RECONSIDERING THE MARKETING ANALYTICS CURRICULUM

FOCUSING ON (OPEN SCIENCE) SKILLS TO SUCCEED ON THE JOB MARKET

HANNES DATTA

TILBURG UNIVERSITY

Tilburg ScienceHub

TILBURG UNIVERSITY

Open Education

Motivation

- Integration of analytics at business schools is challenging (Kurtzke and Setkute 2021)
  - essential to stay relevant
  - unlikely to be achieved easily (e.g., single course, introducing tools)

- Strategic decision to re-brand and develop Tilburg's "Marketing Analytics program"
  - Re-branding (research → analytics) & dedicated academic director
  - Gradually develop and introduce new content
  - Grow from 25 to 125 students per year

- This presentation
  - Sharing experiences, challenges, and full course materials
  - Seeking to build a community – talk to me, drop an email, contribute material (e.g., Tilburg Science Hub)
  - Will share presentation + all relevant links/materials

Disclaimer

- I'm just one of many teachers in Tilburg's marketing analytics program
- I'm new to the marketing education community
- It's not all my own stuff – sought inspiration from many (both inside and outside of marketing)
- I may not have satisfactory solutions to all challenges (but would love to get your feedback!)

Developing the Marketing Analytics Curriculum

Design principles

Student requirements

- Introduce and make directly usable a wide range of coding tools (e.g., R, Python)
- Train on large, real-life data sets
- Complement existing curriculum

Faculty requirements

- Build on existing content where possible & allow for scalability
- Incorporate and maintain content easily
- Generate synergies between teaching and research

Developing the Marketing Analytics Curriculum

Marketing analytics involves **collection, management, and analysis** […] of data to obtain [marketing] insights […]"

(Wedel and Kannan 2016)

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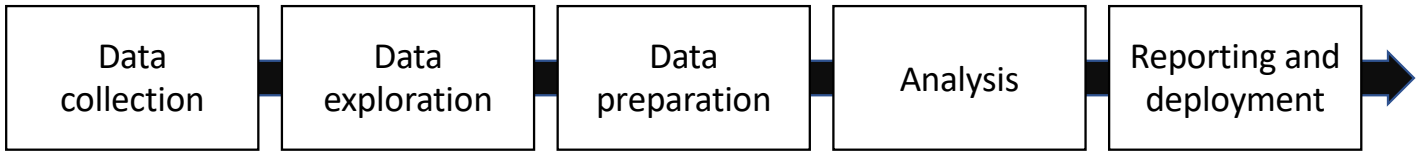
Marketing analytics workflow



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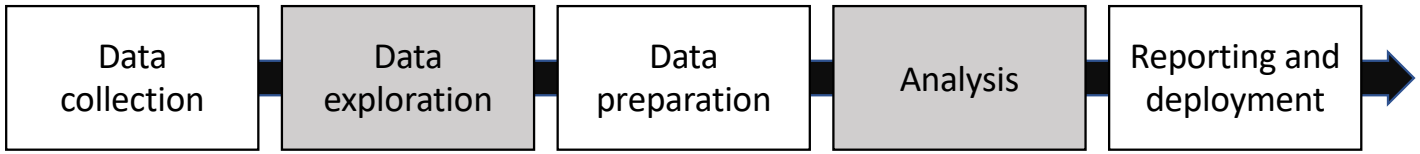

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Marketing analytics workflow

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Marketing analytics workflow

Challenge 1

Cover all steps in the marketing analytics workflow

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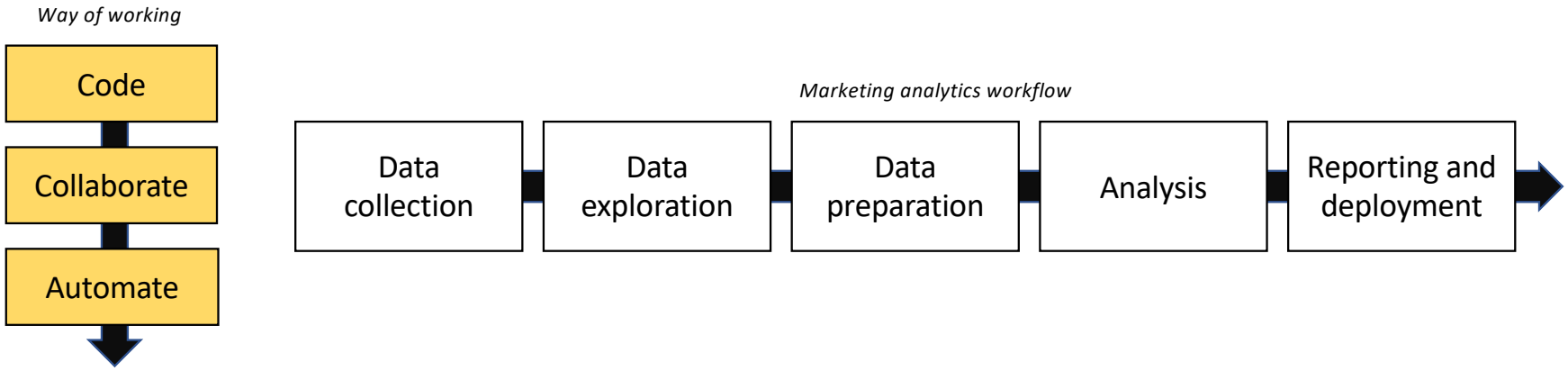

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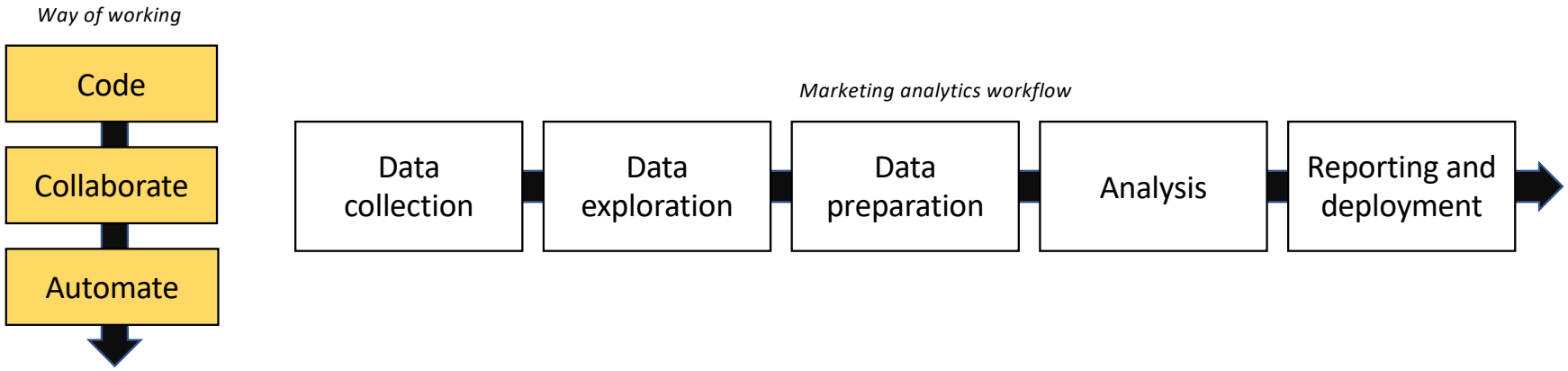


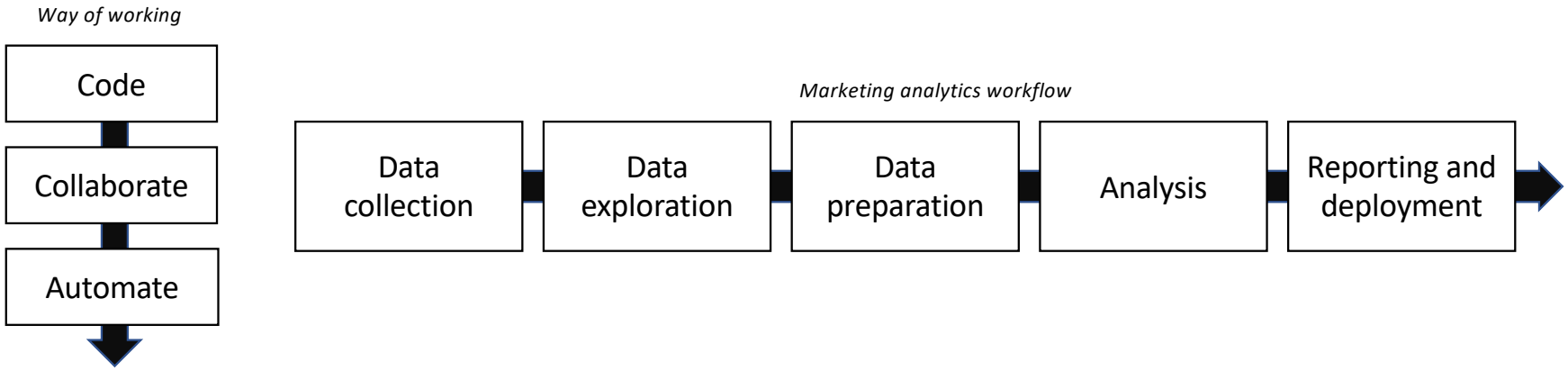
Challenge 1

Cover all steps in the marketing analytics workflow

Challenge 2

Professionalize project management

Developing the Marketing Analytics Curriculum



Challenge 1

Cover all steps in the marketing analytics workflow

Challenge 2

Professionalize project management

Challenge 3

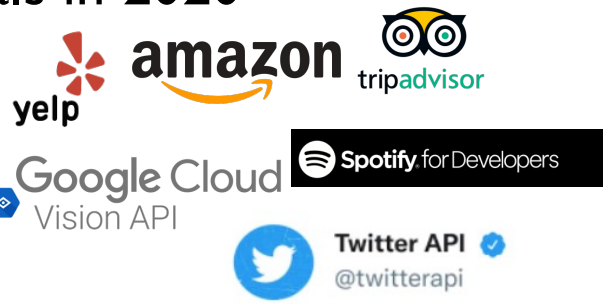
Embracing a diverse student population

Challenge 1

Cover *all* steps in the marketing analytics workflow

Web scraping and APIs

- 20% of all marketing studies in top 5 marketing journals in 2020 were based on web data (Boegershausen et al. 2022)
  - Web scraping: automatically collect data from websites
  - APIs: official interfaces w/ databases of firms, obtain data programmatically



- Technical skills vastly documented, but inaccessible to starters (e.g., lack of Python training)
- "Conceptual" thinking about web data not commonplace
  - How to select websites or APIs for research projects?
  - What are important design decisions in building web scrapers? (e.g., sampling)
  - How to monitor data collections while there are running to ensure the collected data is valid?

Highly versatile data collection technique for marketers

Pathway ①

Studying new phenomena

airbnb Spotify

e.g., Zervas et al. (2017); Datta et al. (2018)

Pathway ②

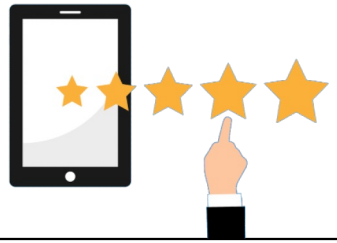
Boosting ecological value

Google Trends Amazon Best Sellers

e.g., Du et al. (2015); Ludwig et al. (2013)

Pathway ③

Facilitating methodological advancement



e.g., Netzer et al. (2012); Liu et al. (2020)

Pathway ④

Improving measurement

WEATHER UNDERGROUND Holiday API™

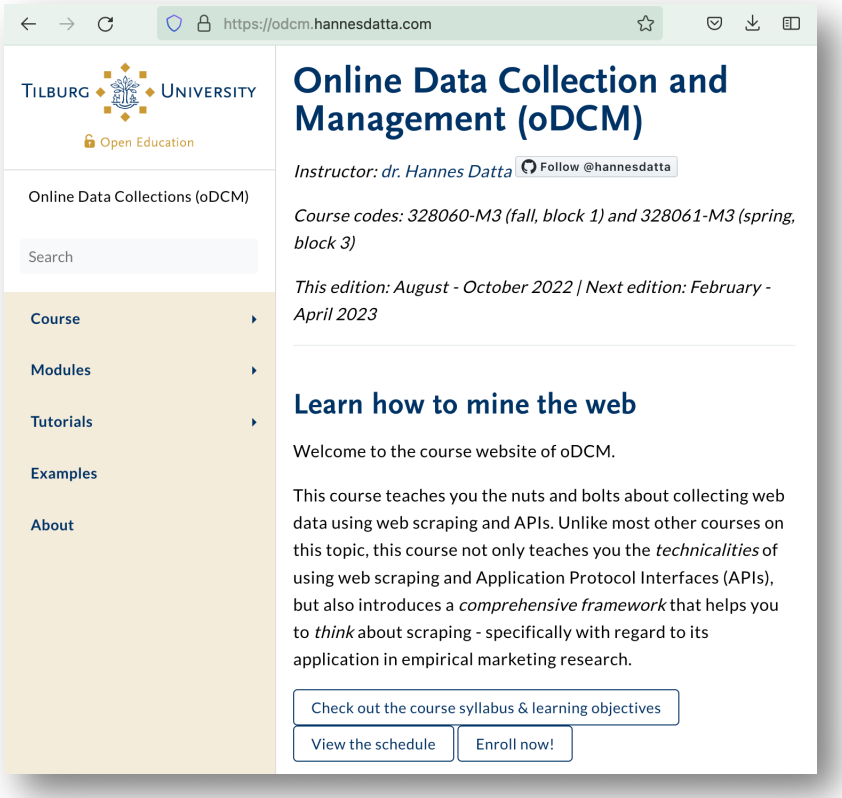
e.g., Li et al. (2017); Datta et al. (2022)

Source: Boegershausen et al. 2022

From zero to hero…

- Developed **"Online Data Collection and Management"** (3 ECTS, 7-week course)
  - Five self-paced (technical) **tutorials** on web scraping and APIs in Google Colab
  - Team **project** to collect web data for marketing insights (e.g., reddit, kayak, bol.com) + **coaching** sessions
  - Taught fully on Zoom initially; course material and code is **open source** and available at https://odcm.hannesdatta.com

- Obtain **synergies between teaching and research**
  - Used classroom to test & develop paper, now forthcoming at the *Journal of Marketing*
  - Developed **searchable database** of web data papers in marketing (https://web-scraping.org)
  - Tested and piloted **documentation templates**, solving typical challenges in scraping, etc.
  - Code from student projects **publicly available at Zenodo**



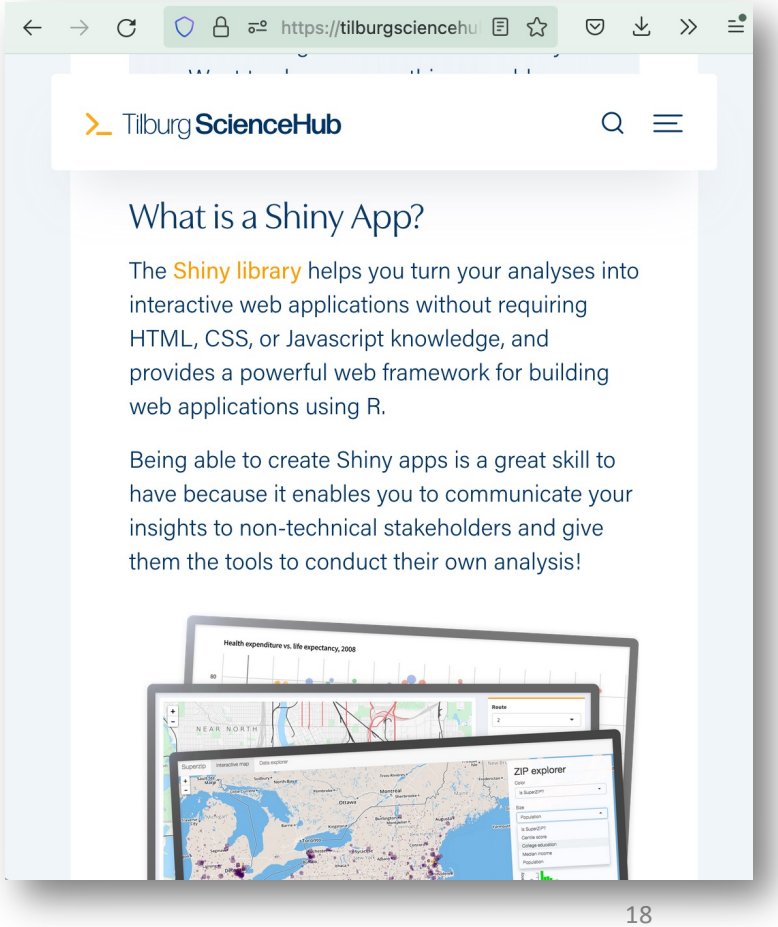
Reporting and deployment

- Much of what we do stops with printing out a regression table or writing a report
- Let's teach novel ways of **deploying insights**

→ How to illustrate research findings using an app

→ Publish e-books and interactive articles

→ Operate own APIs for marketing insights



Challenge 2

Professionalizing project management for empirical research

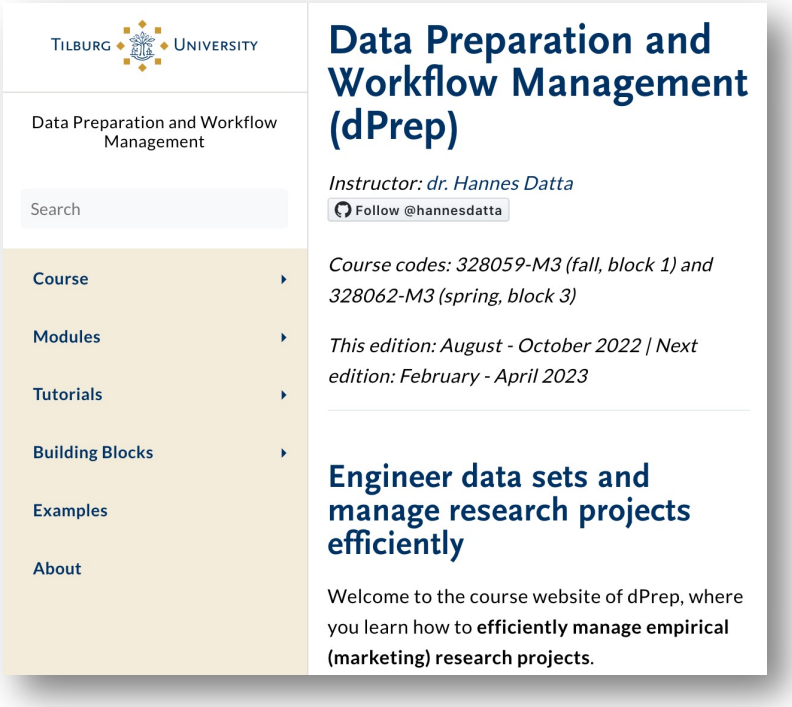
Limited focus on "way of working"

- Maintaining code and files
  - Unfamiliarity with coding conventions
  - No experience with file and directory management
- Using industry best practices
  - Versioning code (e.g., Git)
  - Automation of research pipelines (e.g., make)
- Project management techniques
  - Keeping notes, tracking progress, organizing meetings (e.g., Scrum)

From zero to hero…

- Developed **"Data Preparation and Workflow Management"** (3 ECTS, 7-week course)
  - Maintaining code and files; inspired by Gentzkow's and Shapiro's "Code and Data for the Social Sciences" (2014)
  - Project management using the Scrum method
  - Usage of version control with GitHub
  - Automating research pipelines (re-run code repeatedly)
  - Material openly available at https://dprep.hannesdatta.com

- Synergies between teaching and research
  - **Onboarding** made easier for colleagues and coauthors
  - Porting content to https://tilburgsciencehub.com, "code snippets" to use in research projects



Challenge 3

Embracing a diverse student population

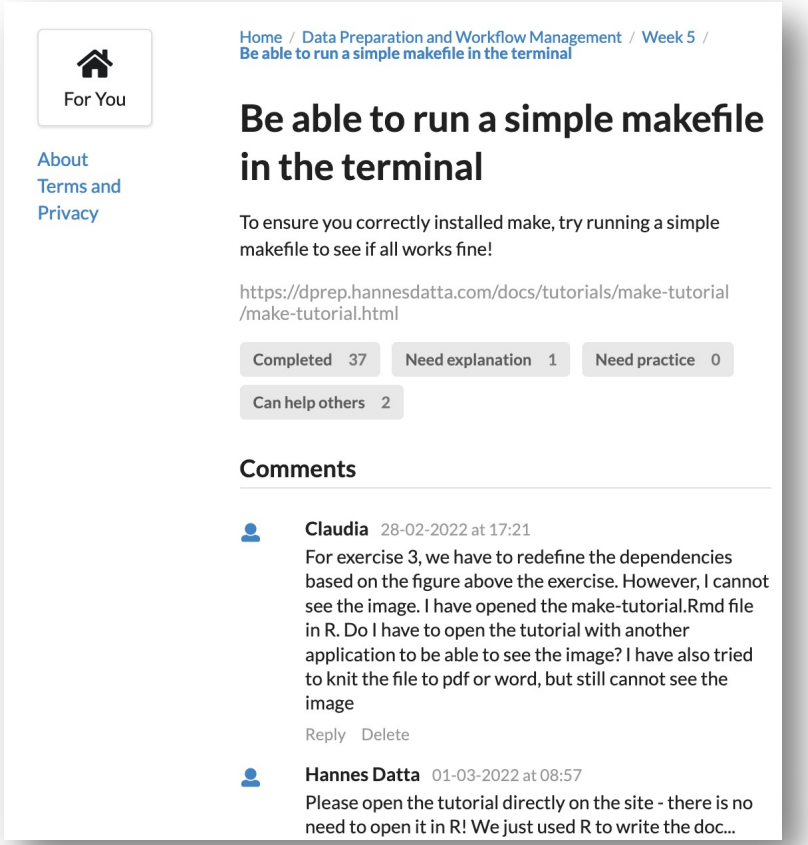
Skill diversity

- Some students enter well-trained; others have limited to no experience with coding

- Minimize student setup costs
  - Cloud-based Jupyter Notebooks (e.g., colab.google.com)
  - Sharing interactive code snippets w/ comments (e.g., gist.github.com)
  - Recorded installation tutorials (e.g., youtube.com/c/hannesdatta)

Managing Engagement using Pulse

- Track learning progress with a (self-developed) web app
  - Students "tick off" weekly to do's
  - Can view each others learning progress in a leaderboard
- Teacher knows how far students have advanced (at any moment)
- Ability to target students for extra coaching or advanced material



Next steps

- Building an open science community in marketing
  - Share and make teaching methods & material broadly accessible
  - Open can range from sharing syllabi to sharing entire courses
- Manage student engagement and workload
  - Further develop tool to track students' learning progress
  - Tackle lower-tier student motivation
  - Manage expectations and deal w/ mismatch with previous skills
- Keep on investing into new skills (and tell others about how it works)
  - Docker for reproducible research
  - Cloud computing to solve research- and teaching bottlenecks

Summary

- Shared experience of teaching Marketing Analytics at Tilburg
- Discovered opportunities to integrate teaching in research (and vice versa)
- Provide a foundation for developing own (open access) classes
  - → https://odcm.hannesdatta.com (Online Data Collection and Management)
  - → https://dprep.hannesdatta.com (Data Preparation and Workflow Management)
  - → tilburgsciencehub.com

Thanks.

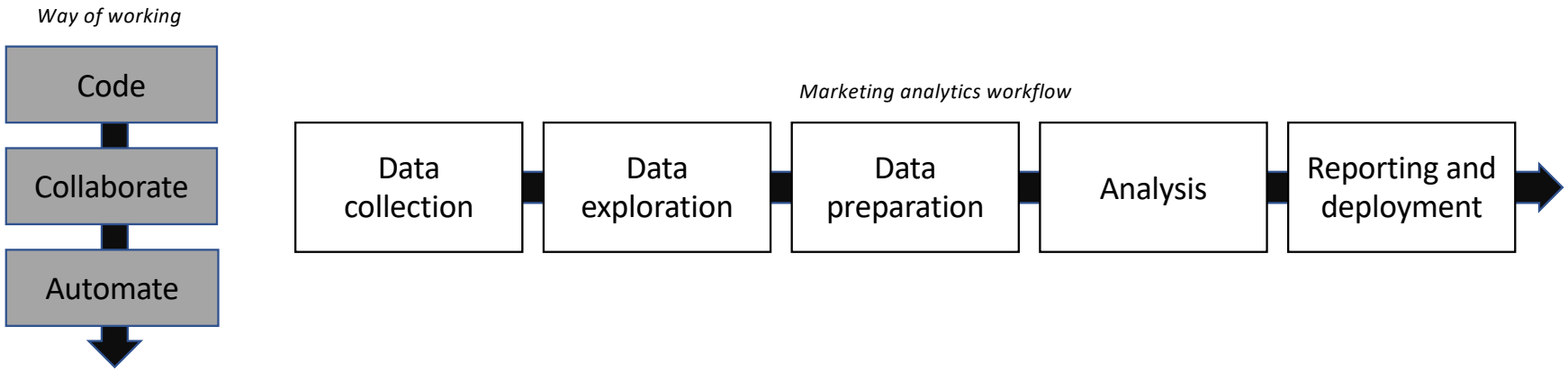
hannesdatta.com
tilburgsciencehub.com
web-scraping.org

Tilburg ScienceHub

Tilburg University
Open Education

BACKUP SLIDES

Developing the Marketing Analytics Curriculum



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Websites vs. APIs

Web Scraping

… the process of developing software to automatically collect information displayed in a web browser

EXAMPLE SOURCES

yelp amazon tripadvisor

Example articles:
Chevalier and Mayzlin (2006); Ludwig et al. (2013)

API

Application Programming Interface

…extract data at scale from a firm's official databases, using Application Programming Interfaces

EXAMPLE SOURCES

Spotify for Developers

Google Cloud Vision API

amazon Product Advertising API

Twitter API @twitterapi

Example articles:
Tellis et al. (2019); Toubia and Stephen (2013)

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Faculty requirements

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→Developed two new classes (source code on GitHub)
  → https://odcm.hannesdatta.com (Online Data Collection and Management)
  → https://dprep.hannesdatta.com (Data Preparation and Workflow Management)

→Developed tilburgsciencehub.com (joint initiative at the school)
  → visited by 4,000 monthly users, covering dozens of code snippets and 10+ research productivity tutorials