



University of the
Sunshine Coast

Accident Research (USCAR)

Optimising incident reporting systems for learning: a systems thinking approach

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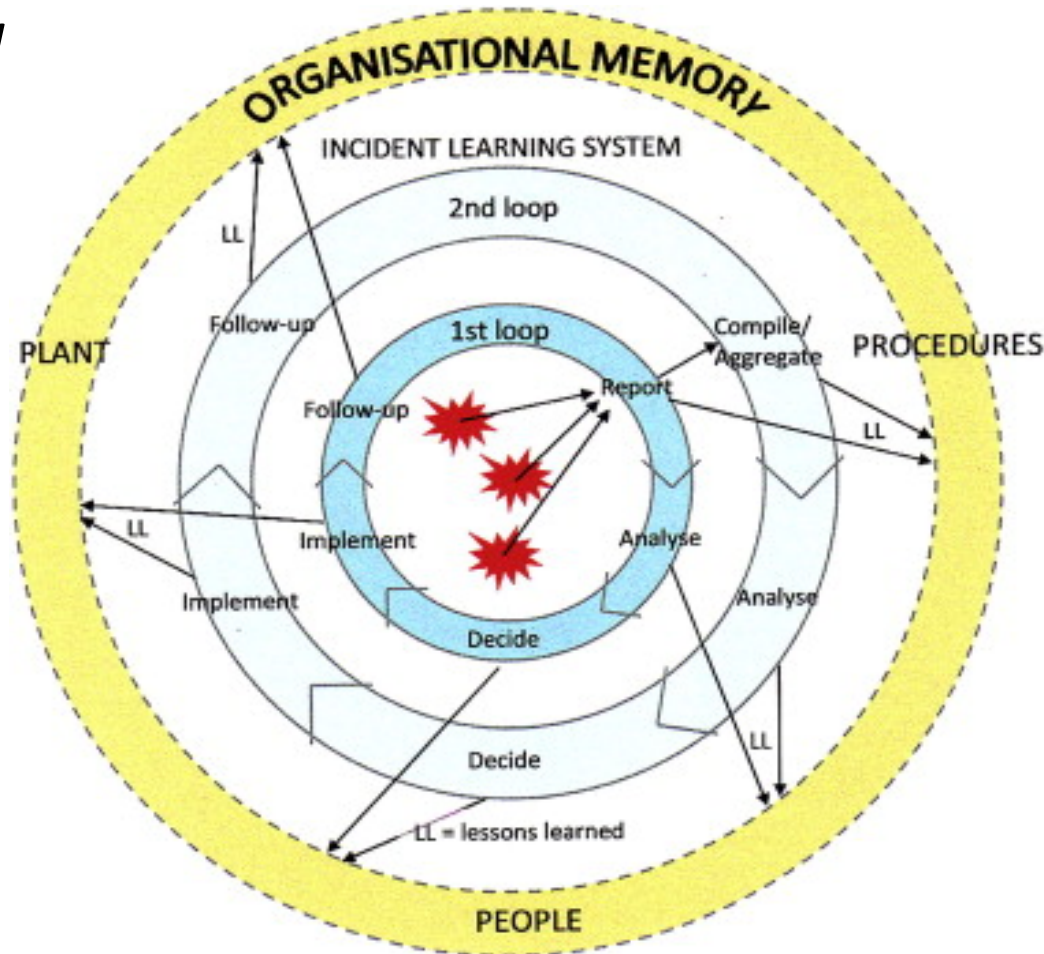


Still a significant
problem in Australia.



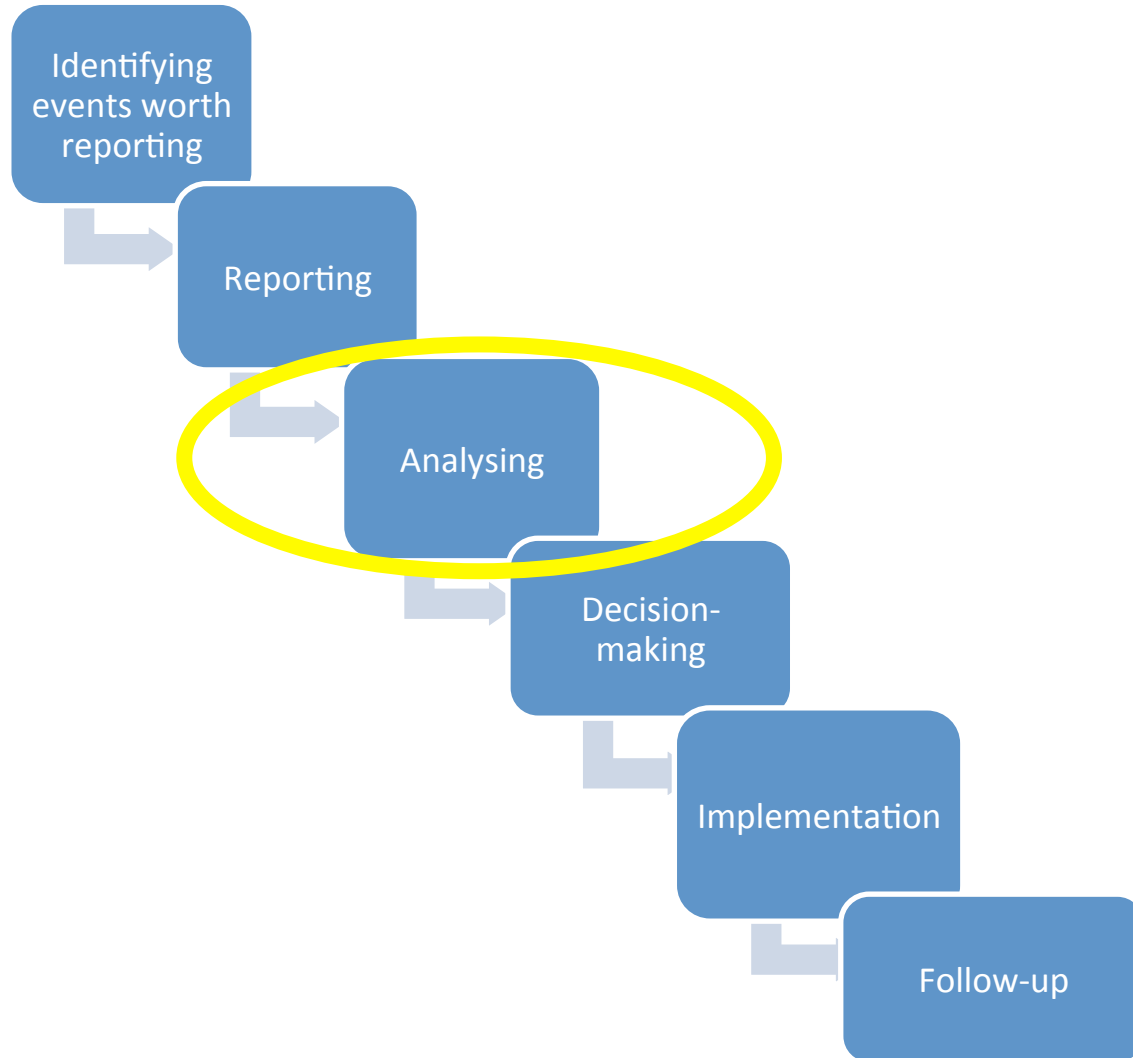
Never again!

*We must learn
from this event!*

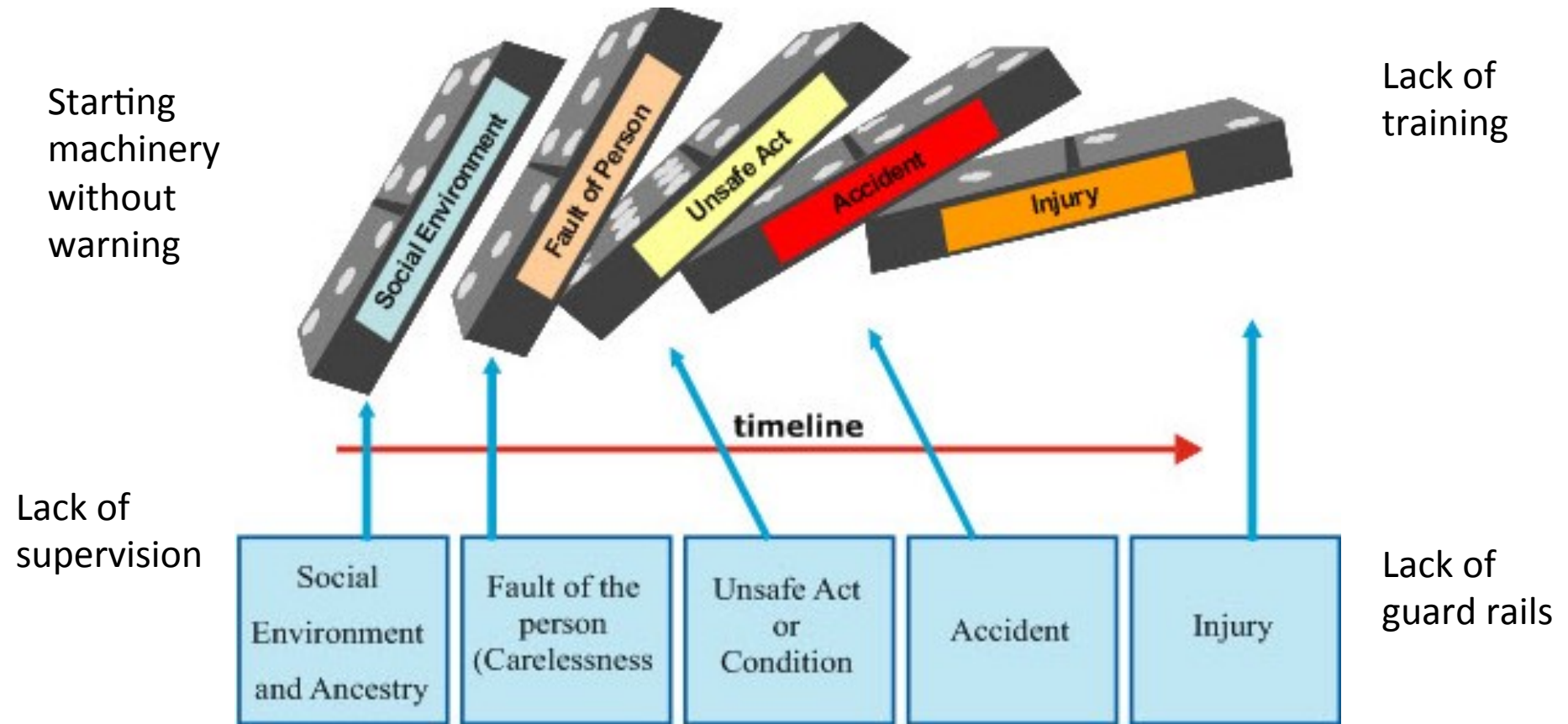


There is little evidence that organisations are learning from incidents and near misses in the workplace.

A long series of steps towards learning...



The problem...models of accident causation



The problem...models of accident causation



The answer:

- strict supervision
- remedial training
- discipline

An alternative: the systems approach

1. Safety is impacted by the decisions and actions of everyone in the system not just front line workers.
2. Near misses and adverse events are caused by multiple, interacting, contributing factors.
3. Effective countermeasures focus on systemic changes rather than individuals.

The goal is not to assign blame to any individual, but to identify how factors across the system combine to create accidents and incidents.

Why haven't we applied this understanding to the analysis of workplace injuries and near misses?

The UPLOADS Project

Goal: develop a standardised, national approach to incident reporting and learning for the outdoor activity sector in Australia underpinned by a systems model of accident causation.

Support:

Organisation in analysing their own data; and

The collection of industry-wide data.



What is the outdoor activity sector?

Horse riding; trail biking; caving; bushwalking; trail running; canoeing; sailing; mountain biking; slacklining; rockclimbing; orienteering; surfing; 4WDing; rogaining; camping; challenge ropes courses; expeditions; fishing; kayaking; snorkelling; off road triathlons; pioneering ...

- Recreation
- Education
- Adventure
- Therapeutic
- Developmental
- Tourism
- Skill development
- Community engagement
- Spiritual development

Just like any workplace

WHS Legislation:

They hold a duty of care towards their clients and employees.

They must eliminate or manage the risks within the workplace as far as reasonably possible.

High risks

2007 - 2009 there were five fatalities in commercial rafting operations in Cairns.

Three different companies.

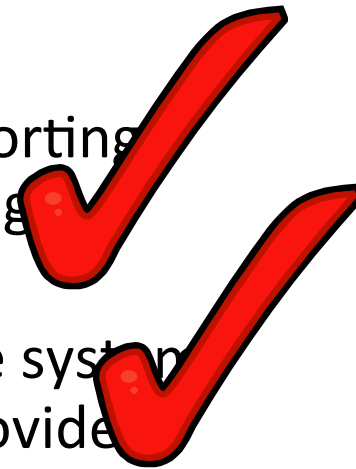
Why?

Prior to UPLOADS what was known?

- A little about the ‘broken component’ (e.g. activity leader failures)
- Limited evidence on system wide failures
- Poor data systems
- Incident reporting limited

Project Phases

1. *Methodological development.* Prototype incident reporting storage and analysis methods was developed, forming prototype accident & injury surveillance system;
2. *Methodological validation and refinement.* Prototype system was trialled and evaluated by led outdoor activity providers;
3. *In-depth incident study.* Injury surveillance system will be implemented in order to conduct an in-depth study of injury causing incidents in the led outdoor activity domain in Australia; and
4. *Accident causation model development.* Based on the findings, a systems-based model of injury incident causation for the led outdoor activity domain will be developed.



UPLOADS Data Collection System

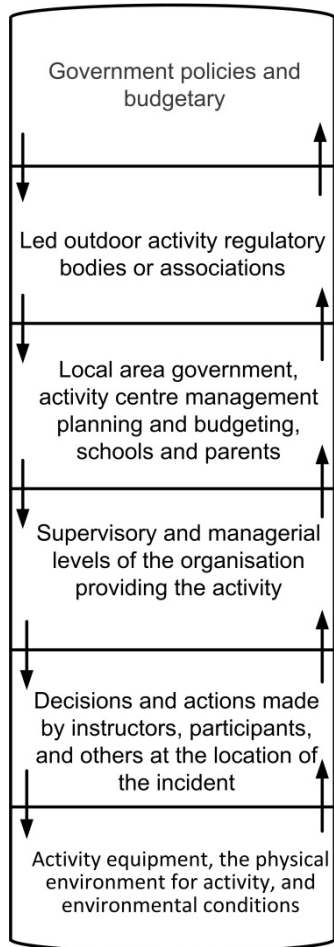
The system consists of:

- 1) A software tool for recording injury and near miss data, tailored to the outdoor activity context;
- 2) A coding framework for classifying the causal factors involved in outdoor injuries and near misses. The framework is underpinned by a systems theory model, Rasmussen's Risk Management Framework.
- 3) Tools for analysing the causal factor data;
- 4) Paper-based and video training; and
- 5) A method for secure and confidential contribution to the industry database.

Coding framework development

1. Comparison of systems-orientated accident analysis methods for the purposes of analysing fatal outdoor accidents (e.g. HFACS; STAMP; and Rasmussen's Framework- Salmon, Cornelissen & Trotter, 2012).
2. Rasmussen's framework was then adapted to describe the 'led outdoor activity system'.
3. Analysis of over 1000 led outdoor incidents was then undertaken to identify a set of specific causal factors involved in outdoor incidents.
4. We then populated the framework with these factors.
5. Reliability testing – 14 safety managers from outdoor activity providers coded 10 detailed incidents, revised the framework.

Coding framework



State and Federal Government (8)

Regulatory bodies and professional associations (8)

**Local Area
Government (6)**

Parents/Carers (6)

Schools (8)

**Higher-level
Management (11)**

Supervisor/Field Managers (10)

Activity Leader (9)

Activity Participants (8)

**Other People in
Activity Group (9)**

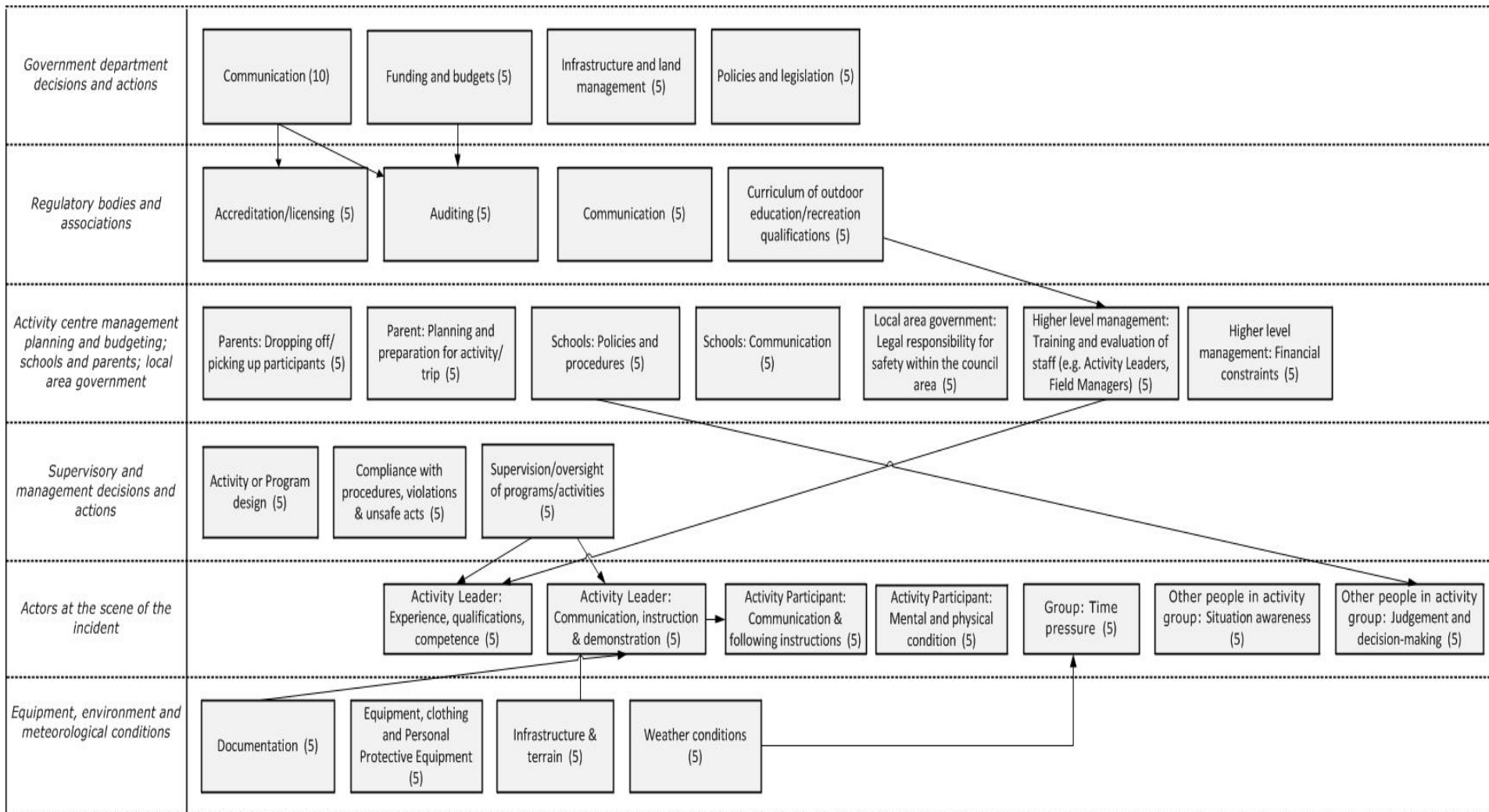
Group Factors (8)

**Other People in
Activity Environment (8)**

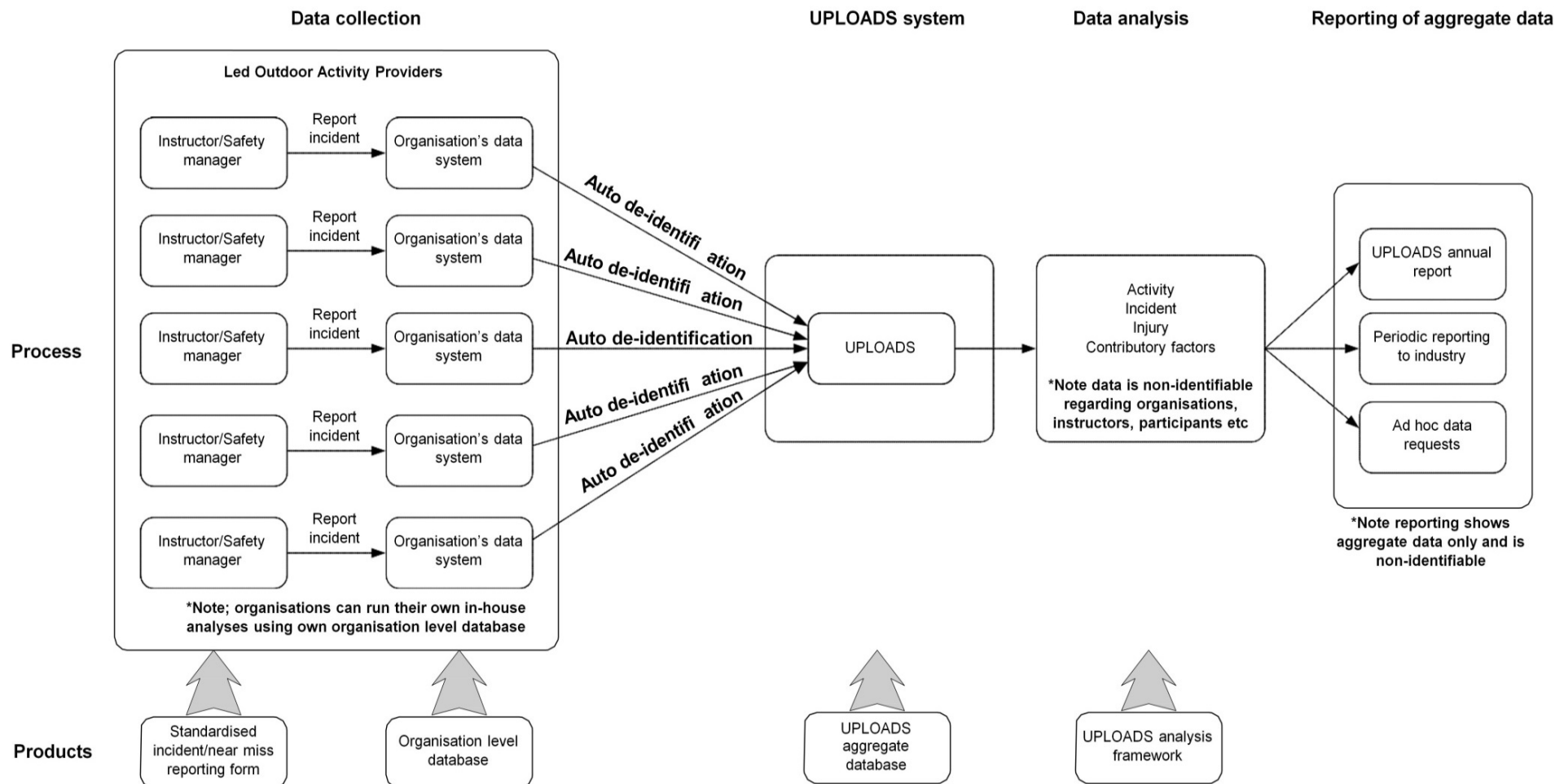
Activity Environment (6)

Activity Equipment and Resources (5)

Automatic tools for analysis



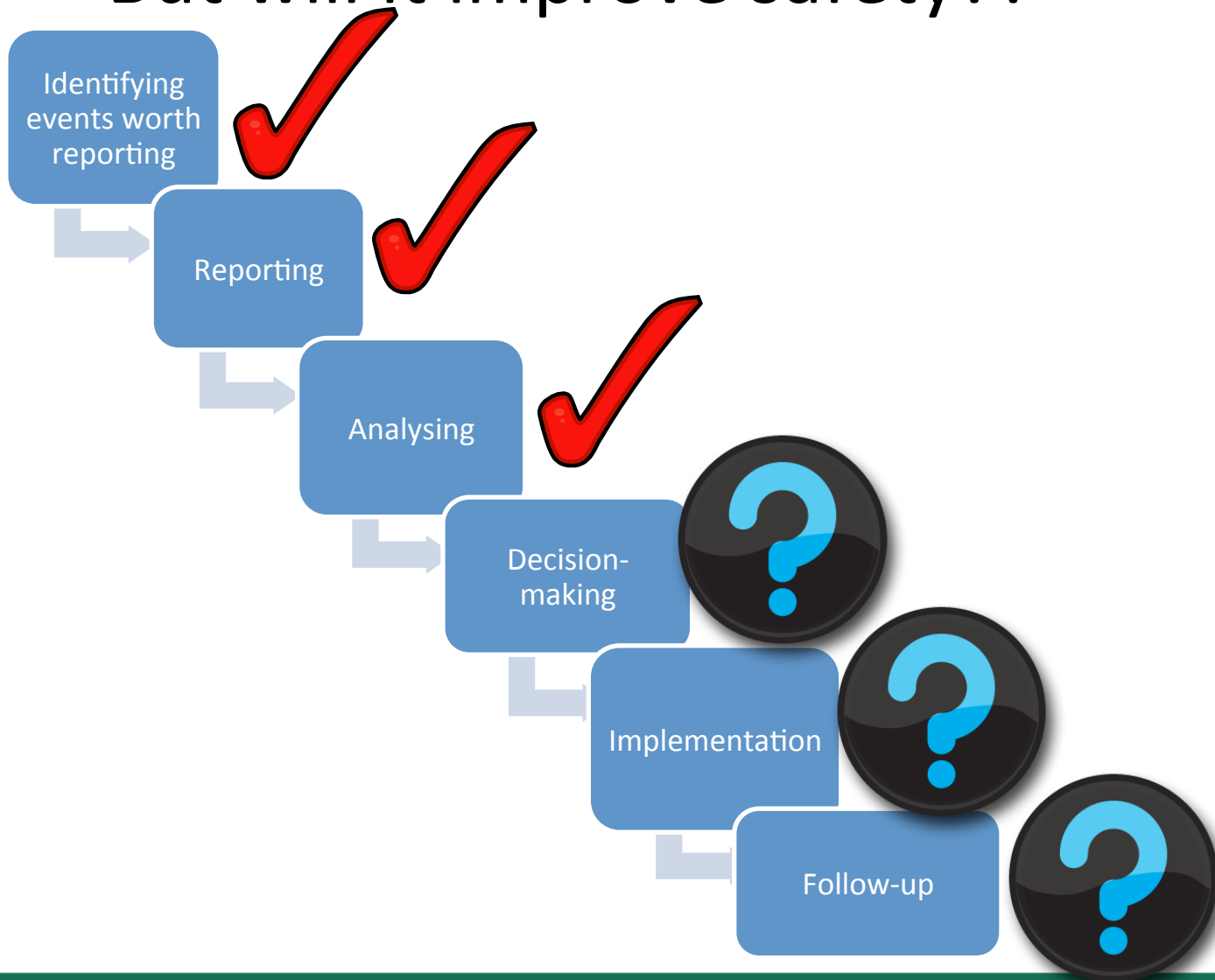
Secure and confidential reporting



UPLOADS: summary of features

- Based on a systems theory framework.
- Specifically designed for outdoor activity providers.
- Systematically track incident, staff and participant data.
- Tools to analyse your own data.
- Video and paper-based training material.
- Allows you to contribute deidentified data to an industry database.
- Analysis of industry-level data will provide evidence to support systemic changes.

But will it improve safety??



Thank you!

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Key future Human Factors Issues in Safety Science

1. We need a method for developing systems-orientated accident analyses into systems-orientated recommendations.
2. We need to better integrate systems-thinking into work planning and design.
3. We need models that can predict when the normal conditions of work are migrating towards the boundaries of safety.