

PLENARY PANEL

NHH



AUDITS IN A DIGITALIZED WORLD – WHAT'S NEW?

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What's new and why should auditing researchers and educators care?



1. The dramatic increase in *accessible data* and *advances in technology* now enable data to be analyzed by a growing set of affordable and more user-friendly analytical software
2. Expanded data access and data analytics are transforming *global markets and businesses*
3. Technological issues impacting the business environment ultimately affect *accounting and auditing practice*
4. Technological issues impacting accounting and auditing practice ultimately affect *auditing research and education of auditors*



Key points

Thus, research and education should not ignore the ongoing digital transformation of the audit process BUT ...

Research

- Research into the digital transformation of the audit process is more a matter of refocusing or “upgrading” of a phenomenon than fundamentally new ways of doing auditing research, but a broader set of literature (incl. AIS and emerging technologies) seems relevant

Education

- At this stage, the digital transformation has not fundamentally changed the audit process as we know it, but expanded data access and advances in software technology will have an impact on how an audit is performed in all phases of the audit



Status of current practice

- The major international public accounting firms promote and *invest heavily* to advance their audit technology and moved to leverage the use of audit data analytics for financial statements audits
- The *combination* of increased access to organized and reliable company data, increased computing power, and advances in software technology now work together such that auditors are **able to** perform procedures with use of expanded data and new audit data analytics (Messier et al. 2019)

Status of current practice



Eilifsen et al. (2019): Based on detailed information on 109 audit engagements (2017) of large international accounting firms we find among other things that:

- Firms differ in their *strategies* on how to implement audit data analytics (ADA)
- Uncertainties about the supervisory inspection authorities' evaluation and acceptance of ADA generated audit evidence make the firms cautious
- The actual use of ADA is relatively limited and the use of more advanced ADA is rare
- When ADA are used, ADA output is mostly used as supplementary evidence
- More ADA are used for clients with integrated ERP/IT-systems
- More ADA are used for newly tendered audit engagements
- Big Data beyond client data is not much used
- The partners and managers are not sufficiently convinced that ADA usage is yet superior to the current evidence gathering and are not quite comfortable with the “support” by their firms, regulators, and supervisory inspection authorities

Next?

- Historical evidence suggests that auditors have lagged in their adoption of technology but it would be surprising if the audit is not *significantly more digitalized* within a few years' time

Research – Where do we stand?



- Research in Big Data and analytics is at *an early stage*
- The auditing literature has mostly addressed the *potential* of audit data analytics, as opposed to *whether and how* data analytics are used in the audit process
- The *accounting information system (AIS)* and *emerging technology* literature has for long investigated issues related to technologies and analytical techniques, including in an audit perspective
 - Research in and development of *audit decision aids* (e.g., Hansen and Messier, 1986, ...) and theories and testing of key factors that impact the *success or failure* of the use of automated tools and techniques (e.g., Sutton and Arnold 1998, “Theory of technology dominance”; Appelbaum 2016; Sutton, Arnold, and Holt 2018; Arnold 2018; No, Lee, Huang, and Lee 2019)
 - Theories and testing of the *acceptance and adoption of emerging technologies* (e.g., Goodhue and Thompson 1995; Dowling 2009; Zhou, Lu, and Wang, 2010; Bierstaker, Janvrin, and Lowe 2014; Payne and Curtis 2017; Wu and Chen 2017; Li, Dai, Gershberg, and Vasarhelyi 2018)

Research – What is next?



- *Behavioral implications* of audit data analytics impact on audit judgment and decision making (e.g., Brown-Liburd et al. 2015)
 - How can Big Data and ADA be leveraged to facilitate and improve auditors' judgments and decision making?
 - Use of Big Data and ADA likely triggers and/or aggravates the common cognitive biases in audit (e.g., dilution, data overload, information relevance, pattern recognition, ambiguity, ...)
- Need and opportunities for auditing researcher with use various methodologies
- A framework for researchers of complementary value of seven empirical methods that gather data in different ways (Bloomfield, Nelson, and Soltes, 2016)

Does the Researcher	Prestructured	Hand-collected	Field Studies	Field Experiments	Surveys	Laboratory Studies	Laboratory Experiment
	Archival Analyses	Archival Analyses					
Record data?	No	No	Yes	Yes	Yes	Yes	Yes
Structure data?	No	Yes	Yes	Yes	Yes	Yes	Yes
Elicit dependent variables?	No	No	No	No	Yes	Yes	Yes
Manipulate independent variables?	No	No	No	Yes	No	No	Yes
Control the data-generating setting?	No	No	No	No	No	Yes	Yes

Education – what should we do?



- Additional skills needed
 - Accounting firms have now *expectations* for audit associates exposure to ADA, understanding how to perform ADA and understand their outputs in the broader context of the audit
- Academics and those responsible for education of auditors need to develop their competence and research skills in the area and offer education that meets firms' needs
- Digital Auditing master course (7.5 ECTS) at NHH from 2018:
 1. Current state and trends of digitization and use of data analytics in businesses and accounting firms
 2. Tools and techniques to obtain, clean and store data for use in audits
 3. Data analytics tools to use in the audit
 4. How to turn output from data analytics into sufficient appropriate audit evidence