

Data quality for safety learning culture

Prof. Raphael Baumler

Head of Maritime Safety and Environmental
Administration

Singapore 31 August 2022

Outline

1. WMU in a nutshell
2. Feedback and feedforward need quality/diversity of data not only quantity
3. Current difficulties in collecting safety related data in shipping
4. Safety Learning Culture in link with SAFEMODE - H2020 EU project
5. Conclusion



1- WMU in a nutshell

WMU CHANCELLOR

“I have no hesitation to state that graduating from WMU was the foundation of my future career, and was one of the most important occasions in my life.”

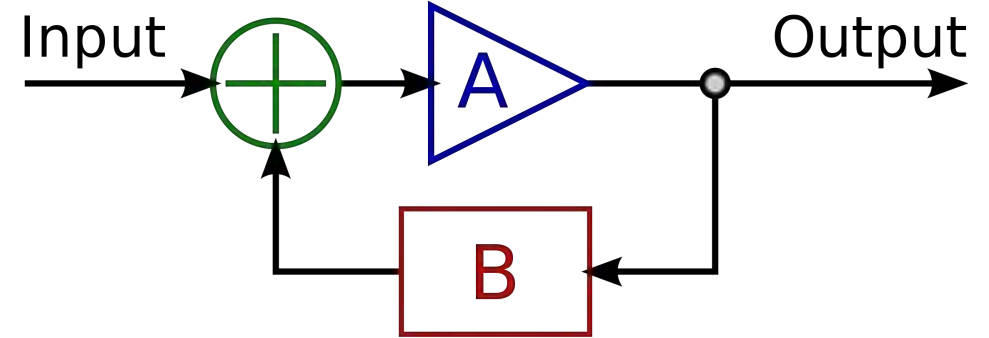
Mr Kitack Lim

Chancellor, WMU
Secretary-General, IMO
MSc, 1991 MSA(N)



2- Feedback and feedforward.
Quality and diversity of data are a must.

Feedback (post-adjustment)



HOW

- **Collect visible & pre-selected dataset** (event or data considered as relevant)
- AND/OR **quest for low intensity signals** informing about safety status (which signals to select as indicators)

WHY

- **Information** gathering **about past safety status**
- **Learning** tool to **analyze and conduct** complex systems in operation

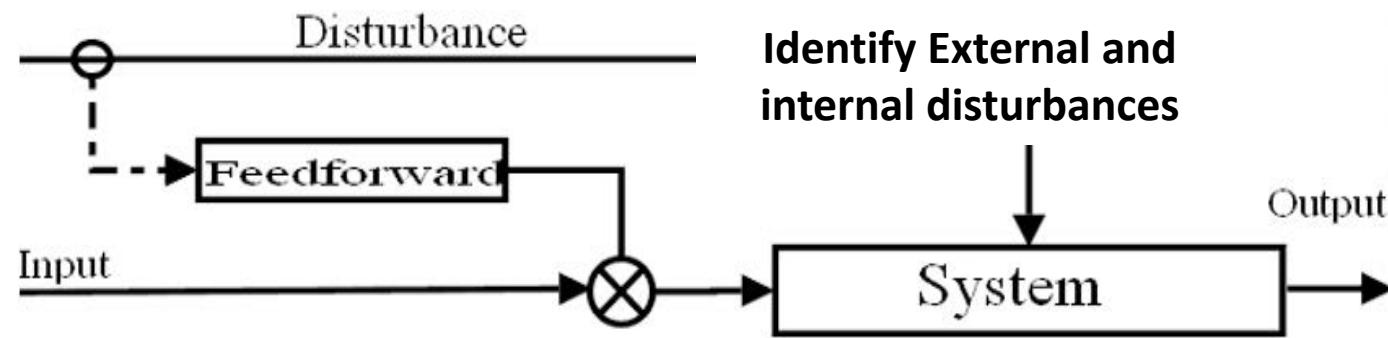
ULTIMATE GOALS

- Trigger **action/corrections** post-event (whenever possible)
- Facilitate continuous and **long-term improvements**

Powerful but some limitations:

- Post-events or sensors data lead to **reactive** response (limited anticipation)
- Collect **pre-selected dataset** considered relevant
- Focus on output but **do not question system's structure**
- Absolute dependence on **data quality** and quantity
- Automatic data collection requires **transformation of a qualitative phenomenon (safety) into numbers**

Feedforward (anticipation)



HOW

- Constant and qualitative **dialogue with the system** and its environment
- **Cooperation** between operators and decision-makers for **high-reliability data**

WHY

- Ascertain its **real condition** of good operation
- Identify potential **sources of disturbance** emerging from the environment OR affecting systems components (e.g., operators)

ULTIMATE GOAL

- **Anticipate** (pro-active)
- Sharing **the same agenda** and goals (**shared SA**)
- Acknowledge **complexity** in sociotechnical systems
- Question **internal structure** impacts on objectives

Acknowledge complexity and allow proactivity but some practical limitations:

- Permanent **research capacities**
- **Not only** simplistic **numbers**
- **Qualitative data** at the core and risk of subjectivity
- **Establish trust** between operators and management

3- Current difficulties in collecting safety related data in shipping

Post-accident data

Almost half of required casualty reports under IMO code not being submitted

Flag states shoot down move to speed up casualty investigations

Of almost 900 very serious maritime investigations over the last five years, just over half

investigation reports, writes Nidaa Baksh. A proposal by industry heavyweights to have a mandatory time frame included in the casualty investigation code was not supported by IMO member states despite repeated calls to be in line with the aviation industry's reporting standards.

Flag states reject proposal to improve casualty reporting

Nidaa Baksh: At a time when flag states are failing to submit casualty investigation reports, a move that maritime industry heavyweights have improved the situation has been thrown out on technical grounds

02 Aug 2022 | NEWS

IMO chief pledges to reverse casualty reporting deficit

IMO secretary-general Kitack Lim says the most notorious safety shortcomings

Time to get serious over reporting casualties

While very serious incidents at sea appear to be on the decline, according to data analysis by Lloyd's List, more needs to be done to get to a zero loss of life situation. One of the factors that improves safety is the filing of accident investigation reports by flag states to the International Maritime Organization so that trends may be spotted and action taken to avoid future tragedies. However, half of all mandatory reports still do not appear in the public database, which means lessons cannot be learned

20 Dec 2019 | INTERVIEWS

Written by

Anastassios Adamopoulos | @Anas

Richard Meade | @Lloydslisted | ric 30 Apr 2019 | ANALYSIS

Flag states still failing to submit casualty reports

Final report into the Wakashio casualty is still pending two years after the grounding caused an environmental disaster

26 Jul 2022

by Nidaa Baksh

Nearly 40% of governments are failing to meet reporting standards

“Nearly 40% of very serious casualties do not result in a flag state investigation being published, and even when governments do manage to file the mandatory reports, many of them fail to meet the basic standards set out for reporting” (LL, 26 July 2022)

Shoddy casualty investigations putting lives at risk

Our round-up of the week's top stories from the Lloyd's List news desk

28 Jul 2021 | ANALYSIS

by Declan Bush | @Declan_LL | declan.bush@informa.com

Compared with airlines, shipping gets off lightly

The aviation industry grounds aircraft at the merest suspicion of a design fault, while its UN agency insists on rapid investigations into major casualties. Shipping adheres to a rather less 21st Century attitude, David Osler argues

Prof. Raphael Bau

12 Mar 2019 | NEWS

Incidents and near-misses reporting

University of Plymouth

PEARL

Faculty of Arts and Humanities

<https://pearl.plymouth.ac.uk>

Plymouth Business School

2018-03-07

Decoupled implementation? Incident reporting in Chinese Shipping

Xue, C

<http://hdl.handle.net/10026.1/10571>

10.1177/0143831X18758175

Economic and Industrial Democracy

WUJ Man Affairs (2019) 40:167-181
DOI 10.1007/s13437-011-0011-0

ARTICLE

Incident reporting in Finnish shipping companies

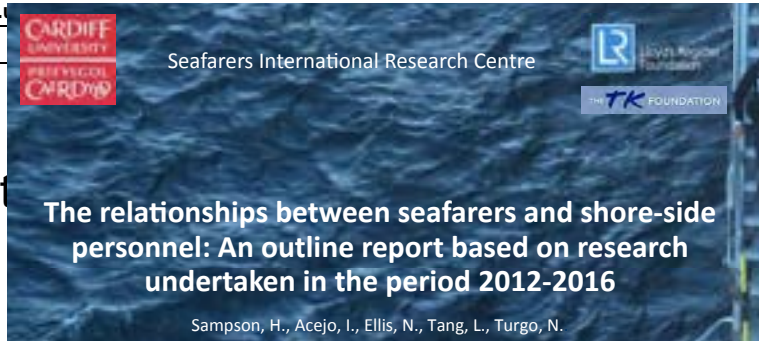
Jouni Lappalainen • Anne Vepsäläinen • Kim Salmi • Ulla Tapaninen

Safety Science 49 (2011) 331-338

Contents lists available at ScienceDirect

Safety Science

journal homepage: www.elsevier.com/locate/ssci



'Between a Rock and a Hard Place': The Implications of Lost Autonomy and Trust for Professionals at Sea

Helen Sampson
Cardiff University, UK

Nelson, T

Cardiff U

TRANSNAV

<http://www.transnav.eu>

the International Journal
on Marine Navigation
and Safety of Sea Transportation

Volume 13

Number 3

September 2019

DOI: 10.12716/1001.13.03.24

Iris A
Cardiff U

Neil I
Cardiff U

The Importance of Reporting All the Occurred Near Misses on Board: The Seafarers' Perception

G. Georgoulis & N. Nikitakos
University of the Aegean, Chios, Greece

Lijun
Plymouth

Sociological factors influencing the practice of incident reporting: the case of the shipping industry

Syamantak Bhattacharya
Plymouth Business School, University of Plymouth, Plymouth, UK

Abstract

Purpose – The purpose of this paper is to present the ways in which underlying social and organisational factors and employment relations underpin the practice of incident reporting in the international shipping industry.

Design/methodology/approach – The paper uses a qualitative case study method involving field trips to two shipping organisations and sailing on research voyages on two ships of each of the organisations. It draws on empirical data using semi-structured interviews, notes from fieldwork observations and documentary analysis of company policies, procedures and practices.

Near Miss Reporting Lacking in the U.S.



BY CAPTAIN RICHARD MADDEN (<https://maritime-executive.com/author/captain-richard-madden/>)
MADDEN | 2018-04-21 19:20:07

Prof. Raphael Baumler - WIVU

Reporting practices in merchant shipping, and the identification of influencing factors

H.A. Oltedal*, D.P. McArthur

Other feedback e.g., case study of fatigue monitoring

QUALITY OF DATA INPUT

THE RELATIONSHIP BETWEEN RECORDED HOURS OF WORK AND FATIGUE IN SEAFARERS

Paul Allen, Emma Wadsworth & Andrew Smith

Centre for Occupational and Health Psychology, Cardiff University, 63 Park Place, Cardiff CF10 3AS

A range of seafarers working on different vessels were asked as part of a questionnaire survey whether they had ever deliberately under-recorded their working hours to comply with regulations. Compared on six measures of health and fatigue the 40% of respondents who admitted at least occasionally to under-reporting their hours worked...

A Culture of Adjustment

Evaluating the implementation of the current maritime regulatory framework on rest and work hours

SHS Web of Conferences 30, 00004 (2016) DOI: 10.1051/shsconf/20163000004
Int. Conf. SOCIETY. HEALTH. WELFARE. 2014

Optimization of work and rest hours for navigation officers on the ship

H. Simkuva¹, A. Purins¹, S. Mihailova², and I.J. Mihailovs²
¹ Latvian Maritime Academy, Riga, Latvia
² Riga Stradins University, Riga, Latvia



Seafarers Work and Rest Hour-Logging Adjustment in the systems

Bachelor thesis for Marine Engineering Program

GUSTAV COLLIANDER
HENRIK OLSSON

DEPARTMENT OF MECHANICS AND MARITIME SCIENCES
CHALMERS UNIVERSITY OF TECHNOLOGY
Göteborg, Sweden, 2021

Executive Summary and Recommendations



Prof. Raphael Baumlér

Fatigued for safety? Supply chain occupational health and safety initiatives in shipping

Syamantak Bhattacharya
International Shipping and Logistics, School of Management, Plymouth University, UK

Lijun Tang
Seafarers International Research Centre, Cardiff School of Social Sciences, Cardiff University, UK



REPORT OF THE MARINE BOARD OF INVESTIGATION INTO THE STEAM SHIP EL FARO (O.N. 561732) SINKING AND LOSS OF THE VESSEL WITH 33 PERSONS MISSING AND PRESUMED DECEASED NORTHEAST OF ACKLINS AND CROOKED ISLAND, BAHAMAS ON OCTOBER 1, 2015



Contents lists available at ScienceDirect
Marine Policy
journal homepage: <http://www.elsevier.com>



Economic and Industrial Democracy 34(3) 383-399
© The Author(s) 2012
Reprints and permissions: sagepub.co.uk/journalsPermissions.nav
DOI: 10.1177/0143831X12439760
eid.sagepub.com
SAGE

Ship first: Seafarers' adjustment of records on work and rest hours

Raphael Baumlér*, Bikram Singh Bhatia, Momoko Kitada
World Maritime University, Malmö, Sweden

ARTICLE INFO

ABSTRACT

The article explores the recordkeeping practices of seafarers concerning the implementation of work and rest hours' regulations. In particular, it considers what motivates seafarers to hide their violations through record



Other feedback e.g., container content & weight

QUALITY OF DATA INPUT

Report on the investigation of the structural failure of **MSC Napoli** English Channel

“The audit of the containers removed from *MSC Napoli* and the deadload calculated on departure, indicate that the **declared weights of many** of the containers carried by the vessel were **inaccurate.**” (MCA, 2008)

January 2007

High-profile box spills double normal annual total

IUMI cargo committee chair highlights recent major casualties, accumulation-risk and riot claims in wake of rise of social justice movements

11 Feb 2021 | ANALYSIS
by David Osler | @finance_LL | david.osler@informa.com



Analysis of accidents and incidents occurring during transport of packaged dangerous goods by sea
Joanne Ellis*
SSPA Sweden AB, P.O. Box 24001, SE-400 22 Göteborg, Sweden

ARTICLE INFO
Article history:
Received 21 August 2010
Received in revised form 28 February 2011
Accepted 1 April 2011
Available online 27 April 2011

ABSTRACT
The release of packaged or containerized dangerous goods during transport can have serious consequences on board a ship. This study was focused on identifying factors contributing to these types of releases and on investigating the contribution of dangerous goods accidents to overall container ship accident rates. Records of dangerous goods releases from a US and a UK database for an 11-year period covering 1998–2008 were analysed to identify and categorize main contributing factors. The majority of releases, estimated as 97% of the US events and 94% of the UK events, did not follow another primary accident type such as a collision. Faults that occurred during activities such as preparation of the goods for transport, packaging, stuffing containers, and loading the ship were main factors contributing to the release of the dangerous goods on board the ship. For container ship casualties occurring worldwide during the same period, 1998–2008, accidents involving packaged dangerous goods were estimated to account for 15% of all fatalities. Self-ignition or ignition of incorrectly declared dangerous goods was identified as a contributing factor for the fatal accidents. Ensuring that dangerous goods are correctly prepared and documented for marine transport is thus very important for preventing releases and improving on board safety.

Bangladesh inland container terminal fire leaves 49 dead

Death toll includes firefighters sent to quell the blaze following suspected dangerous goods explosions

06 Jun 2022 | NEWS
by James Baker | @JamesBakerCI | james.baker@informa.com

Unmarked dangerous goods have been implicated as the cause of an explosion. Initial firefighting efforts were unaware that chemicals were present

Large explosion and fire on containership at Jebel Ali port

The fire on board a containership anchored to authorities

08 Jul 2021 | NEWS
by Inderpreet Walia | @w_inderpreet | nderpreet.walia@informa.com

X-Press Pearl operator says master bailed following court hearing

Sri Lanka is reported to be seeking \$40m in interim compensation from operator X-Press Feeders, partly to cover firefighting costs. Clean-up efforts continue

15 Jun 2021 | NEWS
by Lloyd's List

No casualties have been reported, according to a Sri Lankan newspaper. The Russian master of the fire-stricken boxship X-Press Pearl was released on bail after appearing in court without charge, according to the vessel's container holding 'flammable material' owner

CCC 8/INF.2 Annex, page 1

SUMMARY OF COUNTRY REPORTS 2021

Reporting country	Number of Units Inspected	Units with deficiencies		Documentation
		Number	Percentage	
Chile	3681	108	2.92%	36
Republic of Korea	8537	393	4.60%	-
Finland	446	36	8.07%	-
United States	51619	3260	6.32%	-
Total	64283	3797	5.91%	36

Cocaine Seized from Container Carried By Maersk Ship in Australia

Australian police have seized cocaine worth more than \$195 million transported by a Maersk ship in Sydney's Port Botany.

Australian Border Force (ABF) officers discovered the drugs of shipping containers on *MY Maersk Inverness*, which had some 700 kilograms in total—was found packaged in denim described as containing wood products.

Chemical leak reported on boxship

Fire crews called to Southampton after incident on Vecchio Bridge.

Firefighters were called to the port of Southampton in the UK after chemicals leaked from a container.

The box was on board the 4,738-teu Japanese vessel *Vecchio Bridge* (built 2005), the Daily Echo reported.

Misdeclared cargoes accounting for more container fires

Container fires started by cargoes that are not what they are claimed to be are more widespread than statistics show. If one takes near-misses into account, the figure is closer to one fire per week being largely doused by crews

14 Nov 2019 | NEWS
by Nidaa Bakhsh | @LloydsListNidaa | nidaa.bakhsh@informa.com

Prof. Raphael Baumler - WMU

“Approximately **5% of containers** shipped may consist of **undeclared dangerous goods...**”

(Capt. Rahul Khanna, global head of marine risk consulting at Allianz Global Corporate & Specialty in LL, 23 Aug. 2022)

Total losses in the single digits for the second time in seven years

Analysis of second-quarter casualty reports shows unusually low losses but increased levels of collisions and fires

23 Aug 2022 | **ANALYSIS** | 

by **Bridget Diakun** | @bridget_diakun | Bridget.Diakun@informa.com

Despite only nine total vessel losses being recorded in the second quarter, Lloyd's List Intelligence casualty report analysis shows a growing number of casualties involving fires, an area of significant concern for many shipowners and insurers

No risk
management
possible without
data quality

Expert article 1388 Baltic Rim Economies, 13.11.2013

Quarterly Review 6•2013

Containership gigantism – reaching the limits of uncertainty

By **Raphaël Baumler**

In July 2013, the largest containership ever began its operations. Once more and since 1996, the Danish company Maersk sets containership standards by launching triple-E class which means "Economy of scale, Energy efficient and Environmentally improved" design. Soon after, other companies declared their intention to embrace the race to gigantism. For the time being, this strategy of economy of scale seems successful. The Ultra Large Container Ships (ULCS) category is expanding in size and number. An economic approach (reduction of container slot price) combined with an environmental communication policy (reduced air emissions by slot) justify this tendency.

However, ULCS ships do not exist in isolation: they

Misdeclaration of dangerous goods constitutes one of the main risks affecting safety. Fire and explosion causing extensive damages have been observed. In addition, several security issues have been documented. In this respect, in its 2012 report on Maritime Transport and Destabilizing Commodity Flows, the Stockholm International Peace Research Institute (SIPRI) highlighted the growing use of containerization to traffic of arms. SIPRI declared that control deficiency in the container trade permits unlawful activities to flourish. Drug, waste and human trafficking have also been reported. Moreover, on larger ships, the amount of containers carried increases uncertainty levels and may seriously affect ships' resilience – e.a. the absolute weight gap between declared

For a 4.000 TEUs ship, it makes 200 Containers
And a 20.000 TEUs, it makes 1.000 Containers

IN CONSEQUENCE

No feedback mechanism nor
model nor risk analysis
without quality data

Data/reporting reliability – a matter of trust

STRENGTHENING reporting and data quality by establishing trustful relationships:

- Eliminate fear and reassure / build trust and respect
- Recall vital priorities / Caring for operators
- Change practices and habits / establish long-term commitment
- Establish a learning culture

4- Safety Learning Culture in link with SAFEMODE - H2020 EU project

SAFEMODE Project Consortium



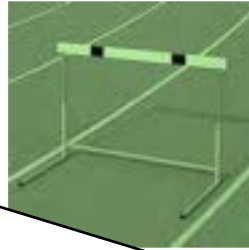
Leaders & participants of the safety learning culture activity



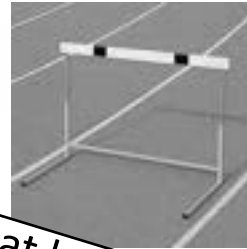
Assessment of:



Investigation



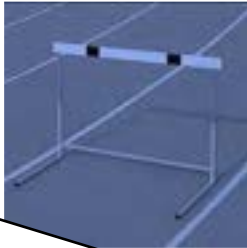
Reporting



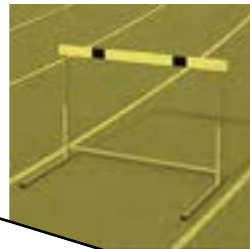
What keeps ship safe



Near miss Reporting



Safety Management System



Understanding Human Element



Just Culture



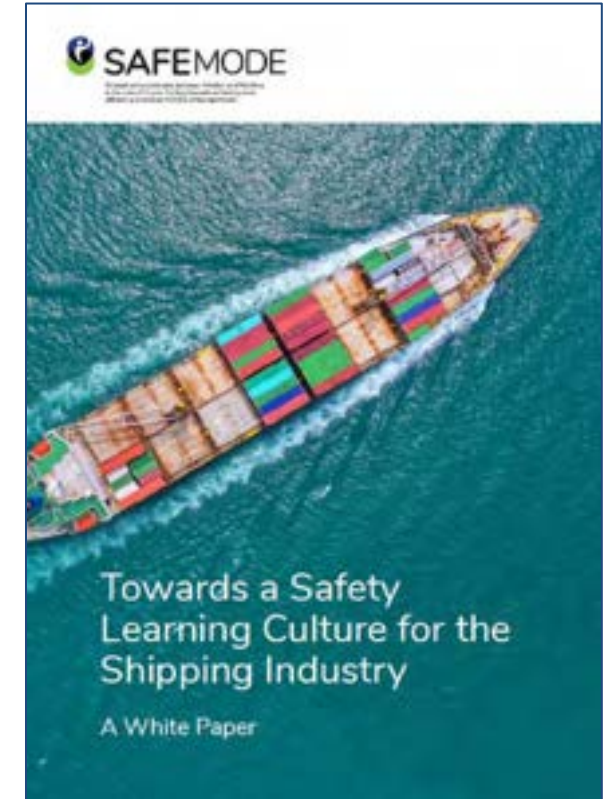
Safety Learning

Via Investigator and Seafarer Interviews

“There needs to be a **Culture** framework put in place in Maritime to facilitate **reporting**, and thus **learning**.”



- To choose **learn over blame**
- To build **trust** and improve **operational safety**
- To obtain more **accurate and consistent understanding** of the critical factors leading to incidents and accidents
- To avoid incidents and accidents via more **systemic accident prevention strategies** that go beyond isolated events
- To ensure **learning occur at all levels**, whether on the ship, onshore, across the fleet, across a segment of the industry, or throughout the industry as a whole



5- Conclusion

Quest for **data reliability** and quality

Focus on **work realities**

Support **qualitative research** to complement numbers

Learning instead of blaming

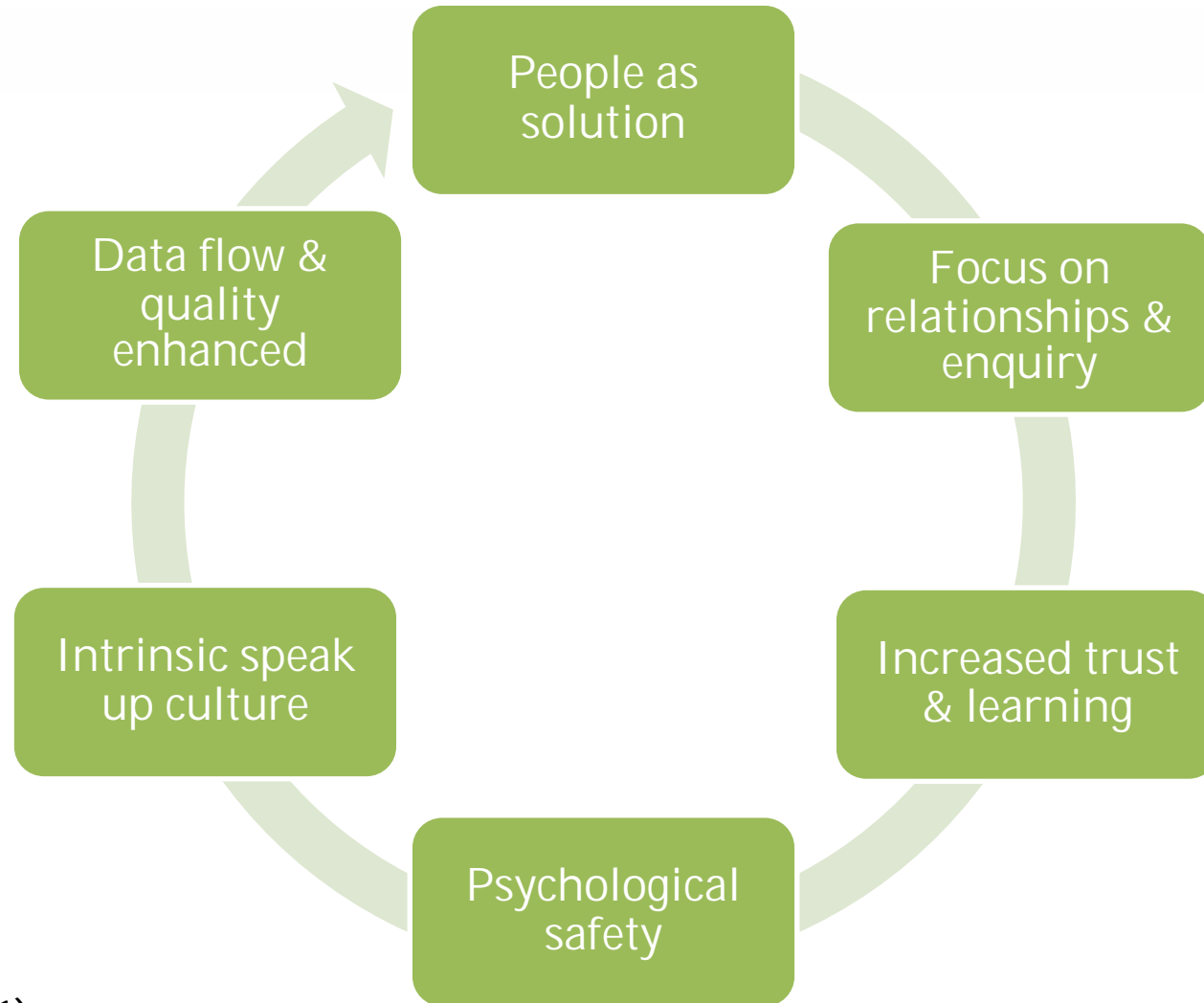
Build trust and enhance **cooperation**

(operators/designers/managers) for quality feedback

Develop **systemic approach** (feedforward)

**Learning is everywhere BUT
identify problems before imposing solutions**





(The Trust loop.
Adapted from C. Lloyd, 2021)



*“It's said that a wise person learns from his mistakes,
a wiser one learns from others' mistakes, but the
wisest person of all learns from others' successes.”*
— John C Maxwell

Prof. Raphael Baumler
rb@wmu.se

Thank you for your attention