



Helping People Make Better Decisions



### Sales





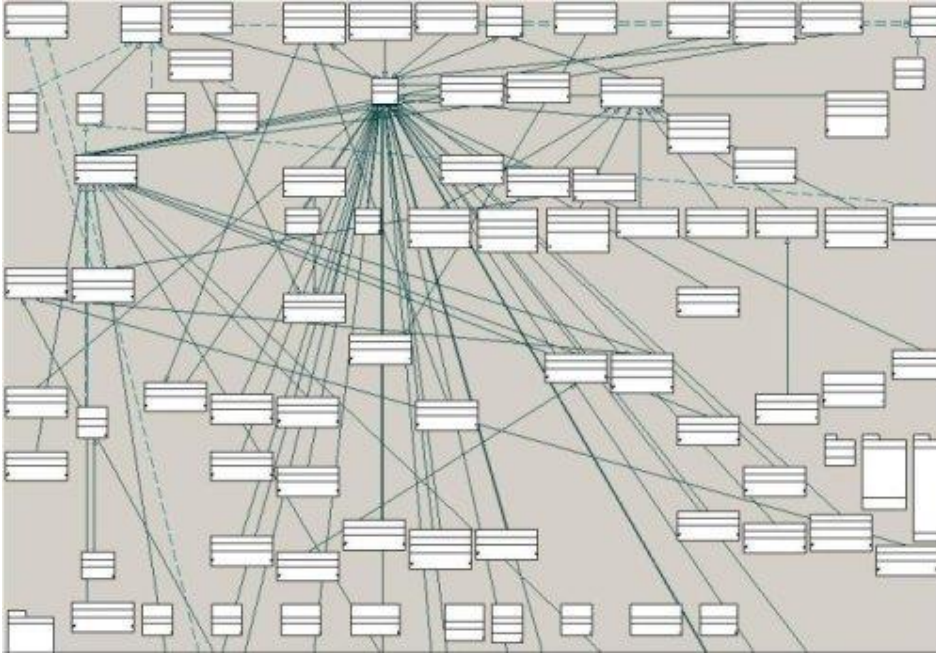
How many upsells from Basic to Premium did we have last year in Bern?



Hm, I will need to look into that...



# Difficult, slow and complicated.



```

SELECT distinct T595.PRODUCT_NAME as c1,
T614.QUANTITY_SOLD as c2,
T614.UNIT_PRICE as c3
FROM
PRODUCTS T595,
(WITH
sum_quantities AS (
SELECT prd.product_id as product_id,
prd.product_name as product_name,
sum( sqn.quantity_sold ) as quantity_sold
FROM products prd, sales_quantities sqn
WHERE prd.product_id = sqn.product_id
GROUP BY prd.product_id, prd.product_name
),
sum_prices AS (
SELECT prd.product_id as product_id,
prd.product_name as product_name,
sum( sup.unit_price ) as unit_price
FROM products prd, sales_unit_prices sup
WHERE prd.product_id = sup.product_id
GROUP BY prd.product_id, prd.product_name
)
SELECT qnt.product_id as product_id,
qnt.product_name as product_name,
qnt.quantity_sold as quantity_sold,
prc.unit_price as unit_price
FROM sum_quantities qnt, sum_prices prc
WHERE qnt.product_id = prc.product_id
ORDER BY product_name) T614
WHERE ( T595.PRODUCT_ID = T614.PRODUCT_ID )
ORDER BY c1, c2, c3

```

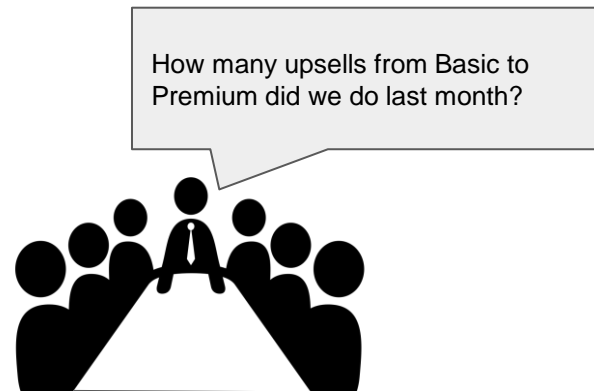
what if you could just ask?



## Learn



## Talk & Learn





Working over lunchtime, Till? So am I! This is a sales database from a fictitious company, which sells products online and ships to locations around the world. Just type 'help me' to see this again!



12:23

cost for each country in Asia by month

How many orders were made to each market?

How much revenue did we make in 2014?



Ask me anything by typing here...



Deep Dive

Ask





## More Data-Driven Decisions

*No training required. Everybody knows how to use it.*



## Faster Decision Processes

*Ask for the information. Get it. No need to wait for days.*

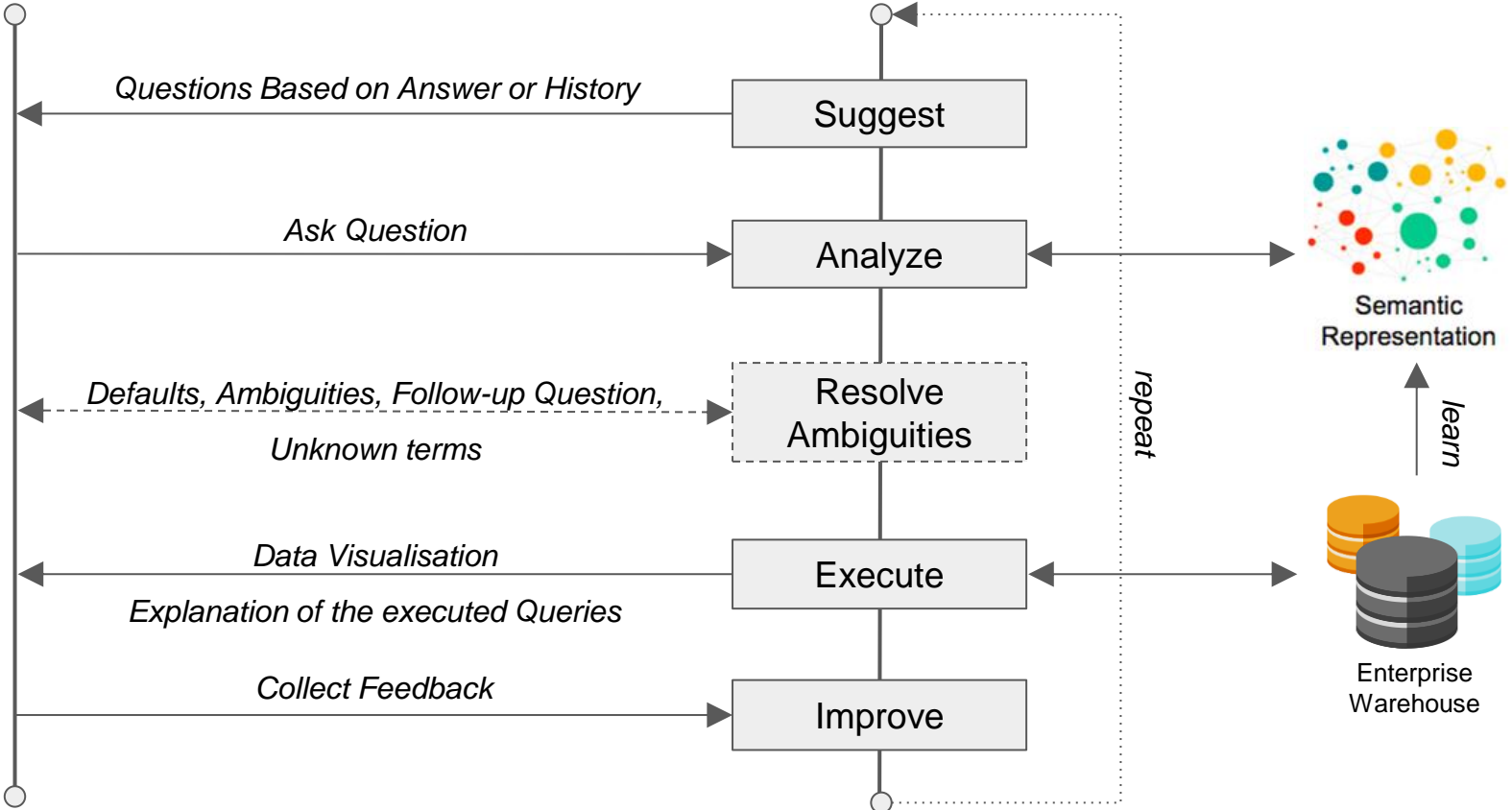


## Focus On Valuable Work

*The best visualisation. The most relevant figures.*



veezoo



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## Neural Multi-Step Reasoning for Question Answering on Semi-Structured Tables

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### Abstract

Advances in natural language processing tasks have gained momentum in recent years due to the increasingly popular neural network methods. In this paper, we explore **deep learning techniques for answering multi-step reasoning questions** that operate on semi-structured tables. Challenges here arise from the level of logical compositionality expressed by questions, as well as the domain openness. Our approach is weakly supervised, trained on question-answer-table triples without requiring intermediate strong supervision. It performs two phases: first, machine understandable *logical forms* (programs) are generated from natural language questions following the work of [Pasupat and Liang, 2015]. Second, paraphrases of logical forms and questions are embedded in a jointly learned vector space using word and character convolutional neural networks. A neural scoring function is further used to rank and retrieve the most probable logical form (interpretation) of a question. Our best single model achieves 34.8% accuracy on the WikiTableQuestions dataset, while the best ensemble of our models **pushes the state-of-the-art** score on this task to 38.7%, thus slightly surpassing both the engineered feature scoring baseline, as well as the Neural Programmer model of [Neelakantan *et al.*, 2016].

soccer games<sup>1</sup>. This line of research is practically relevant for automated systems that support interactions between non-expert users and databases without requiring specific programming knowledge.

Question-Answering (QA) systems are often faced with a trade-off between the openness of the domain and the depth of logical compositionality hidden in questions. One example are systems able to answer complex questions about a specific topic (e.g. [Wang *et al.*, 2015]). Unsurprisingly, these systems often struggle to generalize to other, more open domains. On the other side, topic-independent QA systems that can potentially interrogate large databases are usually limited to simple look-up operations (e.g. [Bordes *et al.*, 2014a]).

Here, we propose a novel weakly supervised model for natural language interfaces operating on semi-structured tables. Our deep learning approach eliminates the need for expensive feature engineering in the candidate scoring phase, while being able to generalize well to never-seen before data. Each natural language question is translated into a set of computer understandable candidate representations, called logical forms, based on the work of [Pasupat and Liang, 2015]. Further, the most likely such program is selected in two steps: i) using a simple algorithm, logical forms are transformed back into *paraphrases* (textual representations) understandable by non-expert users, ii) next, these raw strings are further embedded together with the respective questions in a jointly learned vector space using convolutional neural networks over character and word embeddings. Multi-layer neural networks and bilinear mappings are employed as effective similarity mea-

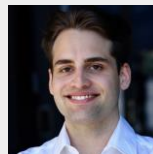
Rank	Researchers	Score
1.	Veezoo AG + ETH Zurich	38.7
2.	Google	37.7
3.	Stanford	37.2

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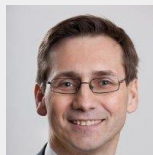
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# Finance & Controlling Use Case

## Problem:

- Existing Solution is **too complex** - users do not use it
- **People get lost** in the data jungle

## Solution:

- Provide **understandable** financial information in a **fast and easy** manner
- Give access to the **relevant figures** in a **revolutionary user experience**

# Finance & Controlling Use Case

## Example Questions:

- 1) How did our earnings develop in the last 3 years?
- 2) Can you break down the operating expenses by location?
- 3) Which was the highest booking last month for my cost objects?
- 4) Where do we have the highest budget deviation?

*“I’m shocked. Shocked and impressed...Veezoo transforms the burden of financial reporting into something intuitive and enjoyable to use”*

**-- SIX Executive**

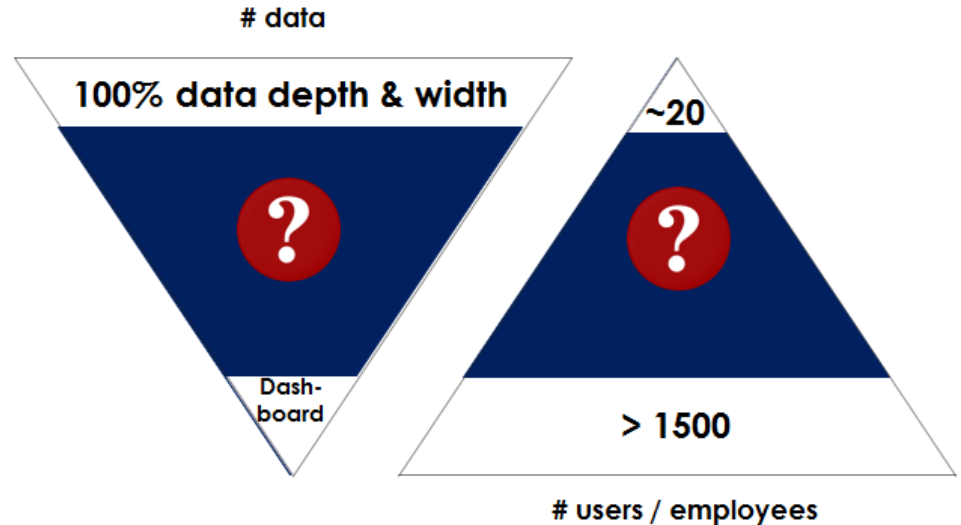


# Sales & Distribution Use Case

We are a data-driven-company.  
 We have a central-point-of-truth.  
 We have many analytics tools.

**But feedback of users ...**

“ Dashboards are good + simple.  
 But analysis and deepdive are not  
 really used because I don't feel  
 comfortable with the tools ...



How can we bring data easier and faster to all people in Distribution / CFO / P&C / Marketing ?



# Sales & Distribution Use Case

## Example Questions:

- 1) In welcher Altersrange verlieren wir die meisten Kunden?
- 2) Wie viele Abschlüssen wurden mit dem ARAG-Rahmenvertrag getätigt?
- 3) Um wie viele Jahre werden unsere MF Verträge im Schnitt verlängert?
- 4) Wie viel SVP hat die Generalagentur Bern West im 2016 im Unternehmenskundengeschäft erreicht?

*"I asked and got the answer within 1s, even as a picture .... Then it took me 3min to verify if the response from Veezoo.com is correct - and it was 100% correct" - AXA User*



# veezoo Customer Behaviour Use Case

## **Problem:**

- How can we best allocate resources to improve Veezoo?
- How is Veezoo being used?

## **Solution:**

- Generate data: Log every touchpoint (questions, suggestions, feedback, ...)
- Let Veezoo digest all the information
- Simply ask the questions to Veezoo

# veezoo Customer Behaviour Use Case

## Example Questions:

- 1) What percentage of questions asked were actually suggestions?
- 2) How many users have asked more than 100 questions last month?
- 3) How long does Veezoo take to answer the questions?
- 4) What is the percentage of follow-up questions, monthly?

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