

Barriers and Facilitators to Incident Reporting in Servitized Manufacturers

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"All the News
That's Fit to Print"

The New York Times

Late Edition

Weather: Partly cloudy and cold today, chance of snow; chance of snow to night. Partly cloudy, cold tomorrow. Temperatures: today 27-30, tonight 13-19; yesterday 14-23. Details, page C19.

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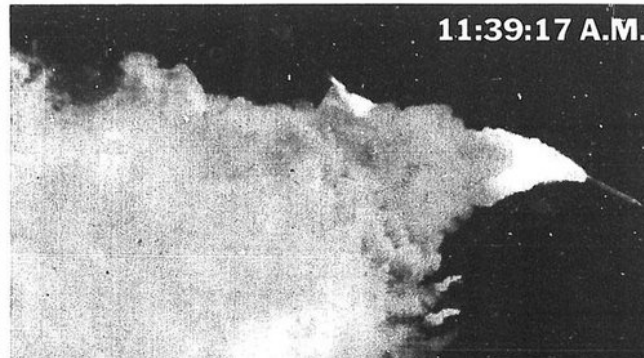
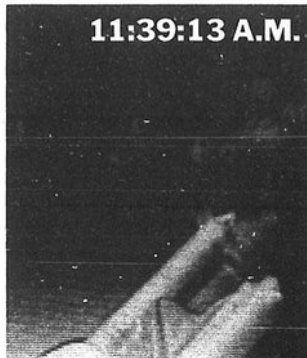
NEW YORK, WEDNESDAY, JANUARY 29, 1986

50 cents beyond 25 miles from New York City,
except on Long Island.

30 CENTS

THE SHUTTLE EXPLODES

6 IN CREW AND HIGH-SCHOOL TEACHER ARE KILLED 74 SECONDS AFTER LIFTOFF



Thousands Watch A Rain of Debris

By WILLIAM J. BROAD

Special to The New York Times

CAPE CANAVERAL, Fla., Jan. 28 — The space shuttle Challenger exploded in a ball of fire shortly after it left the launching pad today, and all seven astronauts on board were lost.

The worst accident in the history of the American space program, it was witnessed by thousands of spectators who watched in wonder, then horror, as the ship blew apart high in the air.

Flaming debris rained down on the Atlantic Ocean for an hour after the explosion, which occurred just after 11:39 A.M. It kept rescue teams from reaching the area where the craft would have fallen into the sea, about 15 miles offshore.

It seemed impossible that anyone could have

Space Shuttle Challenger Disaster

Space Shuttle Columbia Disaster

Weather

Today: Partly cloudy with light snow.
 High 20 to 26, Low 10 to 13.
 Monday: Mostly sunny. High
 15 to 20, Low 10 to 13.
 Tuesday: Partly cloudy. High
 15 to 20, Low 10 to 13.
 Wednesday: Partly cloudy.
 High 15 to 20, Low 10 to 13.

The Washington Post

FINAL

Circle 10 on Page 43

WEDNESDAY, JANUARY 29, 1986

WEDNESDAY, JANUARY 29, 1986

Page 1 of 4

Space Shuttle Explodes, Killing Crew



Here the launch site, Christa McAuliffe's sister, left, and parents meet during shuttle flight.

Suddenly, the Celebration Stopped Joy Turns to Grief in Teacher-Astronaut's Town As Students at High School See Tragedy Unfold

By Laura A. Kizner
Staff Writer of The Washington Post

CORCORAN, W.V., Jan. 28—“We were rejoicing in the thrill. We were excited in it. We were celebrating with her. Then it stopped. There it is. It stopped,” said Concord High School principal Charles Foley, his voice shaking.

During an emotional news conference this afternoon, Foley stood in the auditorium where, hours before, students with party hats and streamers had celebrated long-awaited science as they realized, shortly, that the shuttle carrying Concord teacher Christa McAuliffe had exploded.

The horrifying moment when Challenger lifted off gloriously and burst apart was witnessed as television by thousands, of-line students and families throughout Michi-

gan's town. The excitement that had swelled here since July when McAuliffe was selected as the first teacher in space turned to grief, and shock to grief.

The flight's terrible announcement also evoked consternation from some students toward spectators and camera crews who periodically disrupted their lives over the last six months and made their money a public spectacle today. When the extent of the disaster became clear, a video on the public address system asked students to return to their classrooms and never people to leave the building.

Dismissed early, some of the departing students declined to give their names, asking to speak at all. “It’s pretty hard to handle,” one boy said.

“It’s a terrible, terrible loss for us,” Foley said.

Fire Engulfs Ship With 7 Aboard Soon After Liftoff

By Steve Schneider
Staff Writer of The Post

The space shuttle Challenger, carrying its astronauts and schoolteacher Christa McAuliffe, exploded in a burst of fire 74 seconds after liftoff yesterday, killing all seven aboard and causing a rocket made famous to the world by television.

The catastrophic explosion occurred without warning as the flight seemed to be proceeding flawlessly at about 2,800 feet per second, 50 miles above Earth and eight miles above clouds from Cape Canaveral. The spacecraft appeared to disintegrate into bits of debris that rained into the Atlantic Ocean. Those aboard, still strapped into their seats, had no means of escape.

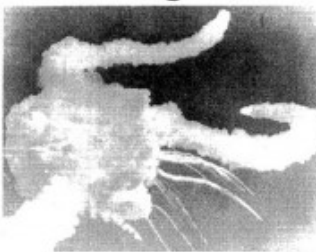
In addition to McAuliffe, those killed were spacecraft commander Francis R. (Dick) Scobee, crew chief Michael J. Smith, mission specialist Judith A. Resnik, mission specialist Ronald E. McNair, Air Force Lt. Col. Ellison S. Sizoo, and payload specialist Gregory B. Bivins.

It was the worst accident in the history of space exploration and the first time anyone has been killed during an American space flight. The tragedy occurred 29 years and one day after U.S. astronaut Virgil I. Grissom, Roger A. Chaffin and Edward H. White died during a training session when a fire broke out in their vesical Apollo spacecraft on the launch pad.

Five hours after yesterday's tragedy, James W. Moore, associate administrator for space flight of the National Aeronautics and Space Administration, announced from Cape Canaveral that the shuttle program had been suspended for an indefinite investigation. But President Reagan, who announced his State of the Union speech from last night to next Tuesday, issued in a radio address a statement from the Oval Office that expressions of grief would continue.

“There will be more shuttle flights and more shuttle crews and, yes, more teachers, more engineers, more teachers in space,” Reagan said. “Timmy and I are pleased to give you the tragedy of the shuttle Challenger. We hope we share this with you.”

Field rocket boosters over area from exploded fragments of Challenger and its liquid fuel tank.



Field rocket boosters over area from exploded fragments of Challenger and its liquid fuel tank.

The Horror Dawned Slowly For One Very Long Moment After the Explosion, Rew Realized They Witnessed a Disaster

By Katie Stover
Staff Writer of The Post

CAPE CANAVERAL, Fla., Jan. 28—Inventors came slowly, not in a busy burst, in those watching the shuttle launch from the better seats—the graduates set up for families of the astronauts, dignitaries, the news media and a class of third graders with connections.

The disconcerting confusion over of the flight, lagging behind the rising spectacle, had reached on The spacecraft, clinging to the “wall” of tanks containing 2.8 million pounds of fuel, had been up about six minutes.

“We were gapping and chewing at the cut-aways of developed inside growing like a bush into a cold, blue sky. As the rumbling sound (with trailing the visible exhaust) continued, a curious rattle (not unusual to launch about gently at the top, with gusts of fire in it.

“They’re coming back,” said Resnik’s flight writer Malcolm McConell, who has covered 20 launches. He and several other reporters started shouting, shouting to make their way to the landing strip toward miles away where the shuttle was to return in an emergency. There were confused shouts, covering a short screen.

“That, still looking up, McConell said back then, “What’s the ship?” someone asked. “That,” he answered later. “We’ve lost ‘em. God bless ‘em.”

AP Wirephoto, ST, 66, 1

• Related stories of the shuttle disaster on Pages A4-A10 and B1.

A finals Game 6
Lakers defeat Celtics, 89-67. 1B



Saving money
Properly store food to avoid waste. 1C



WEATHER
High/94 Low/74
Weather details, forecast 2A



CLICKREAD
A way to digest the news of the day

SPORTS
MLB draftees sign contracts
Two-thirds of LSU's record-setting draft class signed professional baseball contracts Tuesday. Left-handed pitchers Justin Davis and Jeff Neuse were part of a school-record three draft picks in the 2010 Major League Baseball First Year Player Draft. **PAGE 2B**



FOOTBALL
Lee could be NFL QB
Jackson didn't mention did DeLeon, John Dewy, Ricky Harris nor Brian Jordan, head coach Les Miles said Lee is capable of off the incredible. **PAGE 1B**



LOCAL/STATE
City council to vote on rate increase
A meeting costing about \$20,000 a month for the city to run emergency repair lines into its sewer plant, a fact council members noted at a meeting Tuesday when they began the process Tuesday of raising city sewer rates. **PAGE 2A**

ENTERTAINMENT
Cartoon brings experience
Jane Leathers, Valerie Bertinelli, Wendie Malick and Betty White come to TV Land in the network's first original scripted program, "Not in Cleveland," bringing 135 years of TV acting experience with them. **PAGE 7C**



COMMUNITY
Proposal needs explanation
A midmorning meeting in Benton on Tuesday to discuss the proposal to collect another \$1 million in property taxes to fund the city's sewer plant. But perhaps enough people can show up to provide feedback on Bossier Parish's plan to not forward his property tax millage. **PAGE 6A**

WORLD
Violence orchestrated
A U.S. has found evidence behind the chaos in the streets that killed 100 people, left the surrounding ruin and more than 300 ethnic Uzbeks. **PAGE 8A**




President Obama delivered his first televised address to the nation from the Oval Office of the White House in Washington on Tuesday. Obama said the nation will continue to fight the oil spill for "as long as it takes."

'We will make BP pay'

Obama accuses company of 'recklessness' in TV address

By Jennifer Leisen
The Associated Press

WASHINGTON — Dedicating new energy to the Gulf oil spill, President Obama accused BP of "recklessness" in the first Oval Office address of his presidency Tuesday night and vowed to make the company pay for the massive damage it has caused to lives, homes and shorelines.



A cleanup worker vacuums oil from the Deepwater Horizon oil spill along the northern shores of Terrebonne Bay in Plaquemines Parish, on Tuesday.

He announced that he had asked former Mississippi Gov. Ray Mabus to develop a long-term Gulf Coast Restoration Plan — to be funded by BP PLC — in concert with local states, communities, businesses, and residents "on an as-needed" basis.

Obama did not say what his plan should include or how much it might cost, a price sure to be in the billions of dollars.

Whether the bottom line, he declared to his prime-time television

Most blame BP for Gulf oil spill
45% of Americans disagree with President Barack Obama's handling of the Gulf oil spill. And 40 percent do not approve of his performance in the aftermath of the April 20 explosion. **Approve** **Disapprove**

Do you approve or disapprove of the way BP is handling the oil spill in the Gulf of Mexico?

Do you approve or disapprove of the way BP is handling the oil spill in the Gulf of Mexico?

See **Page 4A**

Gulf officials push to ease drilling ban

By Deborah Barfield Berry
berry@shreveporttimes.com

WASHINGTON — Gulf Coast lawmakers pressed the administration Tuesday to shorten a six-month ban on deepwater drilling in the Gulf of Mexico, saying it will cripple a region already devastated by the BP oil spill.

"The last thing we need is a moratorium," said Rep. Charles McMath, a Democrat whose district includes the Louisiana shore.

He said the ban would deliver a "body blow" to the region.

More than a dozen lawmakers from Louisiana, Mississippi and Texas said at a news conference the ban could cost the region thousands of jobs. They plan to meet with Interior Secretary Ron Salazar today to discuss the issue.

"The president ought not kick the people of Louisiana when we're down," said Rep. Steve Scalise, R-La.

From family members of oil industry workers killed in the Deepwater Horizon explosion.

tion say the six-month ban on the local coast should be shortened.

Last month, the administration placed a 300-foot buffer zone around the water — in response to the oil spill caused by the size and sinking of the water Horizon oil rig up by BP.

Federal officials set new permits and continue to deepwater Gulf operations while the area is being investigated a commission reviews standards.

A bill introduced Tuesday by Sen. Charles McMath of Louisiana and Republican Rep. Clayton L. Kopp of Texas would allow the state to finish what the federal government started. "If it stays in place for six months, it will be setting back the recovery."

Budget OK'd for Caddo schools

Board includes \$4.6M for block scheduling program.

By Nicole Blake Johnson
njohnson@shreveporttimes.com

Shreveport's main center school is looking to provide more classes to students who have moved to the area. The board approved a \$4.6 million block scheduling program for high schools and other programs in Shreveport, Bossier and Webster parishes.

Schools Superintendent Gerald Hankins said department heads recommended which programs would be included. The list includes at least eight additional principals, 20 clerical and clerk positions through addition and 12.5 school counselors.

Hankins and his administrative staff have said no employees will be laid off but rather re-assigned if necessary.

Board member Larry Ramsey was concerned that cutting counselor positions could negatively impact efforts to implement block scheduling. He also asked for principals to have a say in which positions would be eliminated.

"It's not one position, it's another position," Hankins said. "We're certainly looking to work with principals, but there must be a dollar amount equal to the cuts that we have to make."

Funding for underpass hard to come by

By William J. Clark
william@shreveporttimes.com

Mayor Bowman, who also serves as the president of the City Council, said they would present their findings to the full council at the next meeting on June 22.

Learn more about the City of Shreveport.

One option involved asking each city department's operating budget by 3 percent. The work would not slightly over \$3 million for the project.

Assistant Chief Administrative Officer Rick Stewart said he will keep working about approval of state dollars, because it's a prudent and helps go

Deepwater Horizon Explosion

Research Motivation

Accidents:

- Present several similarities
- Are the result of a combination of a number of smaller events
- Could have been prevented
- Have major consequences

Indicate:

- Deficiencies in understanding and preventing accidents
- Safety education is not reaching the target audience
- More research and interactions between academia and industry is needed for advancing the safety agenda (Saleh et al., 2010).

Theoretical Background

Safety is...

Theoretical Background

Safety is...

... *'the condition of being protected from or unlikely to cause danger, risk or injury'*

Oxford Living Dictionaries

...also defined as:

'a state where as few things as possible go wrong'

Hollnagel et al., 2013, p. 3

'the state in which the possibility of harm to persons or of property damage is reduced to, and maintained at or below, an acceptable level through a continuing process of hazard identification and safety risk management'

Hollnagel et al., 2013 p.6

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Hard to define

Hard to measure

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Nowhere is
Safe!



Source: tenor.com

Hard to define

Hard to measure



Theoretical Background

Accident Causation Literature

MMD

(Turner, 1978)

NAT

(Perrow, 1984)

HROs

(Roberts, 1990)

STAMP

(Leveson, 2004)

Failures originate from a chain of events that accumulate over long periods of time

(Pidgeon and O'Leary, 2000; Sutcliff and Christianson, 2013)

Not technical but management & organisational issues

(Roberts et al., 2001; Hall, 2003; Saleh et al., 2010)

Systems are complex, not perfect and prone to **error**

(Perrow, 1984; Waring, 2005)

Organisations can learn from past failures & prevent accidents

(Turner, 1978; Roberts et al, 2001; Leveson, 2004; Sutcliffe, 2011)

Theoretical Background

Human element makes systems prone to **error**:
80% of accidents are due to human **error**

(Hollnagel, 1993)

Errors present common **patterns**

(Turner, 1978)

(Perrow, 1984)

Patterns need to be identified and communicated

Failures originate from a chain of events that accumulate

Not technical but management & organisational issues

Incident Reporting System

(Pidgeon and O'Leary, 1995; Saleh et al., 2010)

(Saleh et al., 2010)

Systems are complex, not perfect and prone to **error**

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HROs

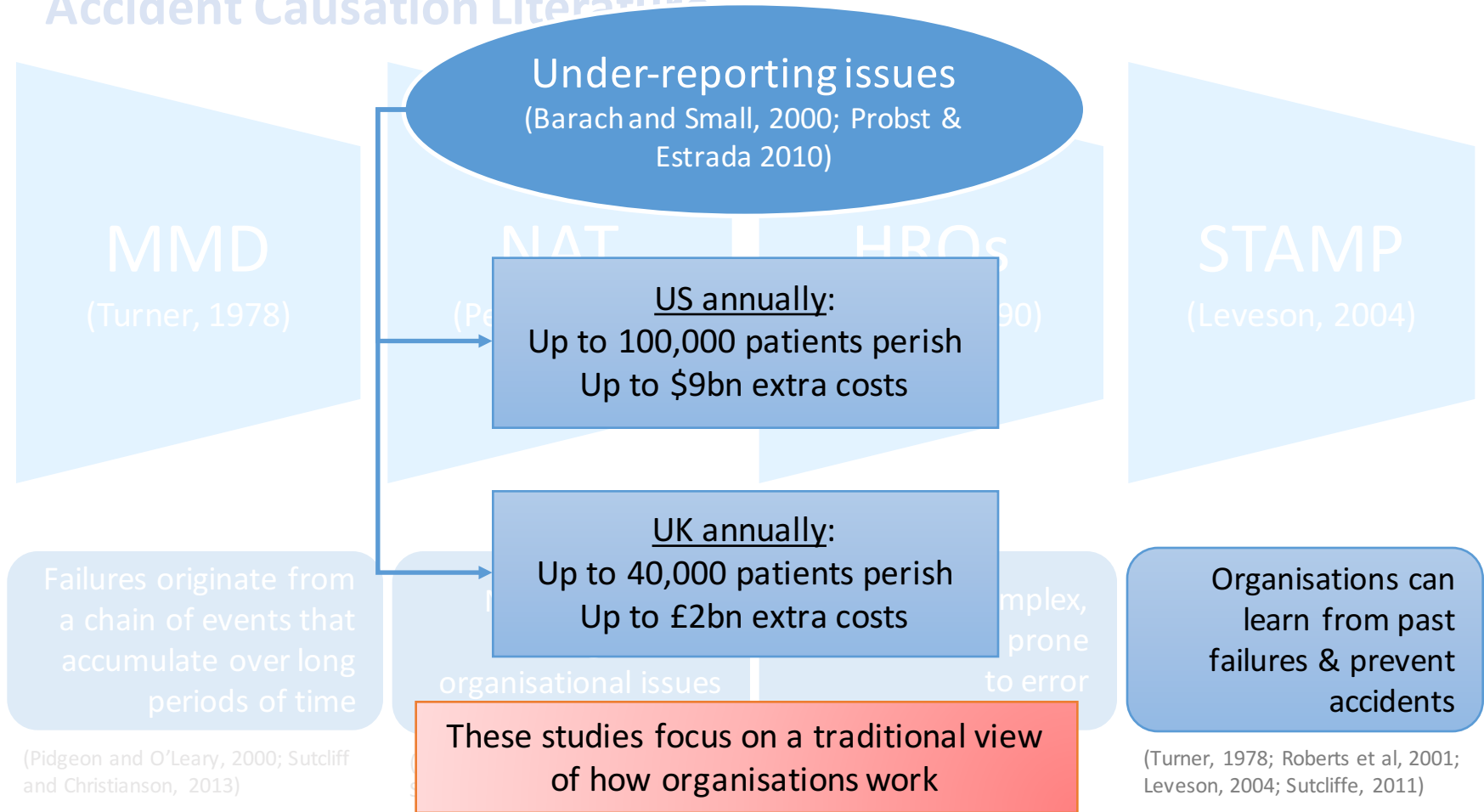
(Roberts, 1990)

STAMP

(Leveson, 2004)

Theoretical Background

Accident Causation Literature



Theoretical Background

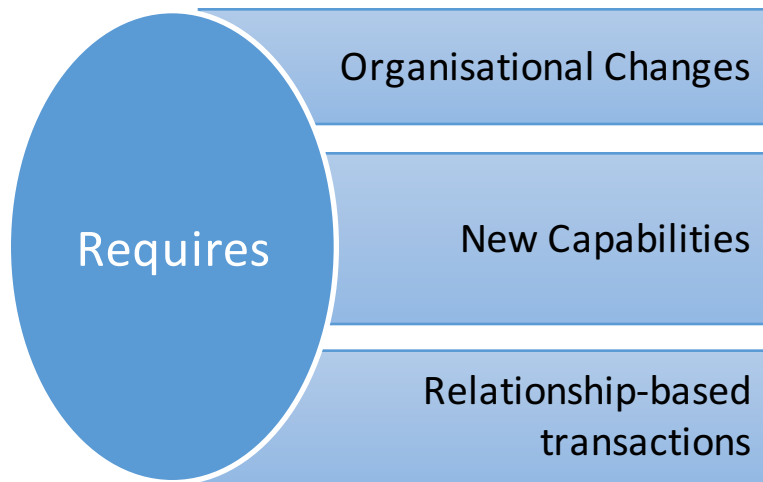
"..the process of creating value by adding services to products." Baines et al., 2009

Servitization of Manufacturing (Vandermerwe and Rada, 1988)

Theoretical Background

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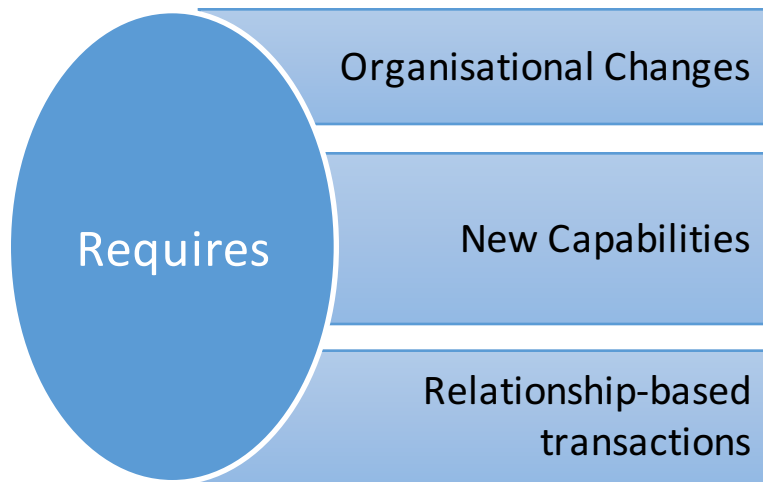


(e.g. Oliva & Kallenberg, 2003; Davies, 2004; Gebauer et al., 2005; Baines et al., 2009; Martinez et al., 2017).

Theoretical Background

"..the process of creating value by adding services to products." Baines et al., 2009

Servitization of Manufacturing (Vandermerwe and Rada, 1988)



(e.g. Oliva & Kallenberg, 2003; Davies, 2004; Gebauer et al., 2005; Baines et al., 2009; Martinez et al., 2017).

Research Objective

What are the barriers and facilitators to incident reporting in a service environment?

Research Design

➤ Single Organisation

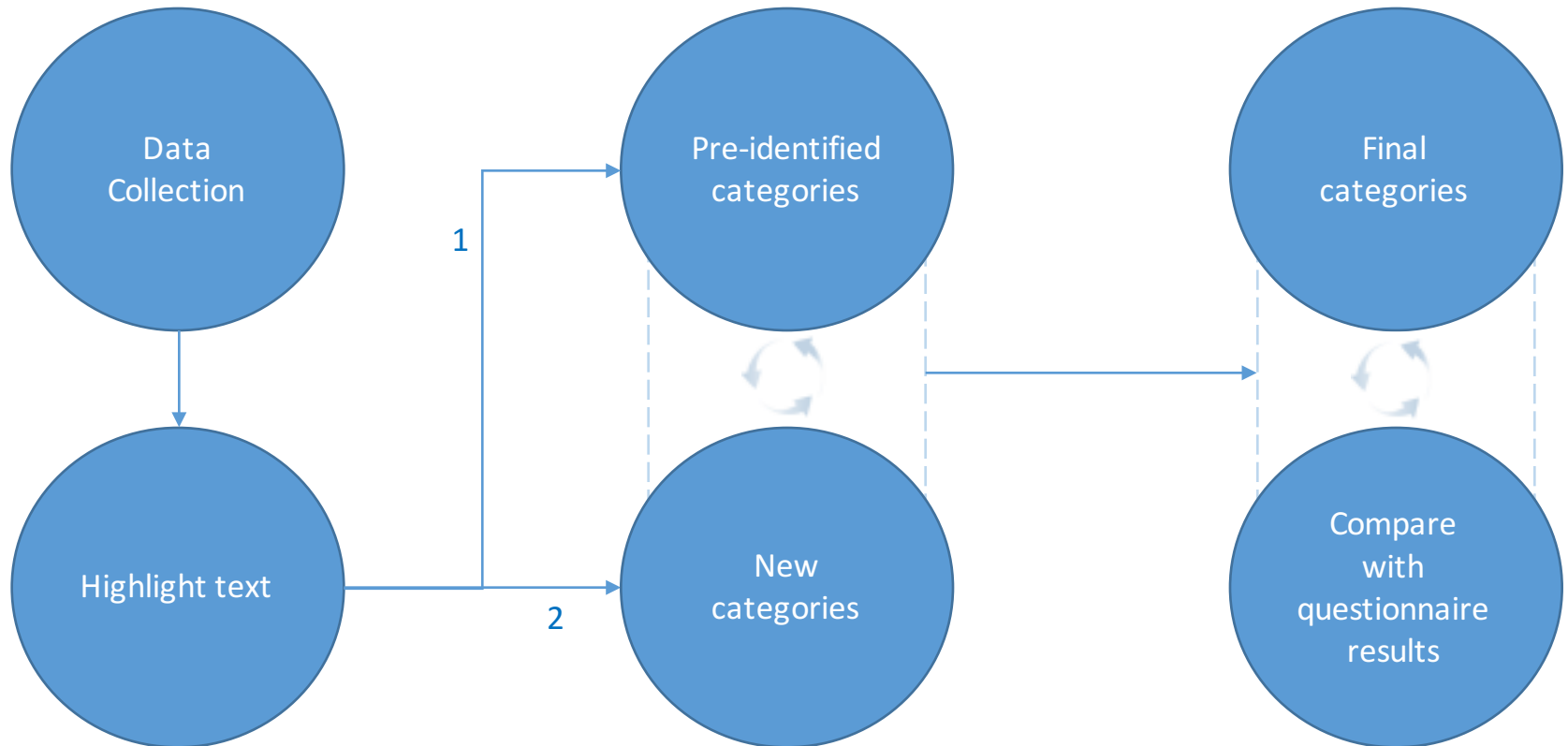
- Examine incidents: sensitive/ confidential information
- Servitized manufacturer, worldwide presence, operating in safety-critical environment with integrated incident reporting system

➤ Qualitative Data: Introduce new constructs

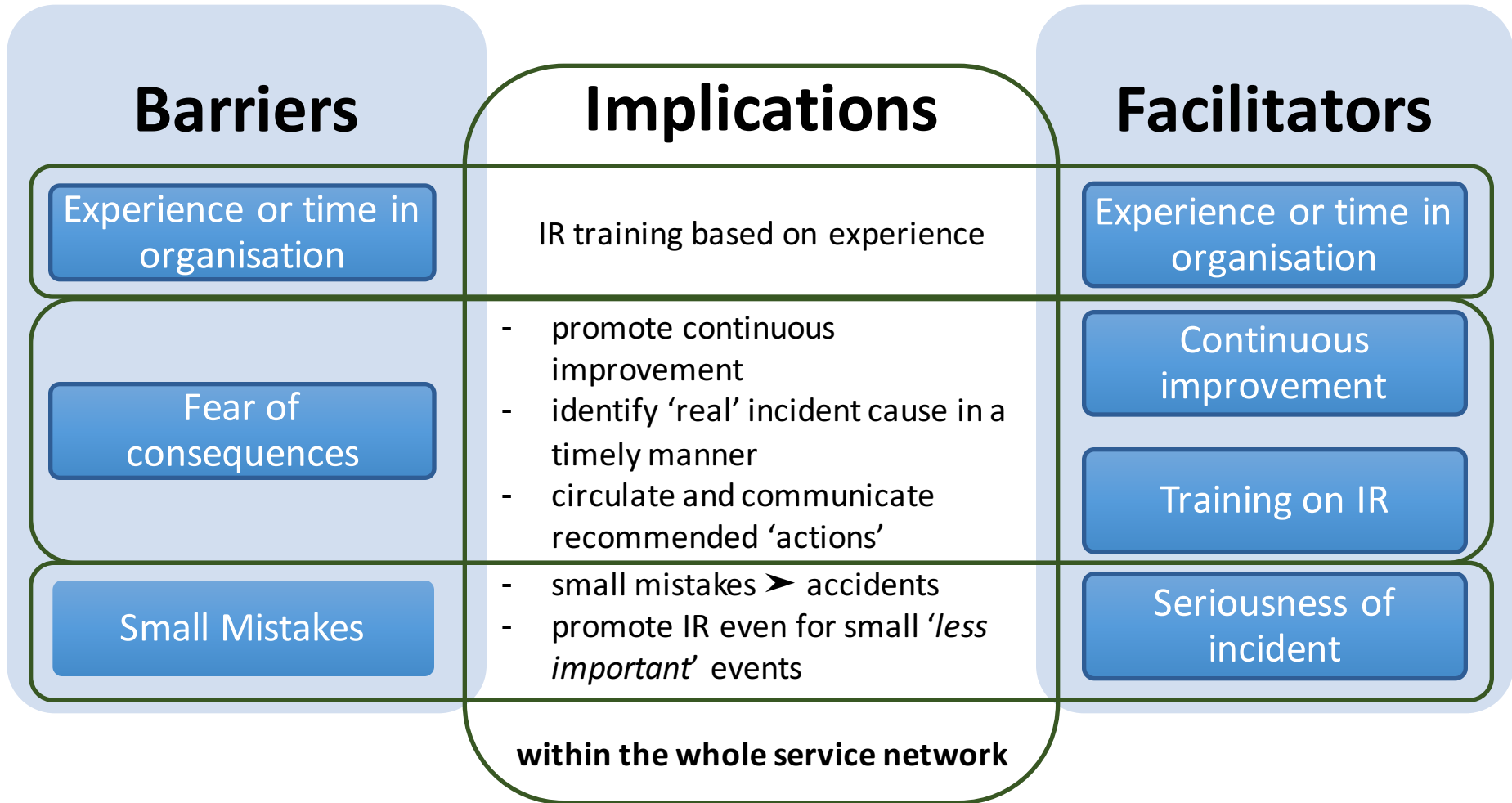
- Use of open ended and targeted questions (discussion & questionnaire)

Analysis

Direct content analysis (Hsieh and Shannon, 2005)



Results & Discussion

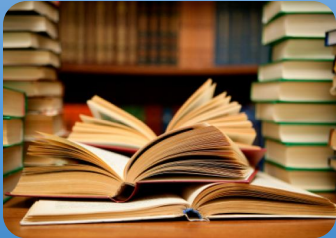


Concluding Remarks



Limitations & Next Steps

- Qualitative Study: Sample Size
- Conduct more interviews in different sites



Theory Contribution

- Servitization
- Accident Causation



Practice Contribution

- Guidance tool for servitized manufacturers

Barriers and Facilitators to Incident Reporting in Servitized Manufacturers

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Chara Makri, *PhD Student*
Professor Andy Neely, *Supervisor*

*This research is conducted in partnership with BAE Systems
and is sponsored by EPSRC*



Forthcoming Webinars

Date	Topic	Invited speaker
14:30hr BST		
2017		
June 12th	Exploring the Service Journey	Veronica Martinez
July 10th	Business Ecosystems: Towards a Classification Model	Florian Urmeter
Sept 11th	Bridging the Co-creation Gap between Co-creators, Companies and Living Lab	Katherina Greve
Oct 2nd	Barriers and Facilitators to Incident Reporting in Servitized Manufacturers	Chara Makri
Nov 13th	A Systems Perspective on Business Model Evolution: The Case of an Agricultural Information Service Provider in India	Chander Velu
Dec 12th	Using outcome-oriented contracts to foster performance improvements in logistics outsourcing relationships	Torsten Steinbach and Florian Urmeter