

# 19 Enticing – Semantic Search Engine

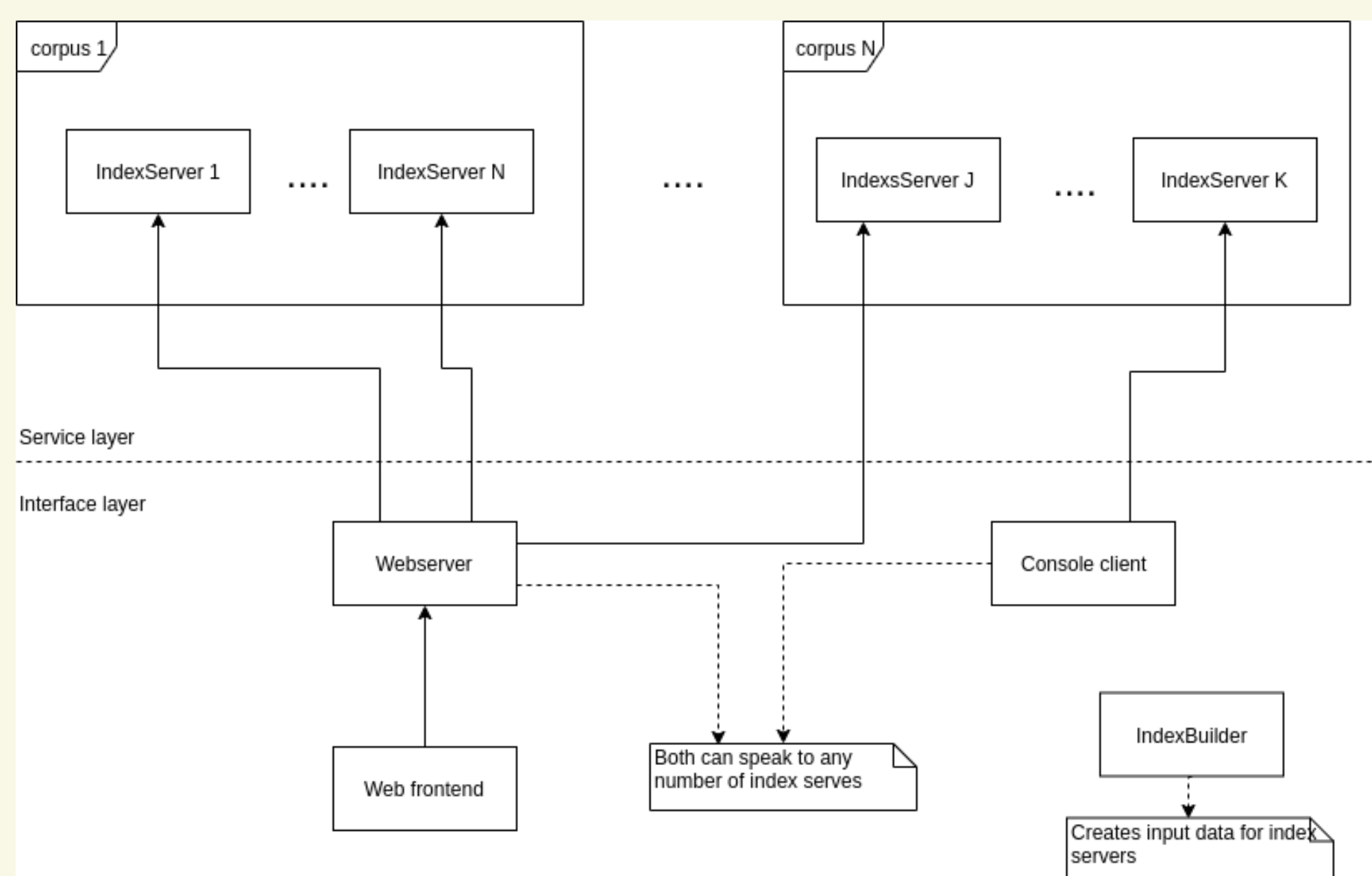
```
a:=nertag:person < lemma:( influence|impact | (paid < tribute) ) < b:=nertag:person ctx:sent && a.url != b.url
```

- + [edit] [share] [link] , and left around 1,000 orphaned children. According to historian **Mark Healey**, the issues surrounding the orphans and the nearly 100,000 homeless had a profound **influence** on the shaping of social legislation enacted during **Perón's** first term as president, two years later. [
- + [edit] [share] [link] its training quarters to **Bir Zeit**, a town near Ramallah . **Abd al-Qadir's** zone of **influence** extended down to the area of Lydda , **Ramleh** , and the Judean Hills where **Hasan Salama** commanded 1,000 men. [ 109 ] **Salama**, like **Abd al-Qadir**
- + [edit] [share] [link] . Despite obtaining permission, the Mufti did not get to **Jerusalem**. **His** declining prestige cleared the way for the expansion of the **influence** of the **Arab Liberation Army** and of **Fawzi Al-Qawuqji** in the **Jerusalem** area. [ 136 ]
- + [edit] [share] [link] the captivity or death of those who defended the settlements. [ 172 ] According to **Yoav Gelber**, the fall and massacre of **Kfar Etzion** **influenced Ben-Gurion's** decision to engage the **Arab Legion** on its way to **Jerusalem**, although the Haganah General Staff were
- + [edit] [share] [link] gained a reputation as an effective politician with a lack of corruption . [ 39 ] By 1925 under **his influence** , Parliament voted to remove **Ahmad Shah Qajar** from the throne , and Reza Khan was crowned Reza Shah Pahlavi , of the **Pahlavi Dynasty** . **Reza Shah**

## Overview

- ▶ Semantic search engine for KNOT.
- ▶ Searching based on the meaning of words.
- ▶ Powerful query language EQL.
- ▶ Scalable distributed system.
- ▶ Built on top of MG4J.

## Components of the platform



- ▶ 5 components built from 13 modules.
  - Webserver
  - IndexServer
  - IndexBuilder
  - ConsoleClient
  - ManagementServer
- ▶ Each of them can be replicated.
- ▶ Currently running on over 50 servers.

## EQL – Enticing Query Language

- ▶ Query entities and their attributes.
- ▶ Context constraints for paragraphs or sentences.
- ▶ Global constraints for relationships between entities.
- ▶ Compiler with extensible semantic analysis toolkit.

## Other features

- ▶ Smart search bar.
  - Syntax and semantic analysis.
  - Detailed error messages.

```
location.surname: 'Smith'
```

Figure: Example of a semantic error

- ▶ Easily extensible.
  - Different indexing libraries can be added.
- ▶ Custom configuration DSL.
- ▶ Built using modern technologies.
  - TypeScript with React & Redux on the frontend.
  - Kotlin with Spring on the backend.

## Performance measurements

EQL Query	Average[ms]	Deviation[ms]	min[ms]	max[ms]
water	711.4	65843.12	337	1823
nertag:person	155.4	2263.76	104	421
nertag:location	177.73	24321.48	93	835
water nertag:person	503.0	35445.24	355	1259
water nertag:person ctx:sent	423.15	8891.11	321	771
nertag:person nertag:location	130.24	1919.32	96	433
nertag:person nertag:location ctx:sent	287.09	2490.72	220	463
water nertag:person nertag:location	453.82	14603.47	331	1056
water nertag:person nertag:location ctx:sent	4317.23	16767.16	4071	4828
nertag:person nertag:person	119.28	1071.40	96	403
nertag:person nertag:person ctx:sent	124.48	828.09	100	330
a:=nertag:person b:=nertag:person	117.31	699.074	97	287
a:=nertag:person b:=nertag:person ctx:sent	130.61	667.64	104	247
a:=nertag:person b:=nertag:person && a.url != b.url	126.33	801.48	98	263
a:=nertag:person b:=nertag:person ctx:sent && a.url != b.url	353.91	10034.46	250	801

Table: Early results of performance tests

- ▶ Platform is still being optimized.

## Current state

- ▶ Core implementation finished.
- ▶ Ongoing testing and optimizations.
- ▶ Many possible extensions.
  - Different indexing libraries.
  - Autocomplete for the search bar.
  - Native mobile client.