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Wer entscheidet darüber, wie das Internet funktioniert?

8. Tag der Junior Fellows

Moritz Mähr

4. Oktober 2022, Walter Benjamin Kolleg

Wer entscheidet darüber, wie das Internet funktioniert?

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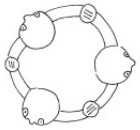
Die Schichten des Internets

Social Layer

The most relatable layer of the internet is made up of the entities that use it and the human relationships that govern it.

citizens

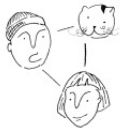
companies



nonprofit organizations

Content Layer

The content layer, what data is accessible and available over the internet, is perhaps the most recognizable for users.



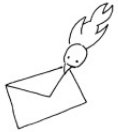
websites (news sites, social media, blogs)

entertainment

Application Layer

Applications are the ways content is served.

web-based platforms

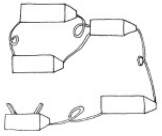


email

instant messaging

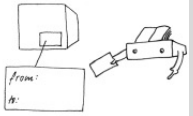
Logical Layer

The logic of the interoperable internet, or its standard protocols, support the connections between devices and the applications running on them.



networking

routing

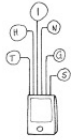


addressing (Domain Name System)

Infrastructural Layer

Internet infrastructure is the material basis of the IP network, or the physical components across which the logical layer can send information from one place to another.

computers (servers, personal computers, mobile devices)

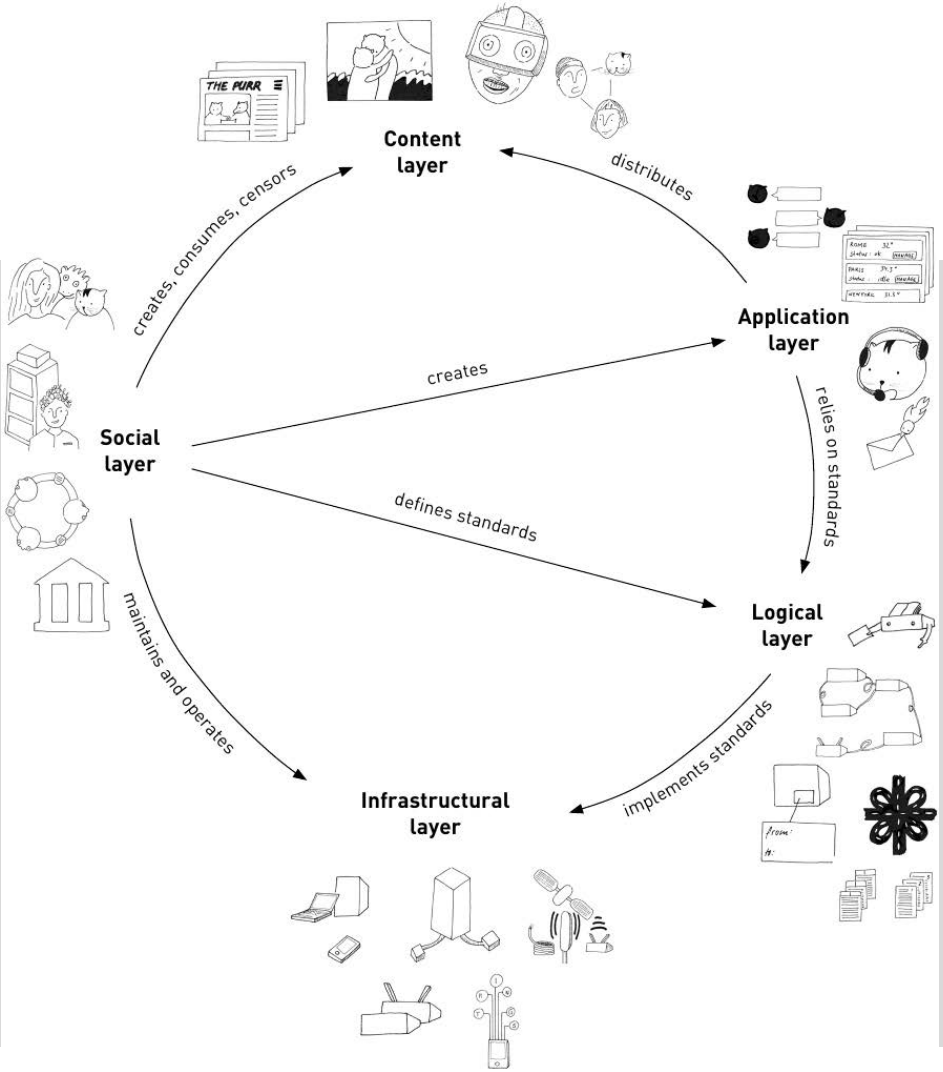


internet of things (IoT)

routers (gateways, switches)

data centers

Wie hängen sie zusammen?



Wie entsteht ein Internetstandard? Beispiel E-Mail

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1960er und 1970er Jahre

- “electronic mail” entsteht in den 1960ern als dateibasierte Kommunikationsform zwischen timesharing Benutzern
- Verschiedene nicht interoperable electronic mail Protokolle (Mail Box Protocol, SNDMSG, FTP Mail etc.) entstehen
- Netzwerke sind klein und geschlossen

1980er Jahre

- Netzwerke werden häufiger und miteinander verbunden
- Viele Technologien konkurrieren
- 1982 definieren Jonathan Postel das Simple Mail Transport Protocol (RFC821) und David Crocker das Internet Text Nachrichtenformat (RFC822) für die Mailübertragung zwischen Computern

RFC821

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Network Working Group — J. Postel
Request for Comments: DRAFT — ISI
Replaces: RFC 788, 780, 772 — August 1982

SIMPLE MAIL TRANSFER PROTOCOL

1. INTRODUCTION

The objective of Simple Mail Transfer Protocol (SMTP) is to transfer mail reliably and efficiently.

SMTP is independent of the particular transmission subsystem and requires only a reliable ordered data stream channel. Appendices A, B, C, and D describe the use of SMTP with various transport services. A Glossary provides the definitions of terms as used in this document.

RFC822

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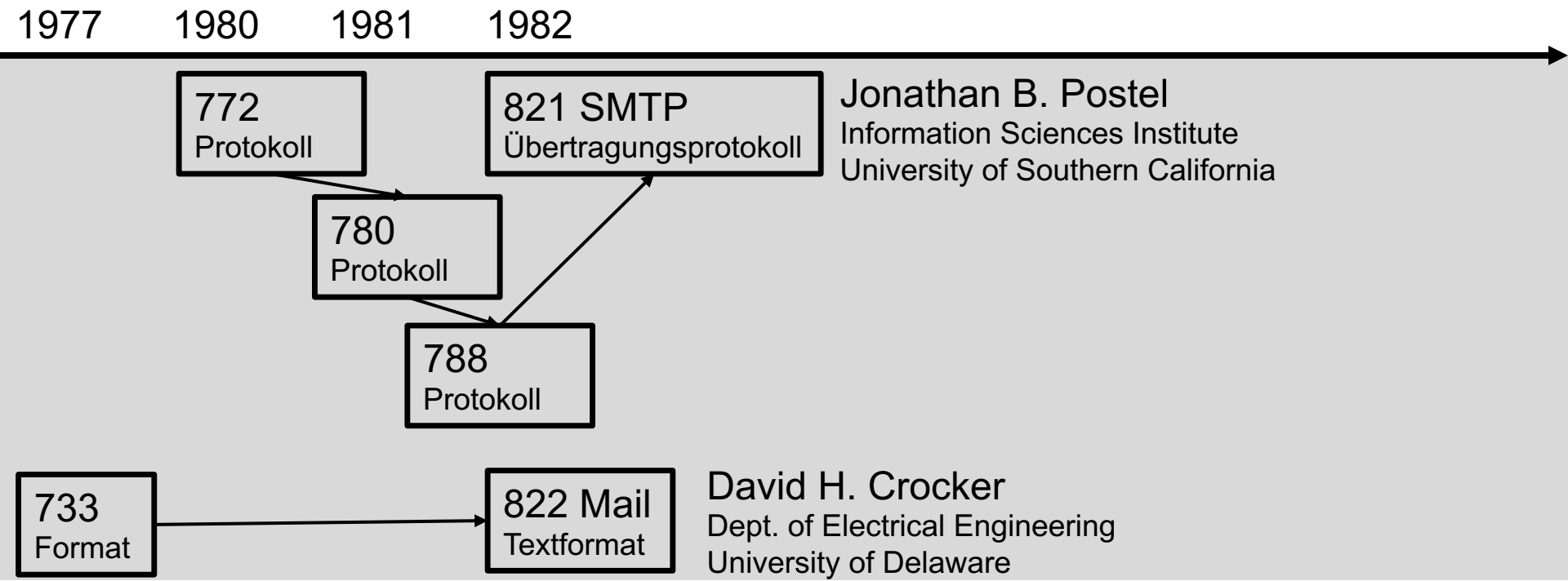
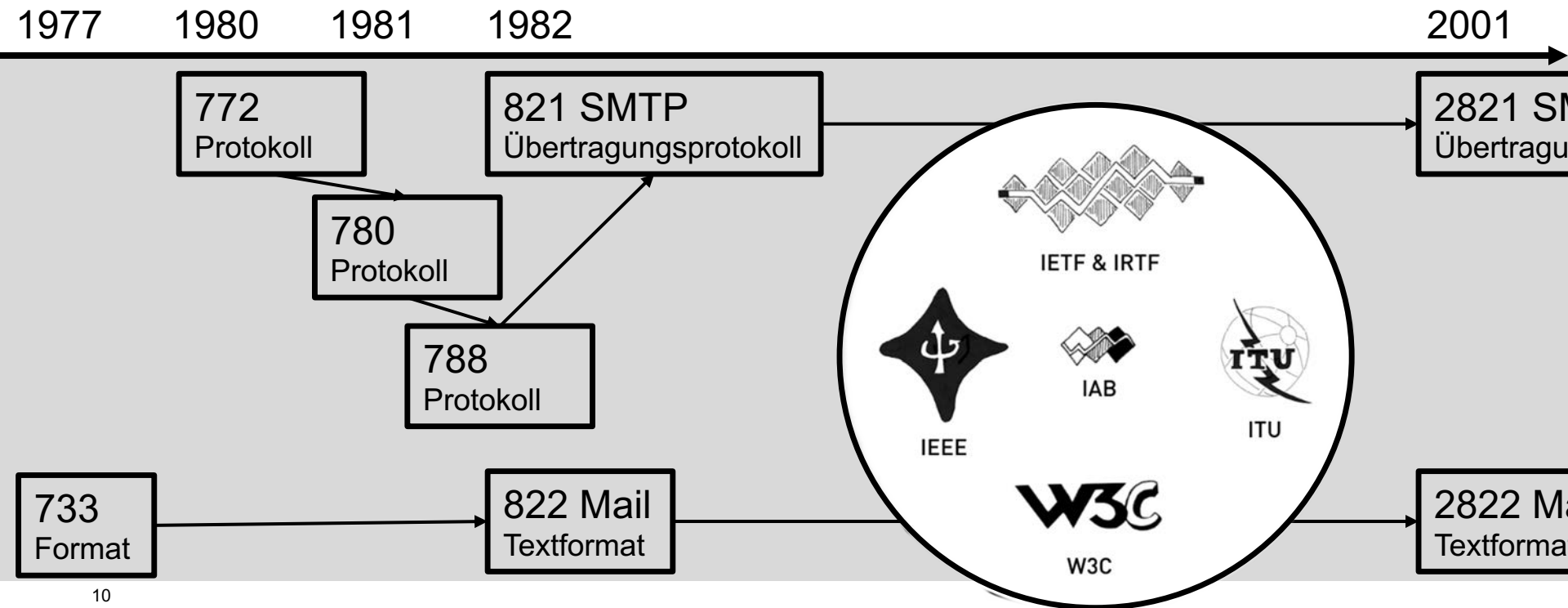
A.3.3. About as complex as you're going to get

```
Date      :  27 Aug 76 0932 PDT
From      :  Ken Davis <KDavis@This-Host.This-net>
Subject   :  Re: The Syntax in the RFC
Sender    :  KSecy@Other-Host
Reply-To  :  Sam.Irving@Reg.Organization
To        :  George Jones <Group@Some-Reg.An-Org>,
             Al.Neuman@MAD.Publisher
cc        :  Important folk:
               Tom Softwood <Balsa@Tree.Root>,
               "Sam Irving"@Other-Host;,
             Standard Distribution:
               /main/davis/people/standard@Other-Host,
               "<Jones>standard.dist.3"@Tops-20-Host>;
```

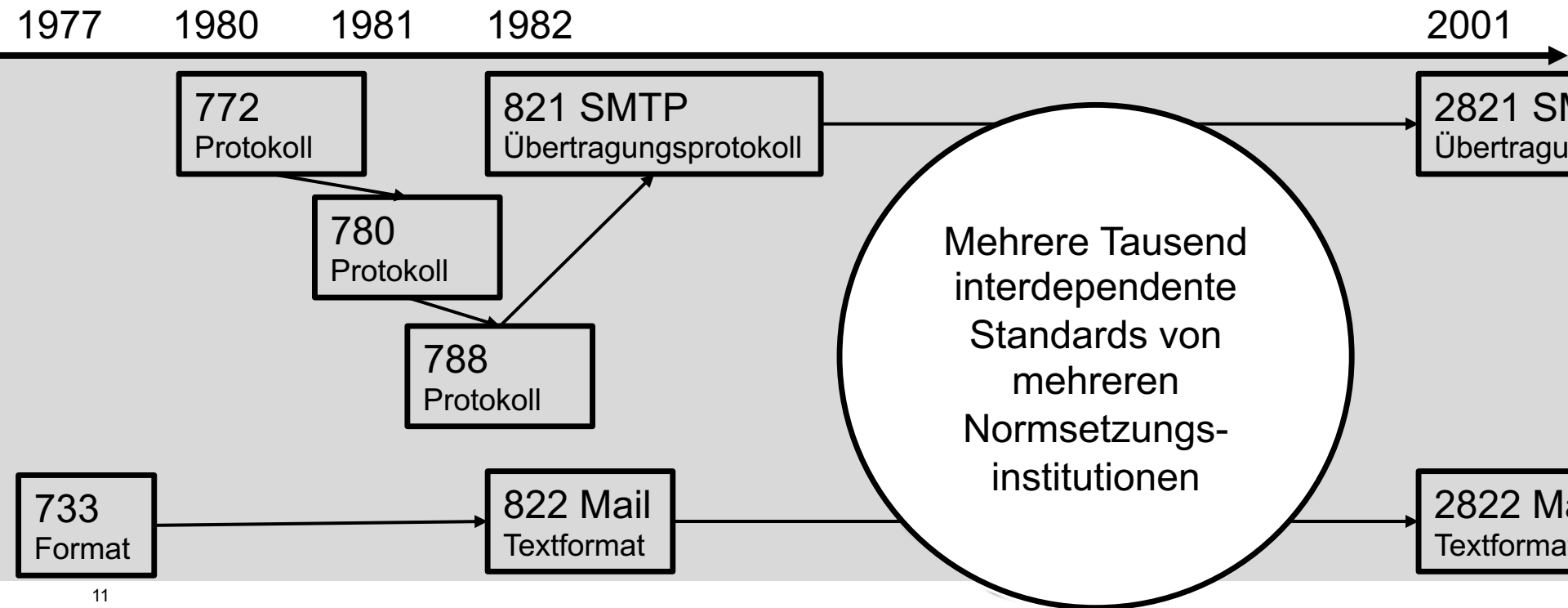
Wie entsteht ein Internetstandard? Beispiel E-Mail



Wie entsteht ein Internetstandard? Beispiel E-Mail



Wie entsteht ein Internetstandard? Beispiel E-Mail



Wie entsteht ein Internetstandard? Beispiel E-Mail

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1977 1980 1981 1982 2001

772 Protokoll

780 Protokoll

788 Protokoll

821 SMTP Übertragungsprotokoll

2821 SM Übertragu

733 Format

822 Mail Textformat

2822 M Textforma

Thesen

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These 1

In der Zeit von 1969 bis Ende der 1990er Jahre gab es eine Verlagerung von öffentlich finanzierten Akteuren (Bildungseinrichtungen, Behörden) zu privatwirtschaftlichen Akteuren und ein Wandel in der Zielsetzung der Festlegung von Internetstandards.

These 2

Standards, die aufgrund ihrer weiten Verbreitung einen infrastrukturellen Charakter haben, können ein Eigenleben entwickeln und sich der Internet Governance entziehen.

Wie untersuche ich die Thesen?

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Zusammenstellung des Korpus

- Standards (RFCs), Spezifikationen, Sitzungsprotokollen und weiteren Dokumenten der IETF und des W3C aus dem Untersuchungszeitraum
- Graue Literatur

Qualitative und quantitative Analyse

- Quellenstudium
- Korpuslinguistische Analyse (NLP)
- Soziale Netzwerkanalyse (SNA)
- Historische Fallstudie (E-Mail)

Zusammenstellung des Korpus

```python
# -*- coding: utf-8 -*-

"""Script to extract the graph from the rfc data."""

import json
import os

# import matplotlib.pyplot as plt
import networkx as nx
import pandas as pd

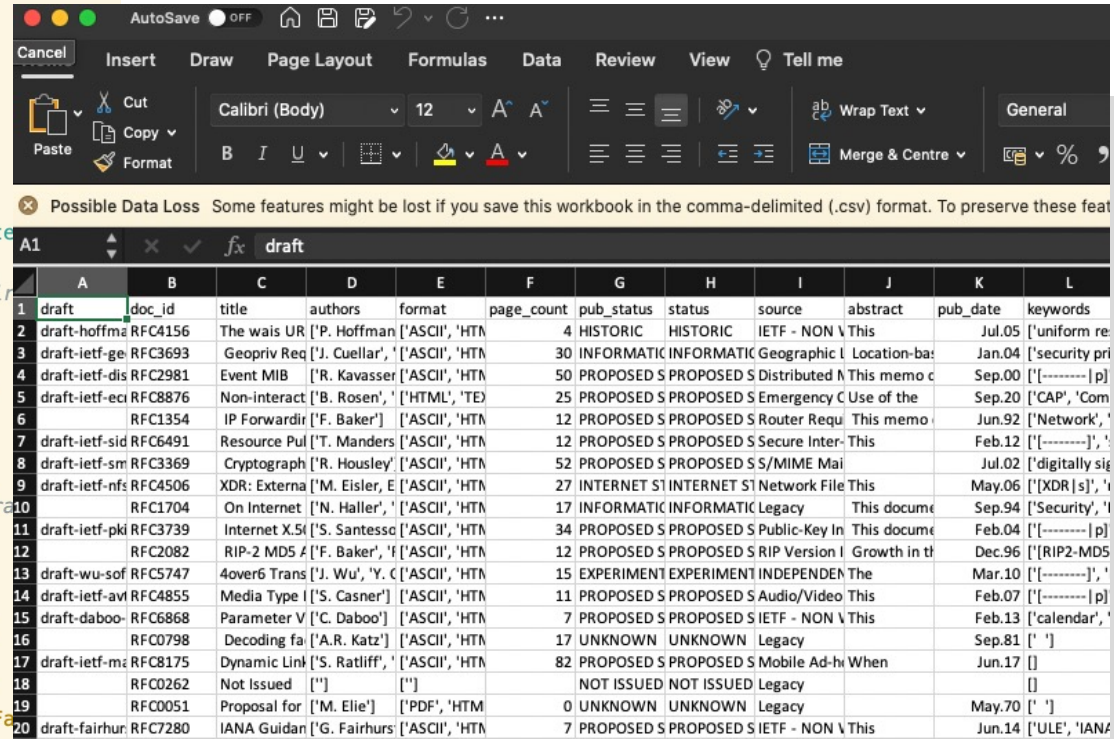
# import scipy as sp

DATA_PATH = "data/ftp.rfc-editor.org/in-note

# Get all the RFC JSON files in the data dir
list_of_file_paths = [
    os.path.join(DATA_PATH + file_path)
    for file_path in os.listdir(DATA_PATH)
    if file_path.endswith(".json")
]

# Read all the RFC JSON files into a datafra
list_of_dicts = []
for file_path in list_of_file_paths:
    with open(file_path, "r") as f:
        list_of_dicts.append(json.load(f))

df_with_rfcs = pd.DataFrame(list_of_dicts)
df_with_rfcs.to_csv("data/rfc.csv", index=Fa
```



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2	draft-hoffma	RFC4156	The wais UR	['P. Hoffman	['ASCII', 'HTM	4	HISTORIC	HISTORIC	IETF - NON V	This	Jul.05	['uniform re
3	draft-ietf-ge	RFC3693	Geopriv Req	['J. Cuellar', '	['ASCII', 'HTM	30	INFORMATIC	INFORMATIC	Geographic L	Location-bas	Jan.04	['security pri
4	draft-ietf-dis	RFC2981	Event MIB	['R. Kavasser	['ASCII', 'HTM	50	PROPOSED S	PROPOSED S	Distributed M	This memo c	Sep.00	['[--------|p]
5	draft-ietf-ecı	RFC8876	Non-interact	['B. Rosen', '	['HTML', 'TEX	25	PROPOSED S	PROPOSED S	Emergency C	Use of the	Sep.20	['CAP', 'Com
6		RFC1354	IP Forwardir	['F. Baker']	['ASCII', 'HTM	12	PROPOSED S	PROPOSED S	Router Requ	This memo	Jun.92	['Network', '
7	draft-ietf-sid	RFC6491	Resource Pul	['T. Manders	['ASCII', 'HTM	12	PROPOSED S	PROPOSED S	Secure Inter-	This	Feb.12	['[--------]', '
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9	draft-ietf-nfs	RFC4506	XDR: Externa	['M. Eisler, E	['ASCII', 'HTM	27	INTERNET ST	INTERNET ST	Network File	This	May.06	['[XDR|s]', '
10		RFC1704	On Internet	['N. Haller', '	['ASCII', 'HTM	17	INFORMATIC	INFORMATIC	Legacy	This docume	Sep.94	['Security', '
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19		RFC0051	Proposal for	['M. Elie']	['PDF', 'HTM	0	UNKNOWN	UNKNOWN	Legacy		May.70	[' ']
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Quellenstudium

rfc821.txt.pdf

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Network Working Group J. Postel
Request for Comments: DRAFT ISI
Replaces: RFC 788, 780, 772 August 1982

SIMPLE MAIL TRANSFER PROTOCOL

1. INTRODU

The ob ans transfer mail

SMTP ic and requi d d lices A, B, C, f SM ervices. A Gloss tion document

An important SMTP is its capability to relay mail across transport service environments. A transport service provides an interprocess communication environment (IPCE). An IPCE may cover one network, several networks, or a subset of a network. It is important to realize that transport systems (or IPCEs) are not one-to-one with networks. A process can communicate directly with another process through any mutually known IPCE. Mail is an application or use of interprocess communication. Mail can be communicated between processes in different IPCEs by relaying through a process connected to two (or more) IPCEs. More specifically, mail can be relayed between hosts on different transport systems by a host on both transport systems.

4 comments

PAGE 5 4

moritzmaehr 16:04

One of many Working Groups
-> Working groups should also pop up in SNA

moritzmaehr 11:42

Jonathan B. Postel, Editor of the RFC Series until his death in 1998

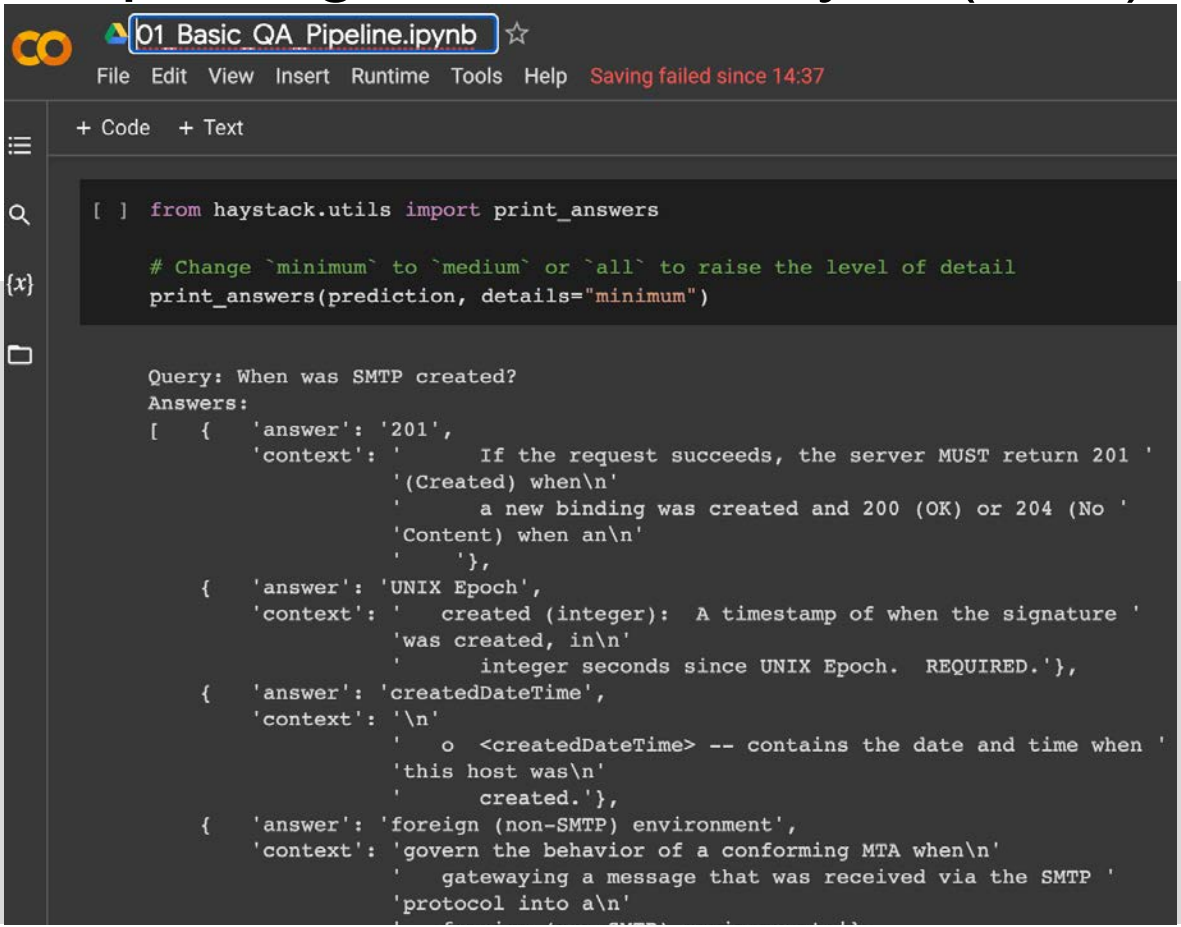
moritzmaehr 16:03

DRAFT does not necessarily mean that th standard is not in use. Only a few DRAFTS were formally upgraded to STD status.

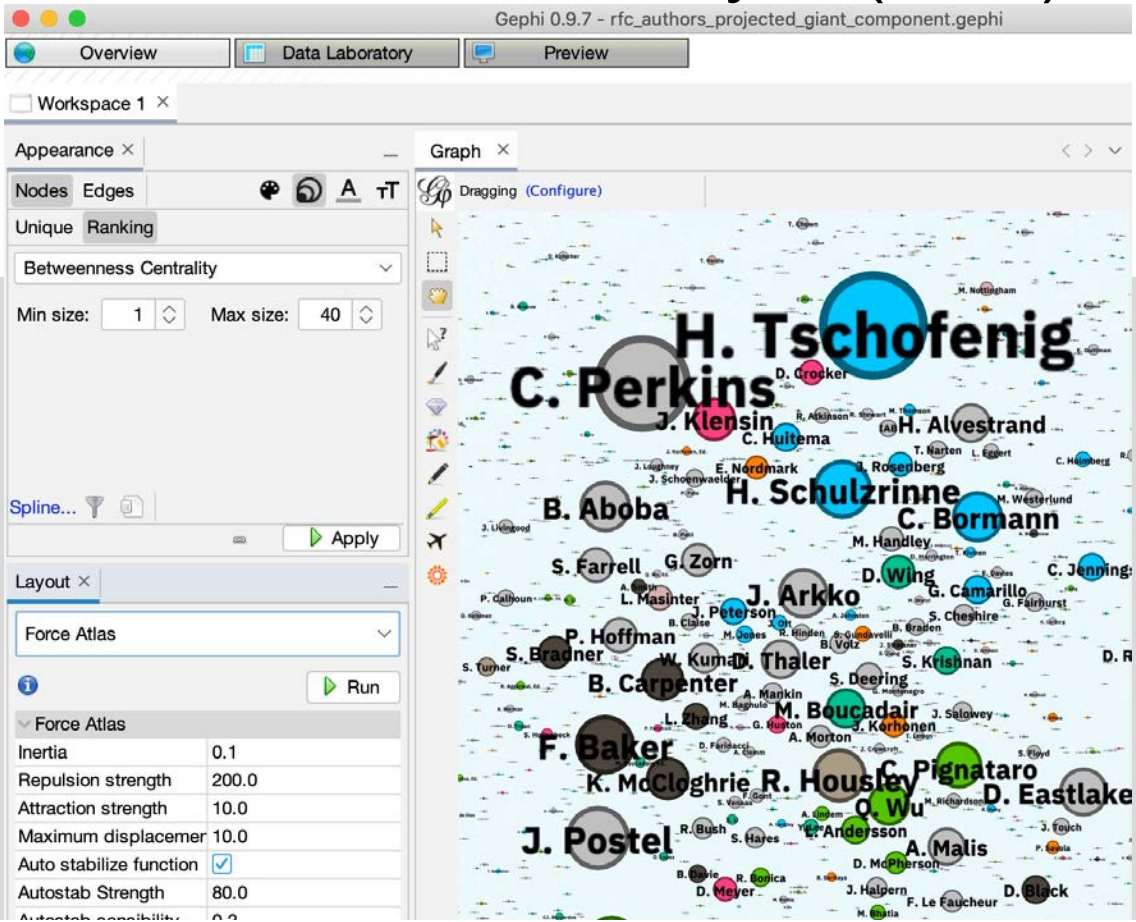
moritzmaehr 28 Sep

1980, 1981 and 1981

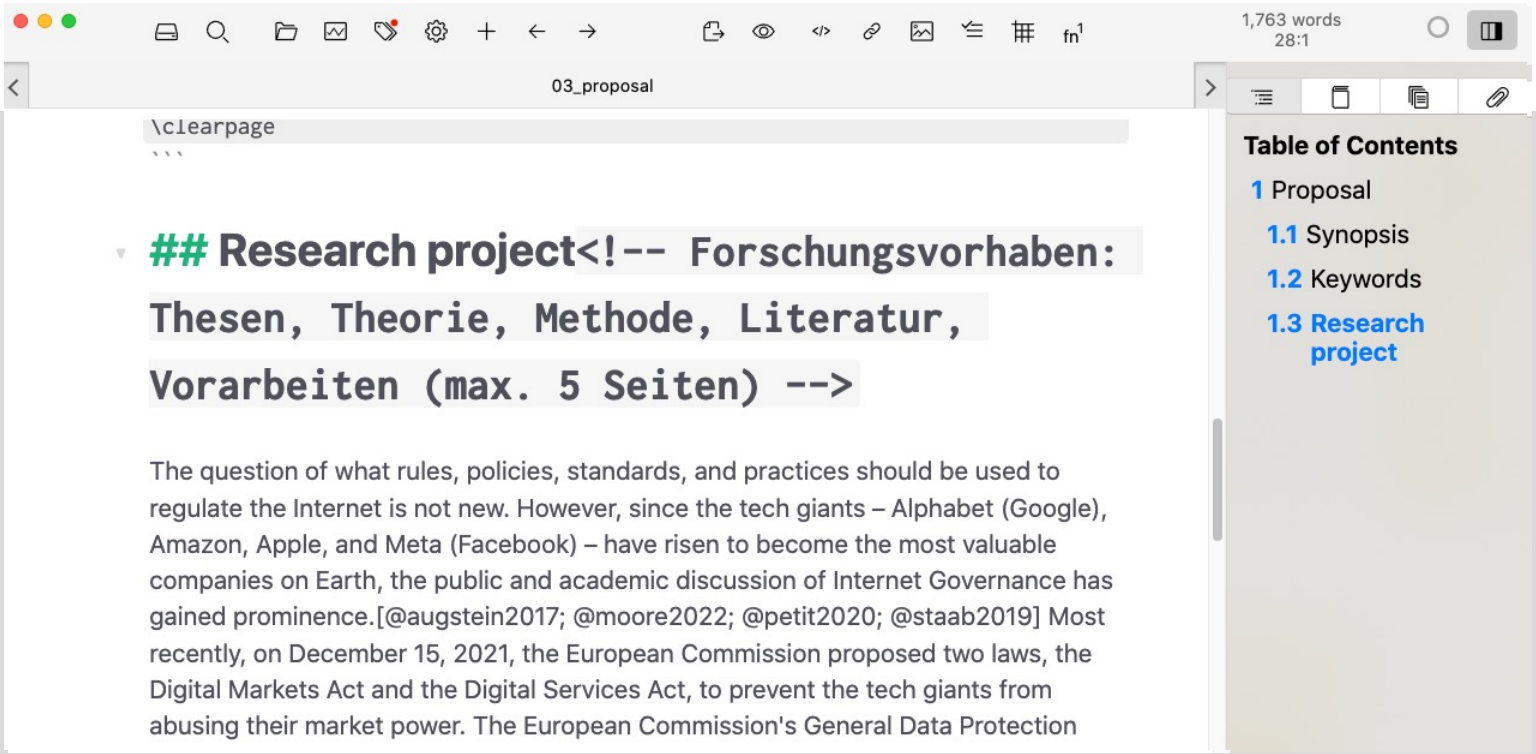
Korpuslinguistische Analyse (NLP)

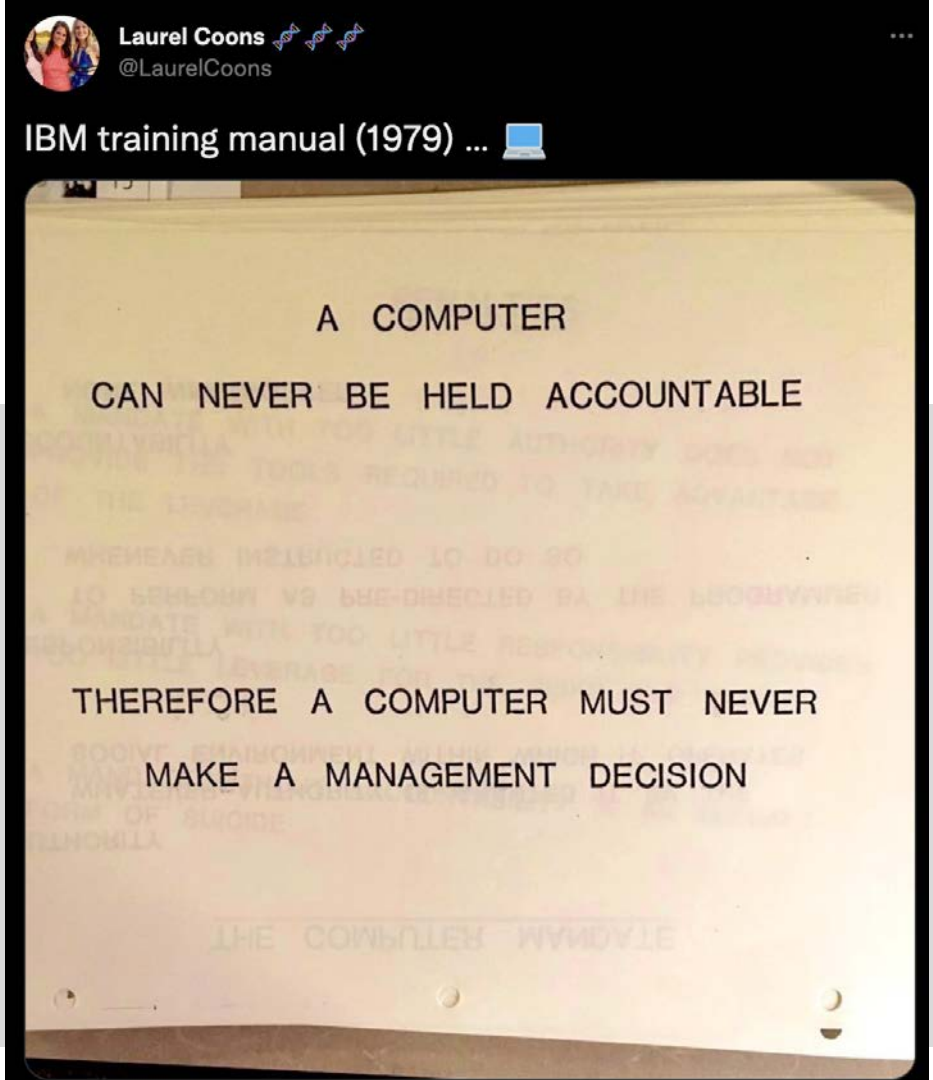


Soziale Netzwerkanalyse (SNA)



Historische Fallstudie schreiben




Laurel Coons
@LaurelCoons
IBM training manual (1979) ... 💻
A COMPUTER
CAN NEVER BE HELD ACCOUNTABLE
THEREFORE A COMPUTER MUST NEVER
MAKE A MANAGEMENT DECISION

Vielen Dank

Für Ihre Aufmerksamkeit

Moritz Mähr

4. Oktober 2022, Walter Benjamin Kolleg

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Literatur und Bildnachweise

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Korpus

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Korpus

```
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```

```
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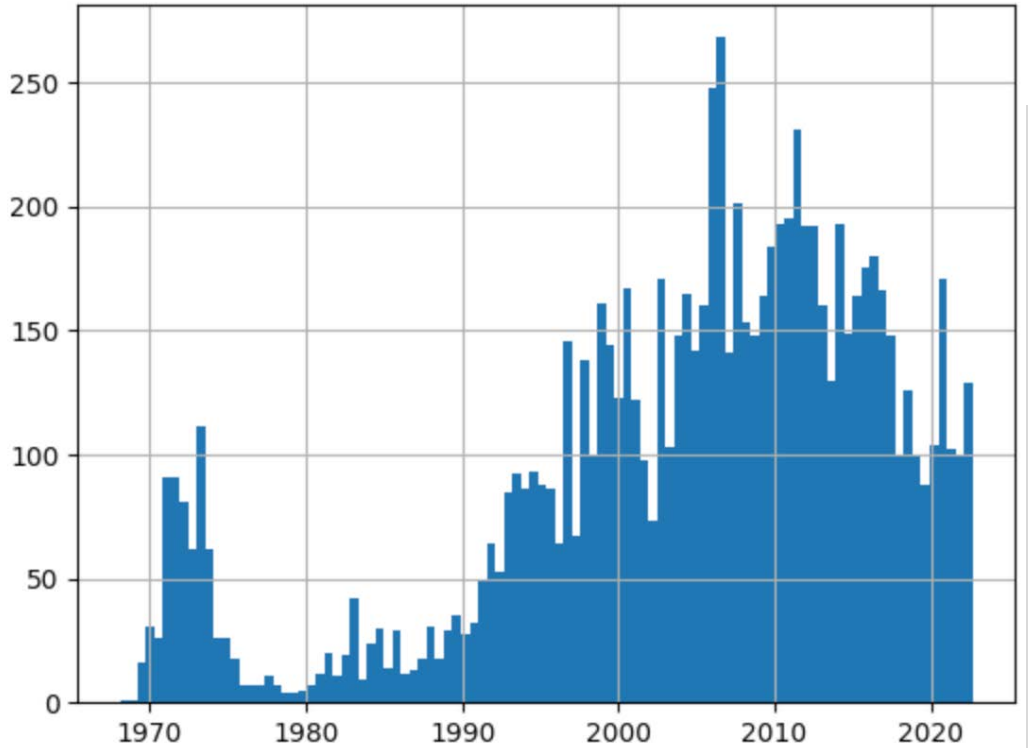

Korpus

```
df_rfcs.plot(x="pub_date", y="page_count", kind="scatter")
```

```
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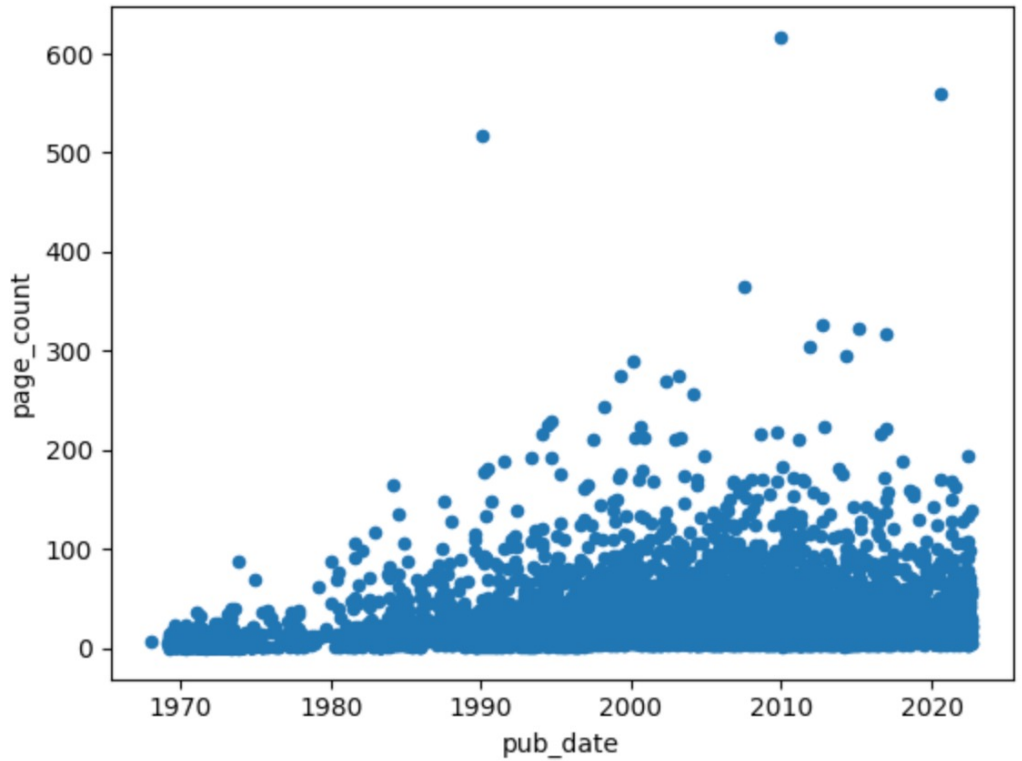
```



Korpus

```
df_rfcs.plot(x="pub_date", y="pub_status", kind="scatter")
```

```
<AxesSubplot: xlabel='pub_date', ylabel='pub_status'>
```