Bringing the User into Sustainable Software Development for Science

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LBNL

What is needed to develop sustainable software?

- $$
- Great developers
- Good design
- Software engineering practices
- ….

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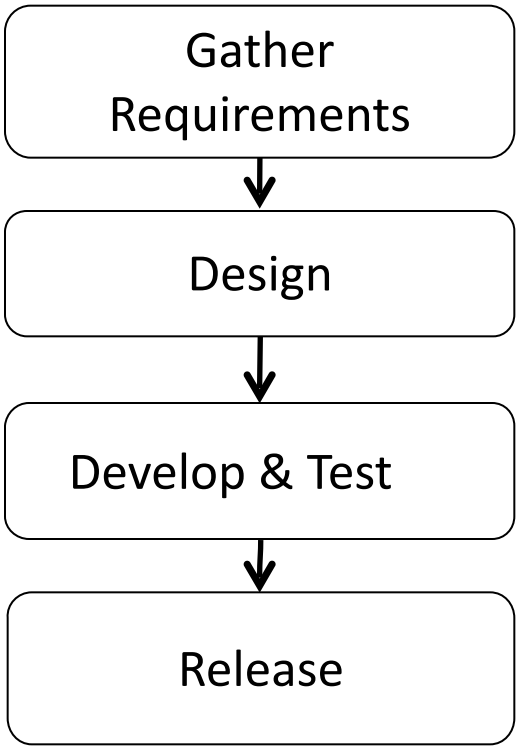
USERS

How do we build software for science?



Talk and assume you know what is needed

Design what it is interesting

See, it works well for ME!

Send the software to the user

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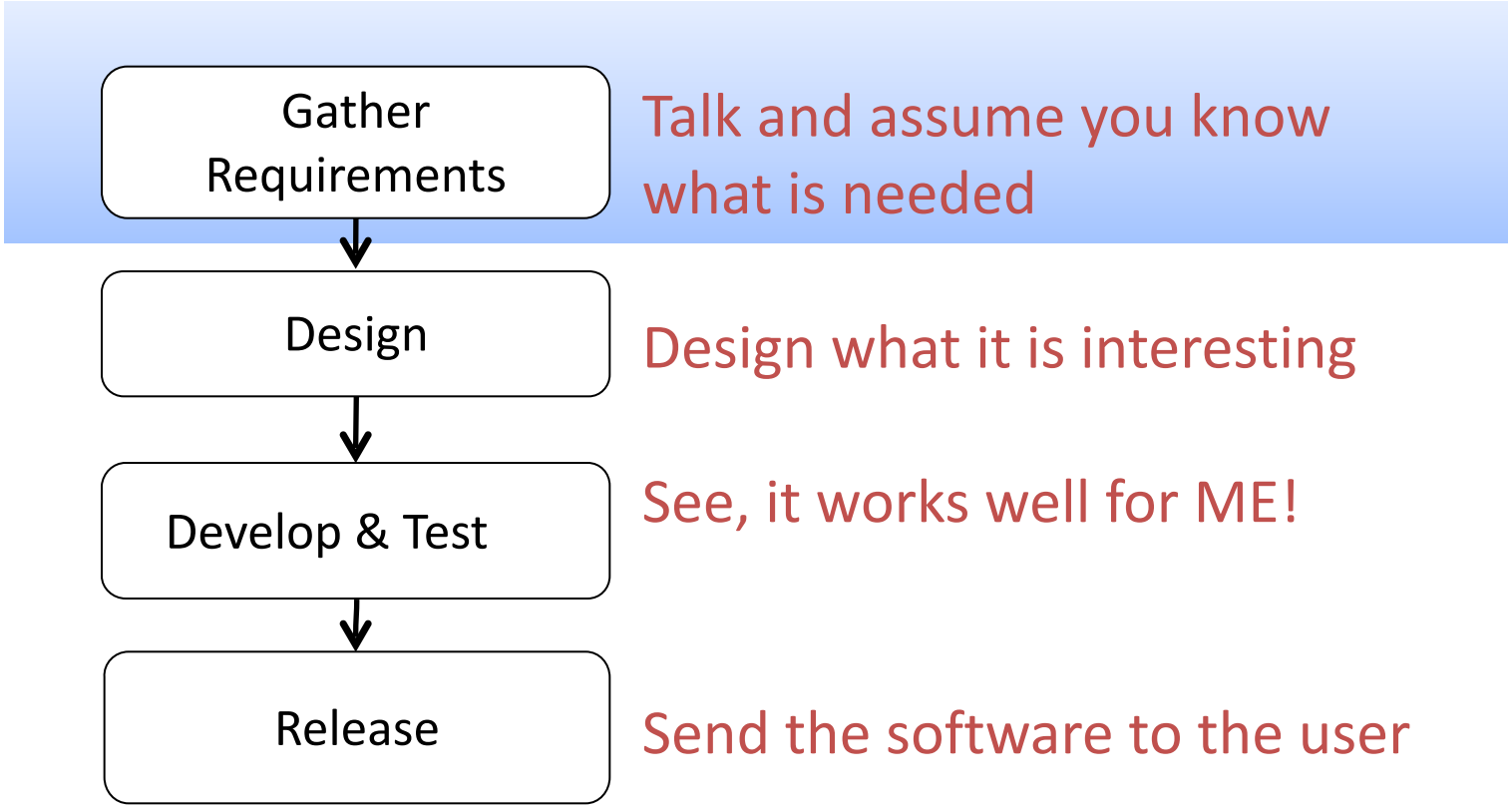

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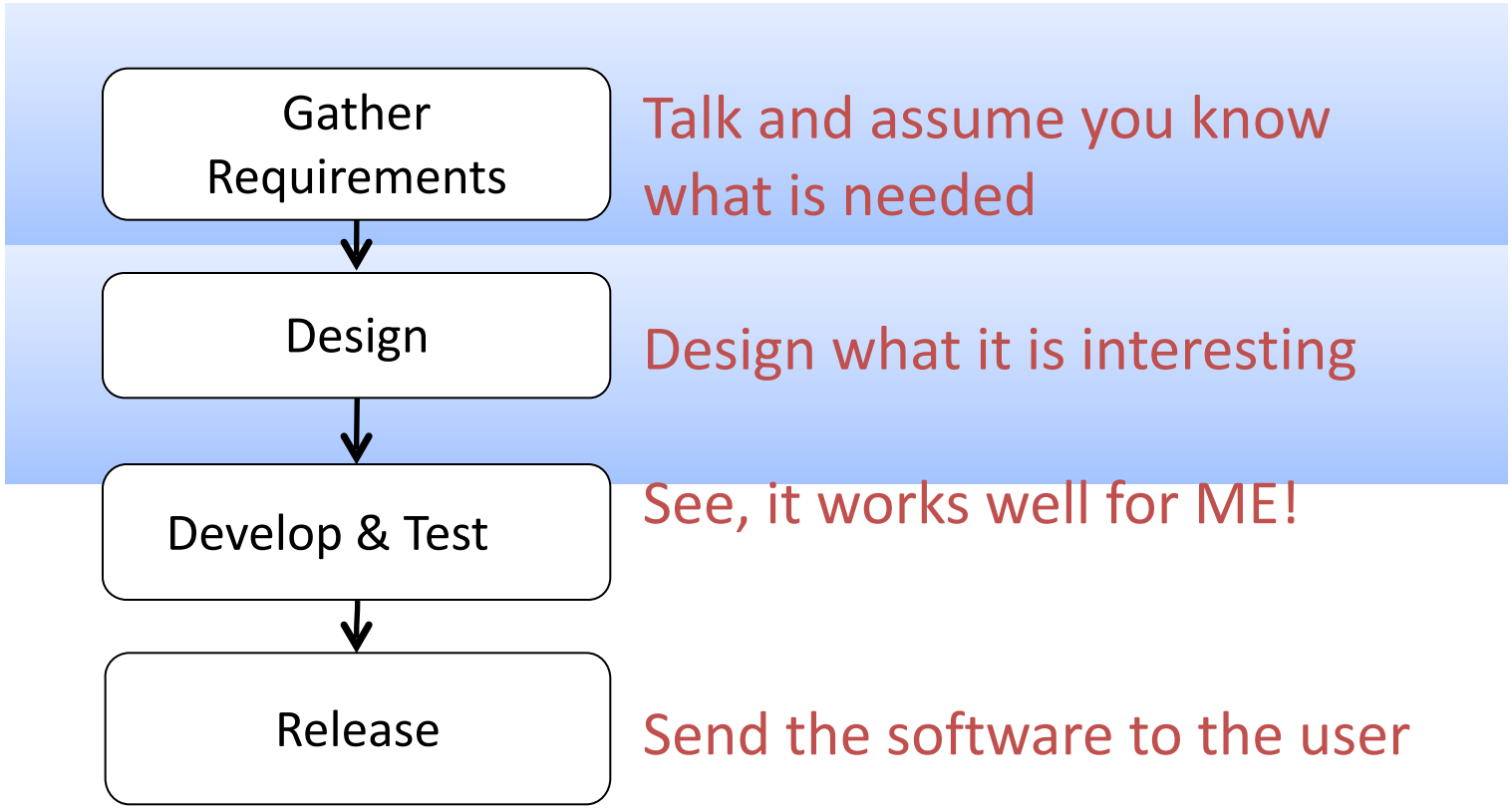

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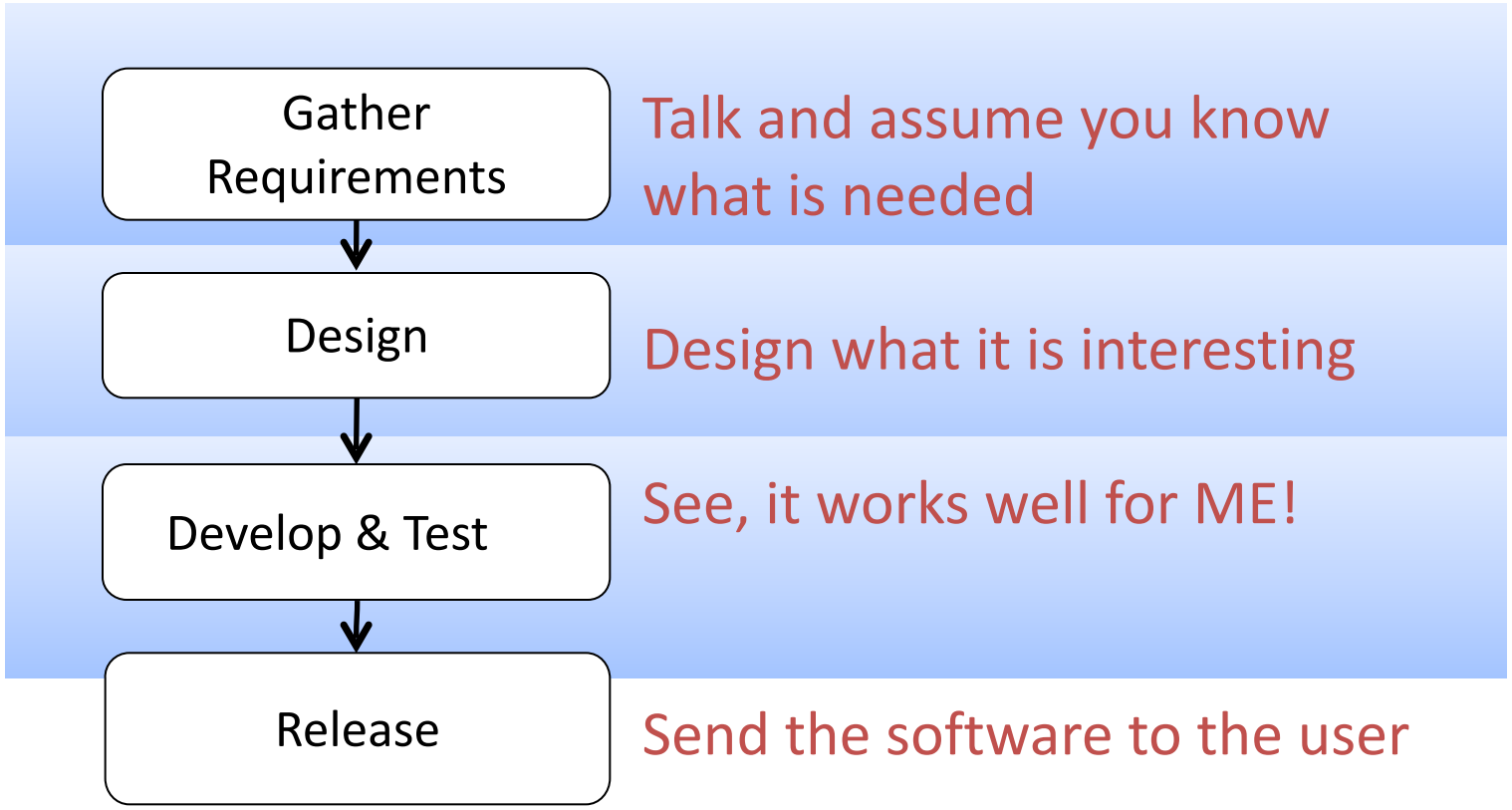

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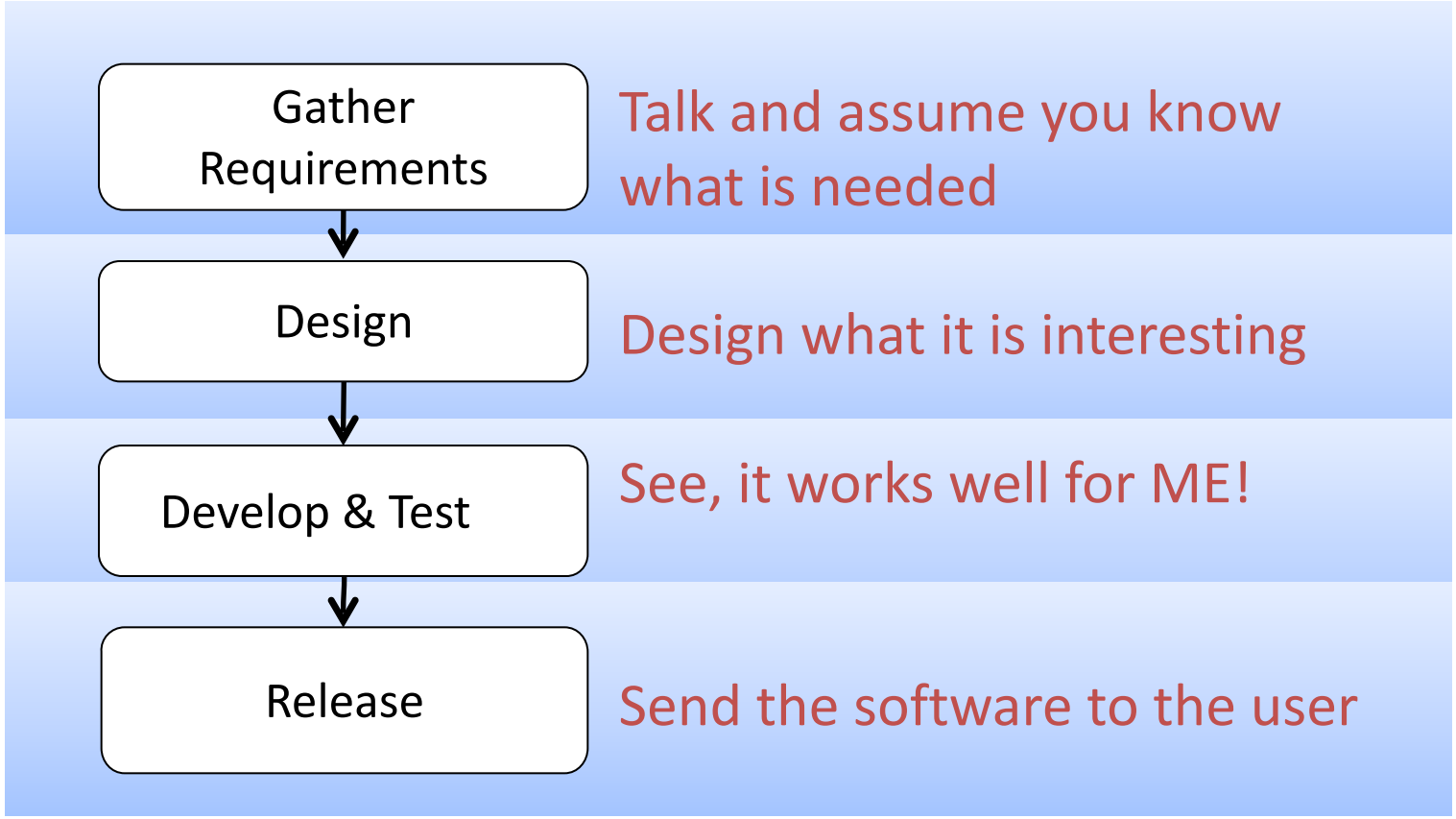
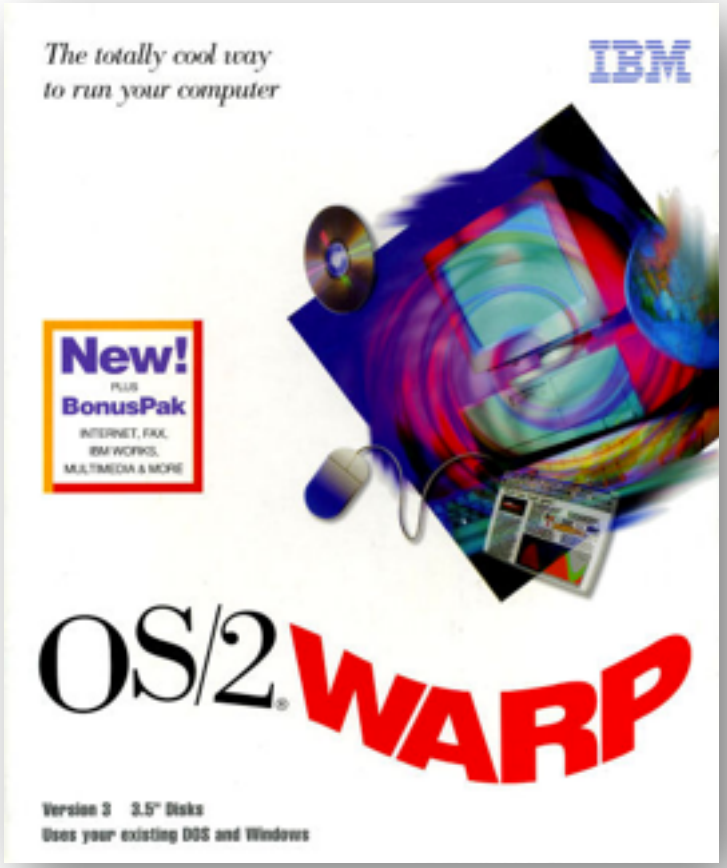


"Build it and they will come?"

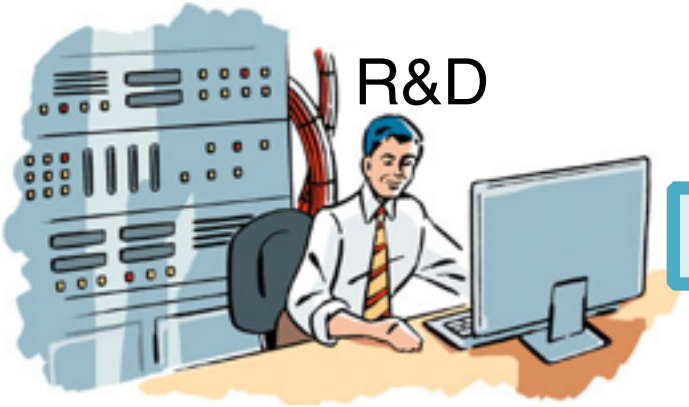
Google wave



User Research

Scientists

User Research



Software

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Product

UX Designer

Image by Chris Gash

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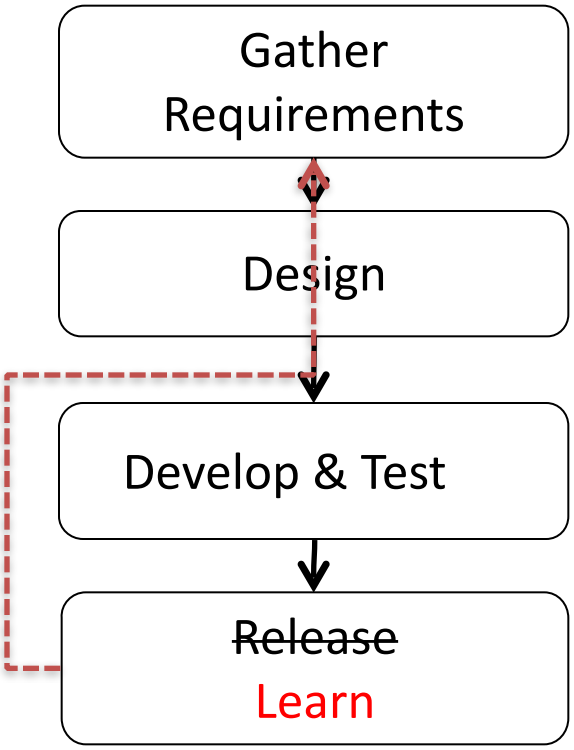
User Research Methods

Ethnography

User Analytics

How should we build software for science?



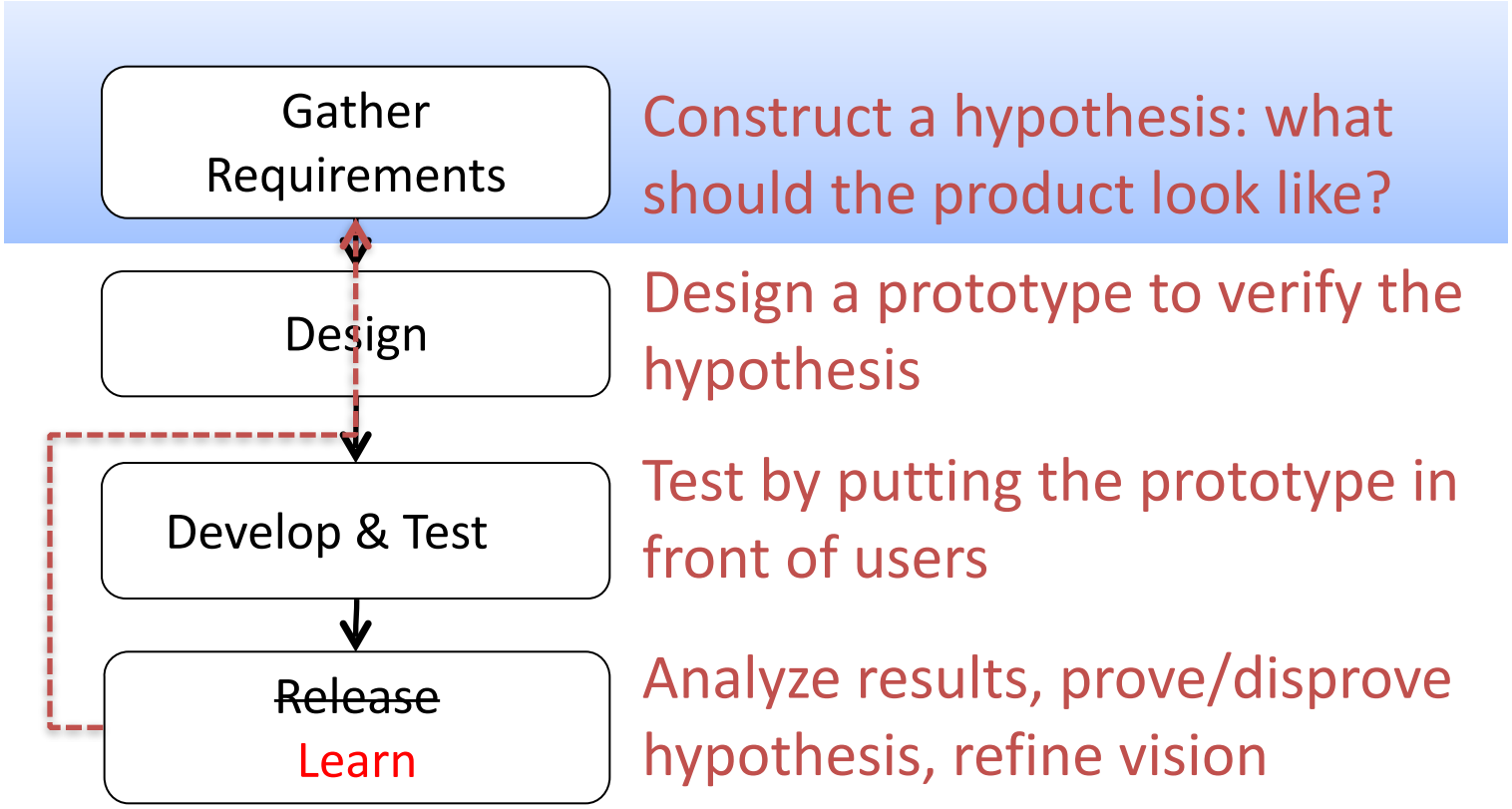
Construct a hypothesis: what should the product look like?

Design a prototype to verify the hypothesis

Test by putting the prototype in front of users

Analyze results, prove/disprove hypothesis, refine vision

How should we build software for science?



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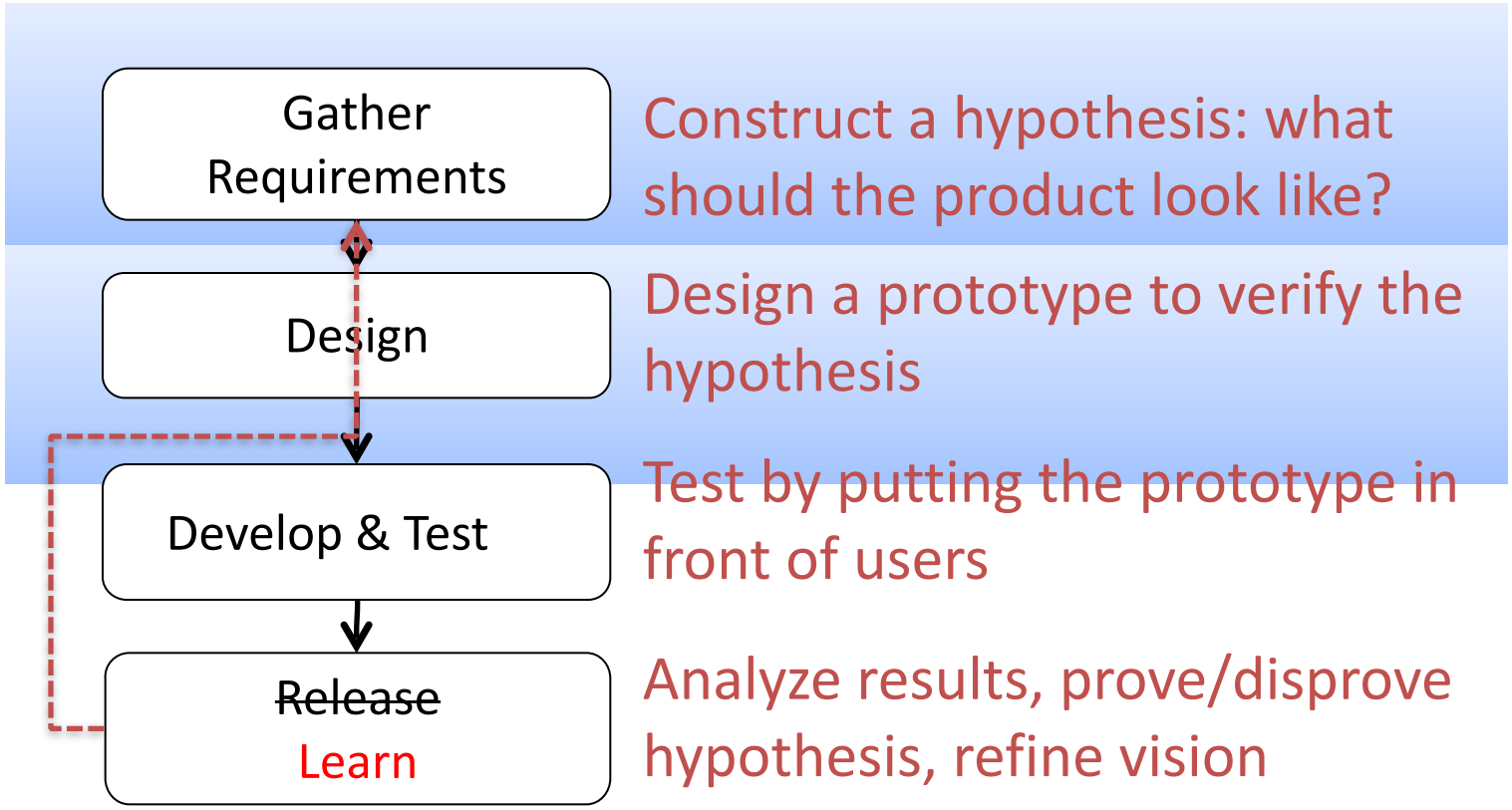

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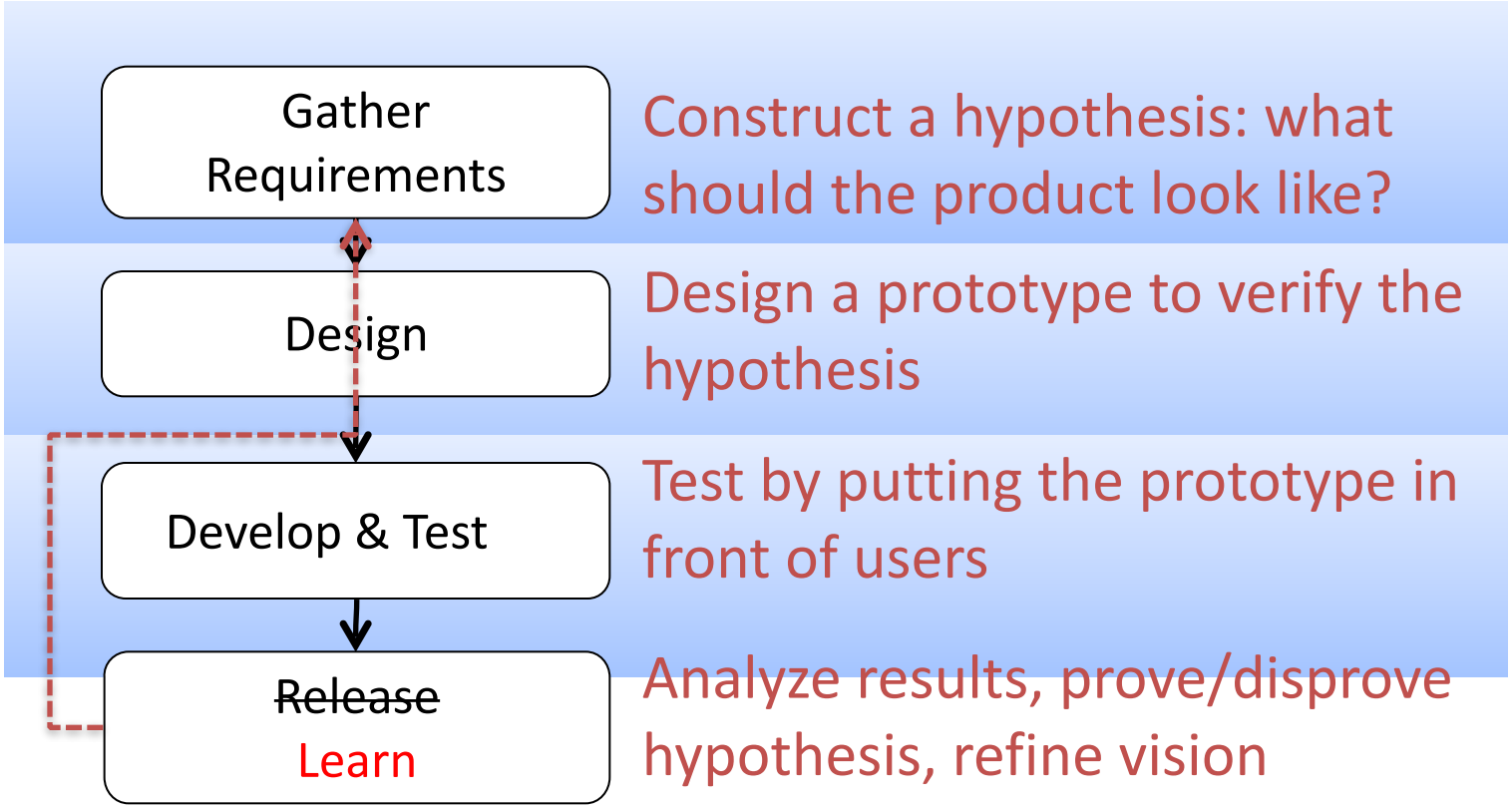

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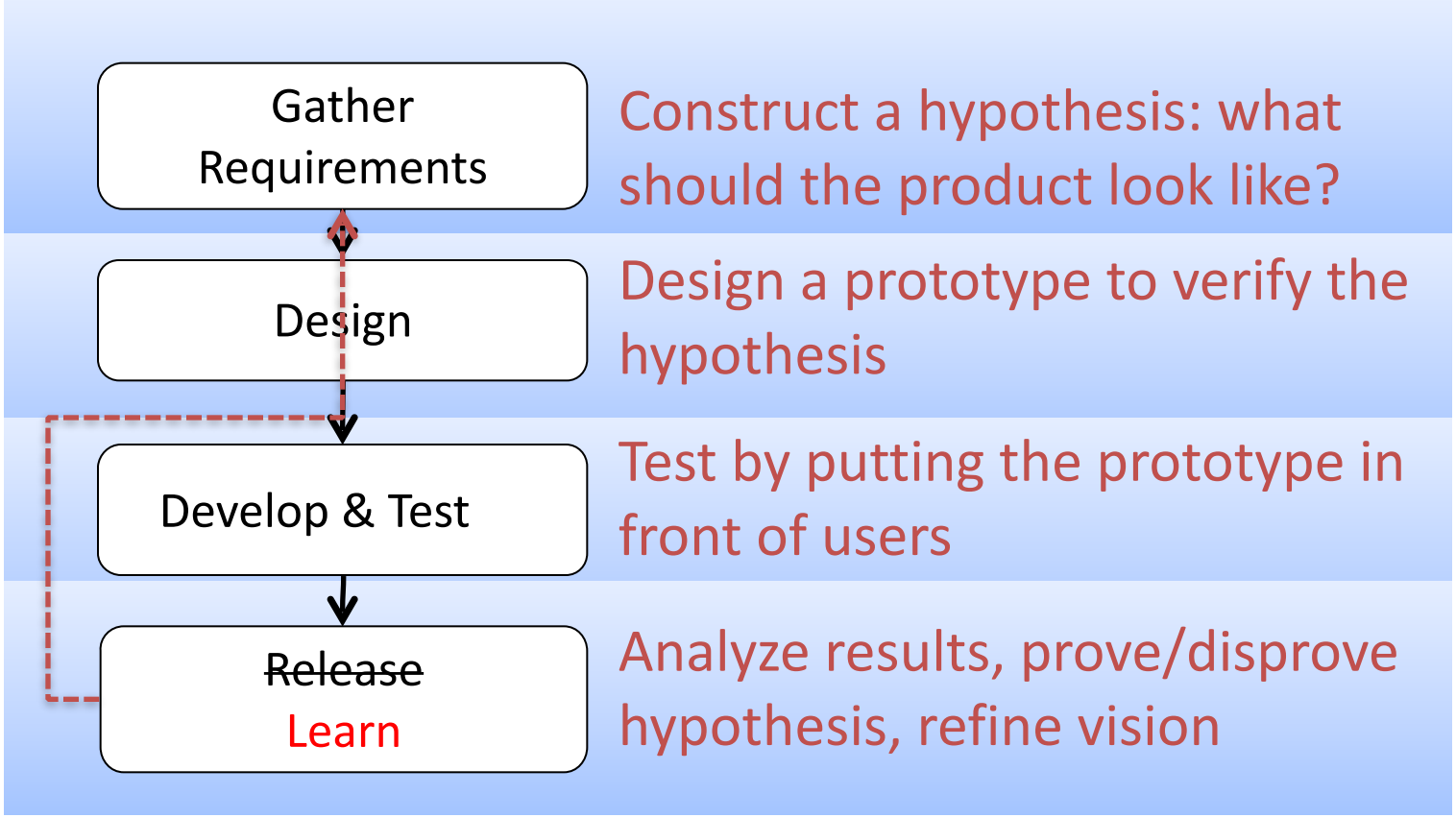
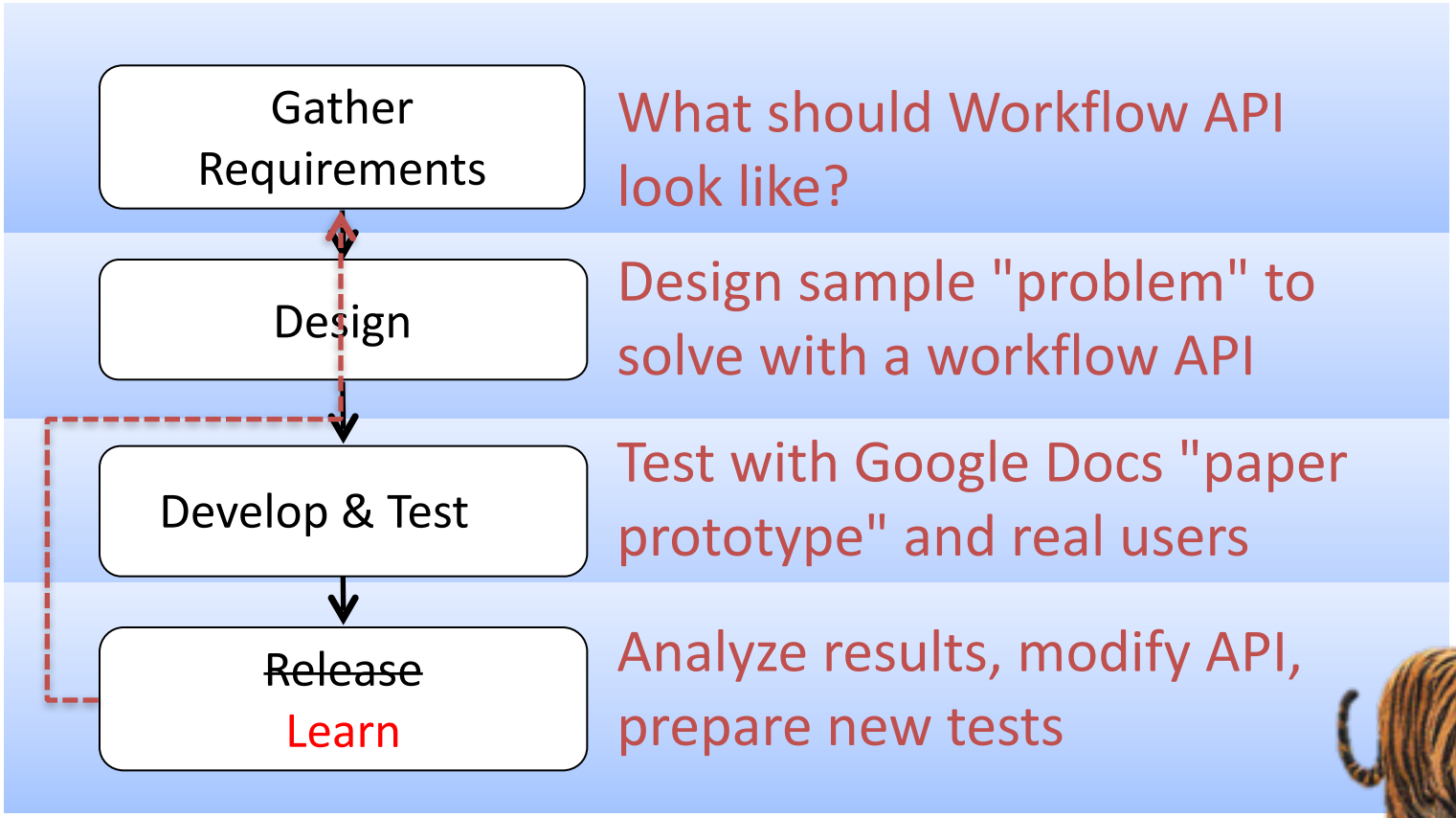


Example: User research to improve Workflow APIs (Tigres project)



http://tigres.lbl.gov

Conclusions

- Sustainable software **needs** users and giving users what they want **needs** better processes and empirical studies (ethnography)

Tigres

- Javier Rojas Balderrama, Matthieu Simonin, Lavanya Ramakrishnan, Valerie Hendrix, Christine Morin, Deb Agarwal, Cedric Tedeschi, "Combining Workflow Templates with a Shared Space-based Execution Model", WORKS, 2014.
- Lavanya Ramakrishnan, Sarah Poon, Gilberto Z. Pastorello, Daniel Gunter, Valerie Hendrix, Deborah Agarwal, "Scientist-Centered Design for eScience:A Tigres Case Study",IEEE eScience, 2014

http://tigres.lbl.gov

USABLE DATA ABSTRACTIONS

"a holistic approach to the development of tools and interfaces [for HPC] .. by employing a user-centered design process .. [and] empirical usability and ethnographic studies"

http://uda.lbl.gov

Extra

Usability

Usability is the ease of use and learnability of a human-made object.

Merriam-Webster
http://www.merriam-webster.com/dictionary/usability

A user interface is well-designed when the program behaves exactly how the user thought it would.

Joel Spolsky.
http://www.joelonsoftware.com/uibook/fog0000000249.html