What is Data Science?

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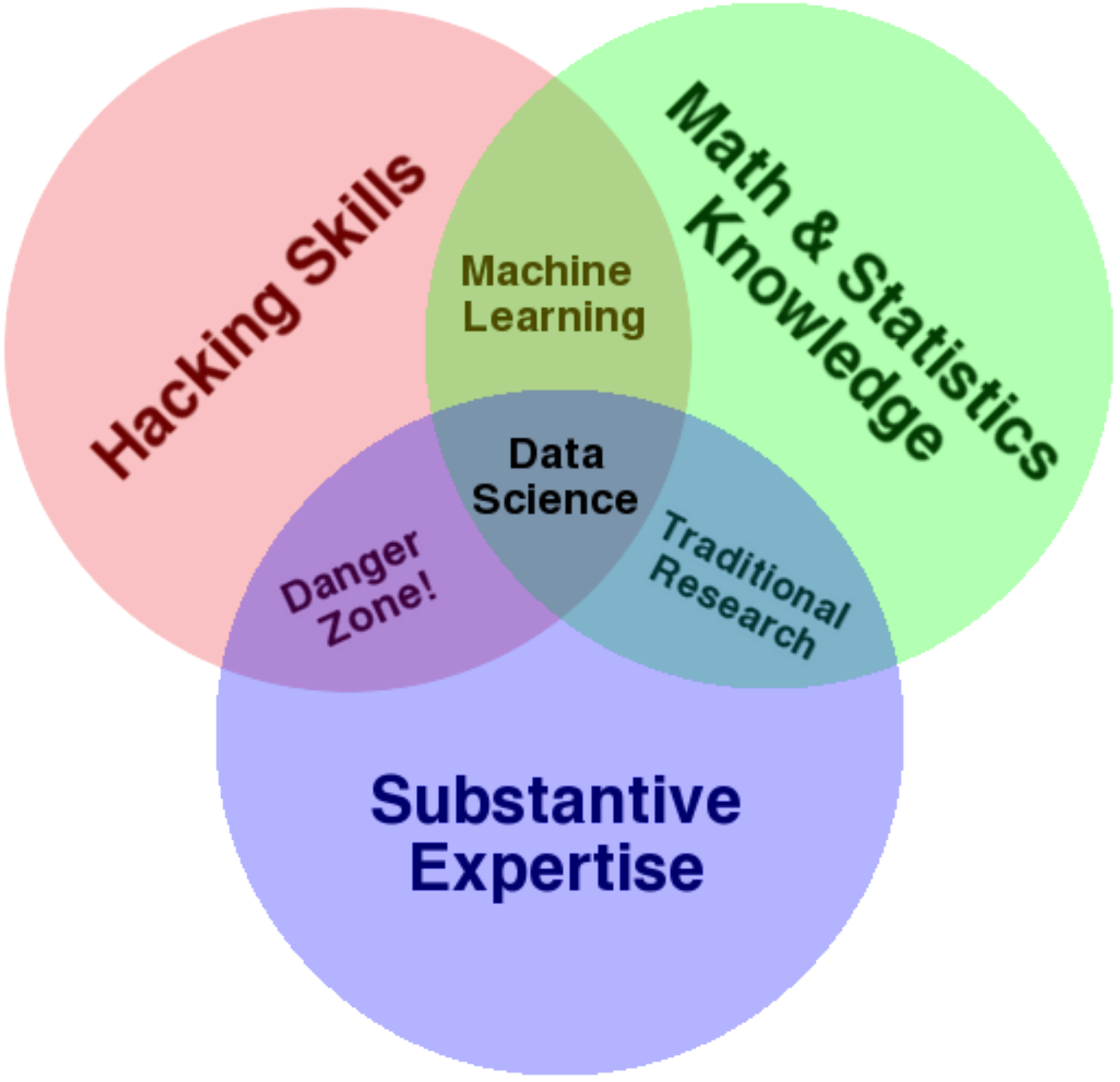
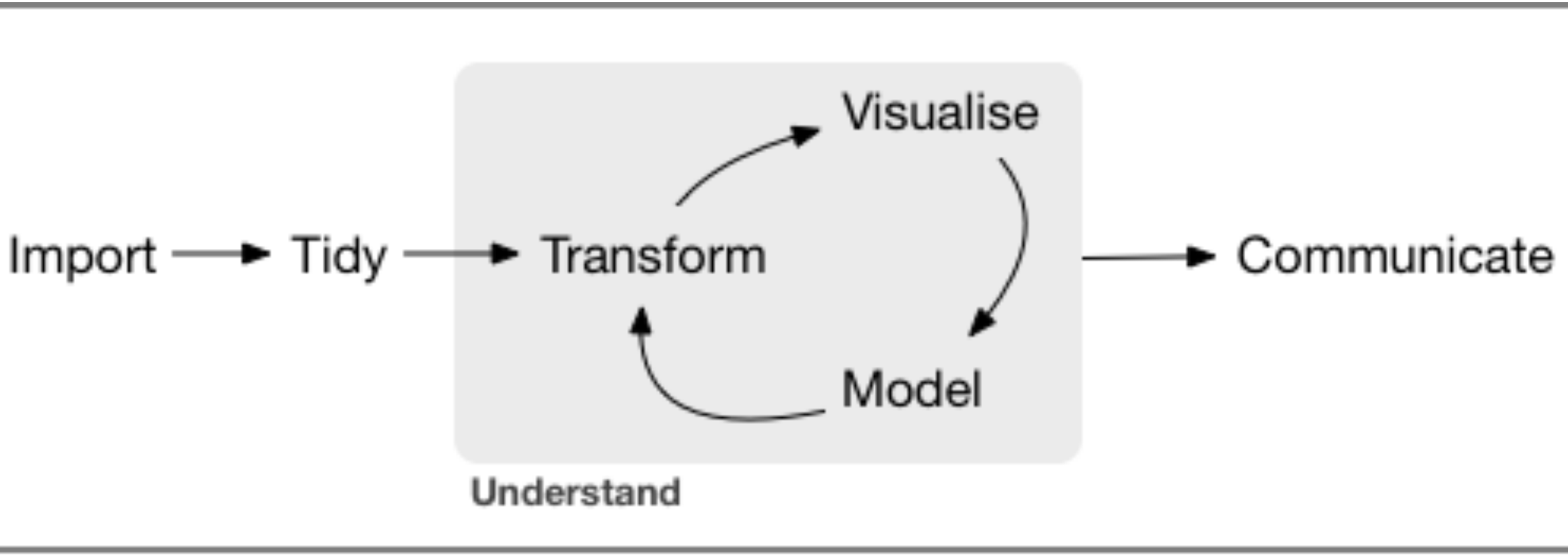
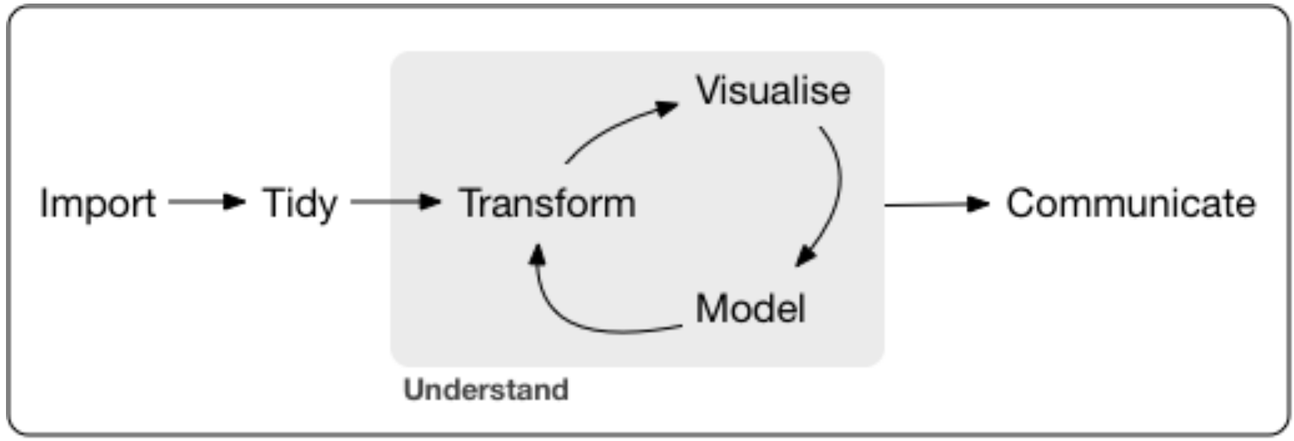
» "Data Science is statistics on a Mac."

» "A data scientist is someone who is better at statistics than any software engineer and better at software engineering than any statistician."


Hacking Skills
Math & Statistics Knowledge
Substantive Expertise
Machine Learning
Data Science
Danger Zone!
Traditional Research


Visualise
Import
Tidy
Transform
Communicate
Model
Understand

This course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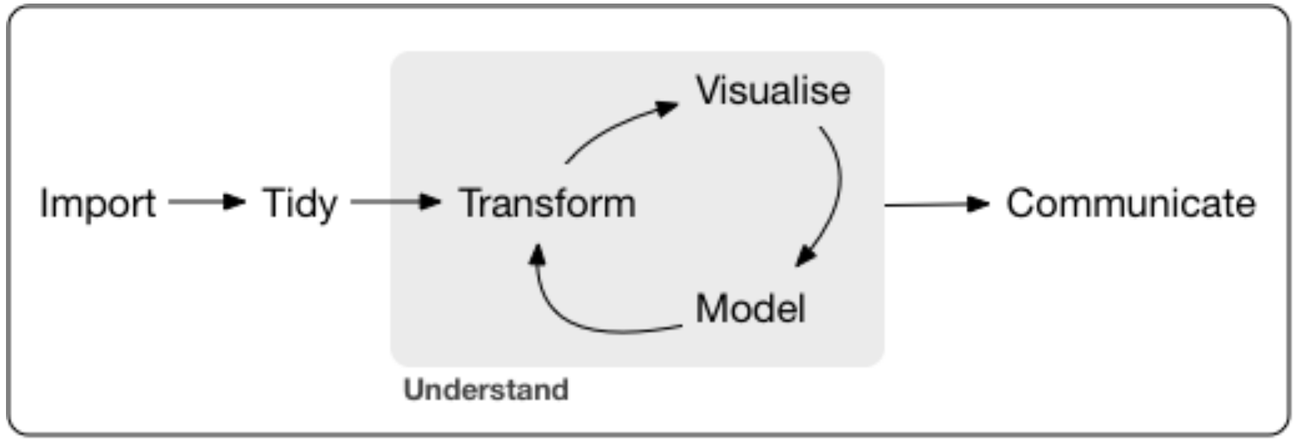
This course

» Statistics courses mostly focus on the central part, and mostly on the model part



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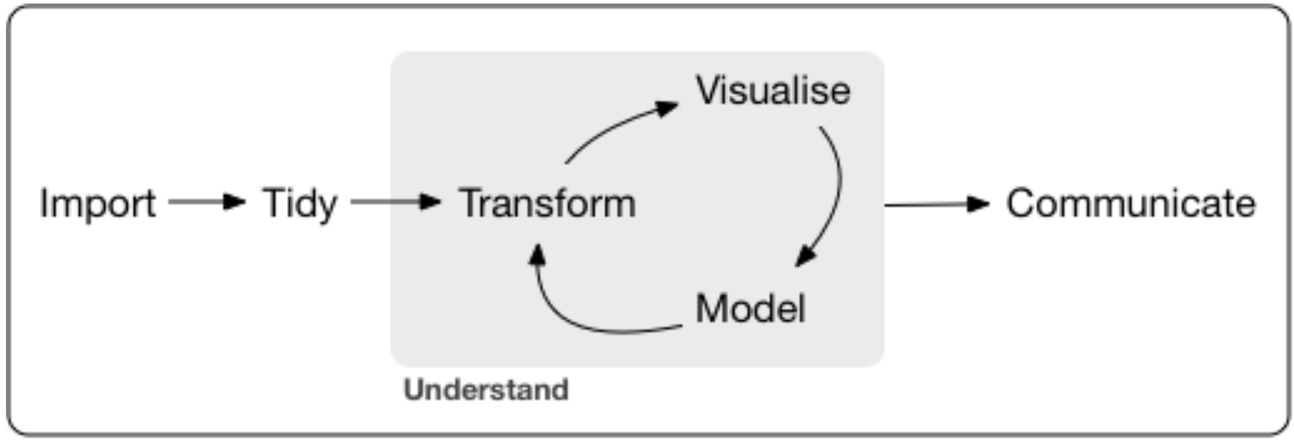
» The steps on the left can easily take 80% of the time



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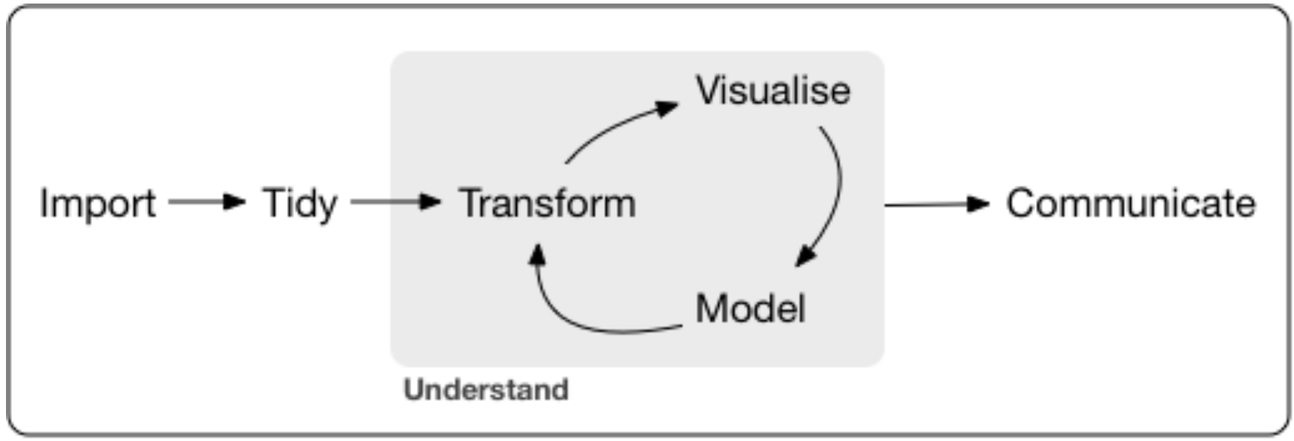

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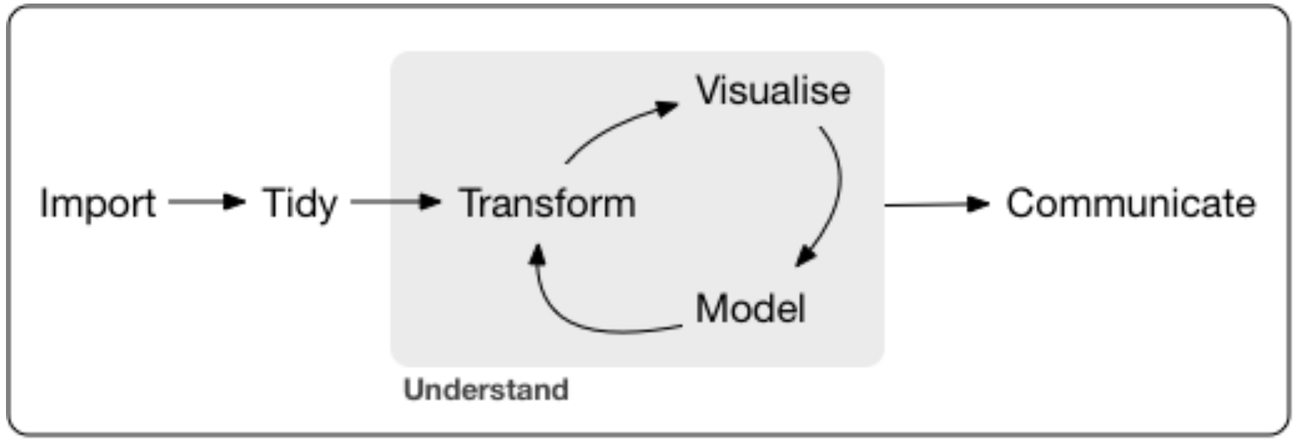
- The course is mostly about tools, somewhat about principles, and not at all about statistical theory



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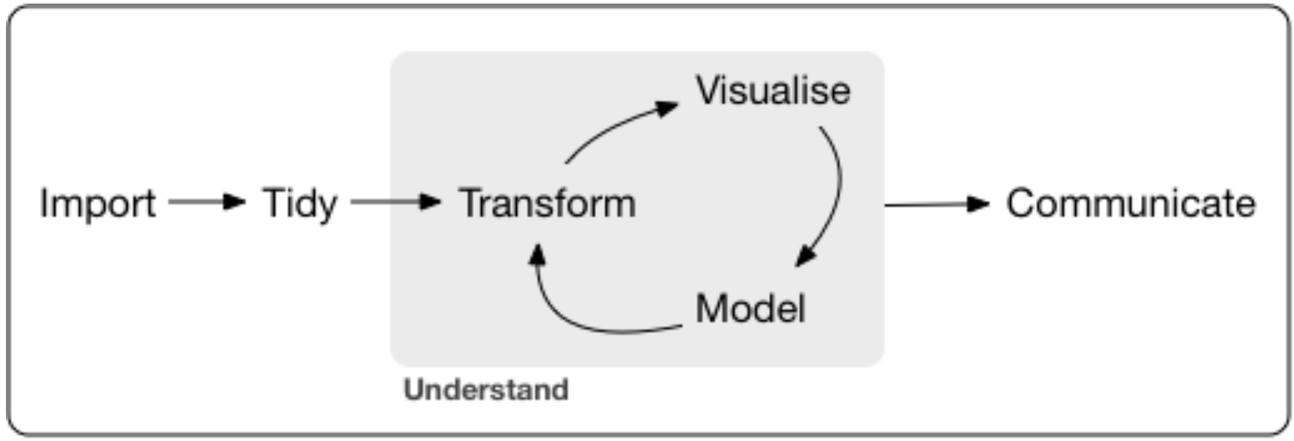
- (Diagram from Hadley Wickham)



TECHNOLOGY

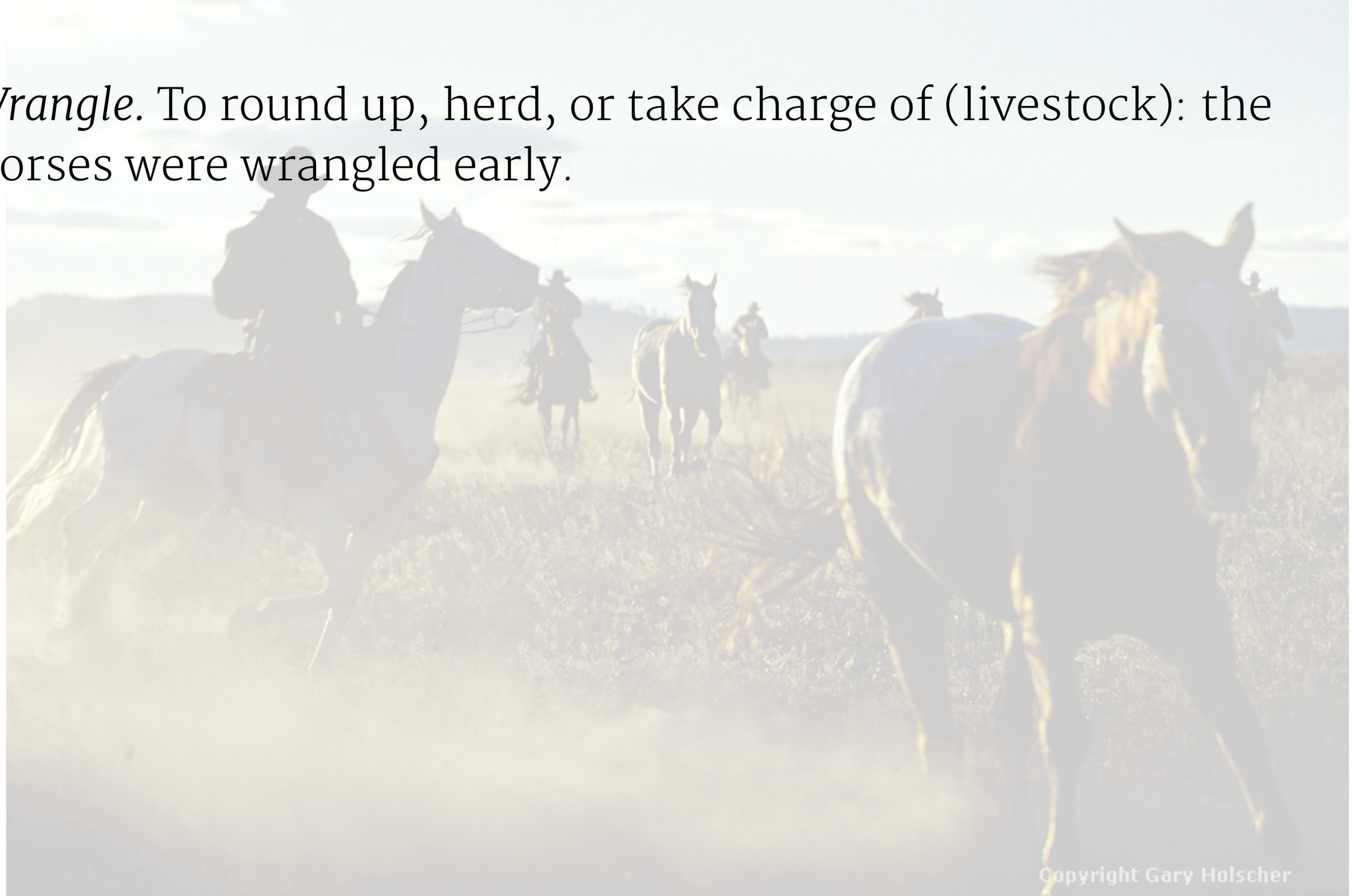
For Big-Data Scientists, 'Janitor Work' Is Key Hurdle to Insights

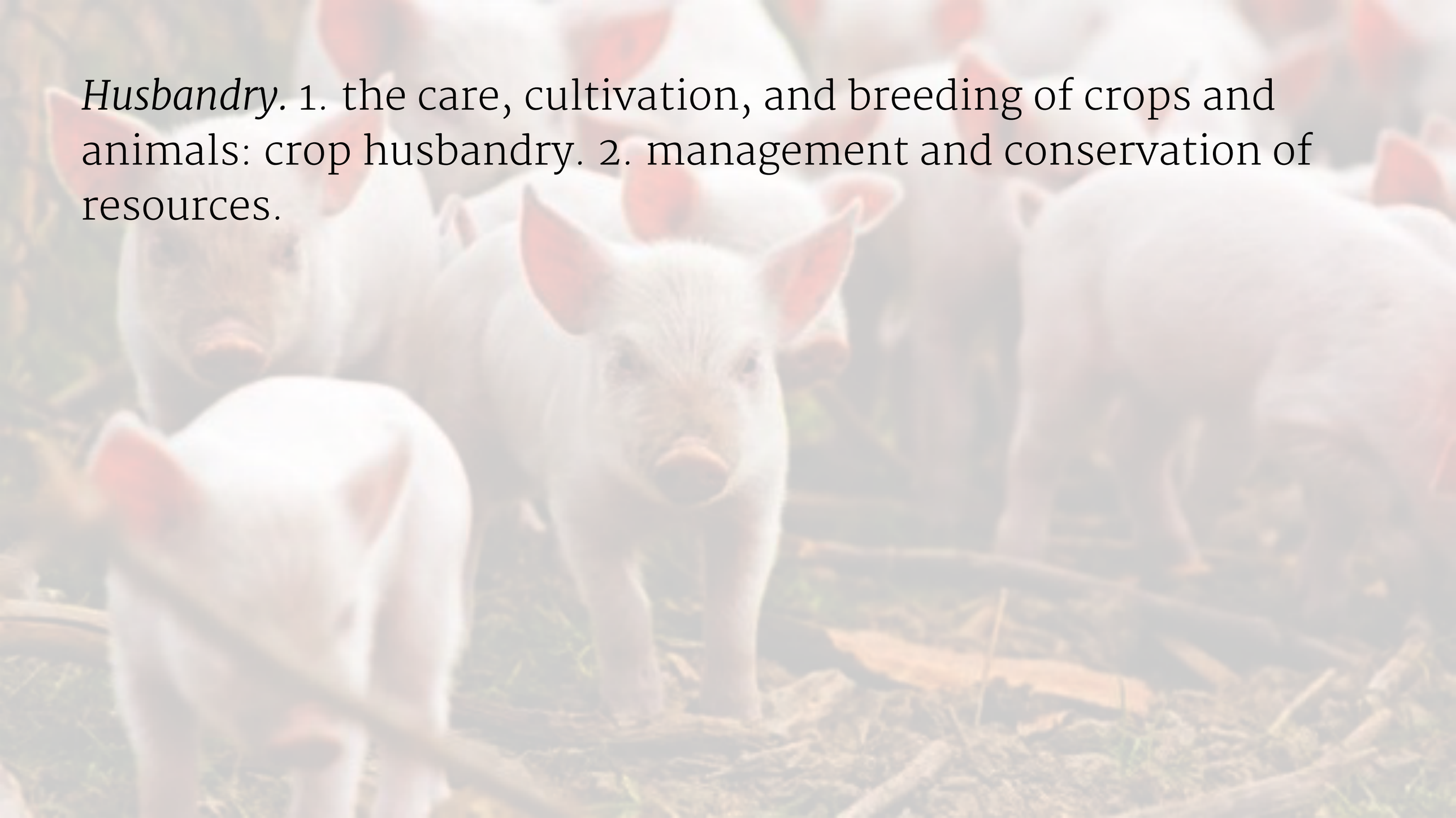
By **STEVE LOHR** AUG. 17, 2014

Monica Rogati, Jawbone's vice president for data science, with Brian Wilt, a senior data scientist.

Peter DaSilva for The New York Times

Wrangle. To round up, herd, or take charge of (livestock): the horses were wrangled early.





Husbandry. 1. the care, cultivation, and breeding of crops and animals: crop husbandry. 2. management and conservation of resources.

"What I Am Looking for in a New Data Science Hire"

(from: http://www.datajujitsu.co.uk/blog/2016/09/03/what-i-am-looking-for-in-a-new-data-science-hire/)

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This is perhaps the only absolute essential thing I am looking for and is why ‘pure’ statisticians with experience only in SPSS, Stata or similar are really not likely to make it past an interview. I need people who are data manipulation cyborgs, for whom filtering, subsetting, merging and transforming data is second nature and can do it using their preferred tool (be it dplyr, Pandas, SQL or whatever) with flow, without being hindered by those tools. Think of the difference between a new driver, who has to think consciously about every single decision (signal, gears, brakes, accelerator, mirrors etc.) and yet is still overloaded with information and someone who has been driving for years for whom many of these tasks are handled by muscle memory and the unconscious brain. . . .

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. . . Data manipulation is not the chore to get through to get to the proper data science – it is data science. The same is true for visualisation. Exploring the data always comes before understanding it and visualising data is a hugely important part of this. Personally I spent a lot of time getting familiar enough with ggplot2 to be able to crank out quality plots on demand but if you have another favourite that you work efficiently with, that is equally fine. Related to this is report building, my workflow has been drastically improved by learning to generate automated reports using tools like Rmarkdown and Emacs org-mode. If new hires have already spent the time getting to grips with these tools, they can get to grips with the data that much more quickly.

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- The tidyverse approach is rapidly winning out

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- Style
  - Style is important in R as in any code
    - "Thissentenceisunderstandablebutnoteasily"
  - Page 24 of *Data Wrangling with R* has a good style guide
  - There's a detailed style guide at style.tidyverse.org. Pay particular attention to the advice on spacing and indentation.