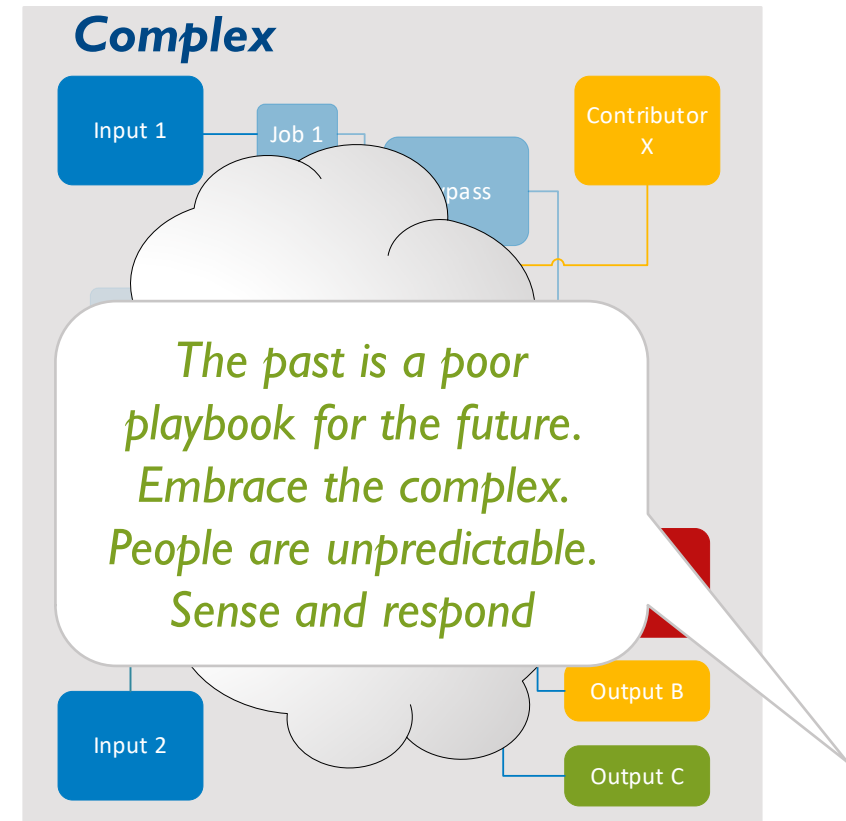
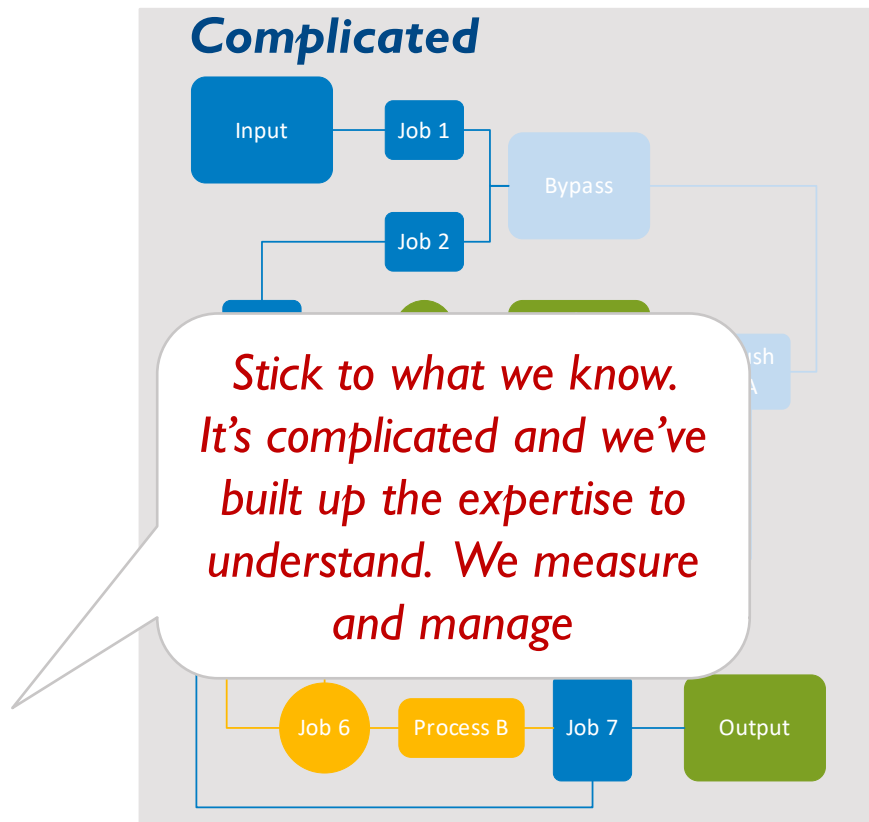
Complicated versus Complex



Best practice is seen as **managing the complicated**



Organizations typically think themselves ‘complicated’.... but they may benefit from embracing **complexity**



Sense and Respond

Recently our work to support organisations has identified the mindset shifts required to unlock this thinking, and next gen. risk management ...

- There is a widely held view that static risk management approaches are no longer delivering value
- CEOs / boards want more of a forward looking risk capability and not to be caught by surprise
- CEOs / boards know that Machine Learning and Artificial Intelligence are 'the next big thing' but don't know how and when to use them
- In parallel, cultural and behavioural barriers to further risk improvement persist



Rearward looking KPIs are no longer enough to protect against increasing threat complexity, KRIs enable forward looking risk mitigation vs reaction

PAST Practice

KPIs

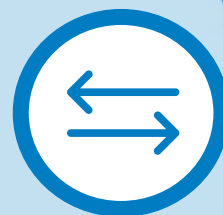
Measure & Manage
is too slow



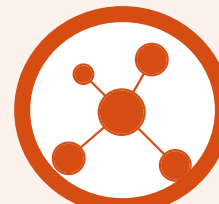
Exec / Board get
Caught out



Pace of change and
threats too high



KRIs



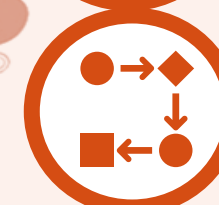
Sense and respond



Powered by AI & ML



Real-time decisions

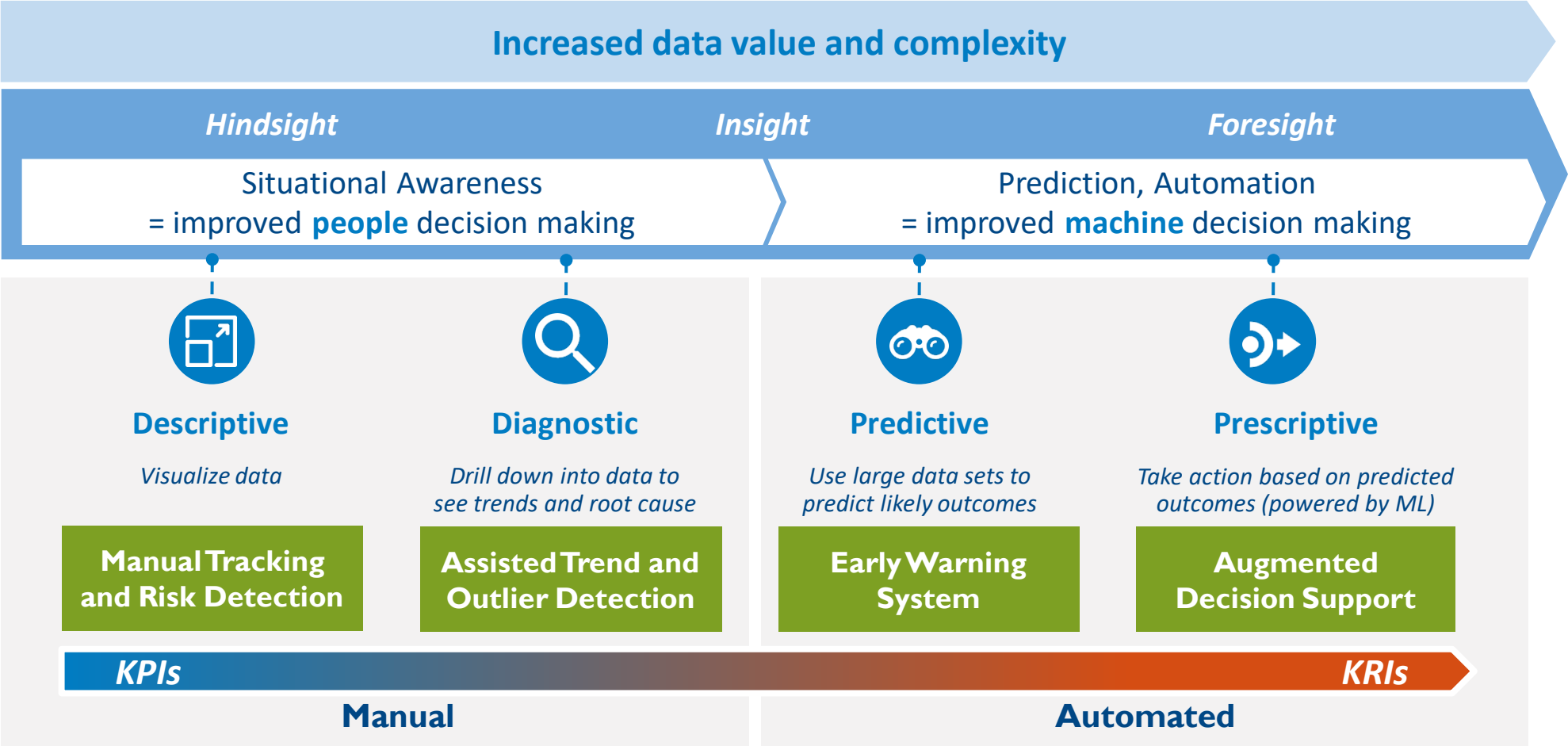


**Anchored in Risk
Understanding**

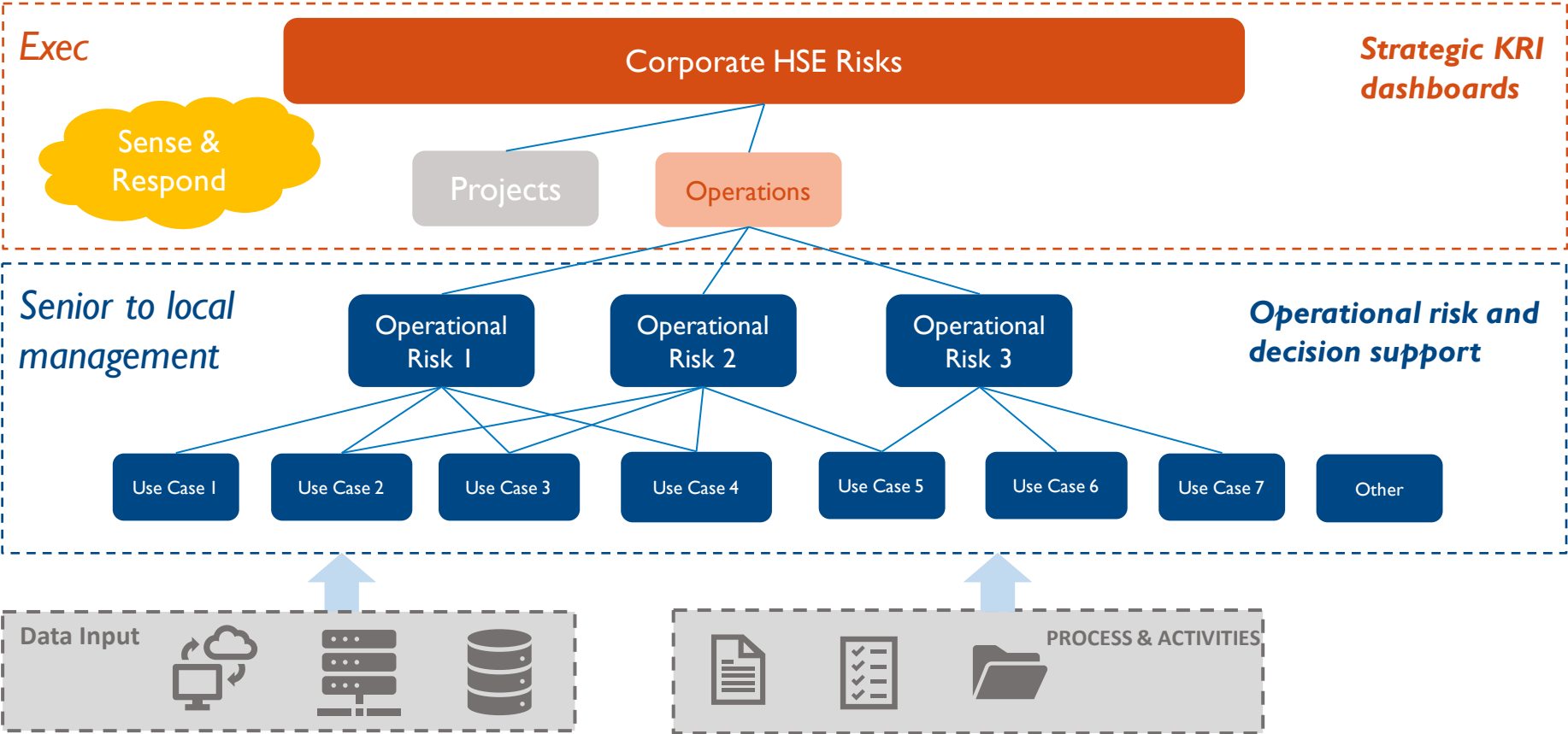


NEXT Practice

We see leading organisations moving to decision-making based on foresight



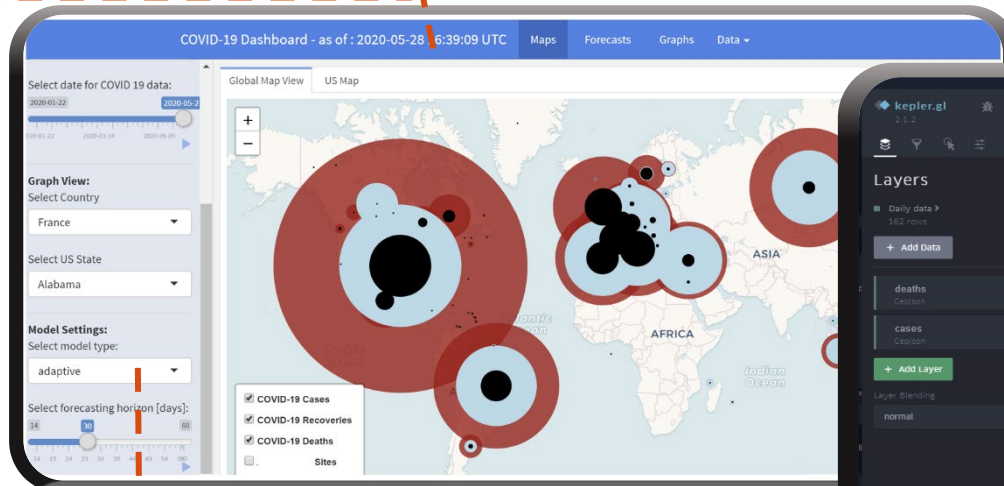
A thorough top-down and ground-up understanding ensures a holistic KRI program can be structured to drive value across the organisation



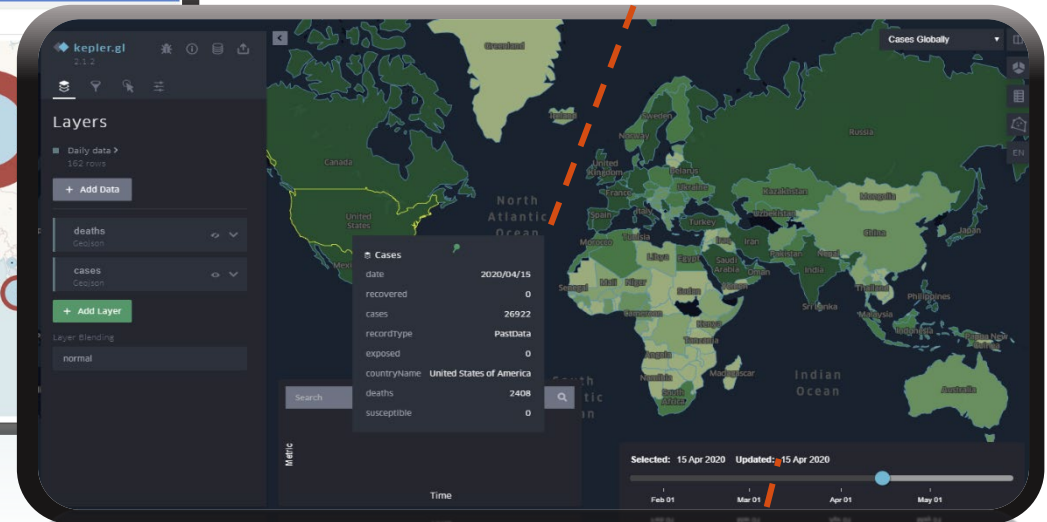
Case study 1: real time dashboard that tracks and predicts Covid-19 progression across multiple countries ...

Interactive maps, tabular views and dynamic graphs

Interactive map showing COVID-19 progression and lock-down index across the globe



Interactive model setting by choosing the country, model type and forecasting horizon



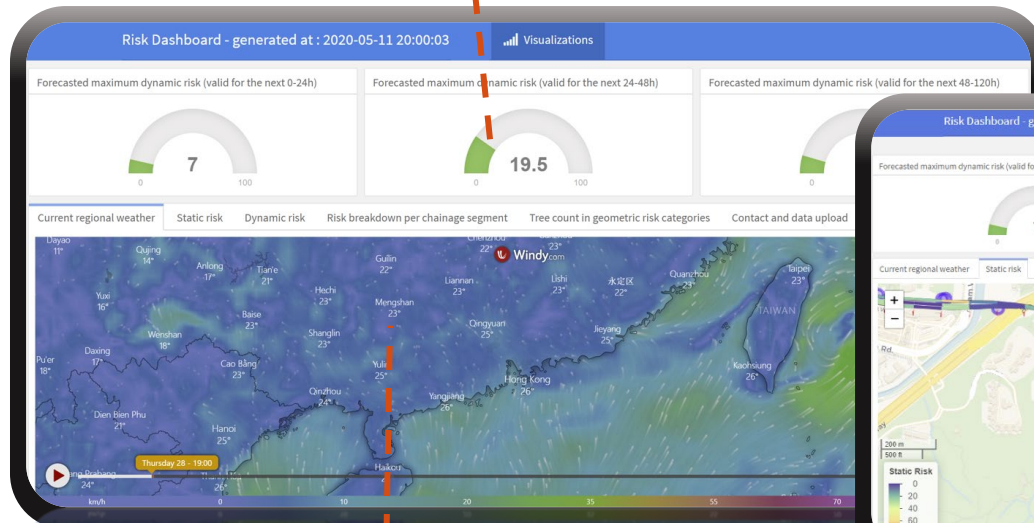
Slide bar to expand outlook and view predictive time horizon

Case study 2: Forward-looking Risk Capability Dashboard for a Mass Transit Operator – operational impact from severe weather events

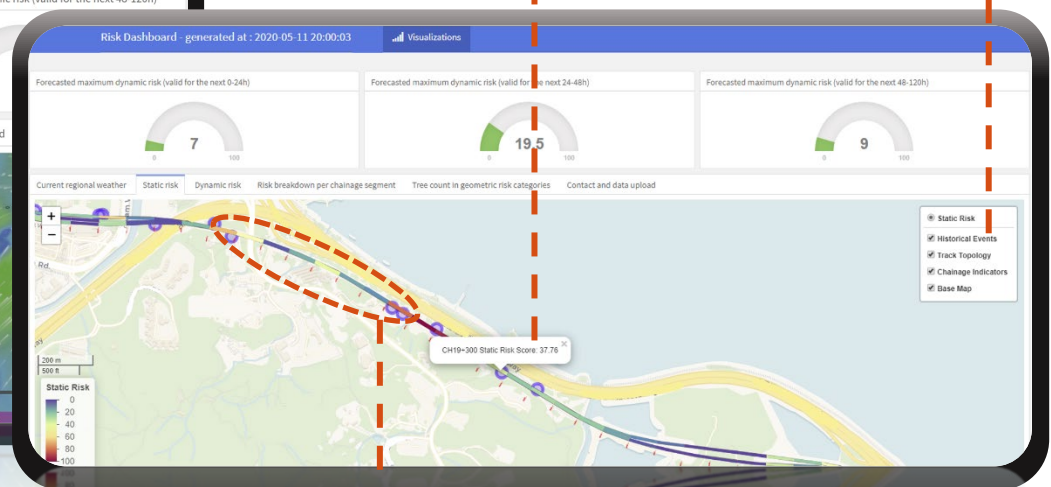
Real time dynamic risk scores showing imminent threat over 24-120 hours time horizon

Interactive data points allowing for user interrogation

Interactive multi-layered maps



Real-time Meteorological data with multi-view capability and directional wind animations



Static and dynamic risk modelling using ML algorithms profiled down to track segments level

Next Practice H&S Indicators: Conclusions



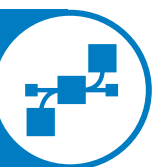
KRIs not only KPIs

Think about different levels of the organisation (strategic to operations)



Forward looking – avoid surprise

Organisations are complex, not only complicated



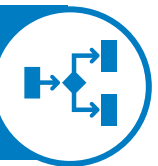
Ingest real-time data

A Three Lines of Defence view of H&S metrics can help build assurance



Leverage machine learning and AI to look for “hard to spot” patterns in data

Challenge the greens!



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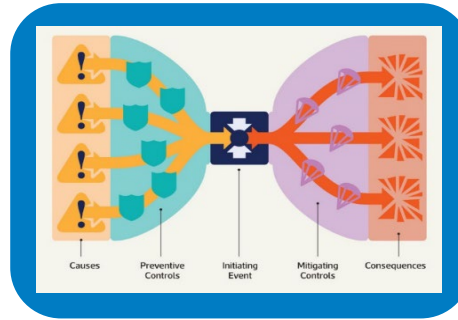
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Key ingredients to get this done

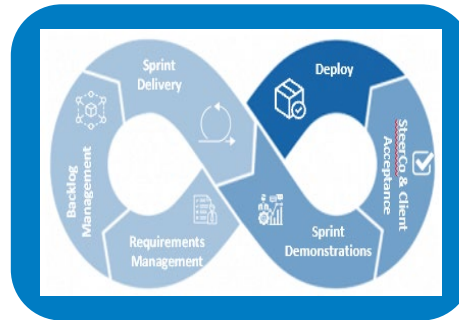
**Build on what is
already working well**
Deliver value at pace



Risk framework
cause & effect



Extensible models, real time data,
ML / AI predictive capability



Foundation for the
“new normal” risks



Rapid deployment and
iteration