

06.11.18

EU Commission IAS 2018 Conference

Artificial Intelligence in Audit & Risk



Mona de Boer

Machine learning: identifying risks at a level/speed that humans can't

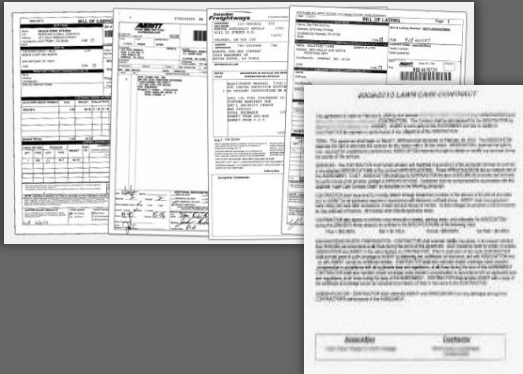
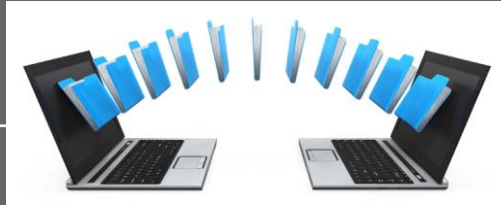
All transactions

Test Results Score Levels Lowest score Highest score

Journal ID	Business Unit	Transaction score	Transaction value (USD)	Unusual Account Combinations	Unusual Approver	Unusual Backdated	Unusual Day and Time	Unusual User Activity	Unusual User
1099987	123	3.000	2,288,472	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
2543773	123	3.000	330,000	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
1056850	123	3.000	320,068	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
1249313	123	3.000	300,000	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
2087536	123	2.771	75,900	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
1059918	123	2.000	2,404,232	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
1356398	123	2.000	1,087,922	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
1108321	123	2.000	800,402	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
1159714	123	2.000	514,973	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
1297246	123	2.000	507,071	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

An IPA challenge in auditing

0 0 0 0	0 1 0 0	1 0 0 0	1 1 0 0
0 0 0 1	0 1 0 1	1 0 0 1	1 1 0 1
0 0 1 0	0 1 1 0	1 0 1 0	1 1 1 0
0 0 1 1	0 1 1 1	1 0 1 1	1 1 1 1



An IPA solution in auditing

Extract text from PDFs and Images

Key Data Points & Relationships Extracted:

- Common Phrases
- Companies
- Locations
- Names



Converted Text

Extracted Content

Name	Abb.	Industry	Score
Microsoft	MSFT	Software	0.95
Amazon	AMZN	Retail	0.92
Apple	AAPL	Technology	0.90
Google	GOOGL	Search	0.88
Facebook	FB	Social Media	0.85
Twitter	TWTR	Social Media	0.82
LinkedIn	LNKD	Professional Network	0.80
Spotify	SPOT	Music	0.78
Netflix	NFLX	Streaming	0.75
Uber	UBER	Ride-sharing	0.72
Lyft	LYFT	Ride-sharing	0.70
DoorDash	DOOR	Food Delivery	0.68
GrubHub	GRUB	Food Delivery	0.65
Postmates	POST	Food Delivery	0.62
Instacart	INST	Food Delivery	0.60
Shutterstock	SHUT	Image Stock	0.58
Getty Images	GETTY	Image Stock	0.55
Adobe	ADBE	Software	0.52
Oracle	ORCL	Software	0.50
SAP	SAP	Software	0.48
Salesforce	SF	Software	0.45
Workday	WDAY	Software	0.42
BlackBerry	BB	Software	0.40
Twitter	TWTR	Social Media	0.38
LinkedIn	LNKD	Professional Network	0.35
Spotify	SPOT	Music	0.32
Netflix	NFLX	Streaming	0.30
Uber	UBER	Ride-sharing	0.28
Lyft	LYFT	Ride-sharing	0.25
DoorDash	DOOR	Food Delivery	0.22
GrubHub	GRUB	Food Delivery	0.20
Postmates	POST	Food Delivery	0.18
Instacart	INST	Food Delivery	0.15
Shutterstock	SHUT	Image Stock	0.12
Getty Images	GETTY	Image Stock	0.10
Adobe	ADBE	Software	0.08
Oracle	ORCL	Software	0.05
SAP	SAP	Software	0.02
Salesforce	SF	Software	0.01
Workday	WDAY	Software	0.00
BlackBerry	BB	Software	0.00

Entity recognition

Check [Entity]

Ontology

Framework

Named Entity Recognition:

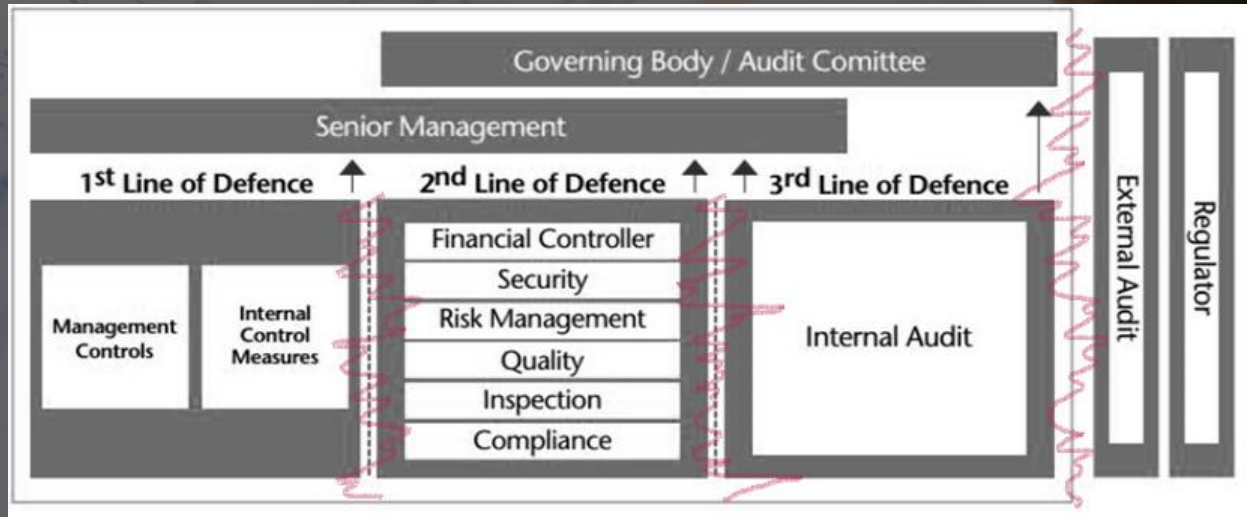
President Xi Jinping of China, on his first state visit to the United States, showed off his familiarity with American history and pop culture on Tuesday night.

Confidence:

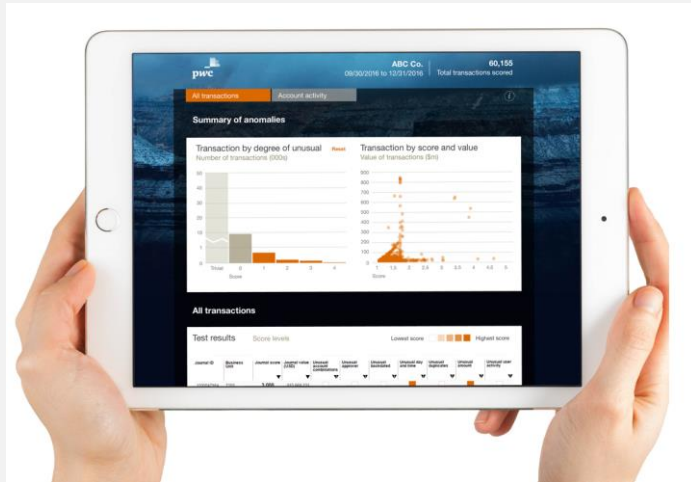
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Basic Dependencies:

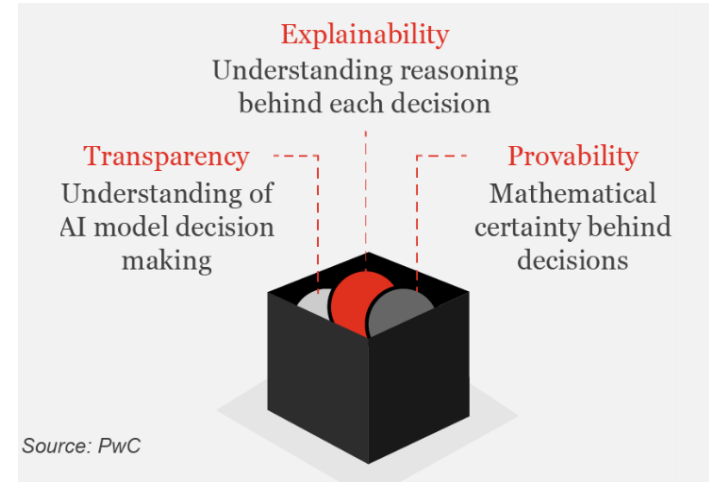
Who 'owns' the algorithms?



AI as instrument



AI as object of examination



Audit & Risk function as business enabler²

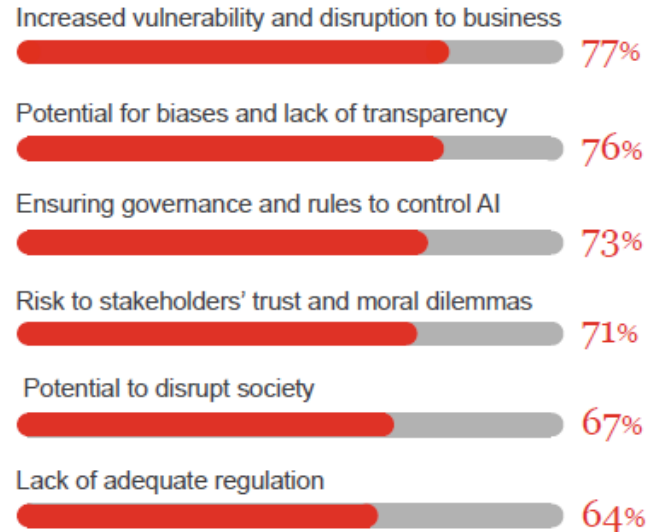
Audit & Risk will benefit from AI through:

- More risk based monitoring/auditing
- More (near-) real time monitoring/auditing
- Less retrospective = more time to help the business navigate



Audit & Risk will need to acquire skills to use and validate data-focused technology, complex automation and AI systems

What's holding AI back in the enterprise?



Source: [PwC CEO Pulse Survey, 2017](#)

Q: Which of the following issues surrounding AI adoption concern you the most?

Base: 239