



**Towards Data Level Assurance:
Process Mining &
A Conceptual Continuous Framework**
Rutgers, 7 November 2015

Prof. Hans Verkruijse PhD, RE, RA &
Angelique J.M. Koopman MSc, RE, RA

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“Elephant paths”



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Your facilitators for this session




Prof. J.P.J. (Hans) Verkruijse PhD RE RA
Hans holds a position as professor in Accounting Information Systems at Tilburg University, is chair of the council for professional ethics of the NOREA, the oversight council for reliable administration, XBRL Netherlands and member of the Member Assembly of XBRL International Inc., International research director at the Global Accountancy Transparency Institute and researcher in the area of continuous monitoring, auditing and assurance.
Hans is also editor for the Journal of Information Systems.
He was a partner at Ernst & Young for many years and international (IFAC/IAASB/IAESB) en national (CCR) standard setter for auditors.



A.J.M. (Angelique) Koopman MSc RE RA
Angelique is a partner at Coney in the audit and consultancy practice. Angelique is also a PhD researcher and guest lecturer at Tilburg University. She is also frequently hired by audit firms to train auditors in how to use (new) data-analytical technologies in the audit of financial statements.
Her research focuses on the application of (process) data-analytics to strengthen internal control in the context of continuous monitoring and auditing. The research question in her thesis is 'How process mining (re)designs the audit; impact on auditors (soft) risk evaluation'.

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Agenda: Towards Data Level Assurance



**Process Mining &
A Conceptual Continuous Framework**


Process Mining

- What is it?
- Demonstration with commercial tool


Continuous Monitoring

- A Conceptual Framework
- Towards data level assurance

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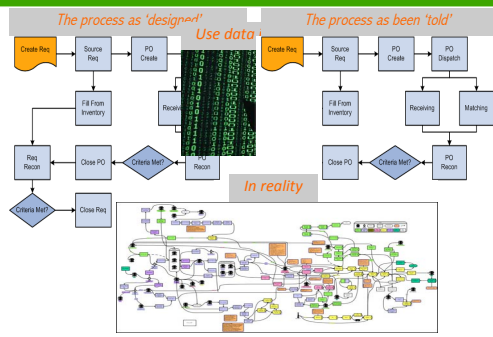



Process Mining:
"I see, I see, what you don't see...."

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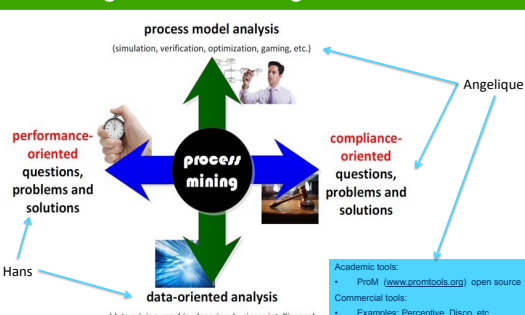
"Flow charts" versus processes in reality....

The process as 'designed' *Use data* *The process as been 'told'*



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Positioning Process Mining and our research



process model analysis
(simulation, verification, optimization, gaming, etc.)

performance-oriented questions, problems and solutions


compliance-oriented questions, problems and solutions

data-oriented analysis
(data mining, machine learning, business intelligence)

Academic tools:
- ProM (www.promtools.org) open source

Commercial tools:
- Examples: Perceptive, Disco, etc.

Hans Angelique

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A demo with commercial tool



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Everything is getting more complex

Science and technology create more and more possibilities and choices. Therefore, organizations are becoming more complex.

Consequences for management these days might be:

- Too much rules and procedures do not fit in the complexity and changeability of reality
- Quality control needs to have flexibility

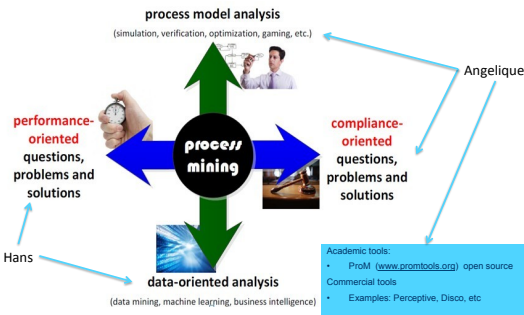
How to control organizations?



Is Extreme Complexity the New Simplicity?




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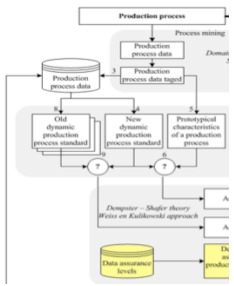



Continuous Monitoring



Towards data level assurance

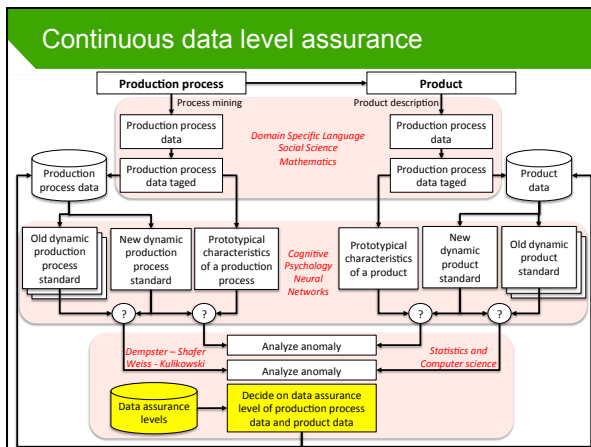
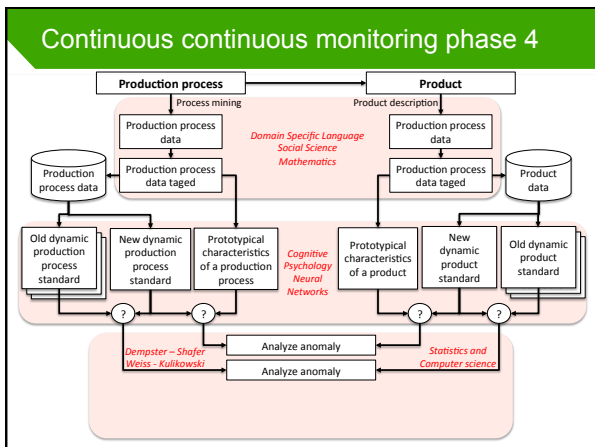
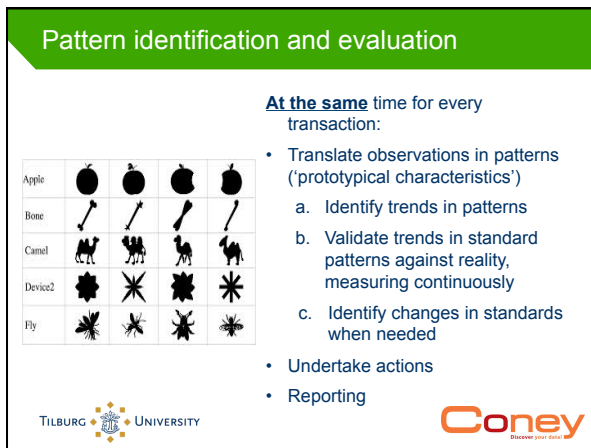
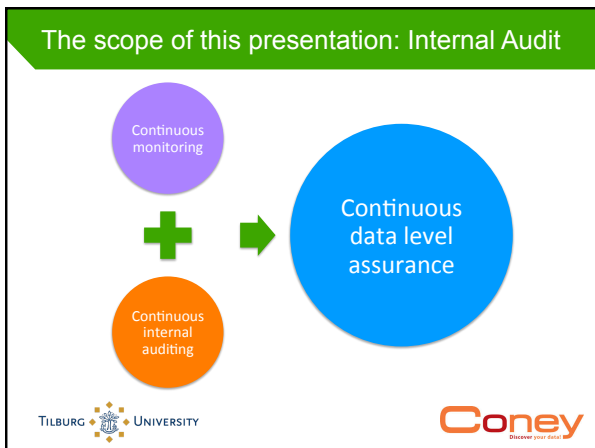



4 basic principles




- Every single transaction in the production process leads to a single product
- Every single product is the outcome of a single transaction in the production process
- A change in a transaction in the production process or a product is the result of a management decision
- Data level assurance needs an assurance continuum








Why? What's new?




- ❑ A certain level of assurance is saved with individual data elements at process and product level:
 - ✓ Automatically when no anomalies are identified by the software, or
 - ✓ After evaluating exceptions
- ❑ No absolute levels of assurance given by internal audit
- ❑ Results in assurance at DATA level, not a document level.....
- ❑ Contributes to transparency when organizations exchange data



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Prerequisites




Reliable automated systems

- Adequate ICT General Controls
 - ✓ Logical access controls
 - ✓ Change management procedures

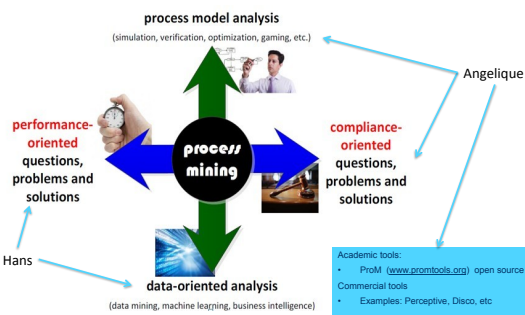
Integration of continuous monitoring controls in software of the organization

Other forms of assurance: at data level, no absolute figures

Prerequisites

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