Symposium Statistical Auditing May 2019

Operations Research in Auditing

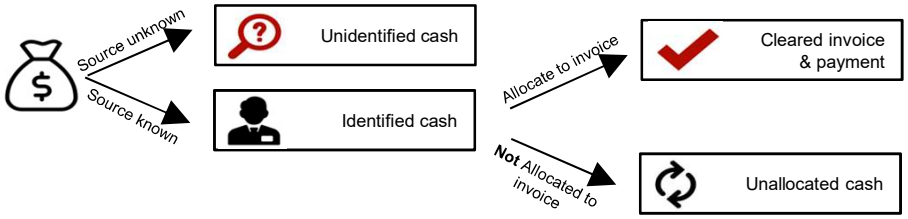
An example on unallocated cash

Steering Group Statistical Auditing

pwc

A international client has an unallocated cash amount that is growing over time

The problem



So why is it a problem?

- Potential P&L impact (bad debt provisions/ gains)
- Risk of blocked sales orders: orders held when customer is over credit limit when payment not posted
- Potential wrong calculation of credit limits/ payment terms used
- Incorrect overdue reporting
- Possibility of incorrect dunning / collections management

And…….is it an indication that the processes are not working as they are designed? (or not clearly defined….)

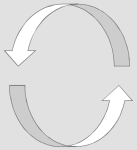
Using The Intelligent Matcher to match unallocated cash with invoices outstanding

How we do it

The Intelligent Matcher (TIM) is a tool created by PwC for matching debit and credit amounts. Search criteria used for matching the debit and credit amounts can be defined and extended based on the data gathered.
Using TIM is an efficient solution to match the unallocated cash and credit notes of our client. The tool will match the amounts automatically with the invoices and no manual interaction is needed to take place. Furthermore, by using smart algorithms, the tool is faster and more accurate compared to the manual exercise.
TIM needs data and a set of matching rules as input. After processing the data and the predefined rules in TIM, a report is generated which shows the matches found. You can also generate a simple report which can be used as an upload template in SAP for clearing purposes.

Data is gathered and used as input for TIM. TIM does have a minimum amount of data fields and a standard set of rules required to ensure matches between the debit and credit amounts

Besides the basic matching rules, additional rules may be implemented into TIM to determine how matches can be made between debit and credit amount (amounts, dates, client names etc)



After running TIM with the defined rules the amount of matches will be presented based on the defined rules. Based on analysis, rules can be added to increase the amount of matches. Non-matched items are analyzed and explained in close cooperation with client

TIM demo
How we do it

www.pwc.nl/en/daapps#smart-processing

Six reasons to work with TIM
What we bring

***Computational efficiency** drives high quality matches within a limited time frame*

Matching journal entries comes down to assigning match numbers to entries such that entries with the same match number have minimal deviation from predefined matching rules. A lot of mathematical research has been conducted to design solvers that try to minimize such deviations whilst having acceptable solution times. TIM employs the world-class (MIP) solvers resulting from this research.

***Fuzzy logic** can be applied in TIM to find complex matches*

If all matching rules would be exactly known upfront, then unmatched journal entries probably would not have developed over time. The fact that the matching logic is - to a certain extent - fuzzy, makes the matching extra challenging. TIM offers a structured approach to define and apply fuzzy logic in matching rules and facilitates to add additional data fields that al low for defining new matching rules during the process.

***Audit trail** is captured by TIM and in addition, TIM provides a fast closure*

TIM structures the matching process by documenting all settings and priorities of matching rules per match. This supports the minimal data requirements for your auditors. In addition, the use of TIM will provide a fast closure.

***Clearing proposal** is generated by TIM and can be uploaded for clearing*

A report will be generated that shows the matches based on the data and rules set, which can be cleared in your finance system by uploading a clearing document created by TIM.

***Extensive root cause analysis** will provide insight in to areas for process improvement*

The problem and the complexity of unreconciled entries is assessed in both a deductive and an inductive way. The deductive approach uses data analytics (TIM) to churn out the problem and its complexity. The inductive approach, on the other hand, investigates the problem and it's complexity by interviewing employees who are executing the processes. The combination of the deductive and the inductive approach supports in fully understanding the as-is process and identification of root causes.

***P&L impact** can be quantified*

Matching unreconciled entries potentially has (material) P&L impact, meaning that e.g. your bad debt provisions are wrong.

Next to root cause identification, the project resulted in multiple important insights

Our results

Out of all unallocated cash for third parties, 94% of total value could be matched and/or explained

Possible P&L impact is identified - One case study with a positive P&L impact of 59%

Initial conclusions, indicate conservative provisioning levels due to unallocated cash

AI is the ability of a machine to perceive its environment & perform tasks that normally require human intelligence

Sense

AI can see, hear, speak, smell, feel, understand gestures and even interface with your brain

- Natural language
- Audio and speech
- Machine vision
- Navigation
- Visualization

Think

AI is helping us **make better decisions** – and doing it faster, better, more cheaply and more accurately

- Knowledge and representation
- Planning and Reasoning
- Machine Learning
- Deep Learning
- Simulation and Digital Twins

Act

AI is **equaling or surpassing humans** in all sorts of tasks

- playing games, driving cars and making recommendations

- Intelligent automation
- Deep question and answering
- Machine translation
- Collaborative systems
- Adaptive systems

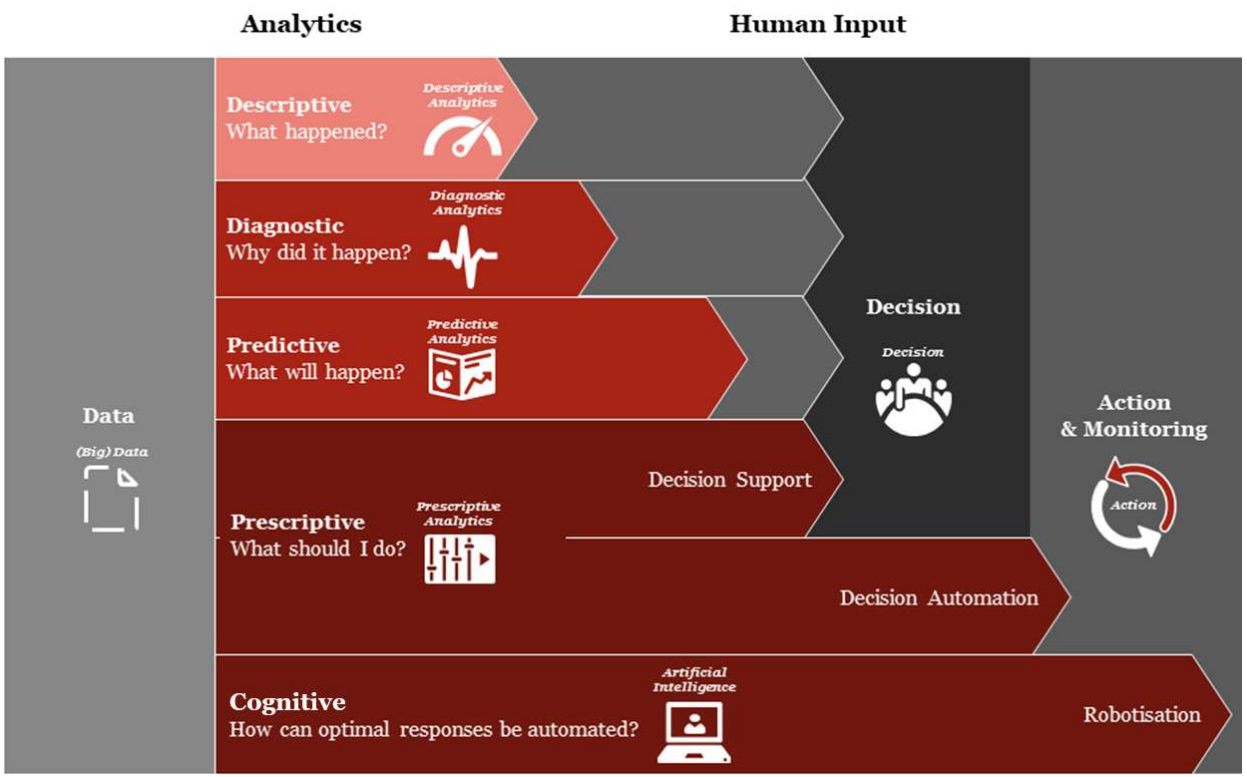
Four ways in which AI gets used in Enterprises

	 Human in the Loop	No Human in the Loop
Hardwired / Specific Systems	**Assisted Intelligence** AI systems that assist humans in making decisions or taking actions. Hard-wired systems that do not learn from their interactions.	**Automated Intelligence** Automation of manual and cognitive tasks that are routine. This does not involve new ways of doing things– automates existing tasks
Adaptive Systems	**Augmented Intelligence** AI systems that augment human decision making and continuously learn from their interactions with humans and the environment.	**Autonomous Intelligence** AI systems that can adapt to different situations and can act autonomously without human assistance

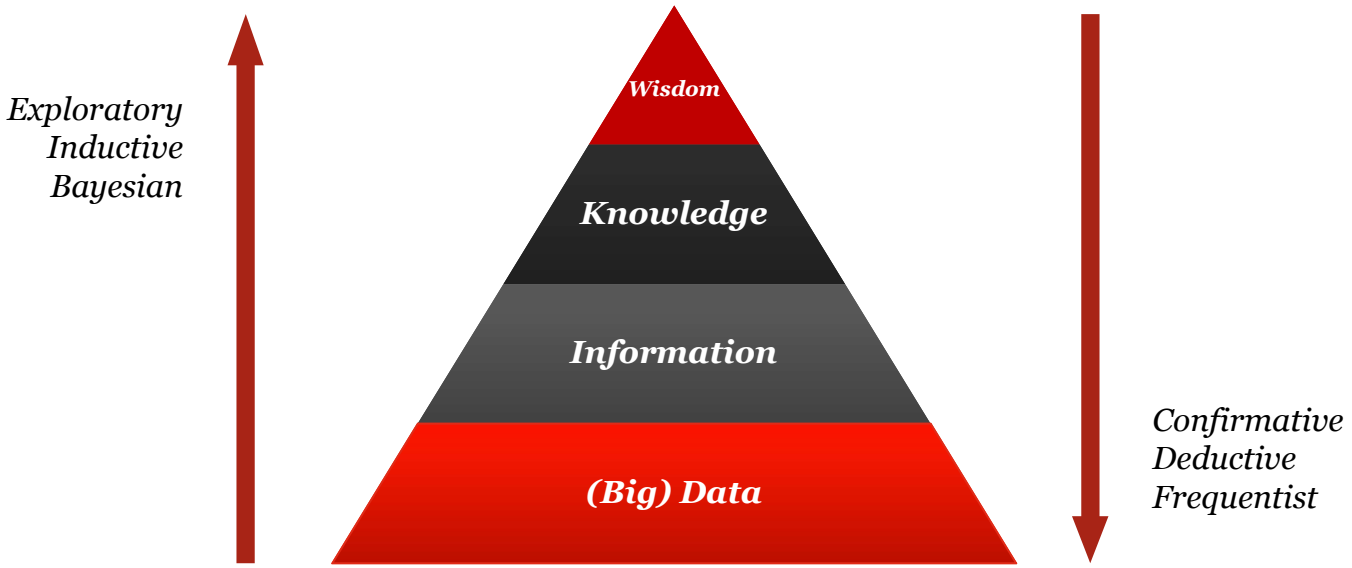
AI goes beyond improving current analysis

source: https://www.youtube.com/watch?v=cVYDkPidXrU

Levels of maturity data analytics



AI tends to focus less on deduction and more on induction



Source: Stephen Tuthill (1990)

Why now?

Four key drivers have pushed AI from theory to reality, leading to much of the disruption we see today

Accelerating Technology

Exponential increase in compute density

Big Data

Digitization of ‘everything’ creates lots of data

Open Source Software

Time to market drops as software is shared

Cloud Computing

Cloud computing reduces marginal costs