



# Human-in-the-Loop

## DevOps

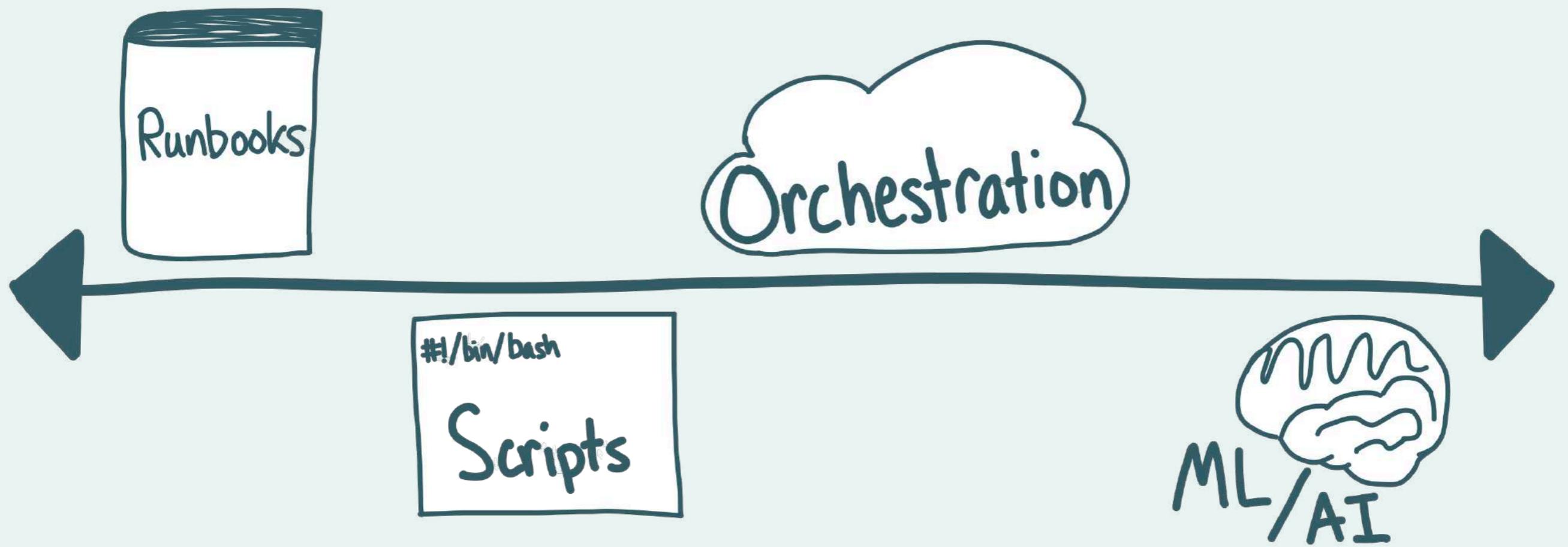
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What exactly is  
automation?

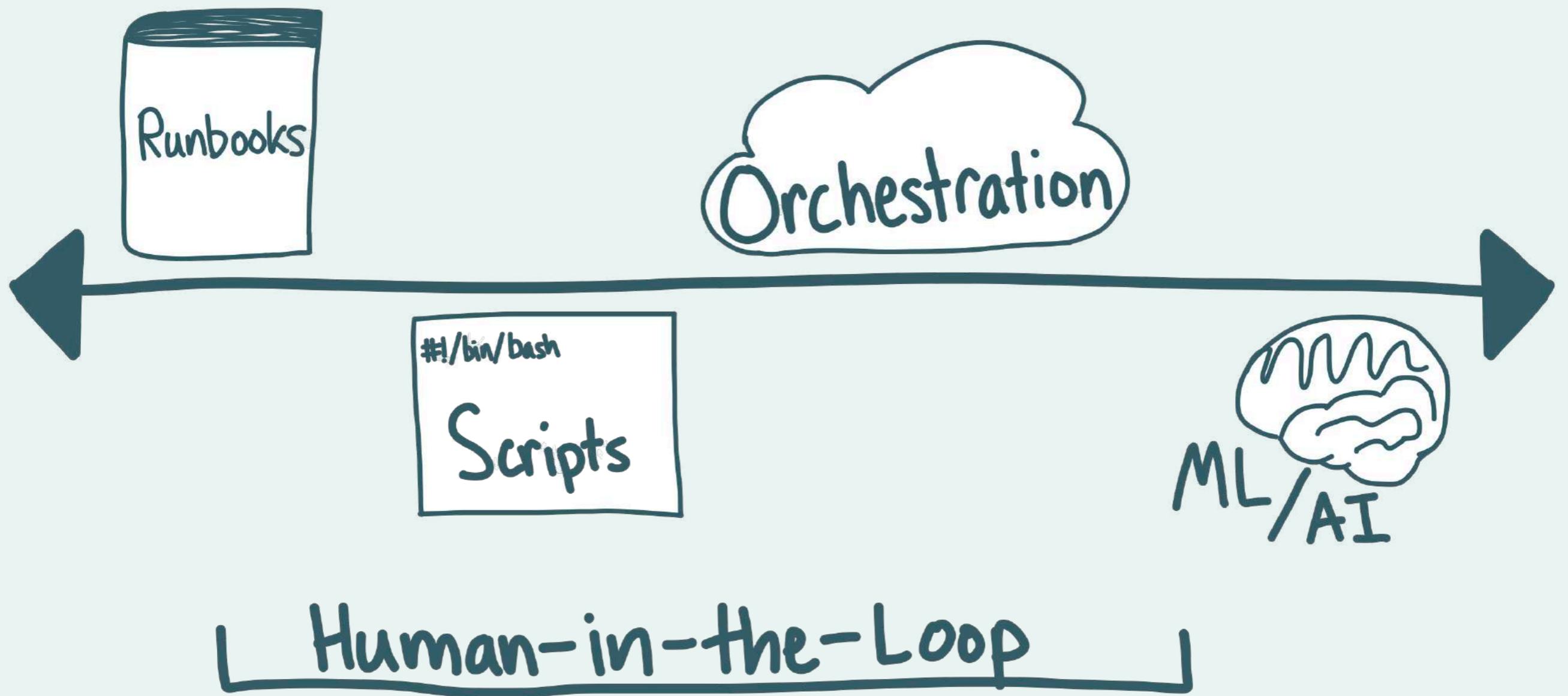
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Taylor Barnett

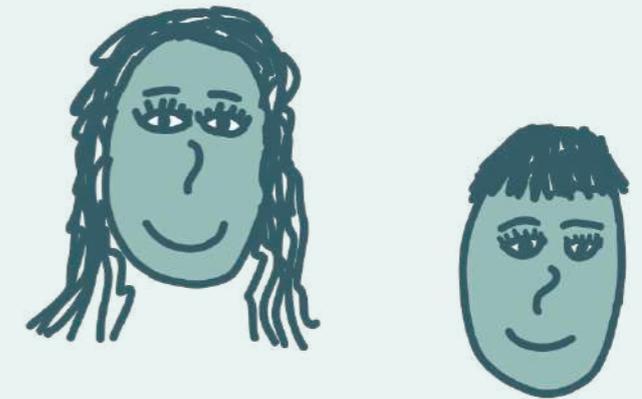
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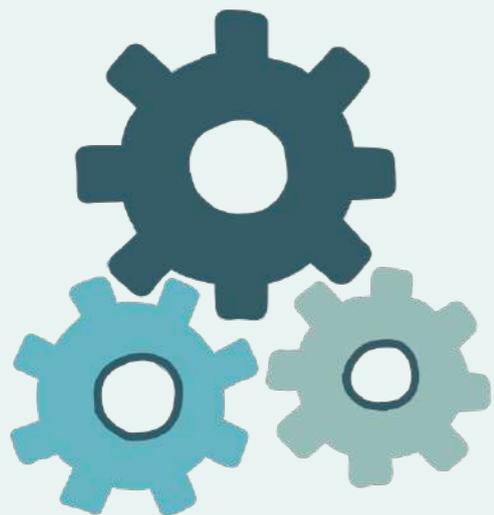


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What is Human-in-the-Loop  
DevOps?



When humans intersect  
at critical decision points



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"#12 Human practitioners are the adaptable element of complex systems"

— How Complex Systems Fail,  
Richard I. Cook, M.D.

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"It depends..."

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"This paper suggests that the increased interest in human factors among engineers reflects the irony that the more advanced a control system is, so the more crucial may be the contribution of the human operator."

Automatica, Vol. 19, No. 6 pp 775-779, 1983

Brief Paper

# Ironies of Automation

LISANNE BAINBRIDGE

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In conclusion: "... possibility that resolving them will require even greater technological ingenuity than does classic automation."

Automatiza, Vol. 19, No. 6 pp 775-779, 1983

Brief Paper

# Ironies of Automation

LISANNE BAINBRIDGE

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End-to-end automation breaks  
down in other ways too:

- Can't redirect or tell end-to-end automation to focus on something specific
  - ↳ Basis of coordination in sociotechnical systems
- Unable to see the larger sociotechnical system

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above  
the line

line of  
representation

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code

databases

orchestration

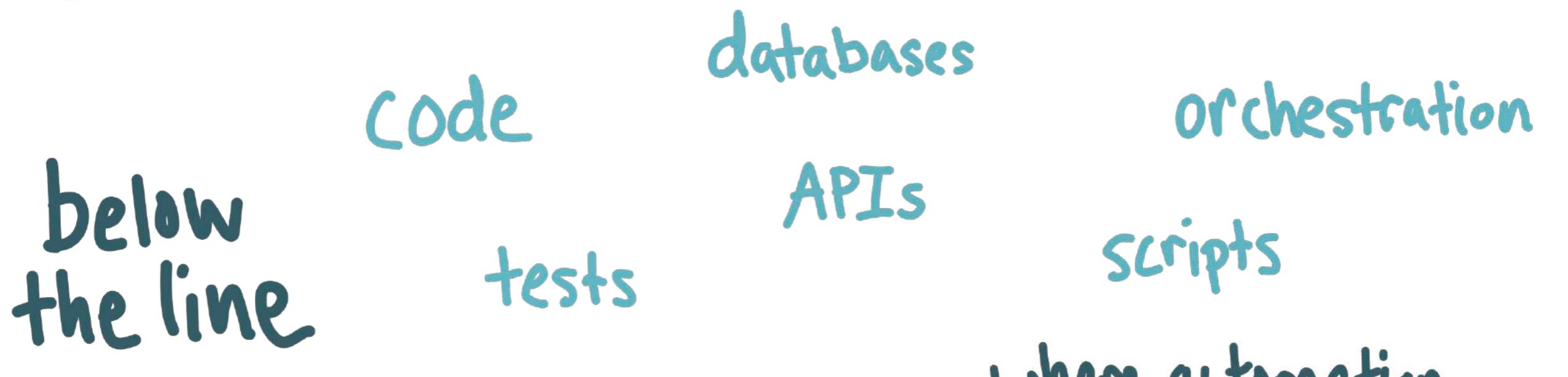
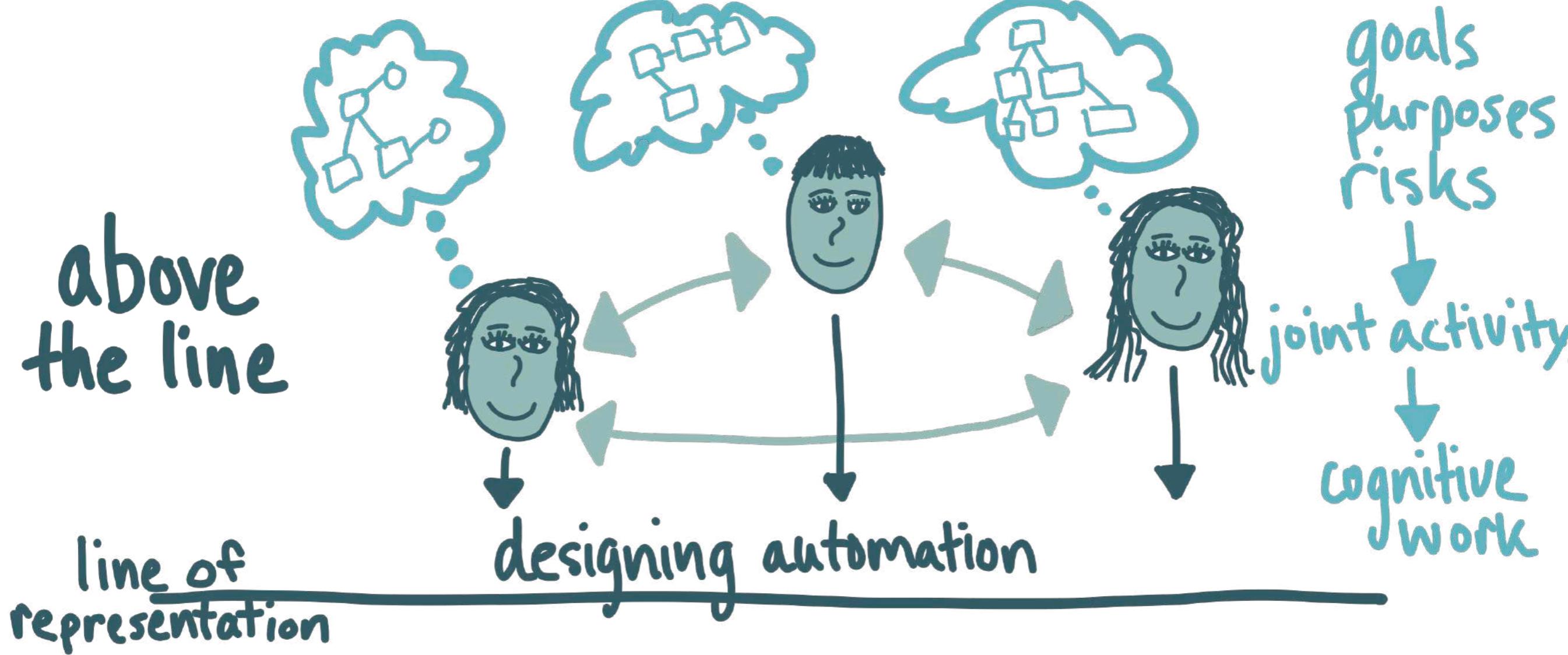
below  
the line

tests

APIs

scripts

From Richard I. Cook, M.D.



From Richard I. Cook, M.D.

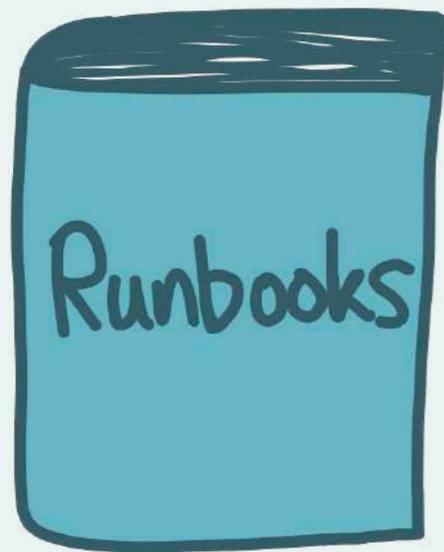
where automation is running

# Human-in-the-Loop

## Examples

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Example #1

# Interactive Runbooks

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Inspired by "Ironies of Automation"

- Instructions and advice
- Mitigate human error
- Access to data and tools

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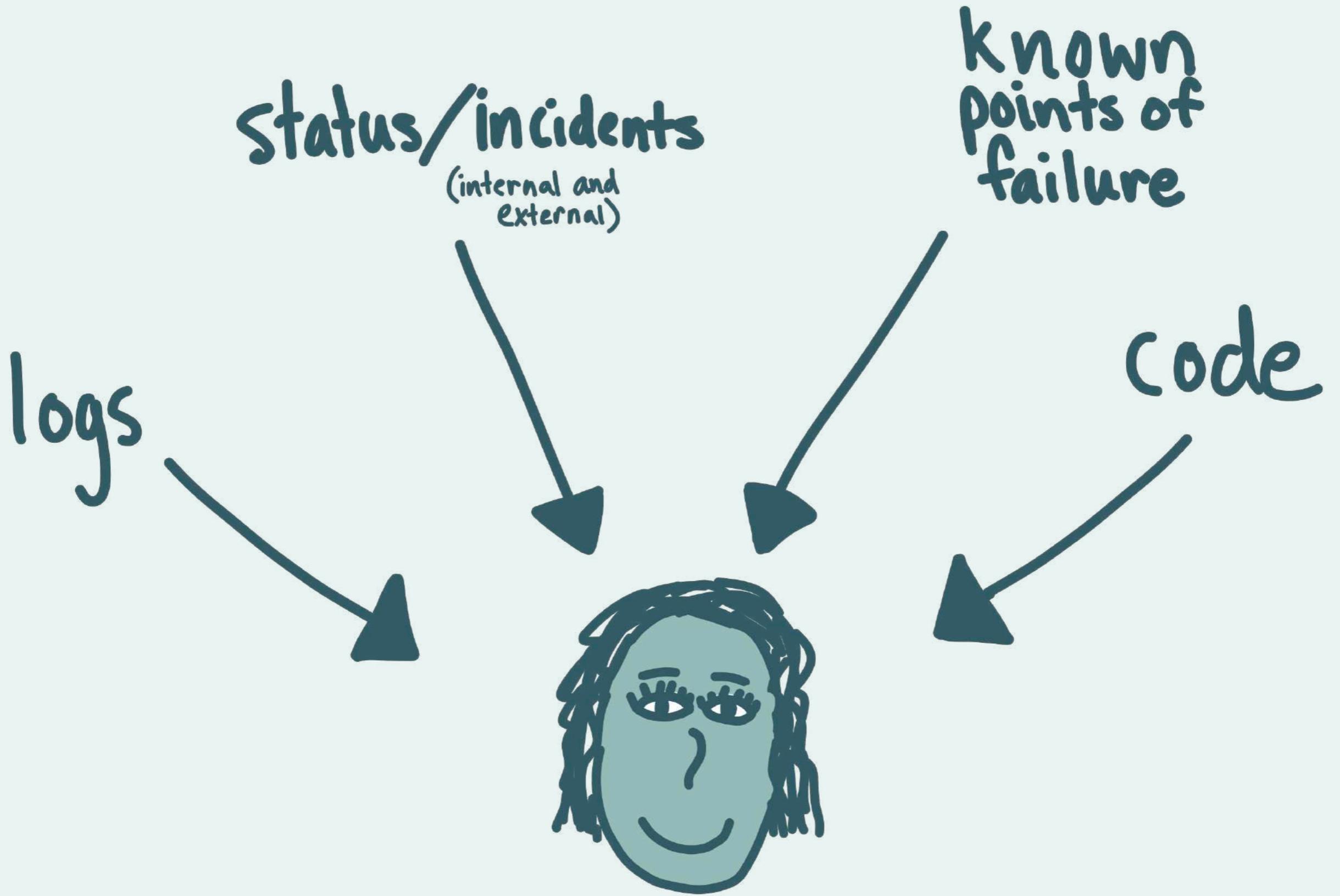
 Build Failed

Example #2

Failed Automated  
Build

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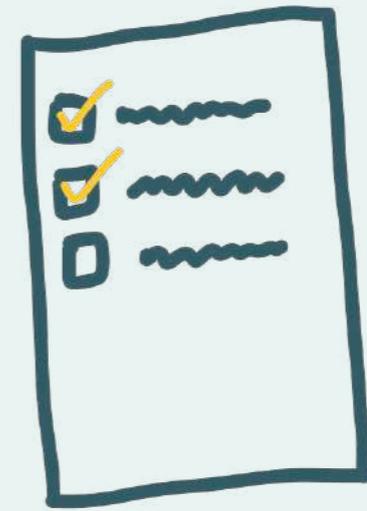
Where do you  
Start?

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Don't forget to:

- Use existing tooling
- Refine checklists
- Add more interactive steps in checklists
- Idea: Do-nothing scripts

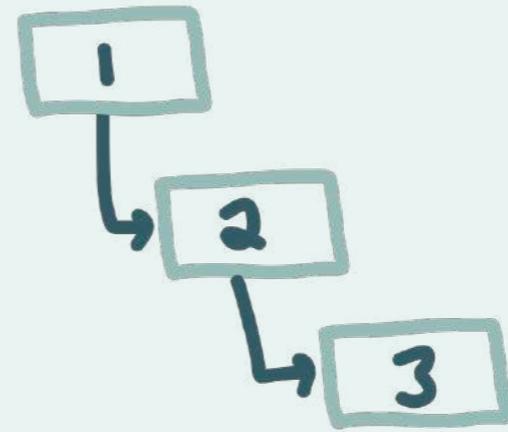
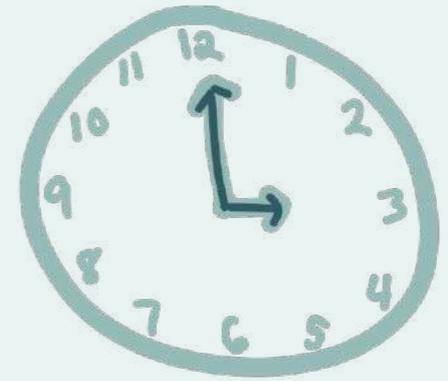


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# Target toil:

- Manual
- Repetitive
- Tactical
- Increases with scale
- Can be automated



Examples of  
"End-to-end Automation"

VS.

"Human-in-the-Loop Automation"

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# "End-to-end Automation"

- Testing
- Build script
- Continuous integration/deployment/  
delivery
- Database creation, monitoring, backups
- Monitoring and alerts\*

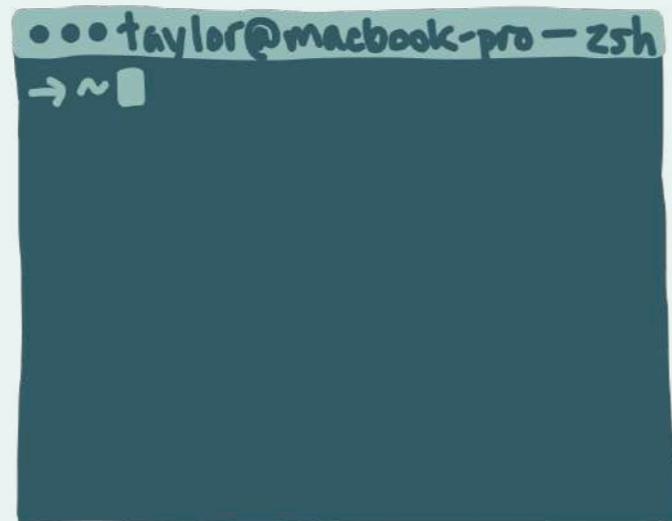
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# "Human-in-the-Loop Automation"

- Approvals and coordination
- Certain types of code reviews
- Rollbacks of deployments
- Augmenting human investigation
- Incident response

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# Where does it happen?



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# Reducing Cognitive Load

Example:

"Playing telephone" in  
the middle of an incident

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Questions,  
Opinions,  
and more!



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#qa-taylor-barnett