Addressing Causes of Human Errors

Chris Travers

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Relevant Summary Thus Far

- ► Human Error is Non-Deterministic, but
- ► Human Error is usually systemic
- ► Changing the system can address human error

So how do we go about doing this?

Context

The "System" here includes:

- Organizational Culture
- Working environment and setup
- Working processes
- Demands of the job

Think about this like software but we are components

Beyond Blameless Culture

Move towards a "just culture" where

- Systemic causes of human error are front and center, but
- Unreasonable breaking of standard operating procedures is still called out, yet
- Operators still get every benefit of the doubt in the investigation
- Where standard operating procedures are built by those following them

This requires noting departures from SOPs in postmortems and also discussing their justifications. In most cases departures from SOPs may be an indication that the SOP is broke or that organizational culture needs some work.

Stage 1: Starting

Fixing organization issues often is harder than fixing software because it often requires more buy-in from key individuals.

- ▶ Cover human factors routinely in every postmortem investigation
- ▶ Track high impact human error causes (like fatige) so financial costs can be evaluated
- ▶ Encourage tracking and invesigation of near misses also
- ▶ Begin discussions of how to fix human problems

Stage 2: Formalising Human Factors Approaches

1. Obtain or build training (initially 3 days, 5 for trainers, 1 day annually).
2. Qualify in-house experts and trainers
3. Use such experts in the postmortem investigation process

Setting Expectations for Yourself

Change doesn't happen overnight

- ▶ Showing that there is a problem can take a while
- ▶ Getting buy-in for solutions can also take time
- ▶ Expect that these will be long journeys, not quick changes
- ▶ Getting organizational buy-in can take a lot of time

Implementing Quick Wins

- NITS
- Bishop's Framework (next slide)
- Rest periods after on call
- Leadership training for on-call engineers

Bishop's Framework

Originally for firefighting, this framework improves clarity of interventions upwards. Interventions are discussed in five parts:

1. Attention-getting greeting
2. Observation
3. Concern
4. Intentions
5. Buy-in

Bishop's Framework Example

1. Hi Robert,
2. I am noticing replication lag is up on our Postgres systems
3. I am worried that we may exhaust disk space
4. I would like to throttle the inbound API endpoints while we investigate.
5. What do you think?

Individual Exercise

Look back to case in your career where you had to propose controversial measures and ask buy-in. Try framing them using Bushop's Framework.

Swiss Cheese Analysis

Originally designed for medical errors, this has become the primary accident model in safety-critical industries including aviation.

- ▶ Safety barriers are seen as swiss cheese slices with dynamic holes
- ▶ Every barrier has holes, and these are always changing
- ▶ Accidents happen when the holes line up and a hazard makes it all the way through

Group Exercise, part 1

Revisit flipboard from first day, see how it looks, if there are additions or things to remove

Group exercise part 2

Work your way through, as a group, the flipboard accident causes and discuss possible organizational or ergonomic fixes.