

## Review of Hadley Wickham: Data Visualization and Data Science

In this speech Hadley Wickham introduced several technologies and techniques, including:

1. Tidy Data:

Each column for one variable

Each row represent one observation

And the key is to have a consistent structure

Also a tidy data was described as the basement of analyzing and visualizing.

2. ggplot2:

A package which was based on the Grammar of Graphic, using it to define the mapping relation between the data and the plot.

3. tidyr: used for data reshaping

4. dplyr: used for data manipulation

5. Read the code like reading a sentence(pipe operator):

This makes us easier to understand the code.

6. gganimate:

Used for animation visualization of time series or changes to show the trend of data evolution over time.

7. R Markdown:

A reproducible reporting tool that combines "text + program + results."

and the output formats include HTML, PDF, Word, and PowerPoint.