

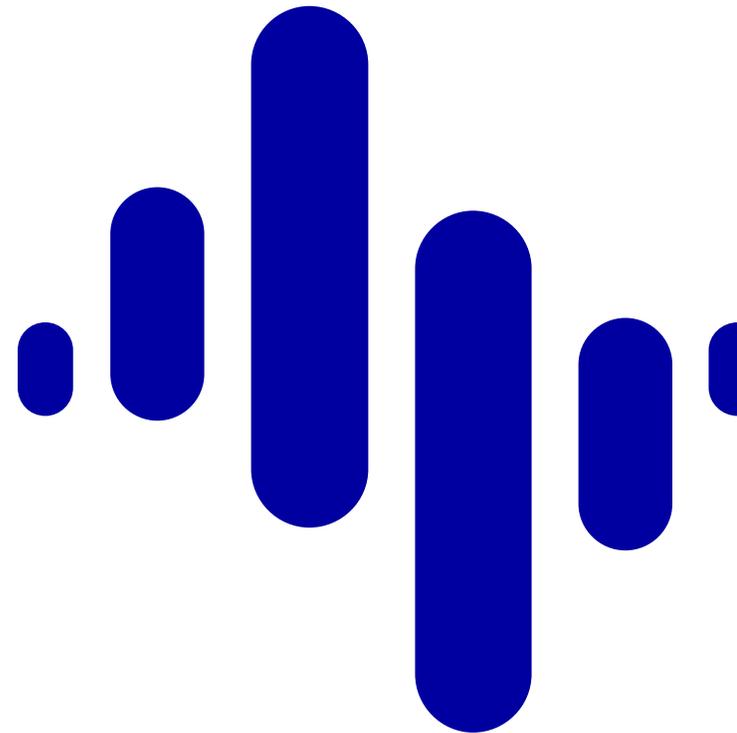
Nordea

Claim Automation at Nordea Life & Pensions

14.11.2018



Introduction



Nordea Liv

- Norges 3. største private livselskap
- Vi tilbyr
 - tjenestepensjoner til bedrifter
 - livs- og pensjonsforsikringer til privatpersoner
- Vi leverer produkter som gir finansiell **trygghet** ved død og **uførhet**



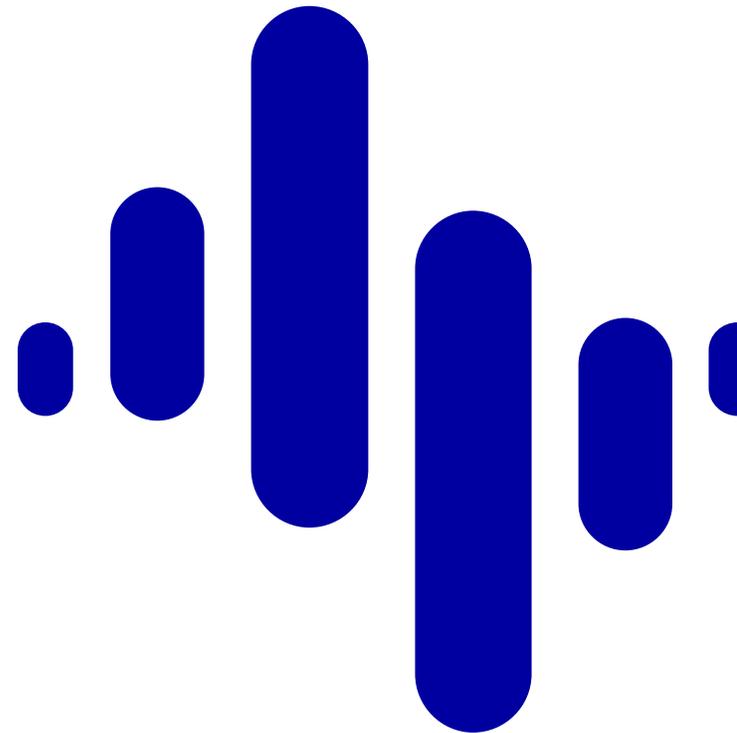
About Me

- Alfonso M. Canterla
- Sevilla – Reykjavik – Trondheim – Oslo
- PhD in Automatic Speech Recognition
- Previous:
 - NTNU, Atmel Norway, If Insurance, Visma
- Current position:
 - Lead Data Scientist at Nordea
 - Technical lead for Claim Automation project

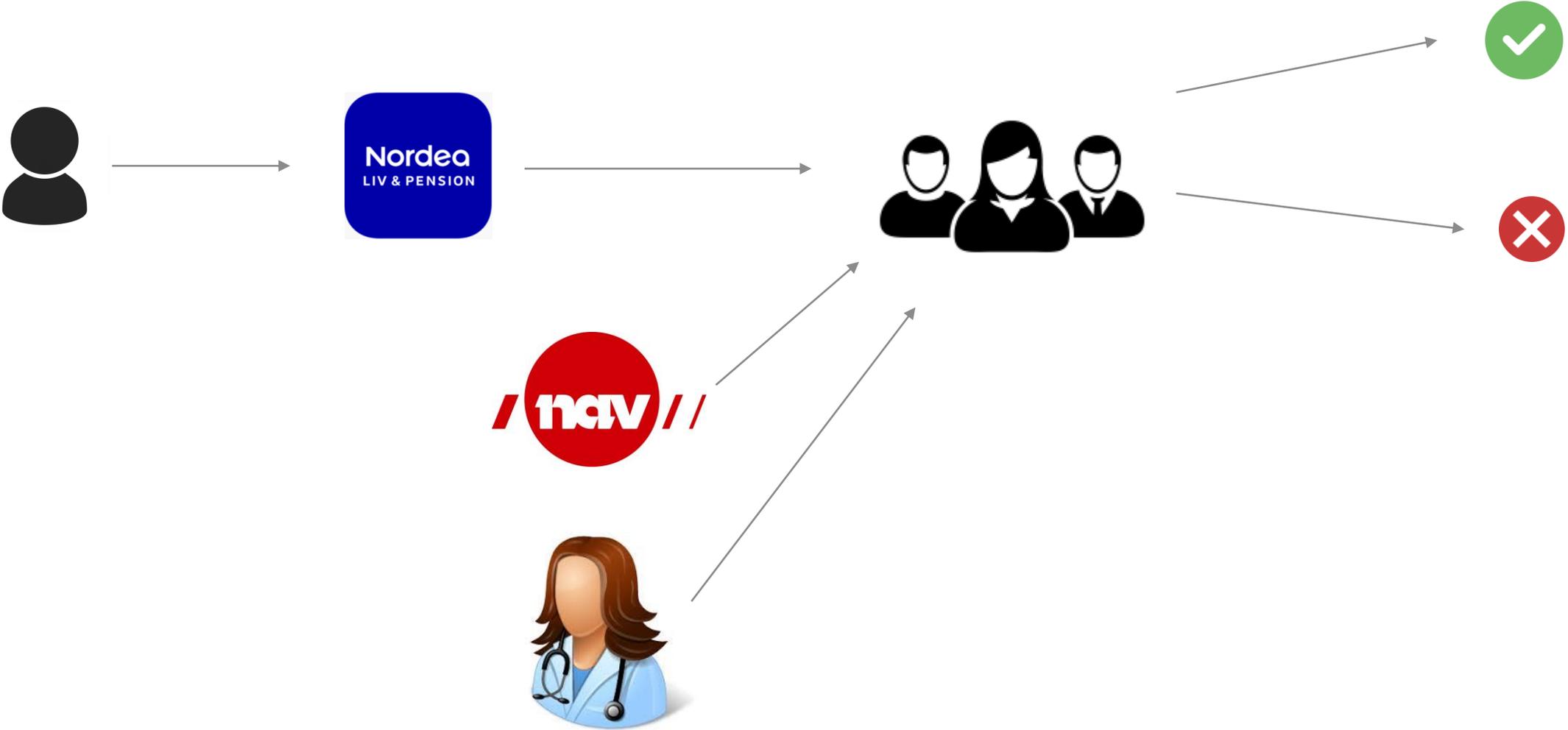
Claim Automation Project

- Develop an application that automates claims
- Focus on one type of claim:
 - Disability claims in the commercial market
- Project started before I joined Nordea

Old Claim Handling Process



Old Claims Handling Process

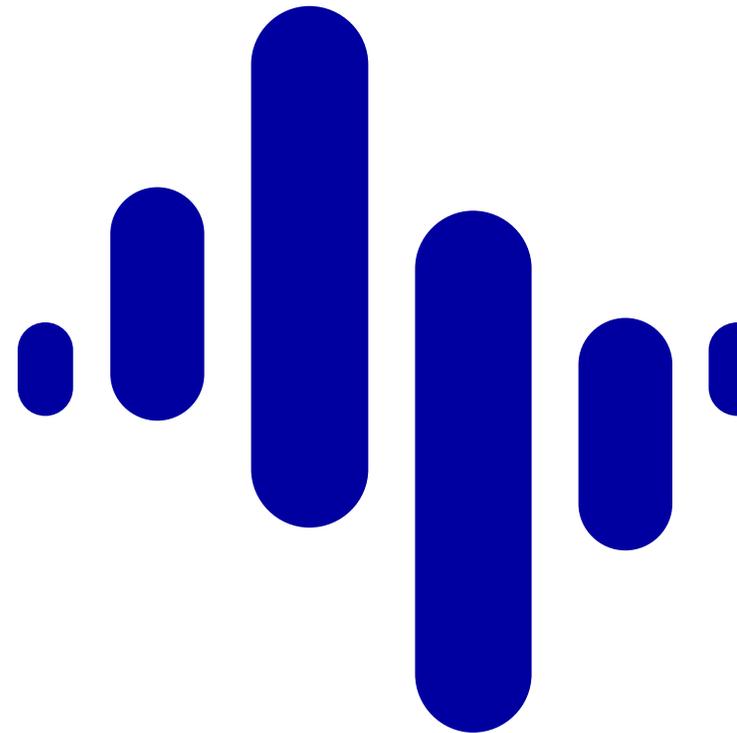


Challenge

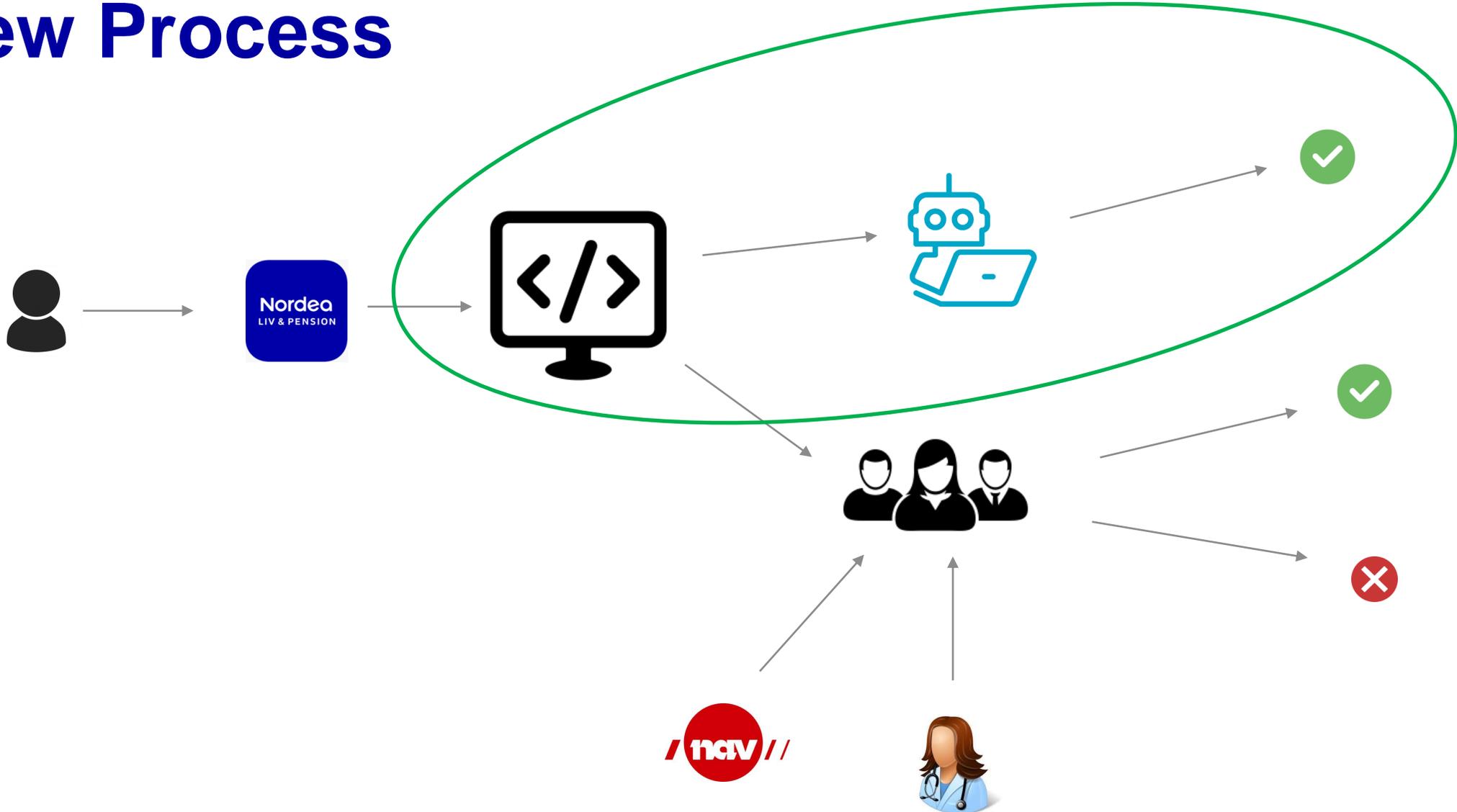
- Average handling time >100 days
 - Waiting for NAV and doctors...



Automated Claims



New Process



Meld krav

[← Tilbake](#)

For å kunne behandle og eventuelt utbetale ett krav fra deg, har vi behov for at du avgir opplysninger.

På bakgrunn av opplysninger du oppgir, kan Nordea Liv ha behov for å innhente ytterligere opplysninger fra lege, Nav eller andre forsikringsselskap. Når du signerer kravet, gir du samtidig fullmakt til dette. Fullmakten fremkommer i oppsummeringsdokumentet før du signerer. Alle opplysningene vil bli behandlet konfidensielt og oppbevares på en sikker måte. Vil du vite mer om hvordan vi behandler personopplysningene dine og hvilke rettigheter du har kan du lese om dette i vår personvernerklæring på nordea.no/liv

Ditt krav

Hva søker du erstatning for?

Hvilken sykdom/skade søker du erstatning for?

Når ble sykdom/skade først oppdaget?

Når ble lege kontaktet første gang for dette?

Dato for diagnose

Eventuelle andre opplysninger

Behandlernde lege

Vi kan ha behov for å innhente opplysninger fra behandlernde lege i vurdering av kravet

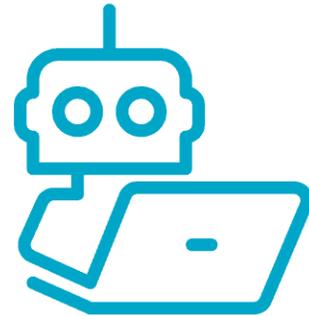
Classification Module

- Initially
 - Rule-based model (RBM)
- Once we have enough labelled data
 - Deep Neural Network (DNN)

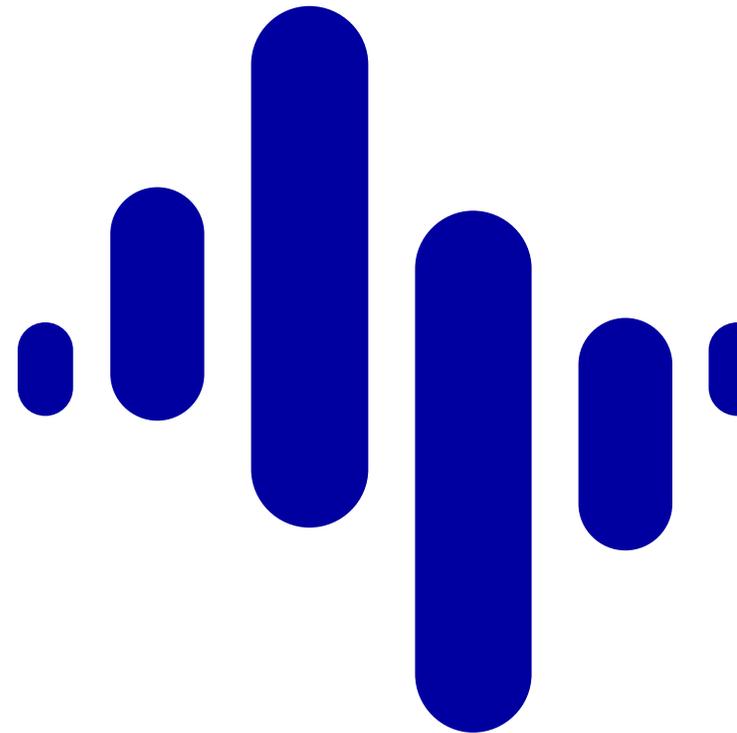


Robotic Process Automation

- Those claims accepted by the model are handled by RPA



User Interface



100

**grønne krav
siden forrige trening**

**200 krav i år
300 krav totalt**

100

**gule krav
siden forrige trening**

**200 krav i år
300 krav totalt**

100

**røde krav
siden forrige trening**

**200 krav i år
300 krav totalt**

Segmenterte saker siden forrige trening

FØDSELSNUMMER	PREDIKERT SEGMENT	KORRIGERT SEGMENT
SSN		Korriger

Modelltrening - Segmentering

Nøyaktighet: 0.0 %

Antall utrente krav: 1



Tren segmenteringsmodell

Trykk på knappen for å endre aktiv modell

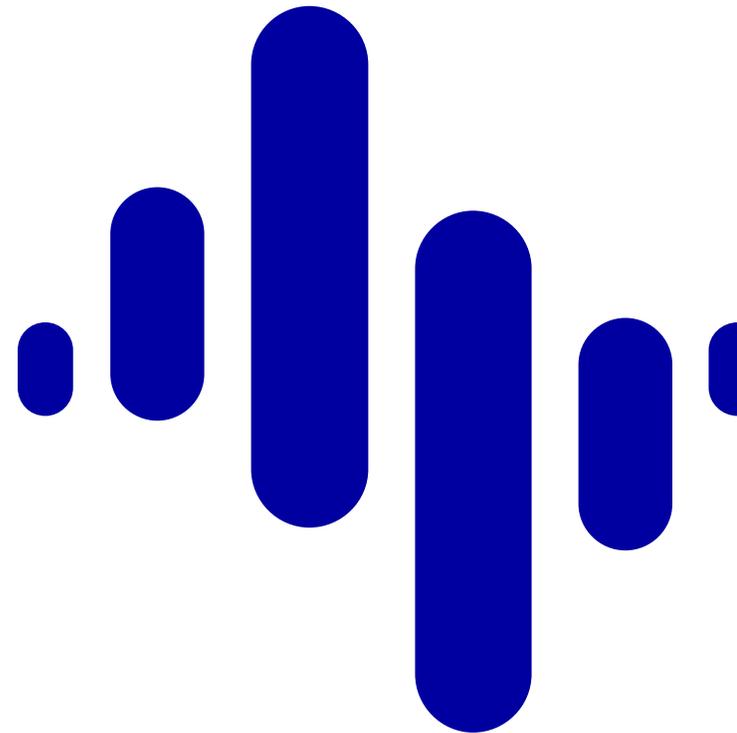


Aktiv modell: Regeltre

Bytt modell til Neuralt nettverk

Last ned regeltre

Challenges



Not everyone speaks machine learning

- Case handlers would train, deploy and monitor models (from the GUI)
- Should a Data Scientist do that instead?
 - You need to understand training, generalization, concept drift...

THE DATA SCIENCE HIERARCHY OF NEEDS

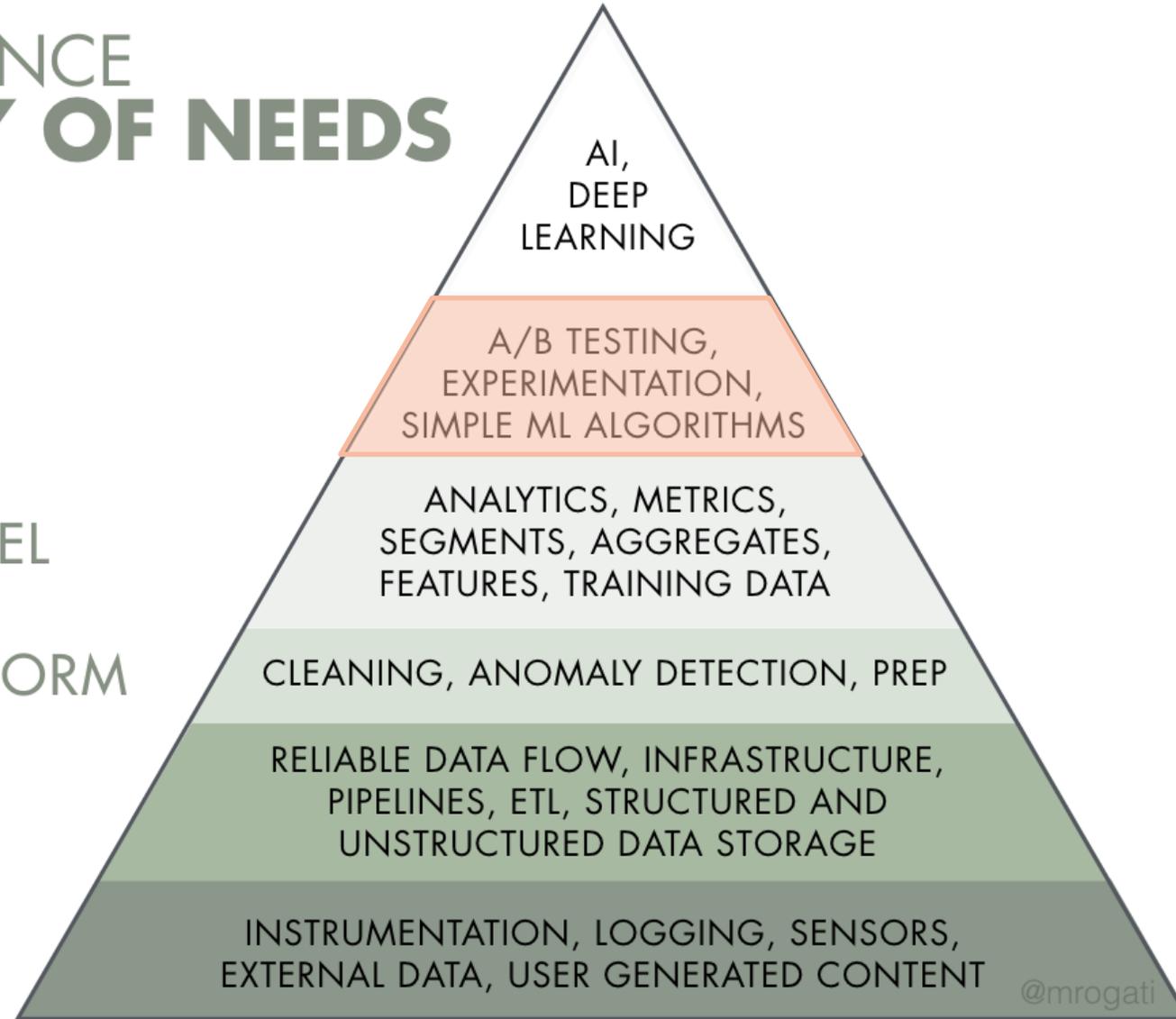
LEARN/OPTIMIZE

AGGREGATE/LABEL

EXPLORE/TRANSFORM

MOVE/STORE

COLLECT



It's not deep learning o'clock yet

- The plan was to use RBM to label data, then switch to a DNN
- Did we really need a DNN?
 - Did we even need a NN?

It's not deep learning o'clock yet

- Does the RBM make errors?
 - If yes: what's the accuracy? Not monitored...
 - If no: why implement a DNN?
- In fact, case handlers assume the tree is always right
 - Therefore they never correct the classification outcome!

It's not deep learning o'clock yet

- In future projects we will:
 - Start with a simple model
 - Improve the model iteratively (if needed at all)

THE DATA SCIENCE HIERARCHY OF NEEDS

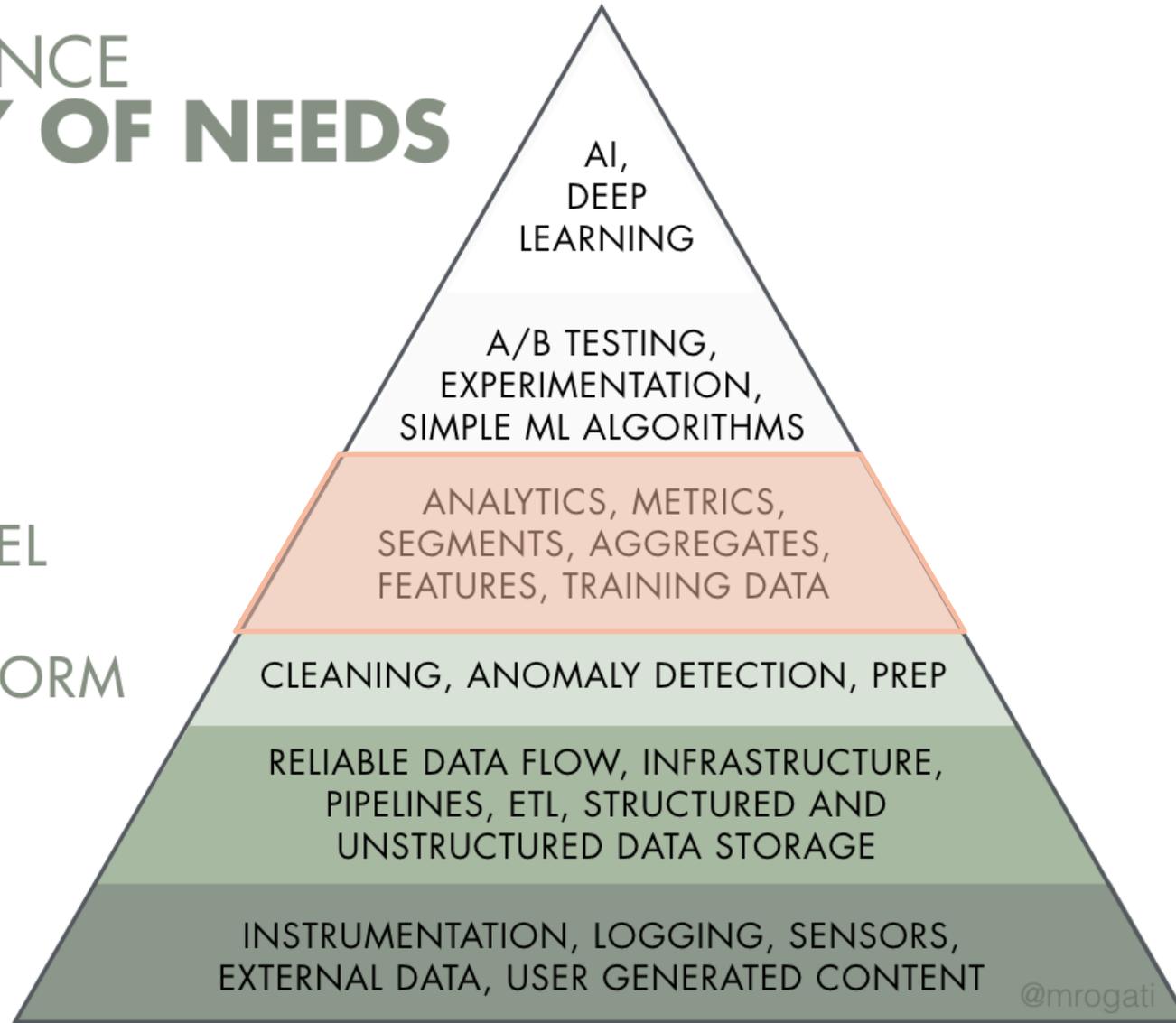
LEARN/OPTIMIZE

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All data integration happens in the solution

- Read data from several core systems and integrate them into a nice table
- This adds some complexity to the application
- In future projects we will:
 - Include Data Engineers in the team
 - Data Scientists define the data set needed
 - Data integration implemented in a data platform (e.g. DWH, data lake...)

17k lines of code is just too much

- The solution is difficult to maintain and develop further
 - 17k lines of code is 5% of Pandas!
- The data integration issue is just one part of the problem
 - Did we really need a GUI? Model manager?...
 - A simple prediction service would've probably been enough
- ML should also follow best practices in software engineering, e.g. modularity
- Data Scientist != Software Engineer

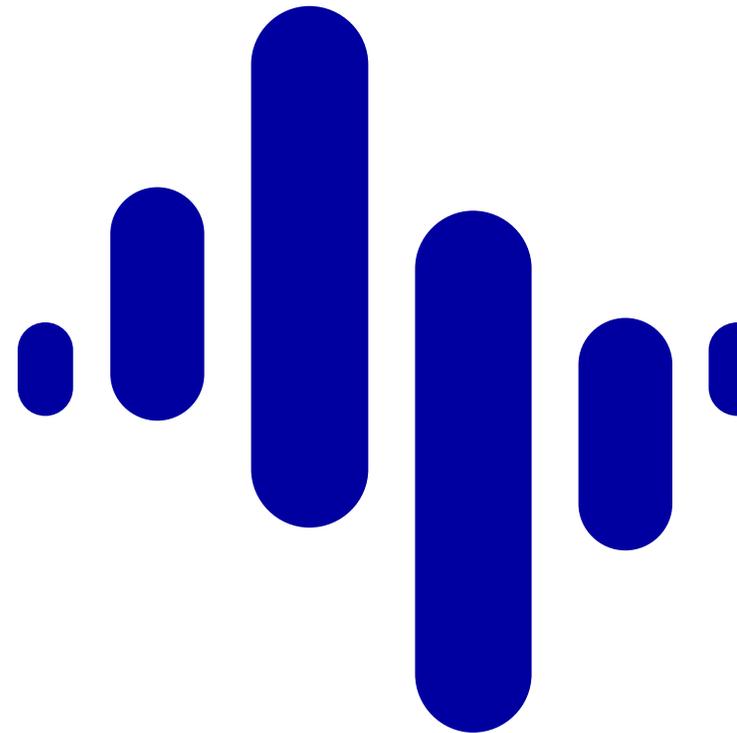
17k lines of code is just too much

- In future projects
 - Include Software Engineers in the team
 - Implement light-weight prediction APIs

No need for a dedicated server

- Solution deployed as a web service in a dedicated production server
 - This requires server setup and maintenance...
- Nordea has a container platform (Open Shift) and we plan to use it instead

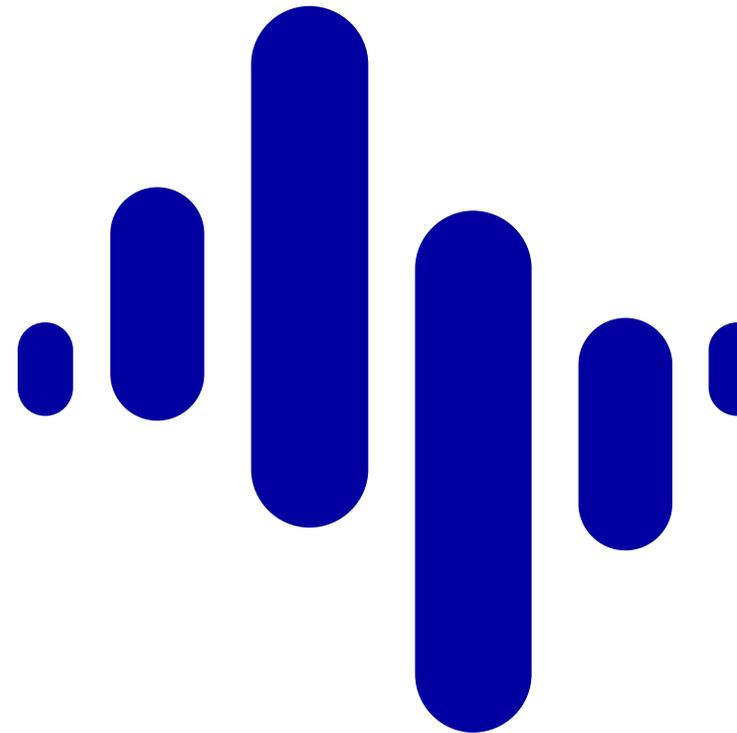
Achievements



Achievements

- 23% cases handled (accepted) automatically
 - These customers get an answer within 1-5 days (instead of >100 days)
- Provide better service when our customer needs it the most
- Case handlers can focus on challenging cases
- Many lessons on how to develop machine learning projects

Conclusions



When developing machine learning solutions...

- Try a simple model first!
- Process automation doesn't necessarily require ML
 - RPA & RBM can create a lot of value
- Combine software engineers, data engineers and data scientists
- Make light-weight prediction services

Nordea

Thank you!

