

The background features a gradient from green at the top to blue at the bottom. On the left side, there is a large, semi-circular scale with tick marks and numbers ranging from 140 to 260. Overlaid on this are several circular patterns, some solid and some dashed, with arrows indicating a clockwise direction. The main text is centered on the right side in a white, sans-serif font.

THE DESIGN OF EVERYDAY THINGS,  
DON NORMAN  
CH4:  
HUMAN ERROR?  
NO, BAD DESIGN

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# WHY IS THERE ERRORS?

- Errors emerge because of poorly-design task that requires unnatural behavior from the user.
- People fear punishment after committing the error and they avoid to report the problem.
- When the higher people look for the error, we usually stop when we find the person who made the mistake. THIS IS WRONG

# ROOT CAUSE ANALYSIS

- Root cause analysis is investigating the accident until the single cause is found. Its purpose is to find what caused the error to happen.
- We shouldn't stop when we find the person to blame, but investigate why did the person fail.
- It is flawed for 2 reasons:
  - The Swiss cheese model of accidents
  - We keep stopping when we can fire a human to blame.

# HOW TO CONDUCT A ROOT CAUSE ANALYSIS?

## The Five Whys:

- It was developed by Japanese.
- It requires to keep asking the "why" question until you uncover the true underlying cause.

# BLAMING THE USER

- Engineers are egomaniacs and thinks the other are always at fault for misuse of their product.
- This idea is anchored in people's brain.
- A good system should provide constraints to prevent the user from making errors at all.

# DELIBERATE DEVIATIONS

- Routine violations
- Situational violations
- Taking risks for higher rewards
- Violate protocol to be more efficient.

# WHAT ARE SLIPS?

- When a person intends to do one action and ends up doing something else.
- Memory slips.
- Action slips.

# WHAT ARE MISTAKES?

- When a user fails to perform the right action
- Memory based
- Knowledge based
- Rules based
  
- MISTAKES AND SLIP ARE NOT ALWAYS USER'S FAULT



# CLASSIFICATION OF SLIPS

- Capture slips
- Description-similarity slips
- Memory-lapse slips
- Mode-error slips

# SOCIAL AND INSTITUTIONAL PRESSURES

- If you work at a company, you have enormous pressure to succussed and if you do, the expectations for the next step are even higher. Error will be inevitable.
- Cheating on exams to success academically to fulfill parents need to brag about you. More pressure if you have successful brothers.
- Stupidity

# HOW TO REPORT ERRORS?

- When we detect errors and record them, we can improve the product by limiting them and eliminating them.
- People are afraid to report errors because of punishment.
- We should change this culture. People should be punished when they fail to report instead.

# HOW TO DETECT ERRORS?

- Errors can only be detected if there is feedback.
- We shouldn't ignore mistakes.
- We expect the future to be like the past, even if the past was abnormal.

# HOW TO DESIGN FOR ERRORS

- Warning and error messages
- Provide enough signifier to prevent wrong usage
- Addressing interruption
- Adding constrains to block errors
- Undo
- Confirmation messages
- Sensibility checks
- Minimizing slips

# PEOPLE ARE AT FAULT SOMETIMES

- People insist on doing tasks when disabled ( show pic of bad use while drunk)
- People insist on doing task that they are not physically able to do
- People insist on figuring stuff out by themselves
- People insist on doing stuff that they don't have competences for
- People ignore safety procedure for the sake of time
- People feel invulnerable

# RESILIENCE ENGINEERING

- Designing to accommodate unusual circumstances
- It could mean altering the design
- Usually because of emergencies

# THE PARADOX OF AUTOMATION

- For automation to work, all conditions must be perfect
- Machines cannot differentiate between the right and wrong thing to do
- No design made for failure cases
- Cannot be done for very complex task



THANK YOU