



Berenschot
Intellerts

Robo-advies in de praktijk

29 maart, 2017

Data Science

Artificial
Intelligence

Data Mining

Statistiek

Machine
Learning

Business Analytics

Statistical Learning

Trekken met en zonder terugleggen

Je pakt 3 knikkers uit een vaas met 3 rode en 4 witte knikkers.
Noem het aantal rode knikkers X .

- Bereken $P(X = 1)$?

Zonder terugleggen

$$P(X=1) = \binom{3}{1} \cdot \frac{3}{7} \cdot \frac{4}{6} \cdot \frac{3}{5} \approx 0,514$$

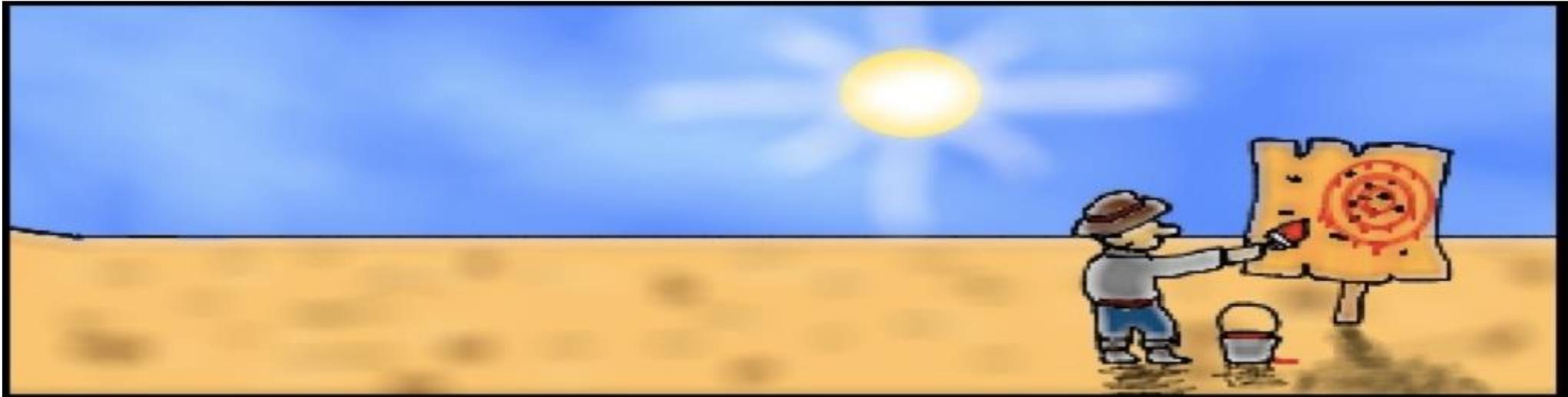
Met terugleggen

$$P(X=1) = \binom{3}{1} \cdot \frac{3}{7} \cdot \left(\frac{4}{7}\right)^2 \approx 0,420$$

aantal
verschillende
volgorden

kans op
één bepaalde
volgorde

$$P(\text{twee witte ballen}) = 3 \cdot \frac{8}{14} \cdot \frac{7}{13} \cdot \frac{6}{12} = \frac{6}{13}$$



Weke partijen zijn actief op het vlak van Big Data & AI?

The image displays a comprehensive grid of logos for various companies, organized into several layers and categories:

- MARKETING EXPERIENCES:** Includes sub-categories like Mobile Marketing, Display & Native Ads, Video Marketing & Ads, Search & Social Ads, Communities & Reviews, Email Marketing, Influencer Marketing, Social Media Marketing, Events & Webinars, SEO, Customer Experience/VoC, Loyalty/Referral/Gamification, Personalization & Chat, Testing & Optimization, Creative & Design, Sales Enablement, Interactive Content, Audience & Market Data, Channel/Local Mktg, Asset & Resource Mgmt, Call Analytics/Management, Team & Project Mgmt, Vendor Data/Analysis, Performance & Attribution, Dashboards/Visualization, and Web & Mobile Analytics.
- MIDDLE-WARE:** Includes Data Management Platforms/Customer Data Platforms, Tag Management, Identity, Cloud Integration/ESBs, and APIs.
- PLATFORM/SUITE:** Includes CRM, Marketing Automation/Campaign & Lead Mgmt, Web Content/Experience Management, and E-commerce.
- INFRA-STRUCTURE:** Includes Databases & Big Data, Cloud/IaaS/PaaS, Mobile App Dev & Marketing, Web Dev, and Marketing Environment.

by Scott Brinker @chiefmartec <http://chiefmartec.com>

Big Data Landscape 2016

Infrastructure

Hadoop On-Premise
 cloudera, Hortonworks, MAPR, Pivotal, IBM InfoSphere, splice machine, bluedata, jethro

Hadoop in the Cloud
 amazon web services, Microsoft Azure, Google Cloud Platform, IBM InfoSphere, CAZENA, altiscale, Du bale, xplenty

Spark
 databricks, GridGain, TACHYON, NEXUS

Cluster Services
 amazon web services, kubernetes, HPCC SYSTEMS, docker, MESOSPHERE, Core OS, peppercorn, StackIQ

Analytics

Analyst Platforms
 Palantir, AYASDI, Quid, enigma, Digital Reasoning, ORBITAL INSIGHT

Analytics Platforms
 Microsoft, guavus, Datameer, interana

Data Science Platforms
 context relevant, CONTINUUM, DataRobot, Alpine, MODE, dataiku, tonian, DOMINO, sense, yhat, ALGORITHMIA

Visualization
 +tableau, Google Cloud Platform, Roambi, QONDATA, Qlik, CHARTIO

Applications

Sales & Marketing
 RADIUS, Gainsight, bloomreach, Zeta, livefyre, blueyonder, kahuna, Lattice, SAILTHRU, persado, infer, sense, AVISO, ACTIONIQ, QUANTIFIND, ENGAGIO

Customer Service
 MEDALLIA, ATTENITY, CLARABRIDGE, STELLA Service, NGDATA, Preact, Wise.io, DigitalGenius, appuri, fuse|machines

Human Capital
 gild, Connectifier, textic, entelo, hiQ

Legal
 RAVEL, JUDICATA, Everlaw, Brevia, PREMONITION

NoSQL Databases
 amazon dynamoDB, Google Cloud Platform, Microsoft Azure, ORACLE, mongoDB, MarkLogic, DATASTAX, Couchbase, SequoiaDB, redislabs, influxdata

NewSQL Databases
 SAP HANA, Clustrix, Pivotal, paradigm4, memsql, nuODB, MariaDB, VOLTDB, citusdata, deepdb, Trafodion, Cockroach LABS

BI Platforms
 Power BI, amazon web services, DOMO, Wave Analytics, GoodData, birst, kyviz insights, platforma, looker, atscale, ARCADIA, SENSE

Statistical Computing
 sas, SPSS, MATLAB

Log Analytics
 splunk, sumologic, kibana, CLOUD PHYSICS, loggly

Social Analytics
 NETBASE, DATASIFT, trex, bitly, synthetio, bottlenose, simple reach

Ad Optimization
 MediaMath, Integral Ad Science, OpenX, rocketfuel, theTradeDesk, Adgorithms, Livelihood, dstillery, DataXu, Cppier, TAPAD

Security
 CYLANCE, CounterTack, cybereason, ThreatMetrix, AREA 1 SECURITY, SentinelOne, Recorded Future, Guardian Analytics, FORTSCALE, sift science, Keybase, feedzai, SIGNIFY2

Vertical AI Applications
 facebook, Clara, KASIST, lumiata

Graph Databases
 neo4j, OrientDB, InfiniteGraph

MPP Databases
 TERADATA, VERTICA, Netezza, NETEZZA, kognitio, dremio

Cloud EDW
 amazon web services, Google Cloud Platform, Microsoft Azure, Pivotal, snowflake, WATERLINE DATA, Infoworks

Data Transformation
 alteryx, TRIFACTA, tamr, Paxata, StreamSets, Alation

Data Integration
 informatica, MuleSoft, snaplogic, BedrockData

Real-Time
 amazon web services, METAMARKETS, confluent, DATATORRENT, dataArtisans

Machine Learning
 Azure Machine Learning, amazon web services, H2O, Dato, SKYTREE, rapidminer, DATAFARM, deepgenio, VISENZE, PredictionIO, glowfish

Speech & NLP
 NarrativeScience, api.ai, NUANCE, Gridspace, semanticmachines, cortico.io, mindmeld, IDIBON, vscop

Horizontal AI
 IBM Watson, Cortana, sentient, VIV, nervana, nora, MetaMind, clarifai

Publisher Tools
 outbrain, mixpanel, Chartbeat, yieldbot, Yieldmo

Govt/ Regulation
 Socrata, OPENGOV, EN FiscalNote, enigma, mark43, PREDPOL, OpenDataSoft

Finance
 Affirm, LendingClub, OnDeck, Kreditech, LendUp, Kabbage, tidemark, Fundera, INSIKT, ZUORA, Dataminr, Lenddo, KENSHO, AIDYIA, ISENTIUM, Quantopian, sentient

Management / Monitoring
 New Relic, APPDYNAMICS, amazon web services, actifio, Numerify, splunk, DATADOG, Yrocana, Anodot

Security
 TANIUM, illumio, CODE42, DataGravity, CIPHERCLOUD, VECTRA, sqrrl, BlueTalon

Storage
 amazon web services, Google Cloud Platform, Microsoft Azure, panasas, nimblestorage, Qumulo

App Dev
 apigee, CASK, Typesafe, CONCURRENT

Crowd-sourcing
 amazon mechanicalturk, CrowdFlower, WorkFusion

Search
 hp, Autonomy, ORACLE, ENDECA, EXALEAD, Lucidworks, elastic, ThoughtSpot, MAANA, swifttype, Algolia, SINEQUA

Data Services
 UO, OPERA, Mtu Sigma, DATASCIENCE, SAP HANA, DATA SCIENCE, kaggle, datascope, DataKind

For Business Analysts
 OrigamiLogic, ClearStory, CIRRO, import io

SMB / Commerce
 Google Analytics, AMPLITUDE, RJMetrics, BLUECORE, sumAll, granify, Airtable, retention science, custora

Education/ Learning
 23andMe, KNEWTON, Clever, Cleclara, PANORAMA, knowre

Life Sciences
 23andMe, Counsyl, PATHWAY GENOMICS, Recombine, KYRUUS, FLATIRON, zymergen, HealthTap, METABIOTA, ZEPHYR HEALTH, ovia, Ginger.io, ZEPHYR HEALTH, Glow, enlithic, AiCure, Atomwise

Industries
 OPOWER, eHarmony, RetailNext, STITCH FIX, duetto, WorkFusion, BLUE RIVER, TACHYUS, SwiftKey, Seeq, FarmLogs, HowGood, select, statmuse, BOXEVER

Cross-Infrastructure/Analytics

amazon web services, Google, Microsoft, IBM, SAP, sas, hp, Autonomy, vmware, talend, TIBCO, TERADATA, ORACLE, NetApp

Framework
 Hadoop, HADOOP HDFS, YARN, Spark, MESOS, TEZ, Flink, CDAP

Query / Data Flow
 SLAMDATA, HIVE, APACHE DRILL, Google Cloud Dataflow, couchDB, riak, OPENTSCDB, nifi

Data Access
 cassandra, HBASE, mongoDB, kafka, CouchDB, riak, OPENTSCDB, nifi

Coordination
 talend, Apache Zookeeper, Apache Ambari

Real-Time
 STORM, Spark, APEX, Flink, TACHYON, druid

Stat Tools
 R, Scala, NumPy, SciPy

Machine Learning
 mlLib, Aerosolve, Apache SINGA, MAClib, mllib, learn, WEKA, FeatureFu, DIMSUM, jupyter, DL4J, TensorFlow

Search
 Elasticsearch, Solr, Lucene

Security
 Apache Ranger

Visualization
 Zeppelin

Data Sources & APIs

Health
 Apple, JAWBONE, GARMIN, practicefusion, fitbit, Withings, VALIDIC, netatmo, kinsa, Human API

IOT
 UPTAKE, ThingWorx, helium, samsara, estimize

Financial & Economic Data
 Bloomberg, DOW JONES, YODLEE, PREMISE, S&P CAPITAL IQ, quandl, xignite, CB INSIGHTS, mattermark, estimize, PLAID

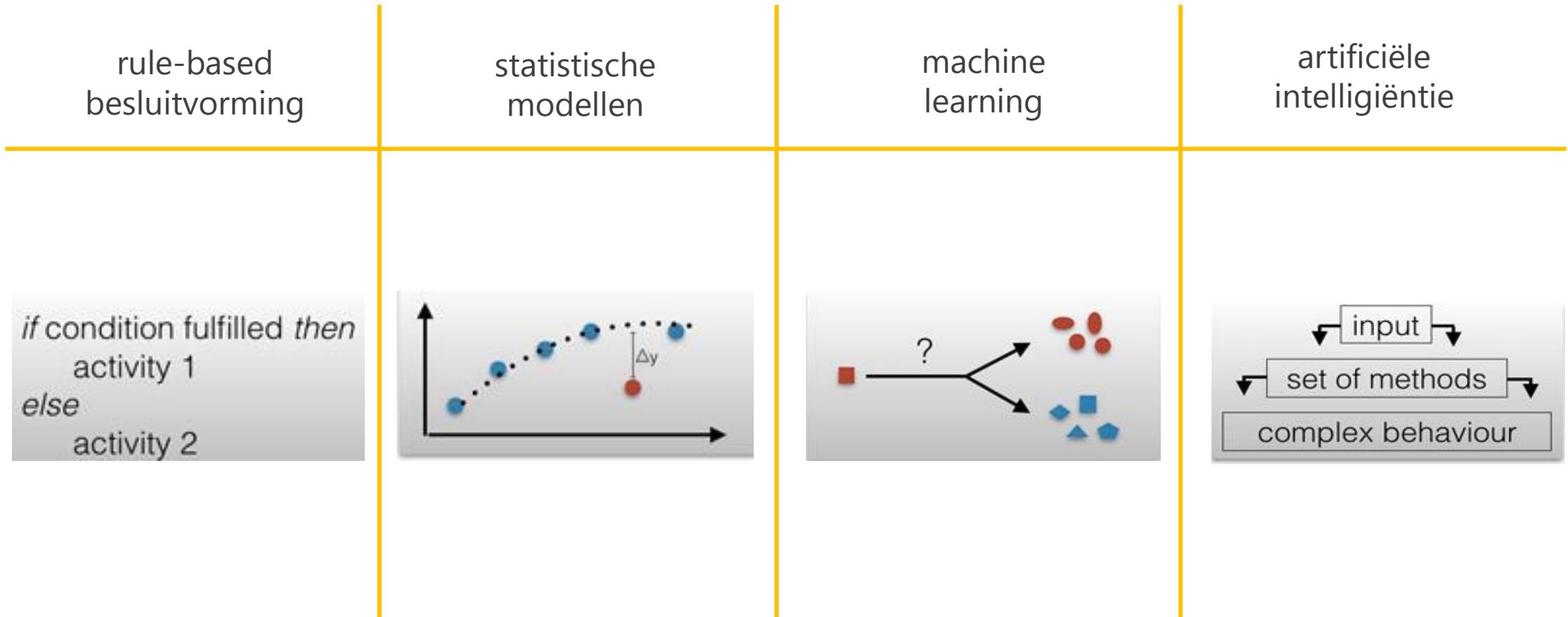
Air / Space / Sea
 PLANET LABS, spire, WINDWARD, CRUISE, SKYCATCH, Airware, DroneDeploy

Location/People/Entities
 GARMIN, foursquare, InsideView, esri, STREETLINE, CARTODB, factual, PlaceIQ, Crimson Hexagon, placemeter, BASIS, Sense

Other
 qualtrics, panjiva, DATA.GOV

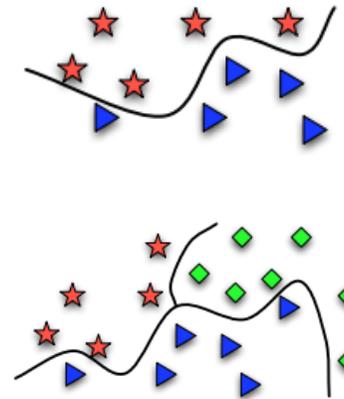
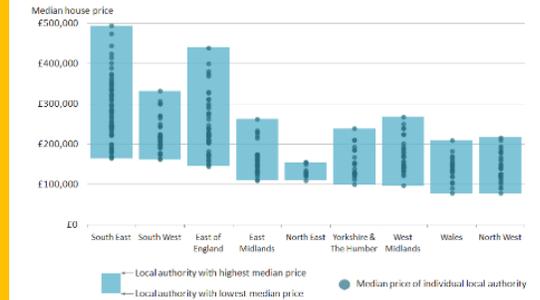
Incubators & Schools
 GA, DataCamp, INSIGHT, DataElite, METIS, The Data Incubator

Kunstmatige intelligentie is een afgeleide en verfijning van klassieke statistiek – de evolutie op een rij:



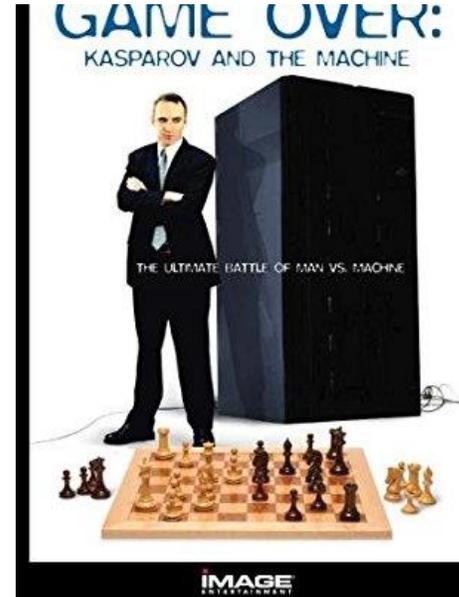
Voorbeelden van toepassingen

1. Rule-based besluitvorming
 - Als x dan y_1 anders y_2
 - De wekker op je telefoon
2. Statistische modellen
 - Voorspellen van huizenprijzen met een set variabelen
3. Machine learning
 - Ontdekken van patronen in consumentengedrag (de consument met deze karakteristieken is al dan niet in staat om een lening af te betalen)
4. Artificiële intelligentie
 - Siri, Google Now,
 - Zelfrijdende auto

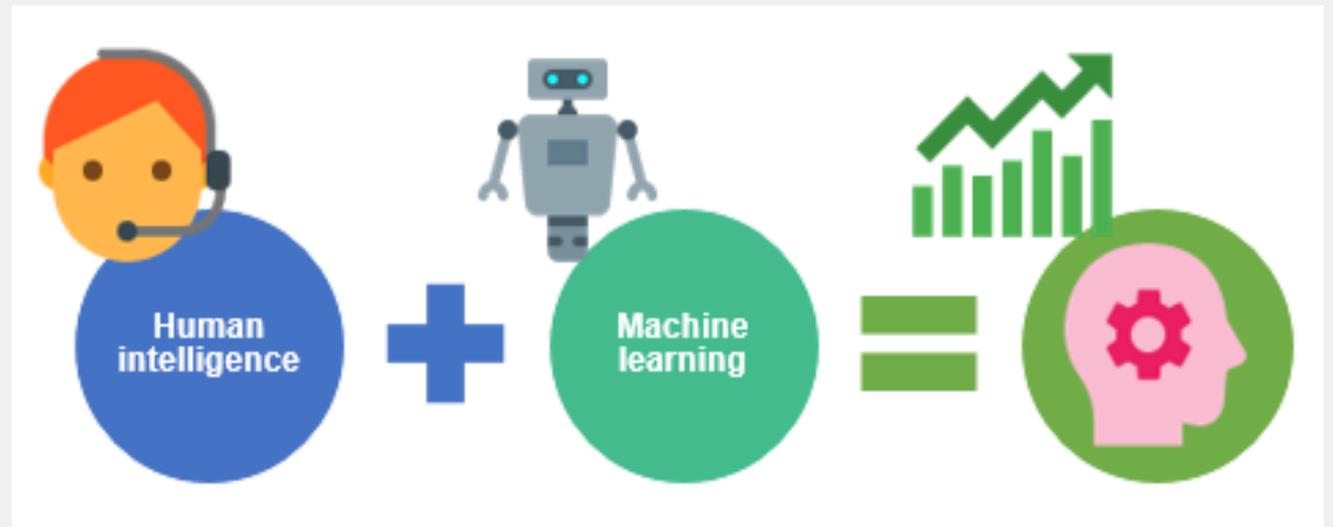


De implicaties van AI voor het adviesvak

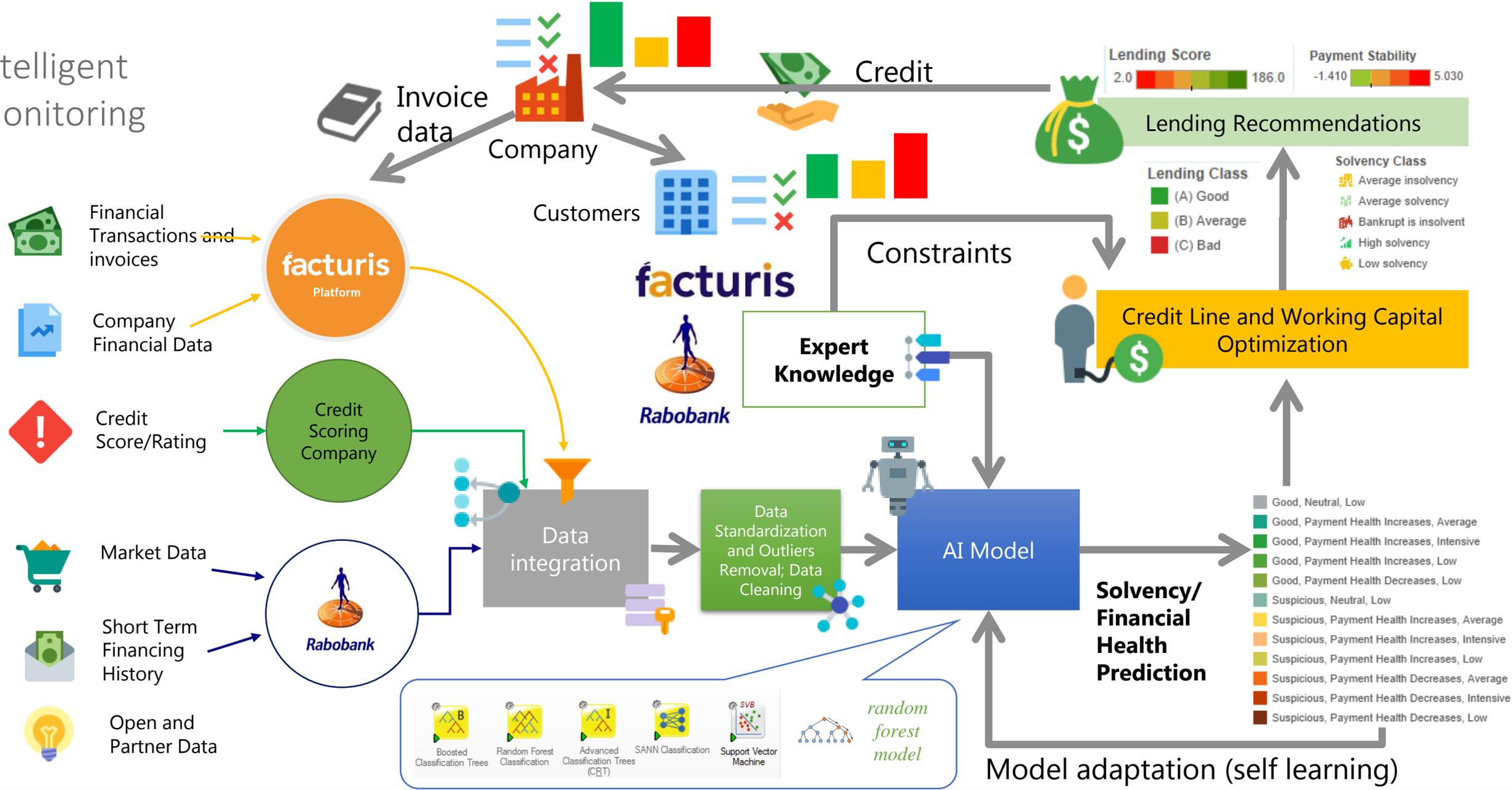
- Meer informatie digitaal beschikbaar
 - Dynamischer
 - Betrouwbaarder
- Verdwijnt de mens dan?
 - Schaakcomputer Deep Blue 2 versloeg in 1997 (!) Kasparov
 - Wie is nu de beste in schaken?
 - Mens en machine samen
- Mens (als expert) blijft nodig



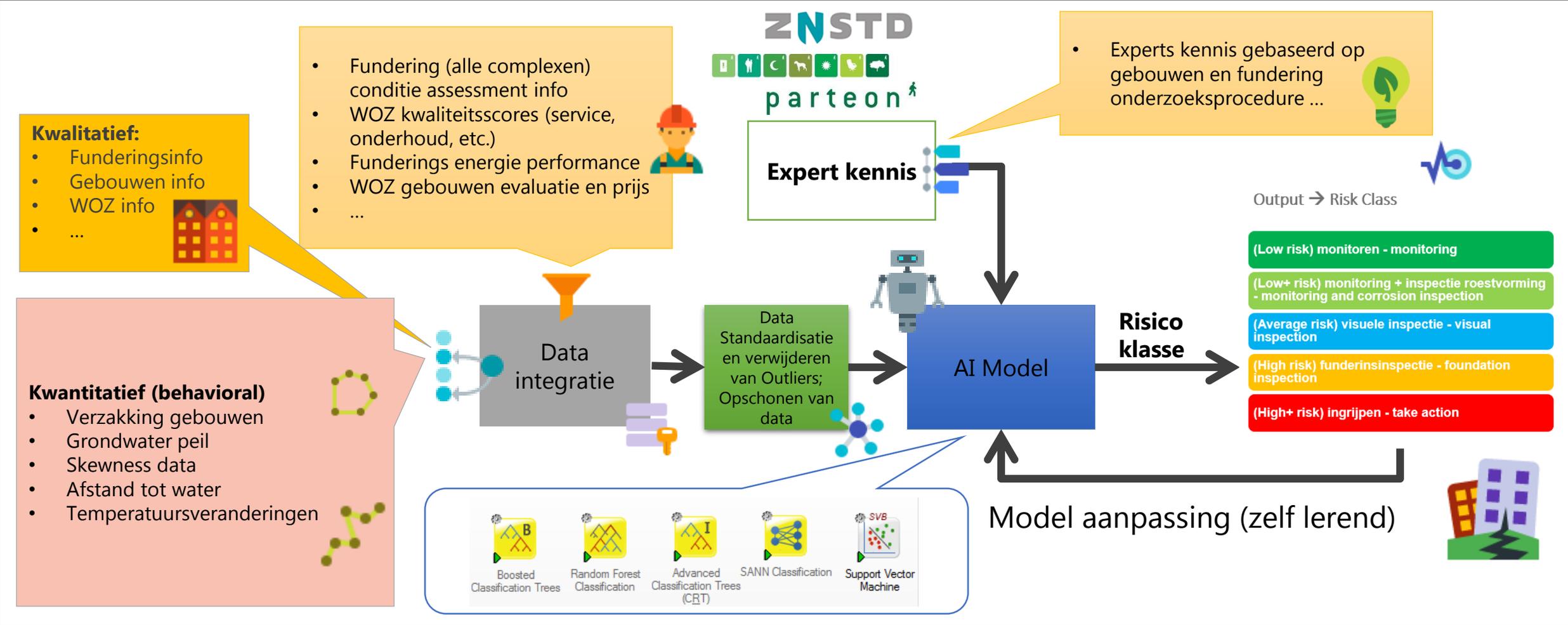
Expert kennis
is cruciaal om
de 'machine'
te trainen



Intelligent Monitoring

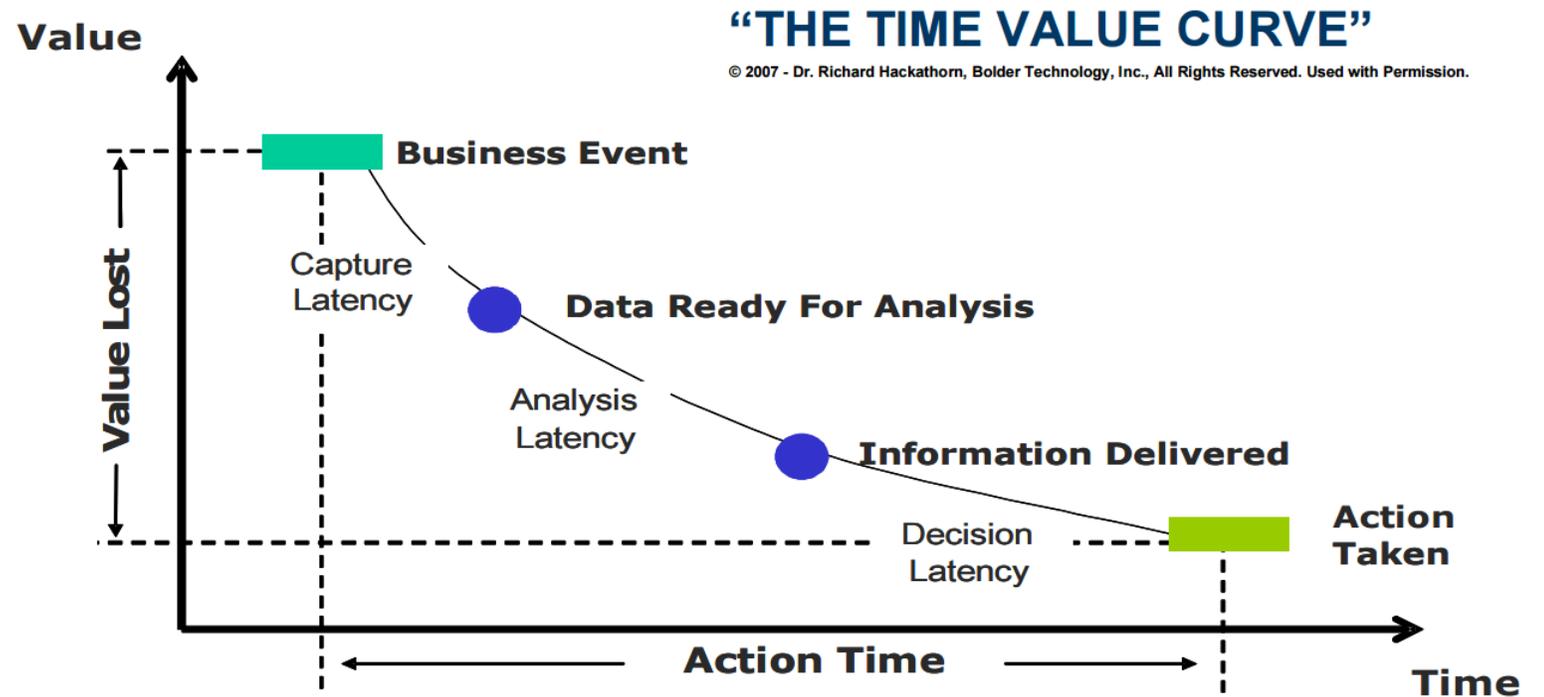


Ontwikkeling risicomodel voor verzakkingen in gemeente Zaandstad



De belangrijkste voordelen van AI:

1. een beter besluit
2. met een kortere doorlooptijd en meer toegevoegde waarde



Hoe kan je je voorbereiden op deze ontwikkelingen

- Beoordeel welke taken de machine als eerste over kan nemen
- Maak gebruik van de tools die voorhanden zijn
- Richt je tijd en aandacht op de echte toegevoegde waarde: menselijk contact, ontzorgen
- Verkort de doorlooptijd van het advies

