



Fundamentals of Reliability Testing

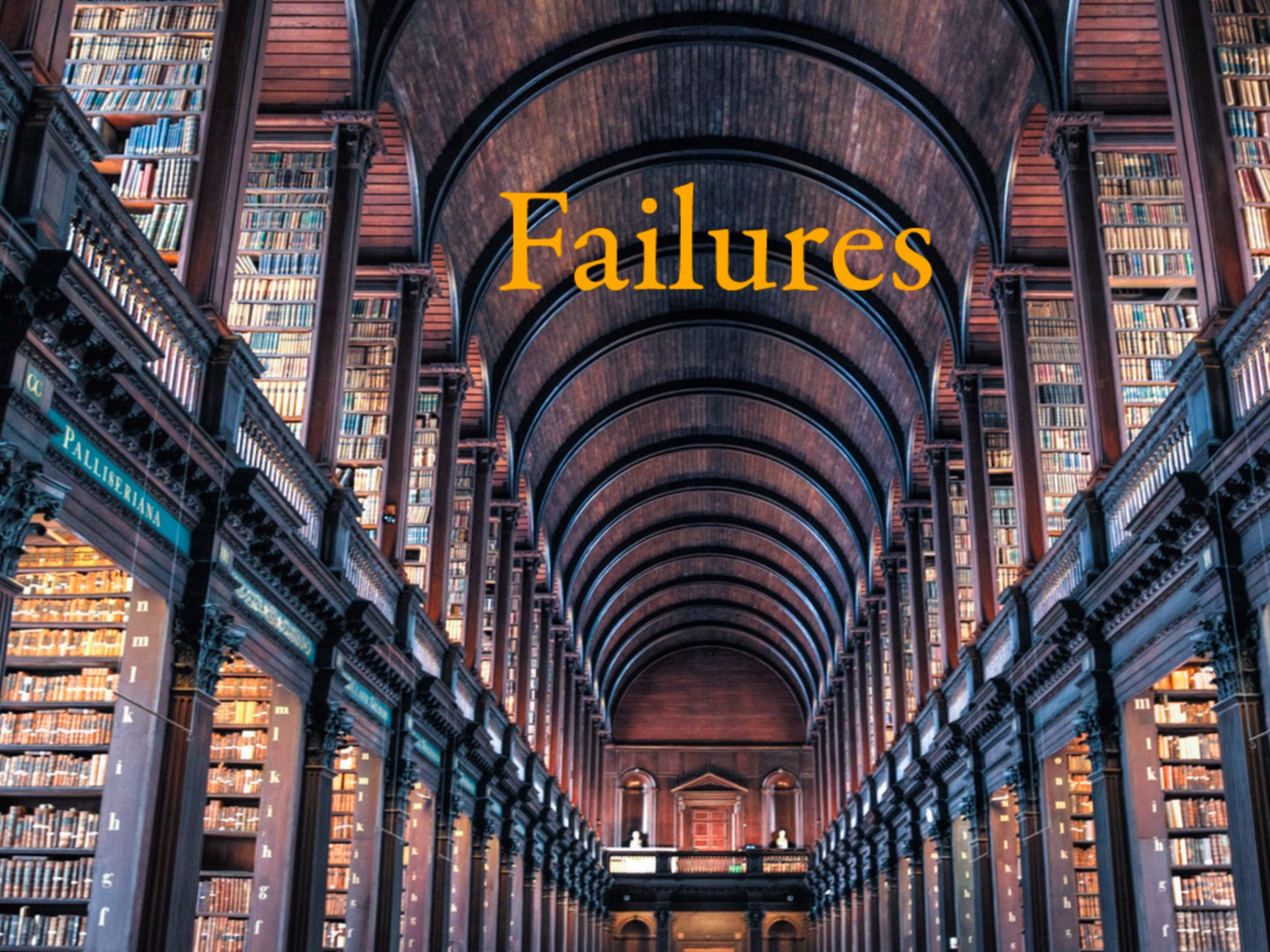
Fred Schenkelberg

Testing

A photograph of a library aisle. On the left, tall metal bookshelves are filled with books. On the right, a series of warm-toned incandescent light bulbs hang from the ceiling, creating a soft, ambient glow. The perspective is looking down the length of the aisle, which recedes into the distance.



Failures



What is the purpose
of reliability testing?

Testing Purposes



Verify



Discover



Decisions

Verify Performance



Check the design against specs

Function under expected conditions

Does it do what it is supposed to do?

Discover Problems



Does the product work as expected?

Failure are good, but not too many

Chip away at what we don't know

To Make Decisions



Generate data and
information

Testing is not the purpose to testing

Decisions need good enough
information

What can you do

instead of testing?

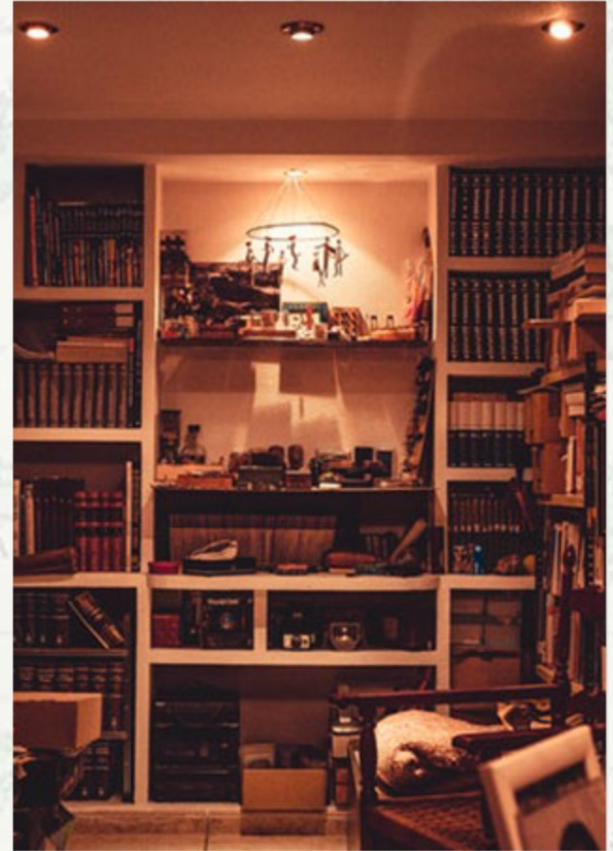
What Testing to Run



Risks



Costs



Critical

Risks & Unknowns



Areas of little margin

Known problems (solved?)

Red flag areas

What can you learn
through testing?

Costs & Time



Testing is expensive

Testing takes time

other constraints?

Consider the constraints

Critical Decisions



Focus on important, not
urgent

There are plenty of testing possibilities
Not all connect to critical decisions

Is every test

of the same value?

Specific Testing Types



OOB



Environ



Discover



Life

A historical map of Australia, showing the continent and surrounding waters. The map is titled 'NEW HOLLAND' and includes labels for 'TASMANIA', 'VAN DIEMEN'S LAND', and 'NEW HOLLAND'. The text 'Shipping Out of Box Installation' is overlaid in a large, orange, serif font. The map also shows the 'INDIAN OCEAN' and 'SOUTH OCEAN'.

Shipping Out of Box Installation





Environmental Use Profiles Unexpected

Discovery HALT MOEST Margin



Life Accelerated Durability Robustness



Where or when do

field failures occur?

Meaningful Testing

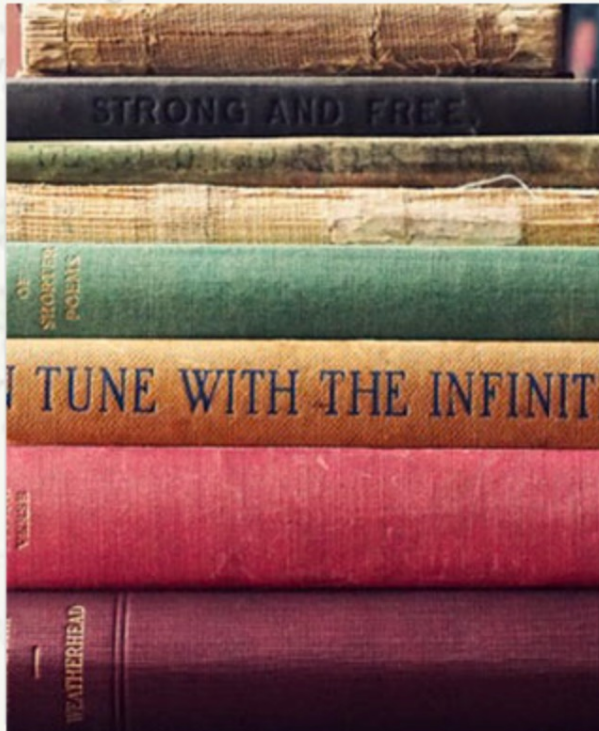


Is...

Is not...

Focus on...

Meaningful Testing Is



timely

informative

what else?

How to create or identify
meaningful testing

Meaningful Testing Is Not



How to spot less than
useful testing

late

devoid of information (small sample
size, no failures, lack of model, ...)

what else?

Focus on Decisions



The goal is to inform decisions

Does the possible outcomes all provide useful information?

no failures

some failures

expected results

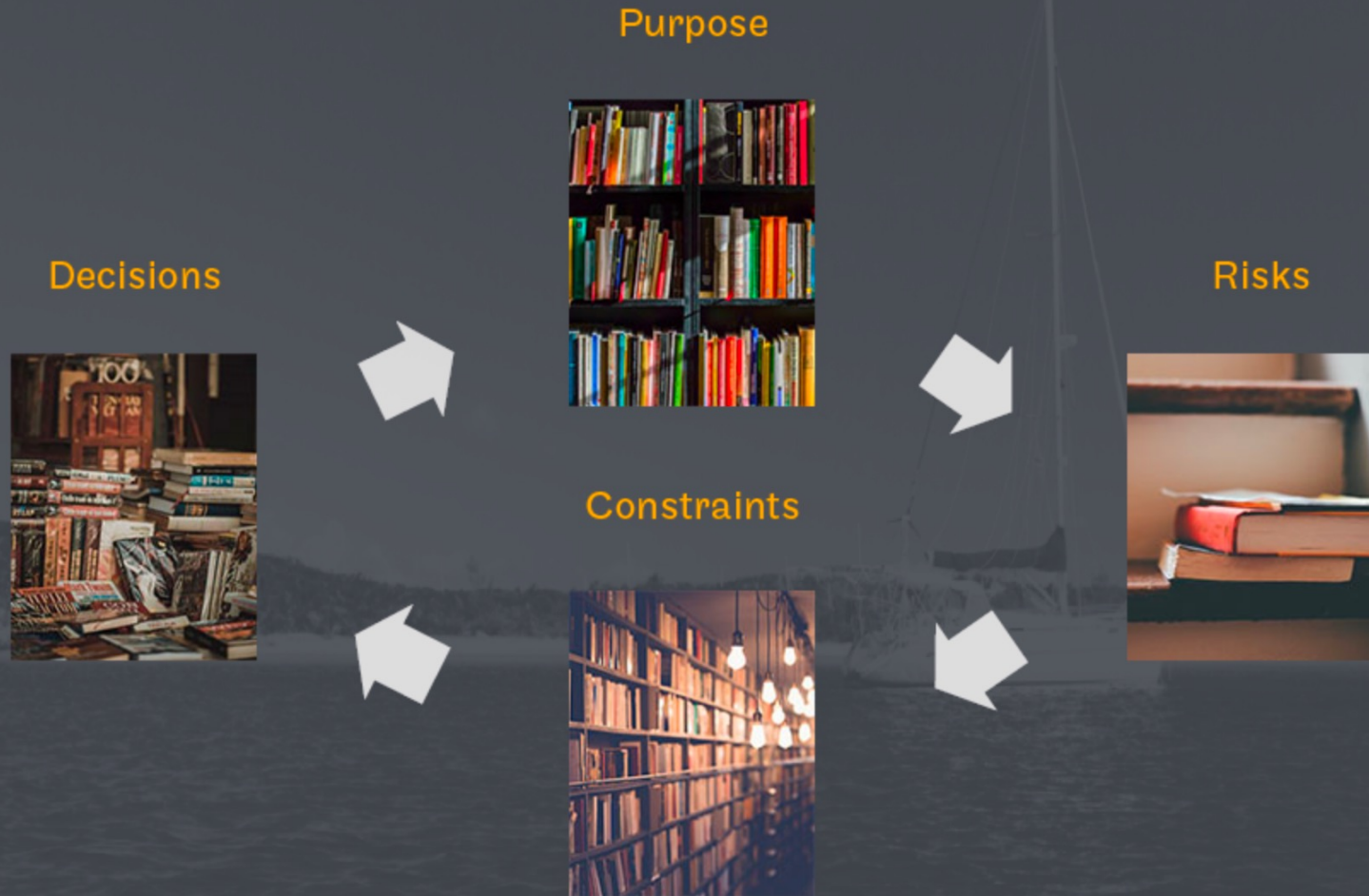
unexpected results

The goal of testing is to inform a decision

Do you have
improvements

to make in your
testing program?

In Summary



More Information

Visit [AccendoReliability.com](https://www.AccendoReliability.com)

Let me know if you have any questions.

Check out the reliability engineering podcast network at [Reliability.FM](https://www.Reliability.FM)

Let's only perform essential reliability testing.