

*Textual analysis,
alternative data sources
and
the role of technology in
accounting research*

Lakshmanan (Shiva) Shivakumar

OUTLINE

- **The History**
- **Technological changes**
 - Hardware
 - Software
 - Networking
- **Implications for data availability & analysis**
- **The Future**

PART III: TECHNOLOGY AND ACCOUNTING

**THE IMPACT OF TECHNOLOGY
ON ACCOUNTING RESEARCH
—PAST, PRESENT, AND FUTURE***

NICHOLAS DOPUCH

Accounting research was not always like this, and its present form and much of its present focus can be traced back to two events which took place around 1960. The first was the Russians' successful exploration in space, and the second was the creation of the Accounting Principles Board (the APB). The fact that another country beat the United States in space exploration set off a wave of reviews of the education processes in this country, from elementary through graduate schools. Business schools also came under attack

Dopuch (1983)

Those who received their PhDs in business fields prior to 1960 were made obsolete almost overnight, unless they found ways to bridge the gap between the kind of research acceptable in the 1950s and that acceptable in the 1960s and after.

Dopuch (1983)

How far have we come? The hardware.



1960s – IBM 7094

1980s & 90s PC



Vax servers



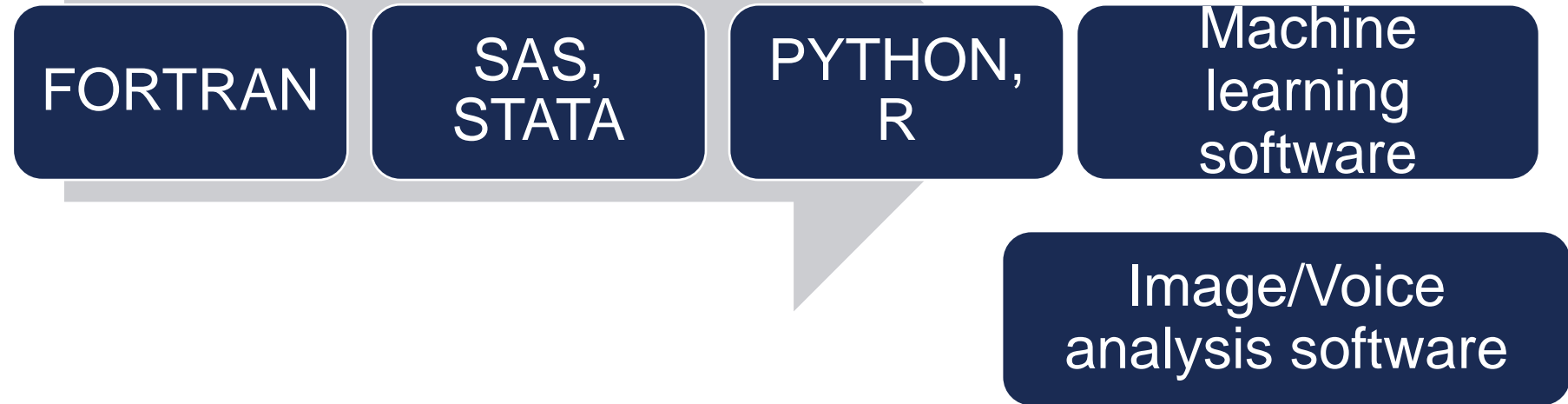
Today's notebook & smartphones

How far have we come? The software.

Operating Software:



Data-processing software:



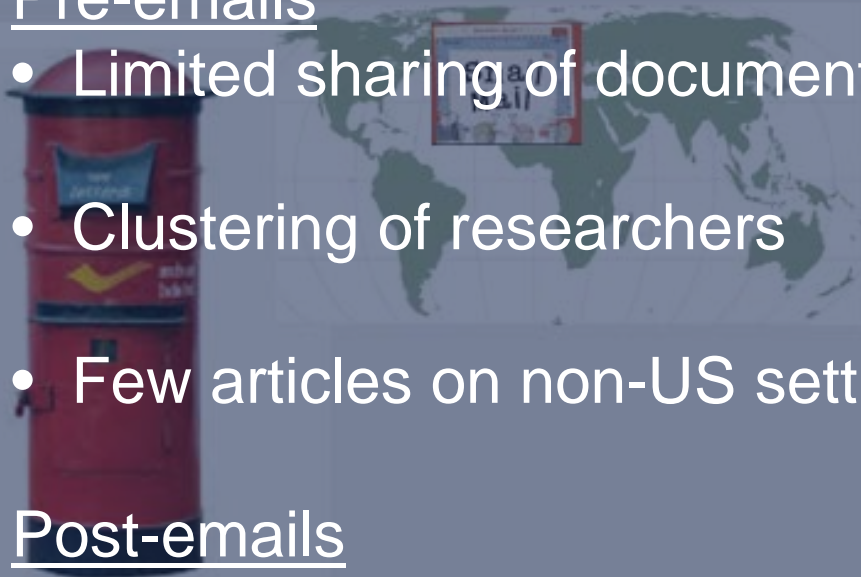
Introduction of the email...and its attachments

Pre-emails

- Limited sharing of documents and data
- Clustering of researchers
- Few articles on non-US settings

Post-emails

- Easier sharing of documents and data
- Geographic spread of researchers and co-authors
- Diverse research settings



What do the technological changes mean for data availability?

- Waning reliance on traditional data sources (CRSP, COMPUSTAT, IBES, etc.)
 - Novel data sources: Public (Internet, social media), Private (Credit card companies) and Regulatory filings
 - More detailed and independent verification of data collected by vendors
- Increased availability of non-US data
- Changing role for data vendors
 - Data vendors more inclined to provide access to original sources than just extracted data

Textual analysis

- Software and digitization of files
 - Easier collection of qualitative data
 - Extend to voice, image and video analyses
- More research on non-financial data
- Three broad approaches to transform narrative into numerical score
 - Frequency of syllables or words
 - Comparison of words in a file against a pre-chosen dictionary
 - Supervised machine learning approaches
- Significant measurement issues
 - Miss out the context (KPIs for executive compensation)
 - Results can be sensitive to choice of dictionary or software
 - Extract meaningless words (“nucor”, “endesa”, “sak”, etc. from machine learning for estimating credit risk)

Benefits of technological changes

- More innovative projects
 - Wide set of contexts
 - More in-depth and shorter windows analysis
 - Studies can go across languages
 - Inter-disciplinary research
 - Less overlap in research ideas
 - Encourage regulatory experiments
- Increased power of tests from larger number of observations.
- More intricate empirical measures
- Easier data-sharing and replication through cloud services
- Greater mobility of researchers

Disadvantages of technological changes

- More common to see purely descriptive studies
- Global competition for publication in top-tier journals
 - TAR submissions have increased from about 500 in 2011 to about 1200 in 2018.
- Information overload
- Plagiarism
 - Easier to copy digital files
 - But also easier to identify plagiarism

Where is technology headed?



[Artificial intelligence](#) >



[Computer vision](#) >



[Human-computer interaction](#) >



[Security, privacy, and cryptography](#) >



[Systems and networking](#) >

How do we face the technological changes?

- Constant updating of computer skills
- Co-authors with diverse skill sets
- Data outsourcing
 - Amazon Mturk
 - Microsoft Video Analytics

Those who received their

PhDs in business fields prior to 1960 were made obsolete almost overnight, unless they found ways to bridge the gap between the kind of research acceptable in the 1950s and that acceptable in the 1960s and after.

Dopuch (1983)

Technological changes are:

- Bringing together diverse researchers
- Opening new data sources
- Leading to a surge in research opportunities.

But,

- Access to new data \neq Innovative research