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Data Science creates value – practical examples

Hans de Wit



- **Telco Norway (since 2013)**
 - Lead data scientist.
- **ING Bank, The Netherlands**
 - Senior member 'model'/Innovation-team ING Retail Customer Intelligence
 - Member analytical campaign management ING Bank Customer Intelligence department, 1997-2005
- **ING Card, 2005-2008**
 - Direct Marketing, Credit Risk, Fraud
- Master of Marketing (SRM) and bachelor of Commercial economics and Direct Marketing.

- **My passion:**
- **Making the unreal happen**

- **My key goal:**



Agenda

- stages of analytics
- Segmentation of customers for effective implementation of analytical projects

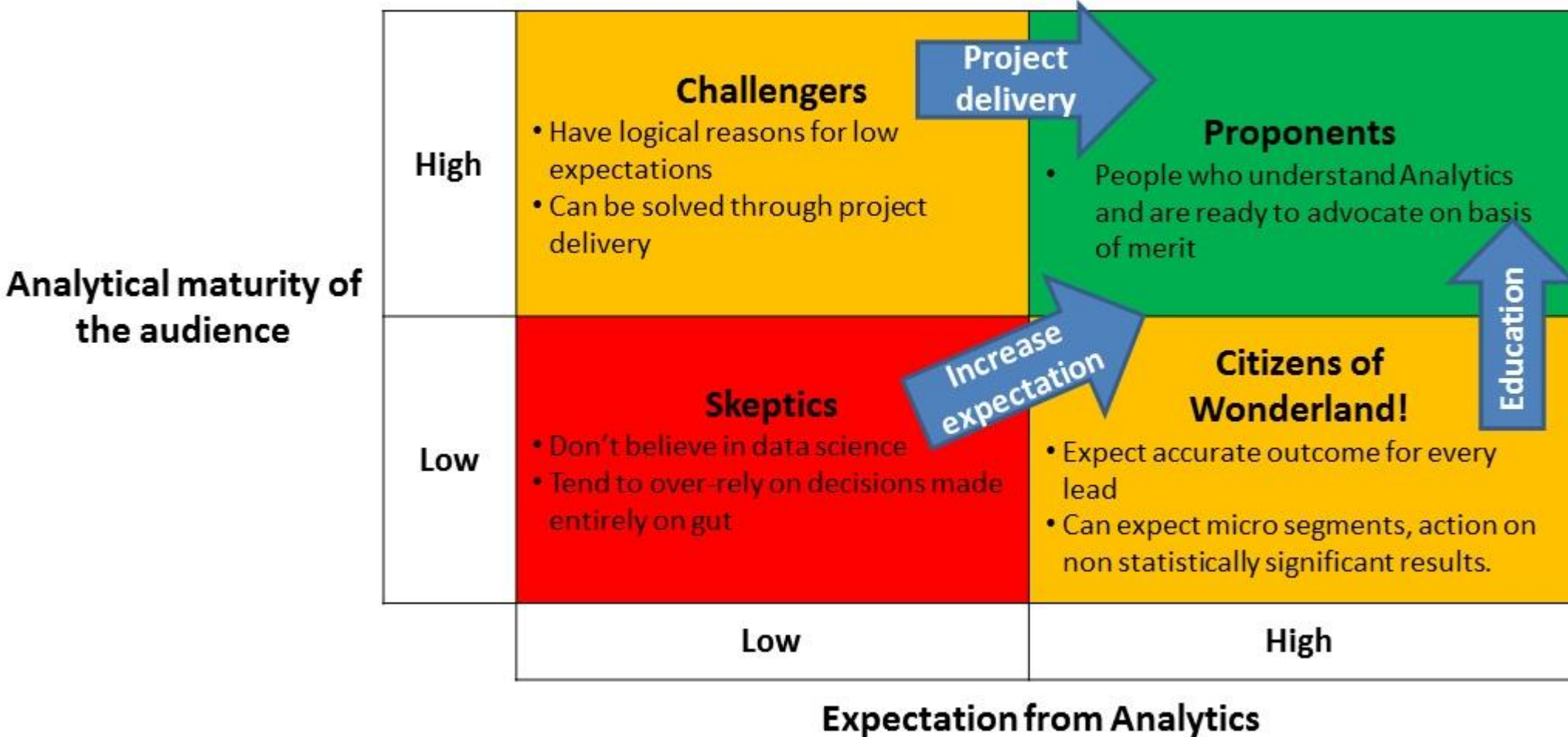
- Next best Action(crm) using predictive models.
 - Modelfactory using modelops method
 - Realtime decisions and scoring models.
- Marketing Optimization in Telemarketing.
- Dynamic pricing.
- Optimize staffing in call centre/customer care .
- Energy saving in the Mobile network using forecasting models
- Network analytics /graph theory use cases

- New AI developments
 - reinforcement learning model to optimize customer journey.
 - Generative AI in Leasing

Different stages of analytics

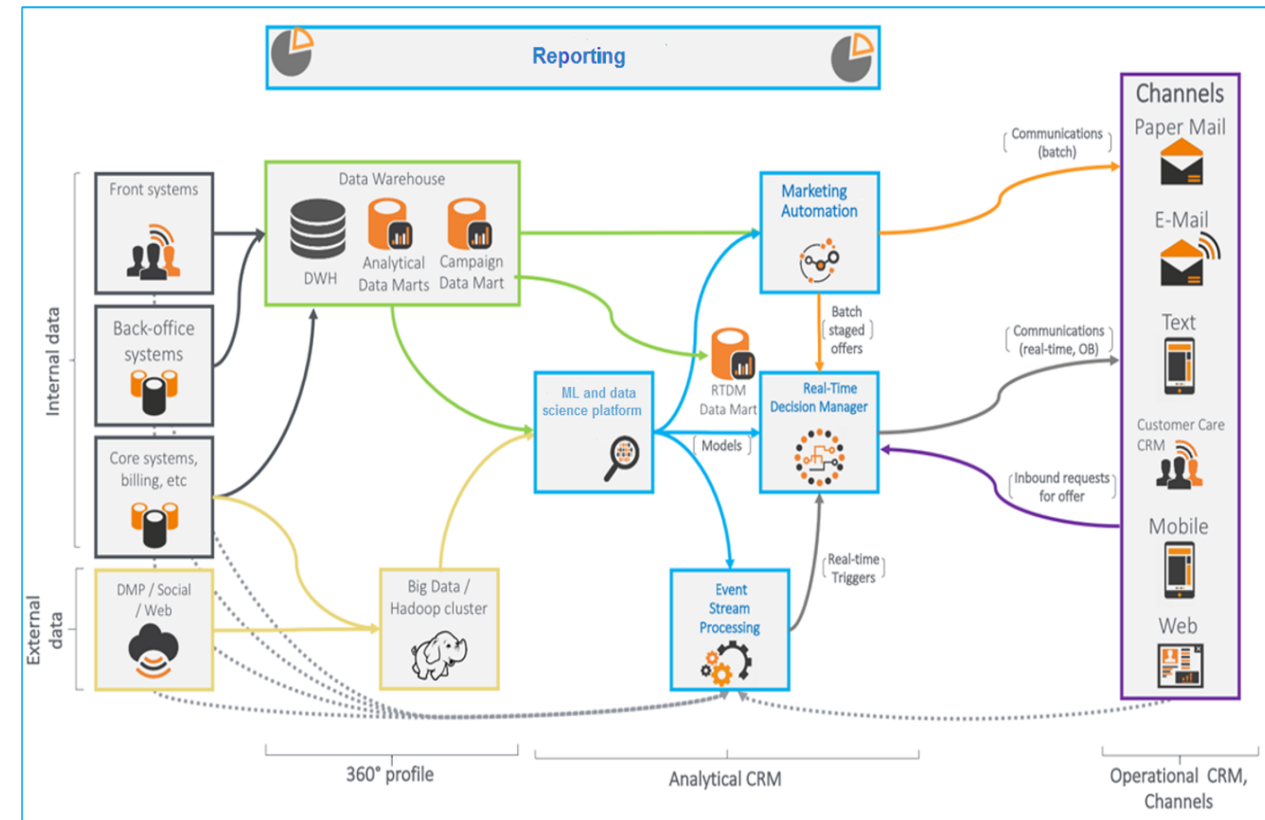


Segmentation of customers for effective implementation of analytical projects



Next best Action(Sales) using predictive models

- Use case:
 - omni channel sales tips (NBA)
 - Sales Tips are based on predictive models (69) and business rules.
 - Realtime scoring (streaming and on demand)
 - We have 69 different products and sales.
- Solution:
 - Modelfactory. Efficient way of developing predictive models and monitoring.
 - Realtime decision manager.
- Result:
 - 12% more sales
 - 20% higher hit rate and more relevancy to the customer.



A Simple Example The Benefit of Marketing Optimization for Telemarketing.

- Definition Expected values= probability to buy this product(output from propensity model) X revenue of that specific product.

Expected Values

Kurt_id	Nse Komplett m+	Nse MBB L	Nse Fix L
1	100	120	90
2	50	70	75
3	60	75	65
4	55	80	75
5	75	60	50
6	75	65	60
7	80	70	75
8	65	60	60
9	80	110	75

A Simple Example

Campaign Prioritization

Constraints:

1. Each customer must get an offer from at most one campaign
2. Each campaign must target at most three customers

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Campaign prioritization = \$655

A Simple Example

Customer Prioritization

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Campaign prioritization = ~~\$655~~
 Customer prioritization = \$715

A Simple Example

Optimization

Constraints:

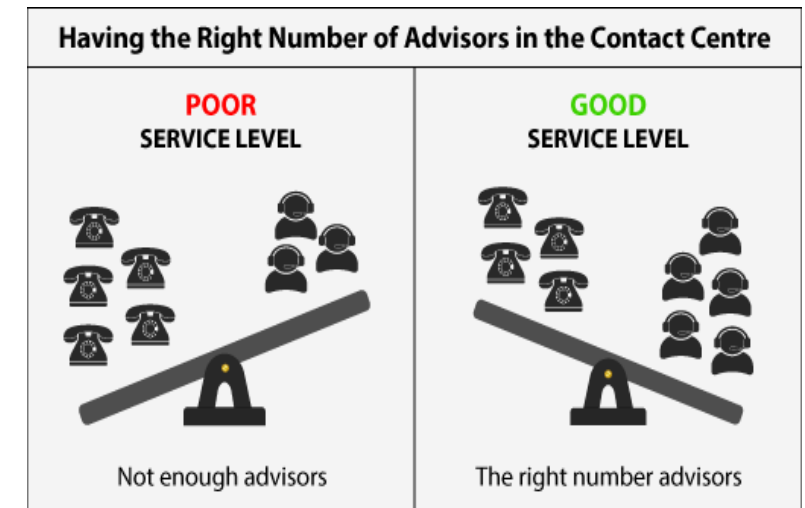
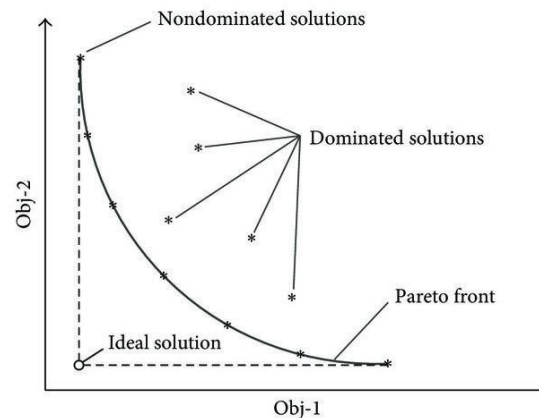
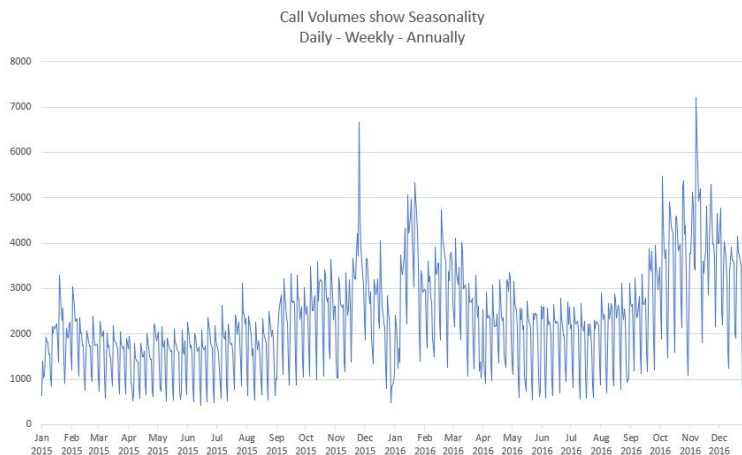
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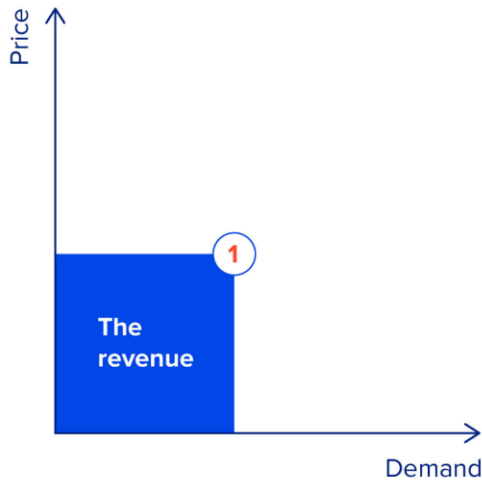
Campaign prioritization = ~~\$655~~
Customer prioritization = ~~\$715~~
Optimization = \$745

Optimize staffing in call centre/customer care

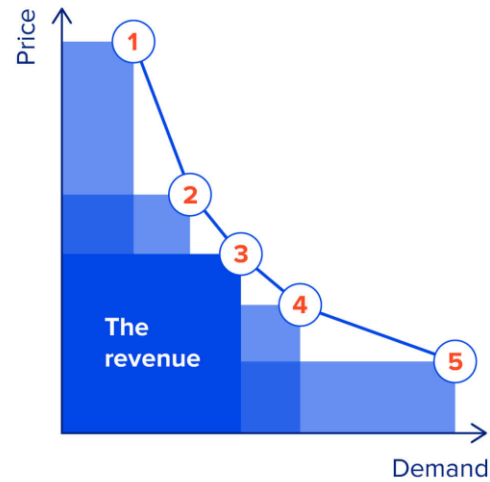
- Combining 2 analytical methods together.
 - Forecast models. How many staff is needed the next day.
 - Mathematical optimization using the outcome of the forecasting model (Pareto Front).
 - Constrains
 - Minimal cost
 - Phonecalls will be answered within 30 seconds (service level).
- result: 20% less staffing cost with the same service level.



Dynamic pricing to personalize prices and optimize revenue for example car leasing.



Static pricing (single price point)



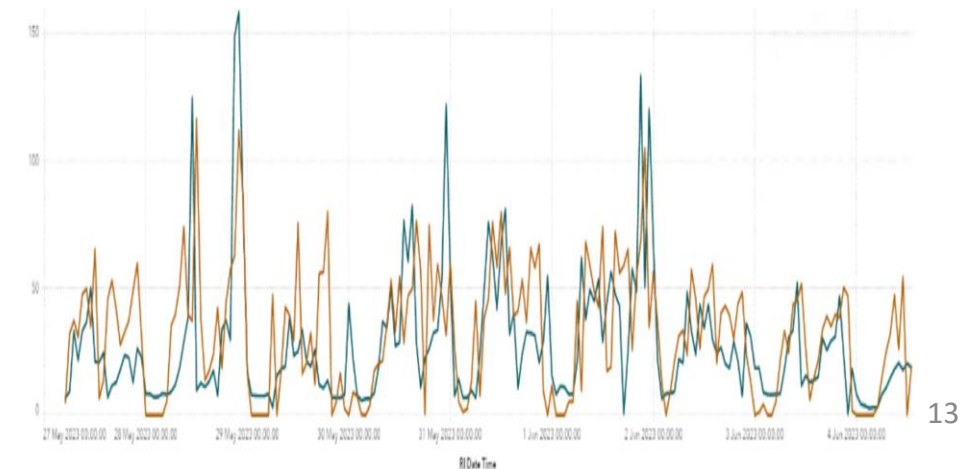
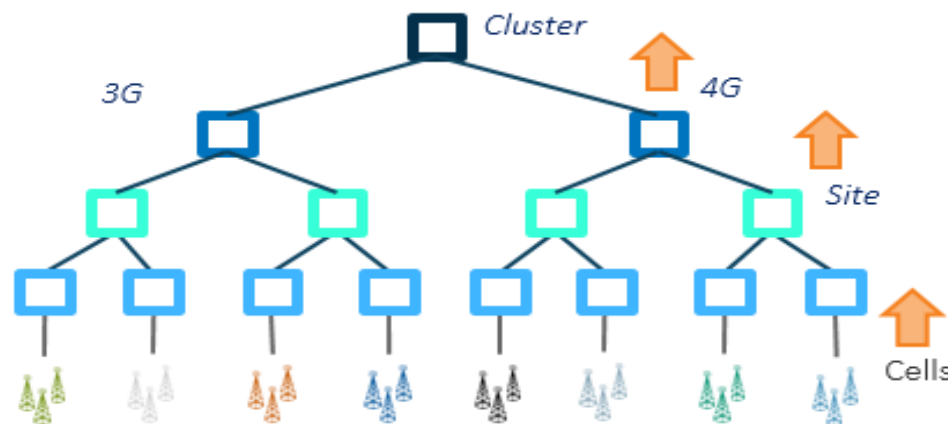
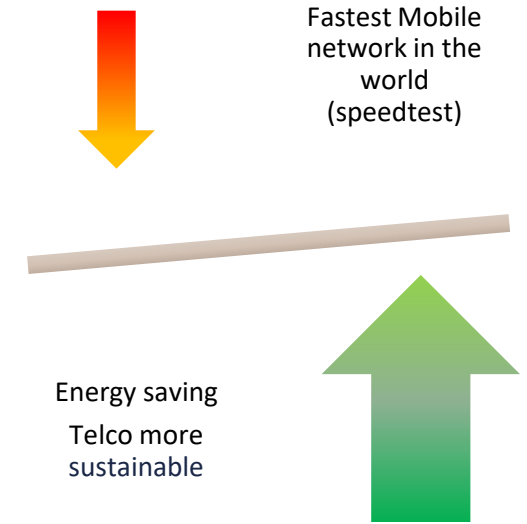
Dynamic pricing (multiple price point)

- integrating numerous data points, market trends, customer credit scores, vehicle demand, and competitive pricing.
- It uses deep Neural networks.
- Generative AI can be added to improve accuracy.
- Optimization problem.
- Each customer can have different price. (price elasticity).



Energy saving in the Mobile network using forecasting models

- Energy costs are in the Telco industry the biggest cost.
- We can save on 8% (7 million Euro per year) of total energy usage in the mobile network, by taking down specific base stations during night/day.
- Solution:
 - Develop High accuracy hierarchical forecast models (55 000 models per day).
 - Cells, where the forecast model calculate a period below a threshold, can be put on a sleep mode. Cells in a sleep mode produce less energy.

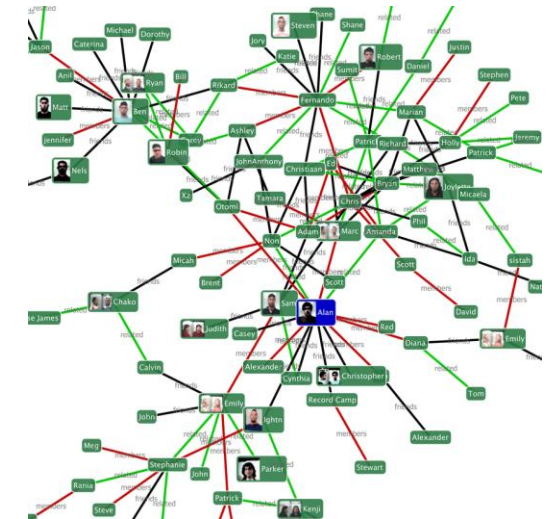
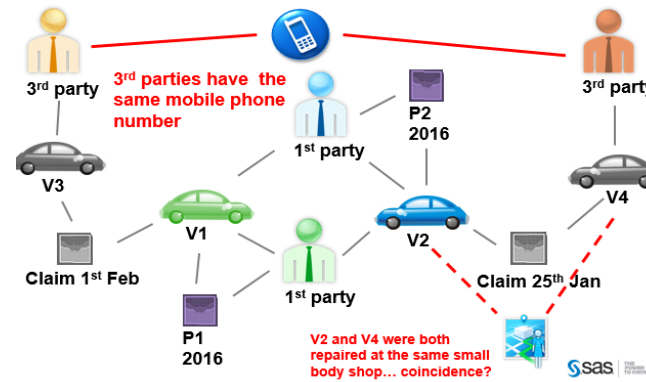
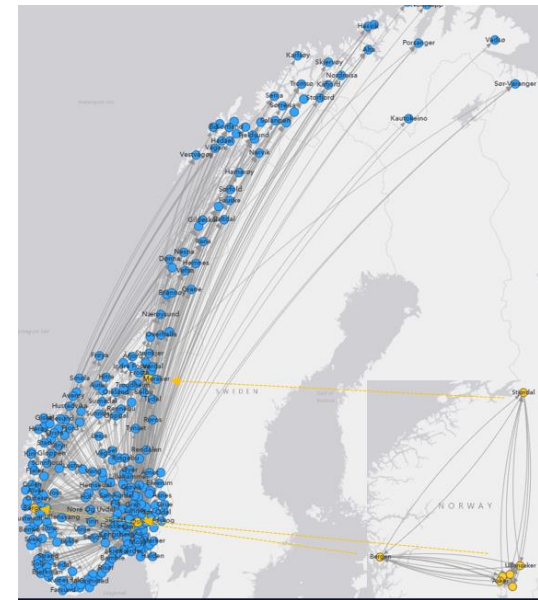


Network analytics /graph theory use cases

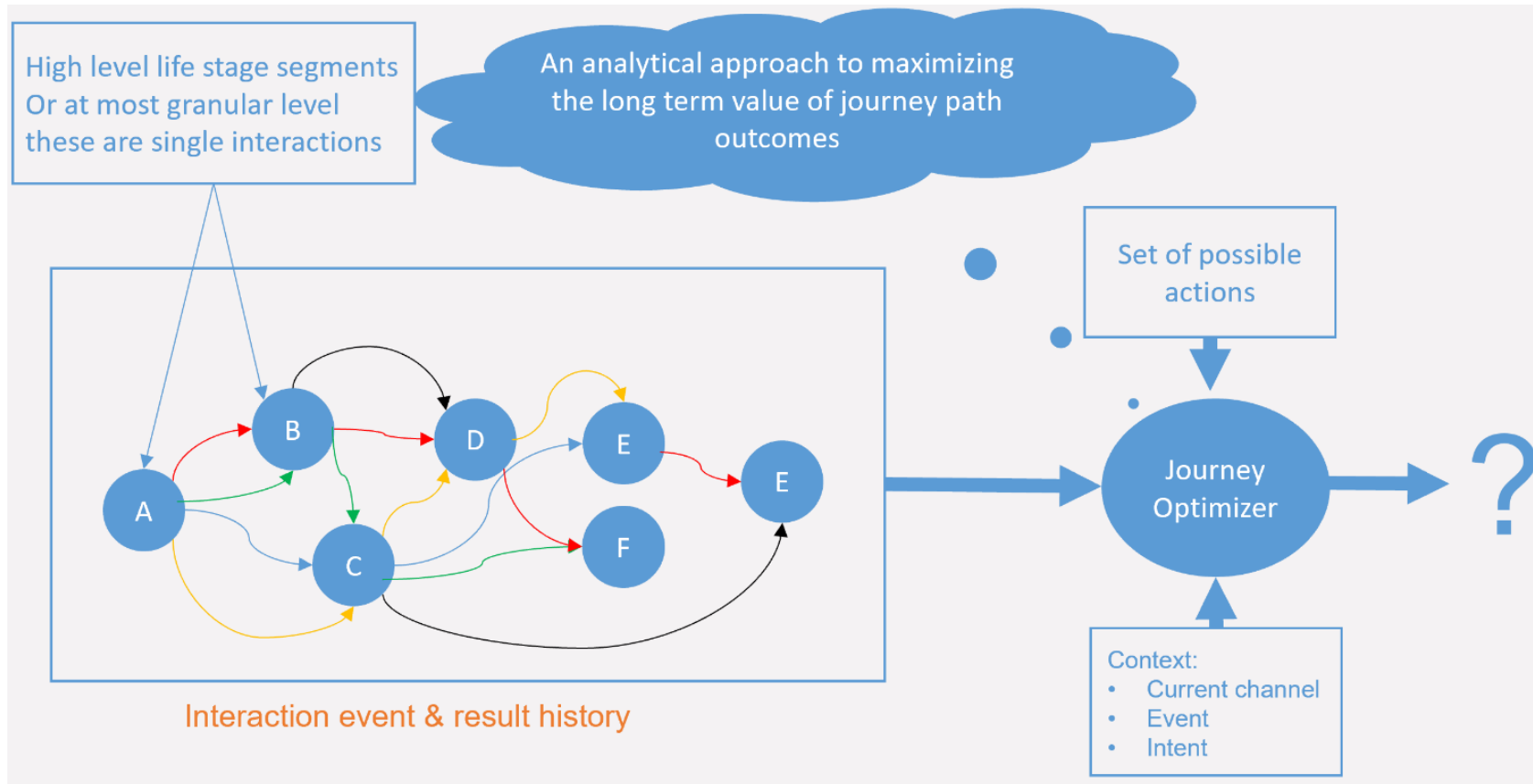
- Predict virus (covid-19) cases using mobile network data (movements)

- Fraud/anti-Money laundering
 - Creditcard
 - Insurance

- Police
 - Cyber security
 - Crime investigation



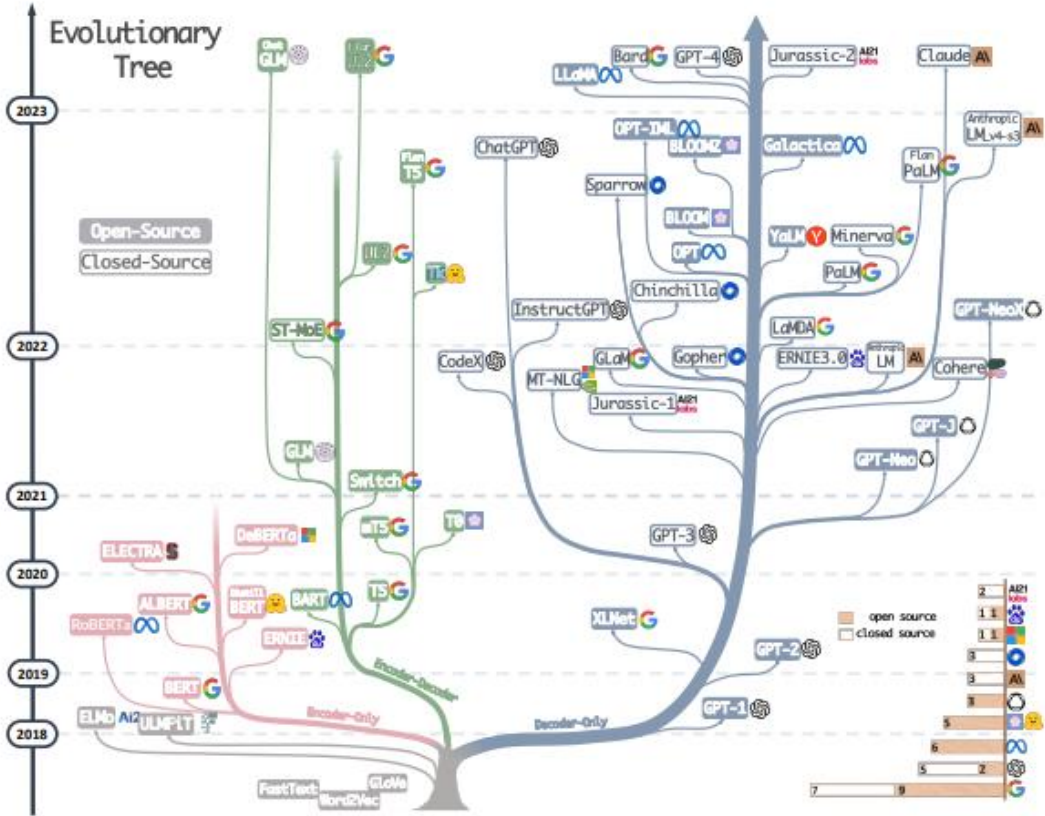
Final challenge #2: Fully AI enabled customer journey optimization



Developing deep reinforcement model to optimize customer journey, based on all the interactions of the customer.

Generative AI Use cases in Leasing industry

- Large language models family
 - Most famous Chatgtp (microsoft) and palm 2 (Google).
 - Can generate text, audio, computer code and data.
- Use case
 - Synthetic data generation
 - Personalised Car Search
 - Fraud detection
 - Dynamic Pricing
 - Streamlining Processes: Automated Loan Documentation



Thank you

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