

# Preventing Catastrophic Failure and Building Resilience

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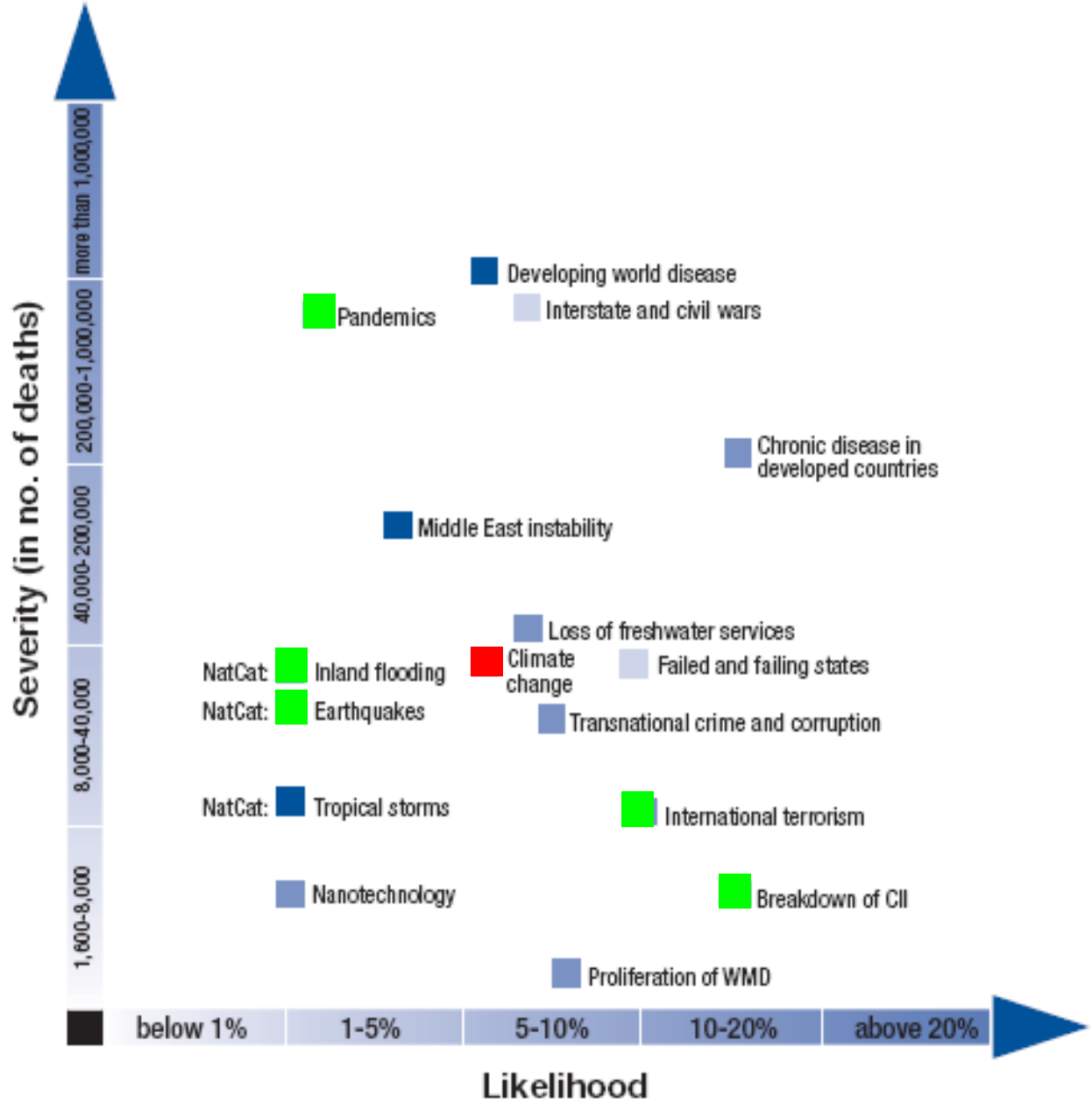
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# A Continuum of Risk



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**What is resilience?**

The ability to anticipate and adapt to volatility

It is about agility to work around failures and bounce  
back from adversity

On a ***continuing*** basis

## ***Current Approach***

- Focus – minimize short term harm
- Heavily driven by a standardised process
- Strong basis on predicted events
- Heavily plan based
- Increasingly prescriptive & inflexible
- Continuously out of date
- Assumptions rarely challenged
- Development of process capability

## ***Adaptable Approach***

- Longer term strategic advantage
- Driven by emergent leadership
- Strong basis on uncertainty
- Heavily 'blink' decision based
- Guidance driven
- Continuously evolves
- Contestable assumptions
- Development of adaptive capability

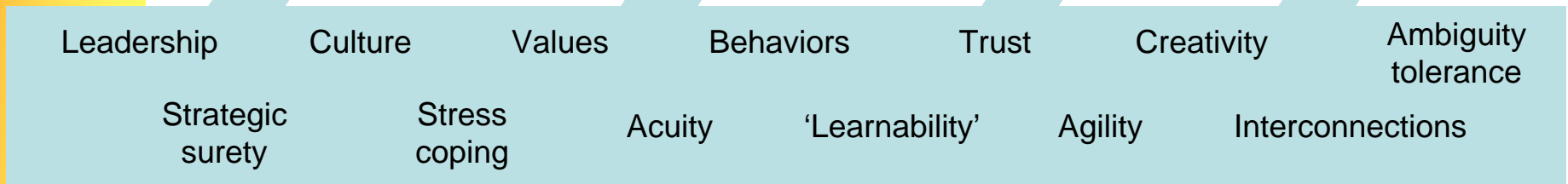
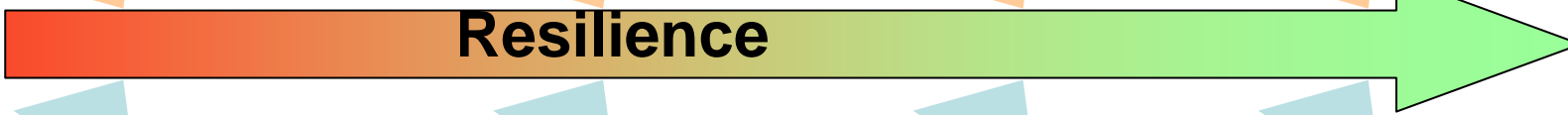
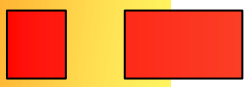
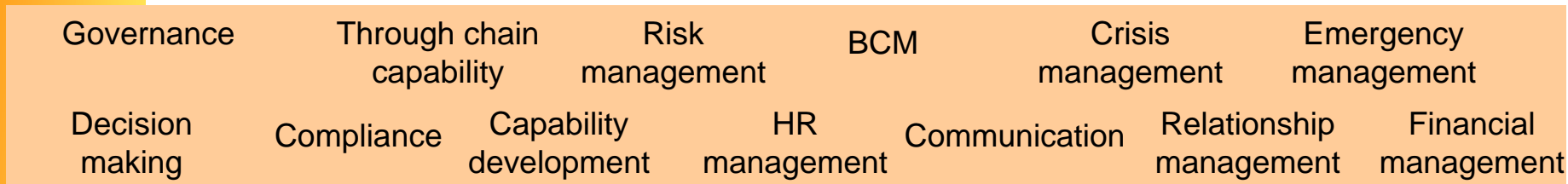
**ROBUSTNESS**

- Strength
- Power
- Durability - resistance to change
- Avoid failures
- React to predicted future events
- Precision based

**RESILIENCE**

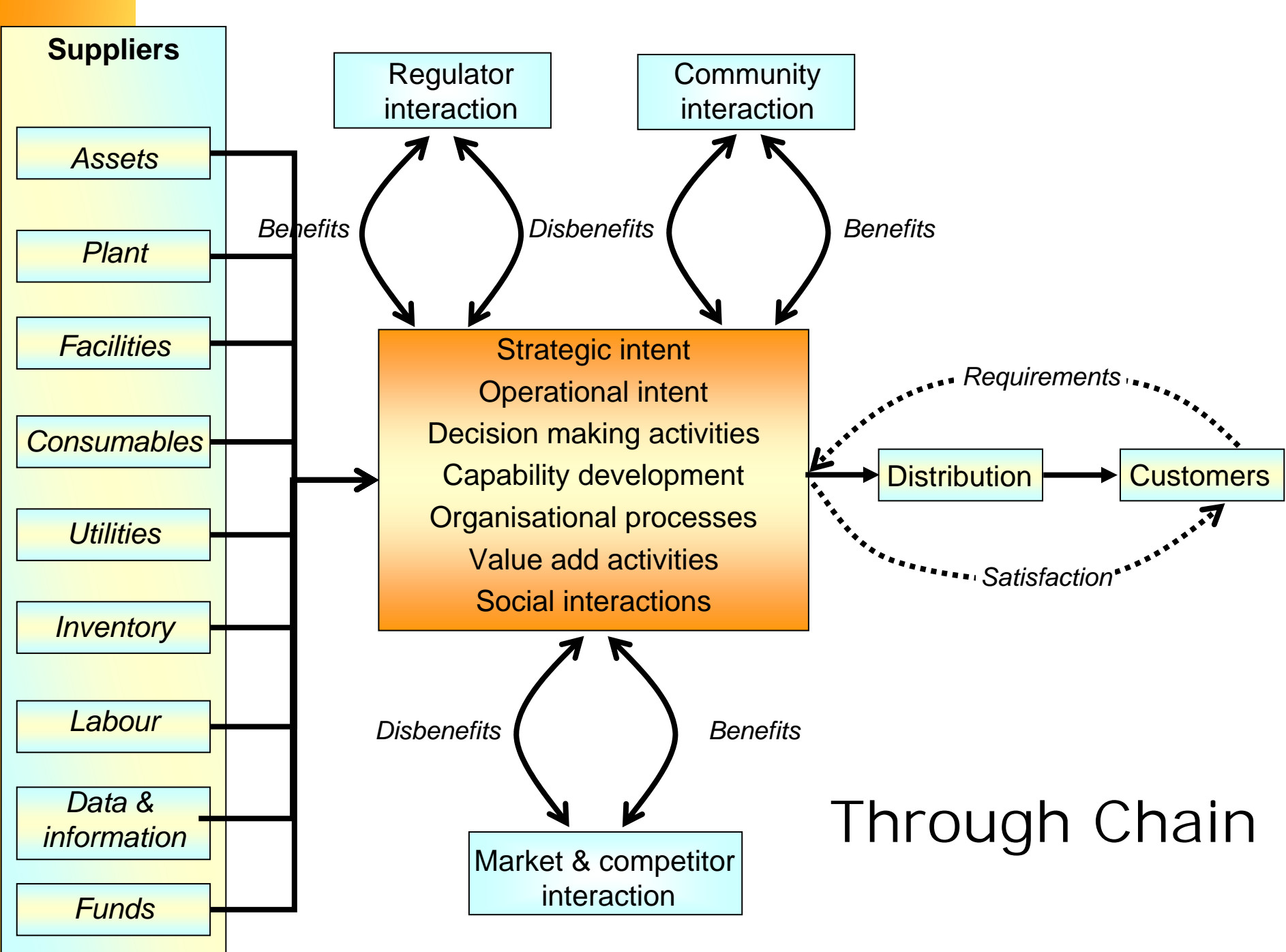
- Deformation
- Rebound
- Adaptability – adaptation to change
- Reroute around failures (tolerates)
- Respond to unanticipated shocks
- Generalization based

### Activities



### Characteristics



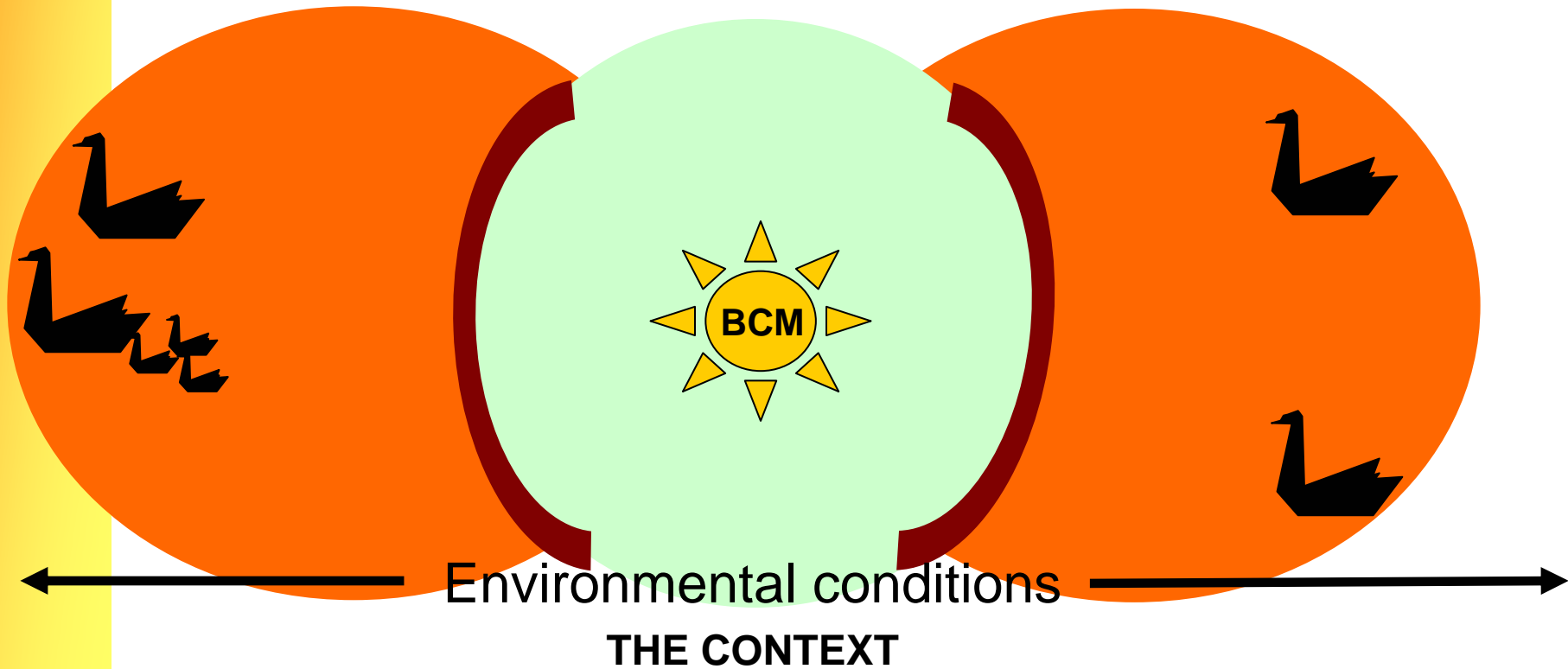


Through Chain

# **‘Science’ of low resilience**

- Complex adaptive systems (CAS)
- Apply BCM to CAS – increases resilience?
- Creates Highly Optimized Tolerance (HOT)

# Highly optimized tolerance



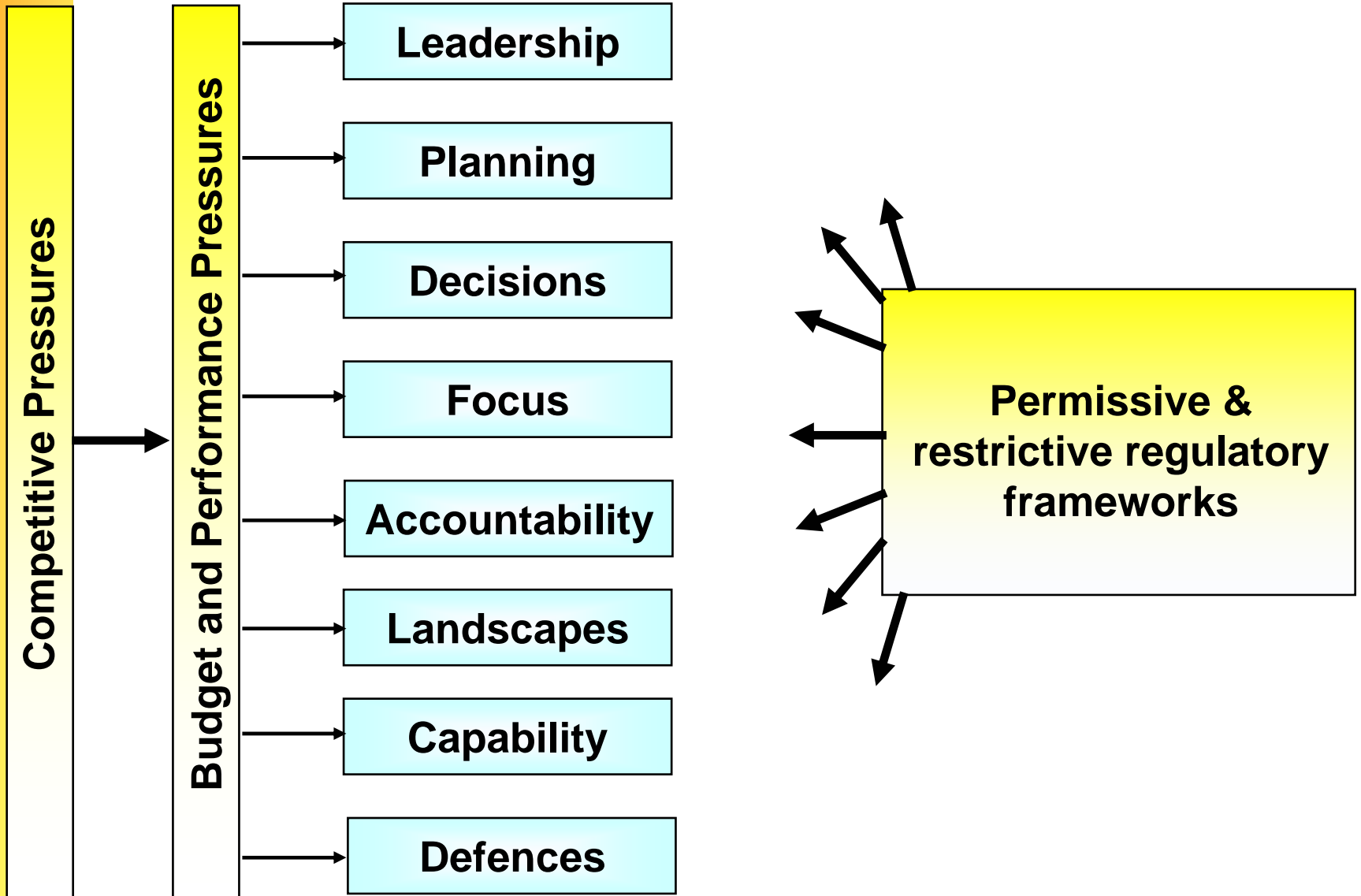
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**A look at some case studies**

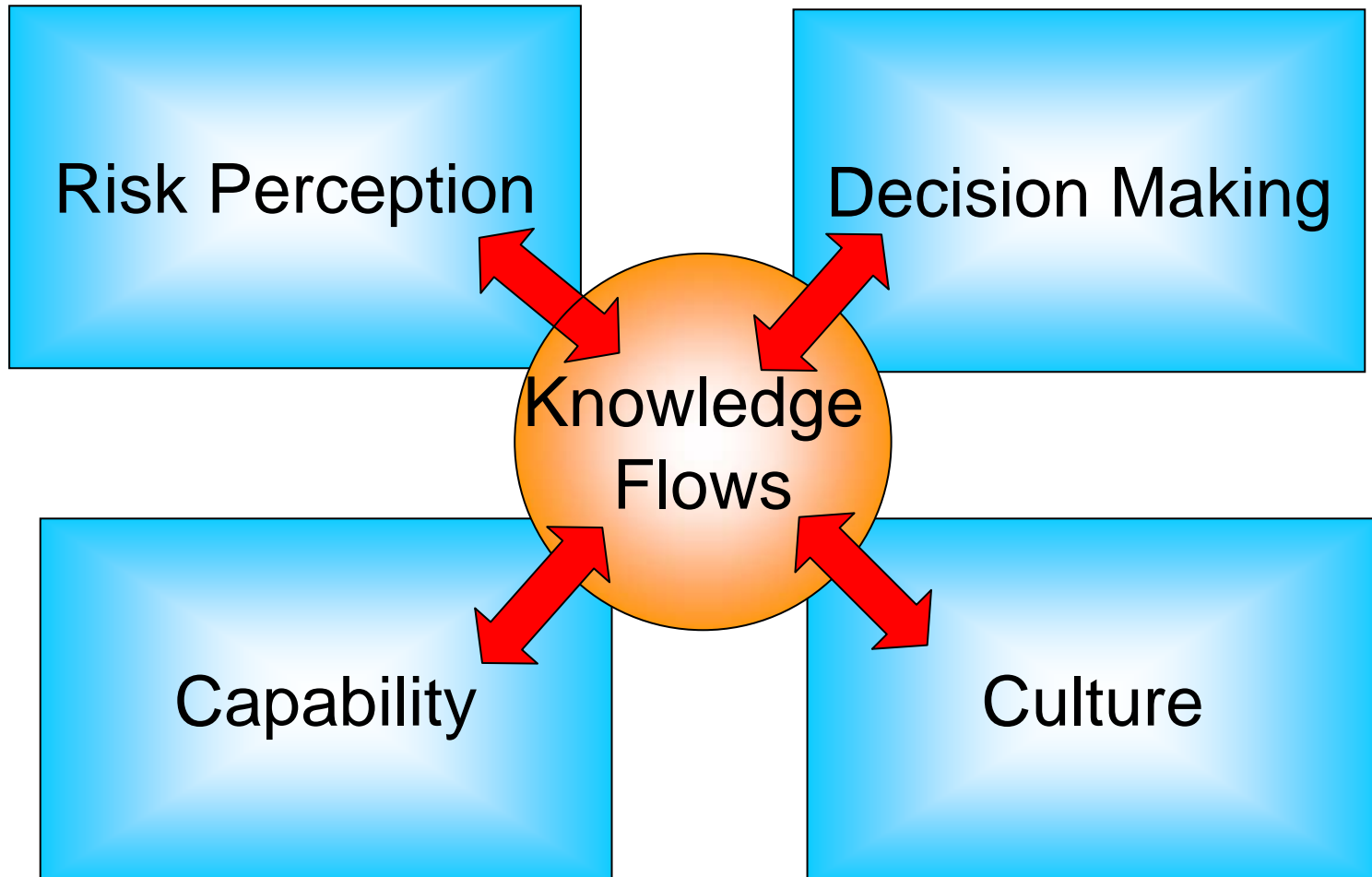
# Common Features



# Common Features



# The Organic Model



# A Case Study

- 18 November 1987
- Fire – Kings Cross Underground Station
- 31 fatalities



## Risk Perception

- Multiple fires (400) but no fatalities
- Fires = smoldering
- Focus on damage & disruption
- Smoke - not a hazard
- Staff & people = fire detectors

## Decision Making

- No fire certification required
- Railway inspectorate misunderstood responsibilities
- LRT- financial not safety
- Recommendations not followed
- Assistance not called for

## Knowledge Flows

Poor incident reporting  
Poor liaison between directorates  
Sentinels ignored  
Equipment out of order  
Control room not manned  
PA system not used

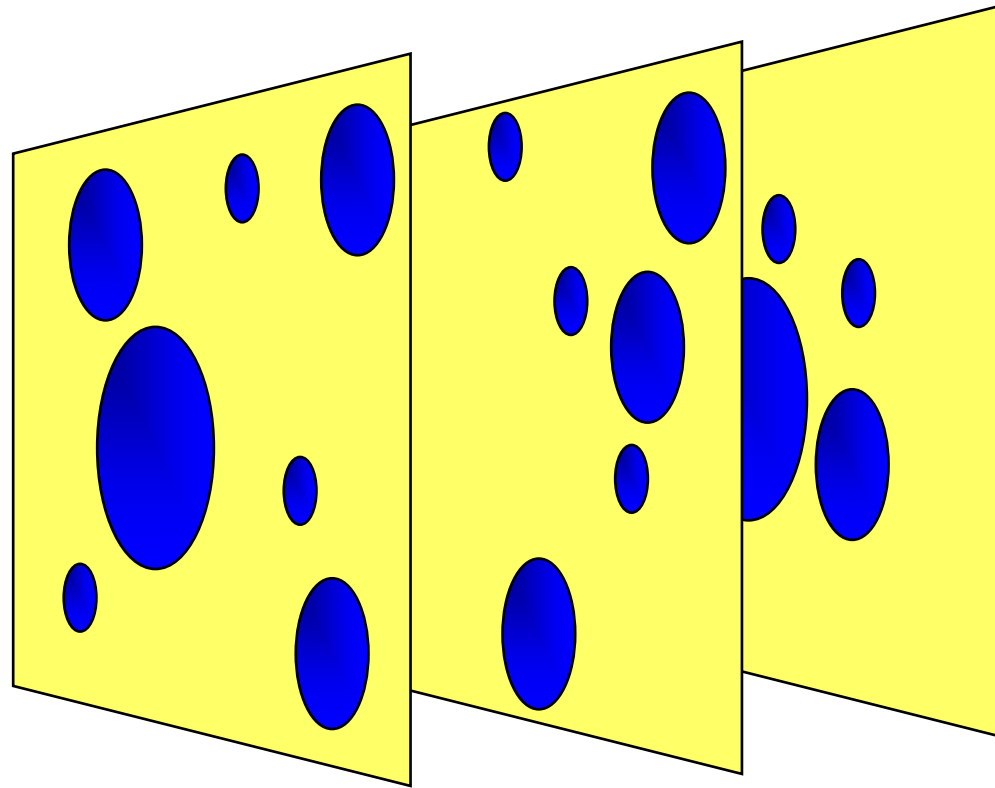
## Capability

- No one person accountable for safety
- Untrained staff
- Uncertain responsibilities
- Uncoordinated response
- Lack of evac plan
- Inadequate fire suppression
- Delayed maintenance
- Loss of staff
- Police lack of local knowledge

## Culture

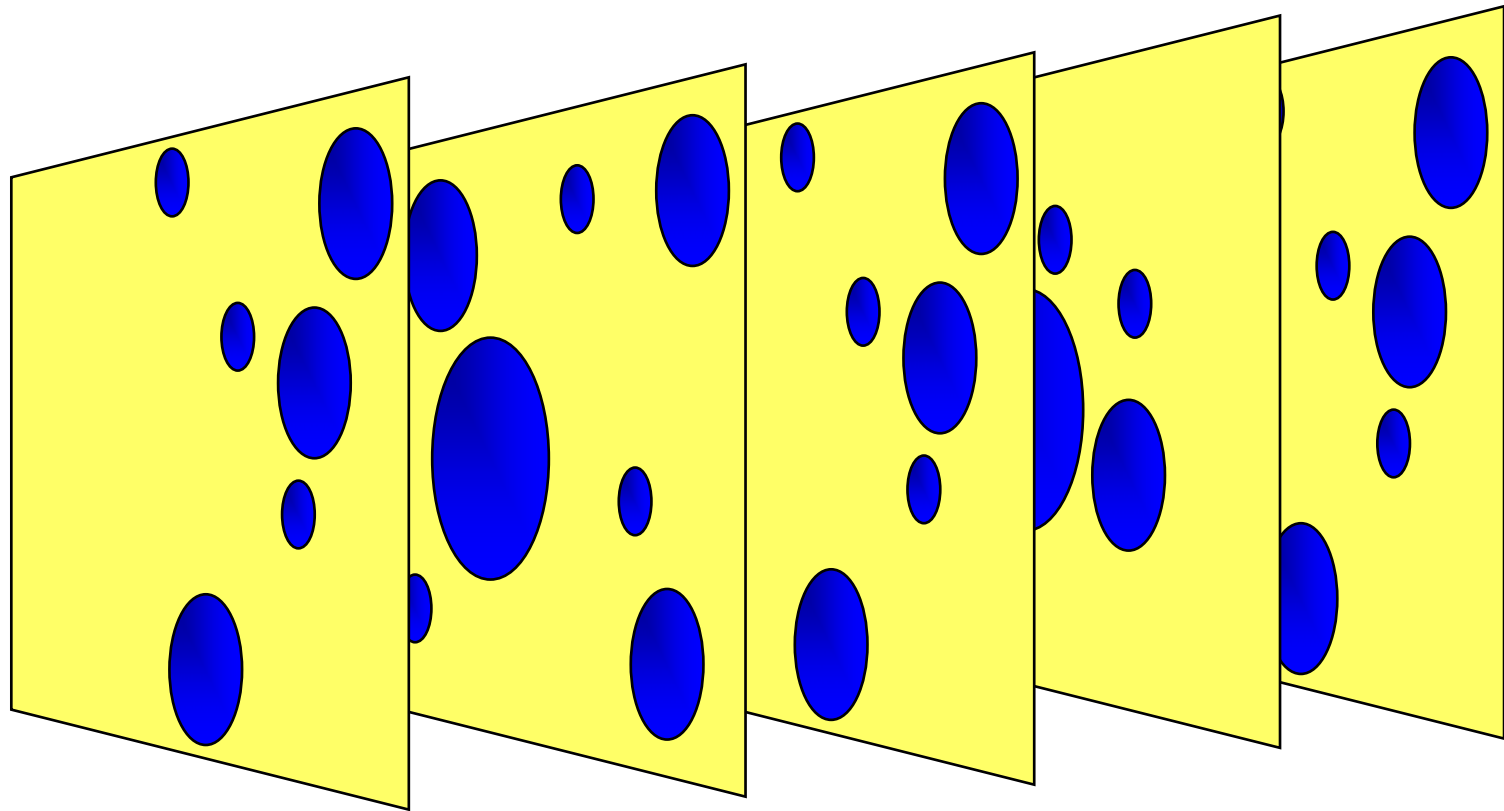
- Fires = accepted part of operating
- Lack of interest at senior level
- Old blinkered approach & fiefdoms
- Organizational change
- Complacency
- Lack of supervisory control
- Lack of accountability for job performance

# The “Swiss Cheese” Model\*



\*After Prof. James Reason

# An Adaptation



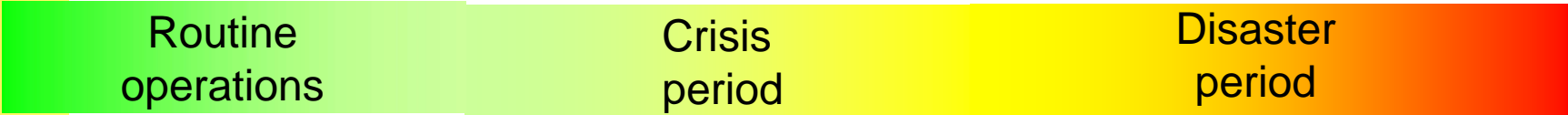
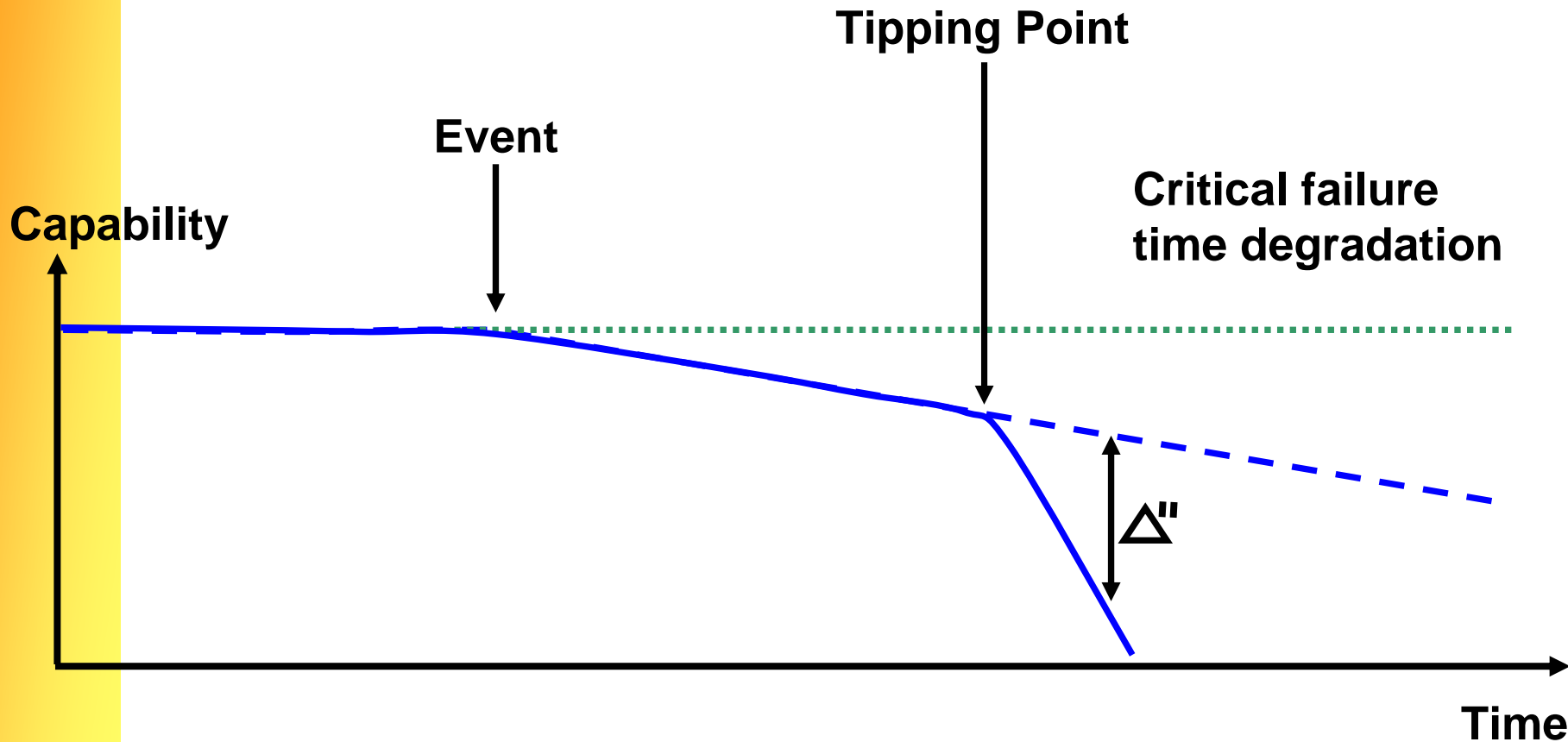
Socio-economic  
political factors

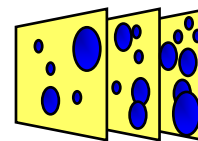
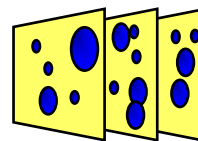
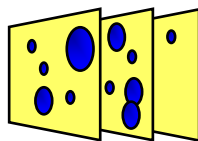
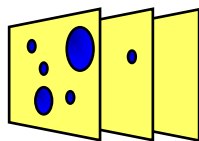
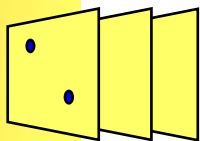
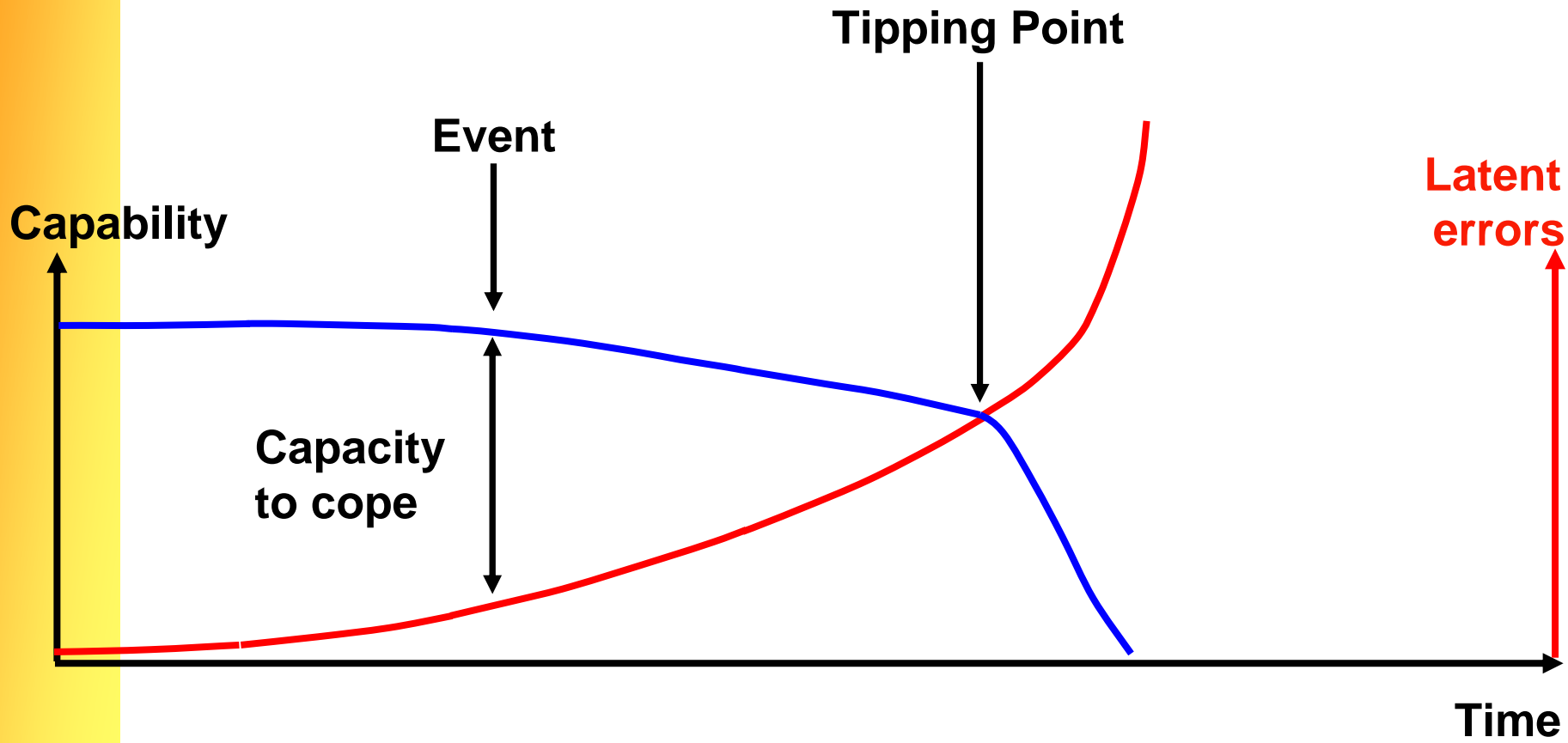
Organisational  
factors

Local  
factors

People  
factors

Defensive  
factors





# A New Model for Resilience

