

# Managing risks – A model for risk assessment

- Welcome to a short introduction on how to work with a resilience-based risk assessment.

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*“Risk is uncertainty about and severity of the consequences of an activity with respect to something that humans value”  
SRA, 2020*



# Small introduction

## The personal stuff

Experience with life 49 years

Experience as a dog owner  
23 years

Experience as a father 22  
years

Experience as a husband 21  
years

Experience as a houseowner  
21 years

## The professional stuff

Experience with risk and  
safety management systems  
25 years

Experience with aviation  
logistics 10 years

Experience with education 9  
years

Experience with research 6  
years



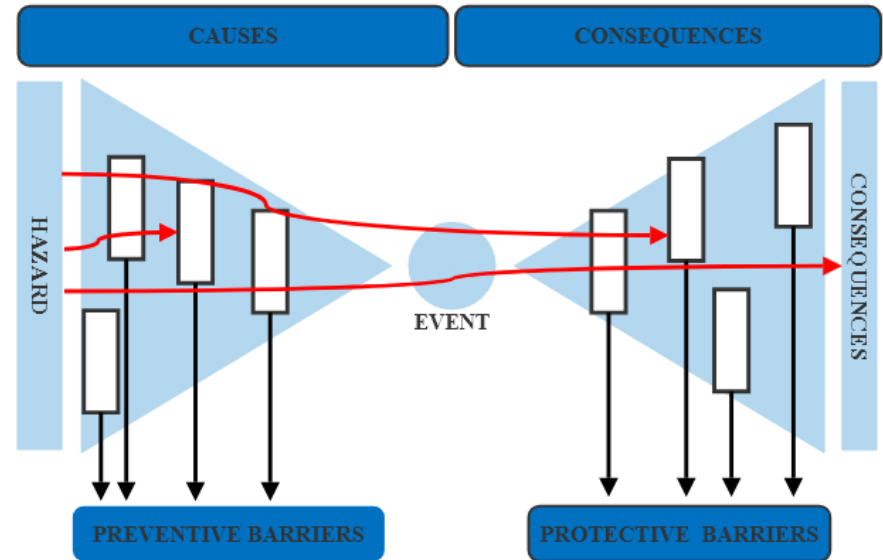
# Traditional risk assessment models



# The Bow-tie model

The analysis includes the complete event scenario, compounded by a fault tree (the left side), which identifies causes to the event, and an event tree (right side) dealing with consequences once the event is realised.

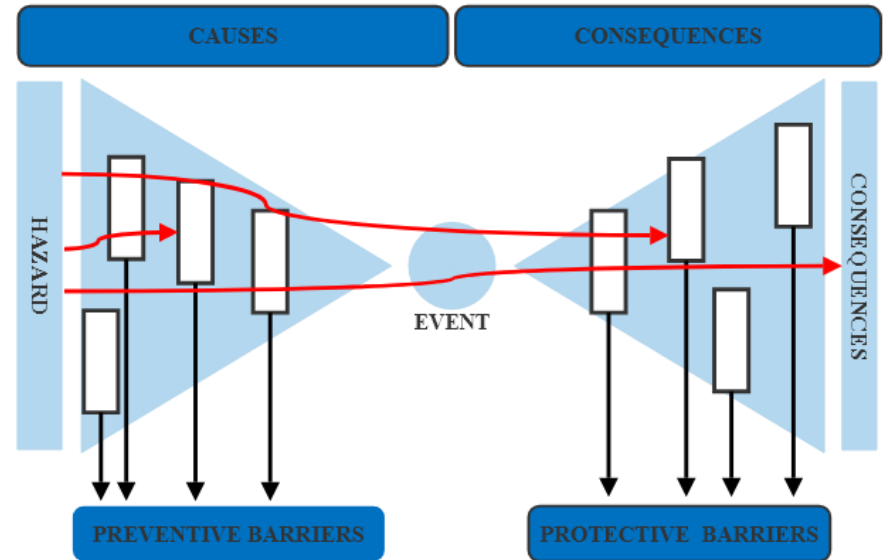
The Bow-tie, identifies all connections between the hazard, the event and the outcome, in the form of consequence.



# The Bow-tie model

A series of barriers exist that will either prevent the event from materialising and protect the organisation if it does.

These barriers are physical or organisational structures that, in different ways, hinders a hazard in becoming an event and further materialise into tangible consequences that result in a loss *“of something that humans value”*.



# The Traditional risk assessment models and The Bow-tie model

## The two models work well together

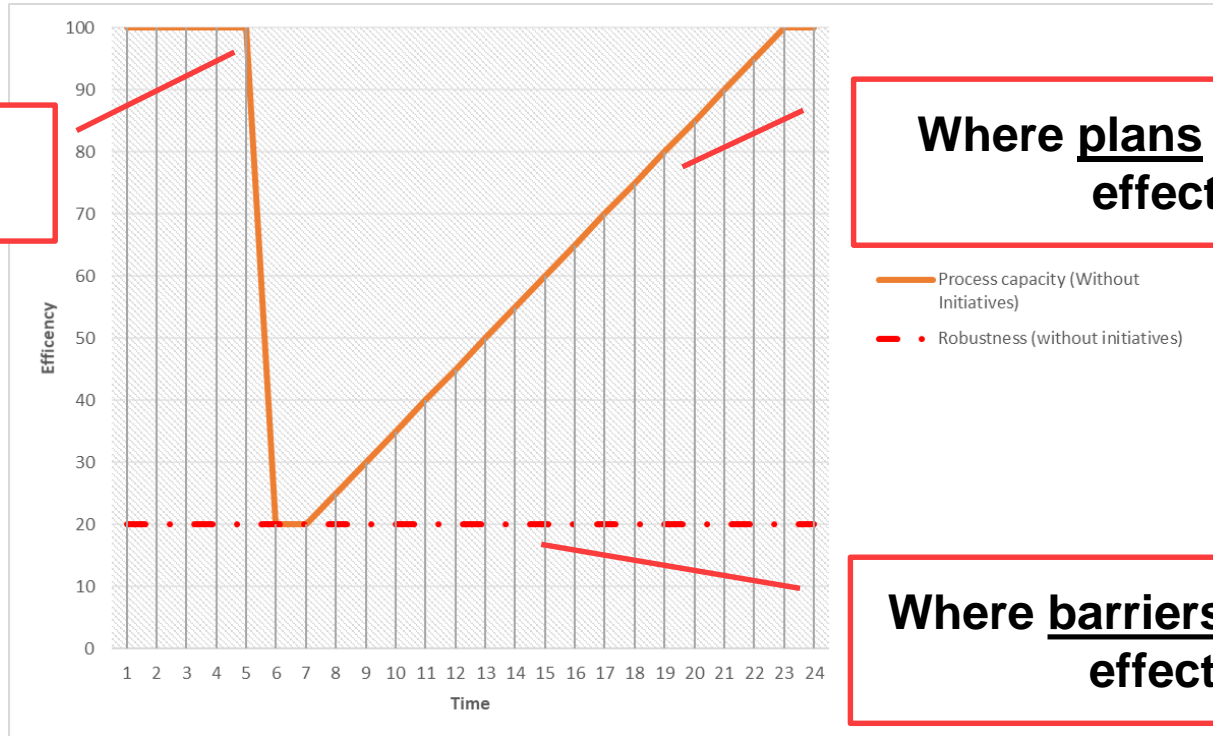
1. **Risk identification** is related to **Hazards** (knowing what out there)
  2. **Risk Analysis** is related to **Events** (and understanding hereof)
  3. **Risk Evaluation** is related to **Consequences** (What decision to take)
- Introduces the idea of Preventive and Protective barriers
  - Connects Hazards/Risks with events and consequences

## However...

- Little input is provided as to the nature of **Barriers**
- Provides little input as to **Agency**
- Does not provide much insight into organisational **Resources**
- Does little in terms of **Understanding** how organisations deal with consequences (potential or realised)

# Effect of organisational resilience

Event



Where plans have an effect

Where barriers have an effect

# Using a Organisational resilience approach to Risk assessment

- Focusing on processes rather than events (reducing your guesses by starting with what you try to do)
- Working with processes and what brings value to the organisation and its members (sense of direction)
- Emphasis on the contribution of risk managers (Capabilities, Monitoring, Competence, Evaluation)
- Recognising that organisation needs to resolve problems themselves (at least in the initial phases of an event)
- Correctly resolved events do not inevitably result in a crisis (planning is everything, but plans are nothing)
- Acknowledging that the consequences, potential or realised, affect a wide range of stakeholders (interorganisational learning)



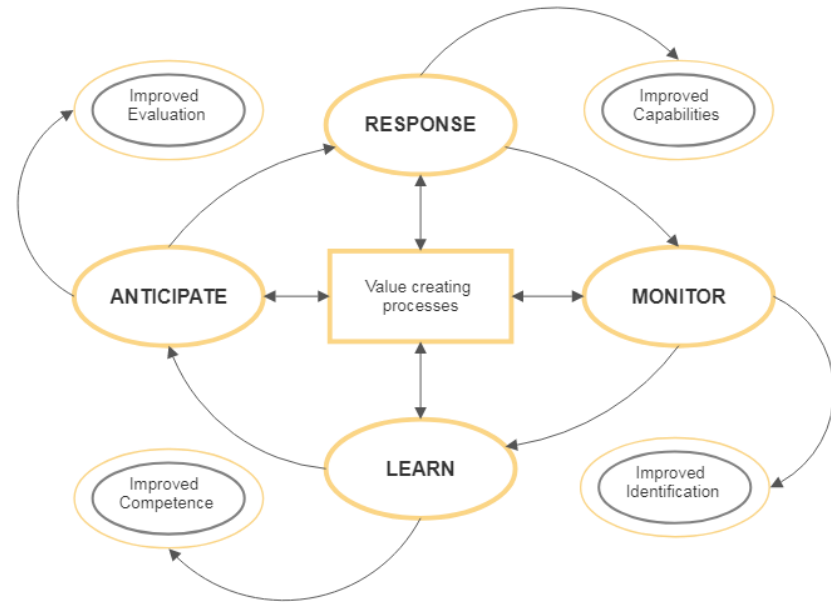
# Assessing risks and creating barriers

A systemic *response* to known and unknown events by creating organisational capabilities that will stop, mitigate or delay consequences.

To *Monitor* how processes are supposed to be carried out, identifies how an event influence them and systematically collects information about them.

To *Learn* means learning from experience by analysing impacts of events in the past and the organisations' ability to behave appropriately.

To *Anticipate* future developments, threats and opportunities that arise both internally and externally that have the potential to disrupt or alter processes.



# Response

An organisation's ability to *respond* in a systematic manner to a deviation in how processes are supposed to perform.

Organisations create capabilities or systems that will enable it to perform tasks in a way that ensure risks are addressed in a timely and effective manner.

For example, through the adoption of standard operating procedures (SOPs), standardized briefings or recovery plans. Having the right equipment for the job, etc.



# Monitoring

*Monitoring* is related to risk identification as the organisation systematically collect information about its environment and identify changes to it.

Knowing what has happened in the past can inform the organisation of what to prepare for in the future.

For example, sharing experiences using a log like a notice board where operational information is conveyed such as weather, production figures, staff at and off-site, incidents of relevance.

The aim is to provide decision makers with information that enable risk identification by looking for changes from the norm.



Lars Holst Hansen/Aarhus University

# Learn

The accurate assessment of risks in the internal and external context is connected to the organisation ability to *learn* from experience.

While the system enables a response through capabilities these are of little use if the individual does not possess the right competencies to utilise these.

For example, employing specialised engineers to a mining site will improve yield or having people trained in emergency response will reduce the chance that fire hazards become events or minimises their consequences if realised.



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# Anticipate

Being able to anticipate changes to context and organisational processes enables improvements to the evaluation of risks and hence qualifies decisions to prevent, mitigate or accept a possible event.

For example, understanding seasonal changes in the weather will influence logistics or sighting of polar bear in the region can result in heightened alertness and implementation of countermeasures.

The ability to anticipate also improves capabilities as evaluation of risks becomes SOPs or parts of briefings.



Lars Holst Hansen/Aarhus University





# The Traditional vs Resilience risk assessment model

## Traditional model

- **Static** (Becomes obsolete quickly)
- Works well in **Large** organisations
- Focuses on **Hazards**
- Works when you have **Full** information
- Drive towards **Zero** accidents
- Identifying root **Causes**

## Resilience model

- **Dynamic** (Can be constantly updated)
- Works well in **Small** organisations
- Focuses on **Resources**
- Works when you have **Little** information
- Drive towards **Learning** from accidents
- Identifies root **Practices**

# Short quiz and discussion on resilience

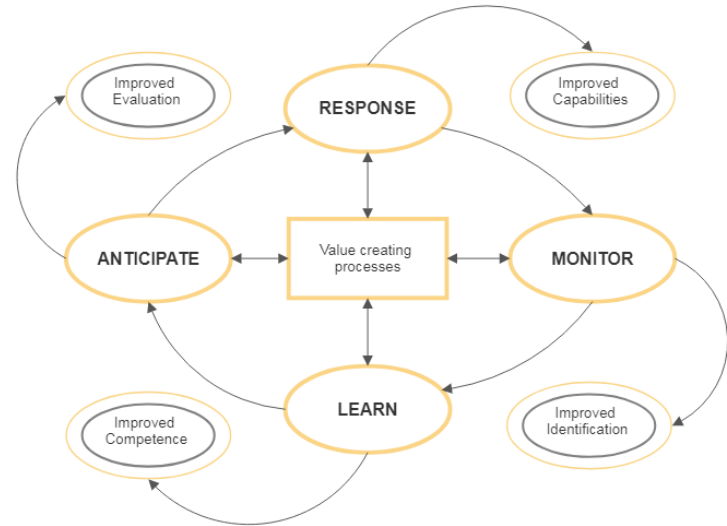


Anja Kade/University of Alaska, Fairbanks

# Exercise – In breakout rooms

Using the small survey as a starting point discuss the following statements:

- Our work environment has become safer in recent years
- My stations current risk assessment is accurate
- I have the resources needed to ensure a safe work environment for current visitors
- With an increase in visitors I will need the following competences and support systems to ensure that our work environment is safe (prioritise three)





# Presentations from breakout group sessions

- Our work environment has become safer in recent years
- My stations current risk assessment is accurate
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# Follow-up