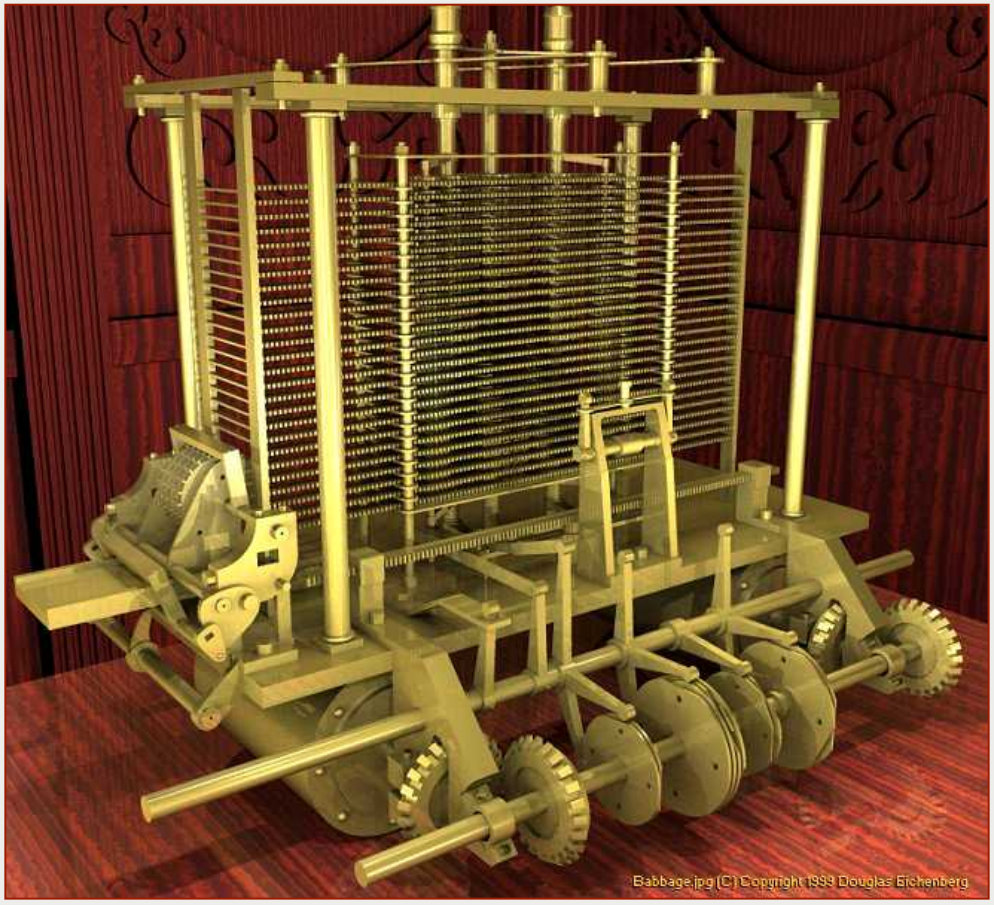
NOSQL intro

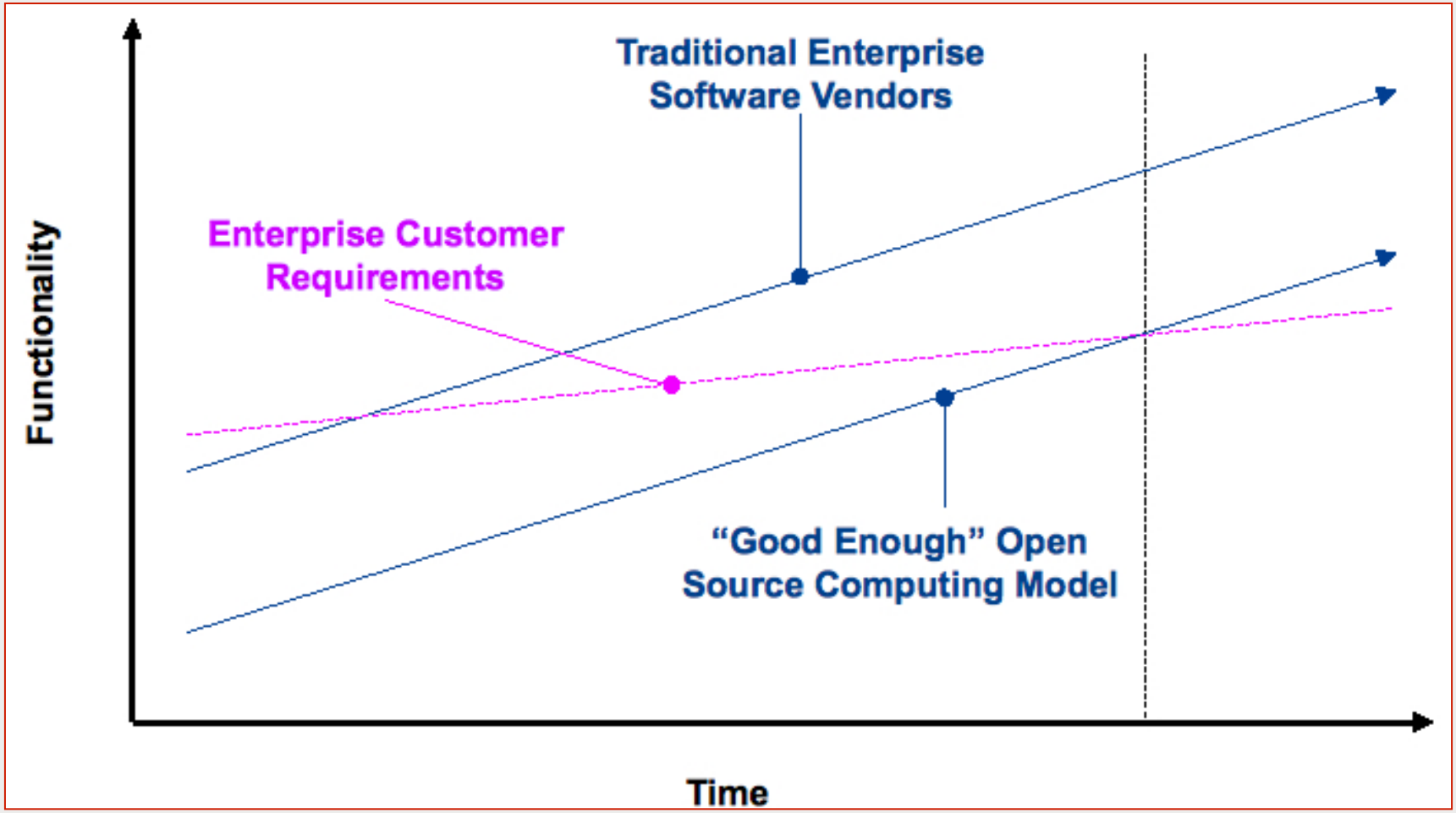
Arató Bence
BI Consulting
arato@biconsulting.hu



A NOSQL jelenség

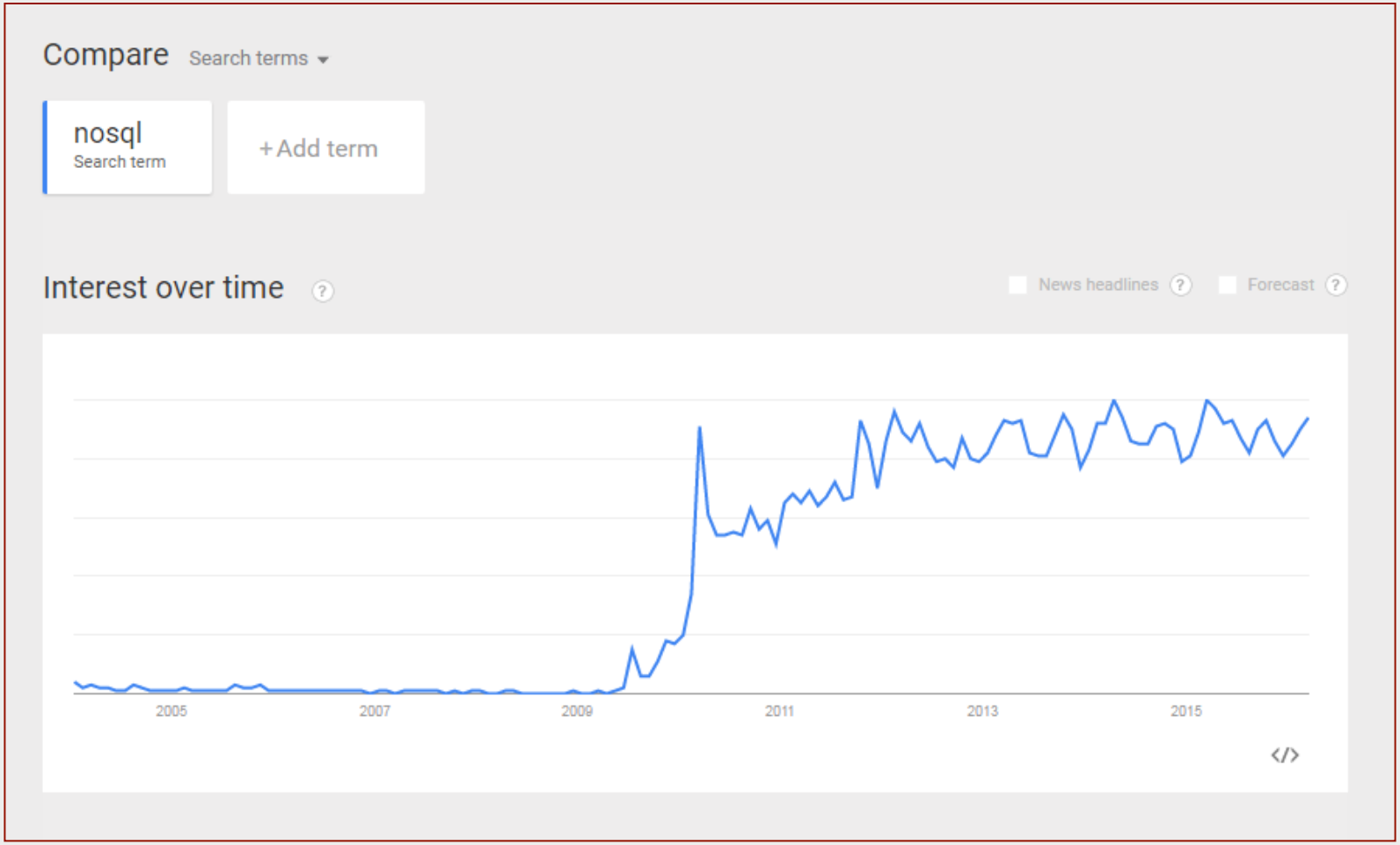
- Egy jó adatbázis mindenre használható
- Mit szeretnénk?
  - Funkcionalitás
  - Rugalmasság
  - Skálázhatóság

- Egy jó adatbázis mindenre használható
- Mit szeretnénk?
  - Funkcionalitás
  - Rugalmasság
  - Skálázhatóság
- De néha elég az egyszerűbb is



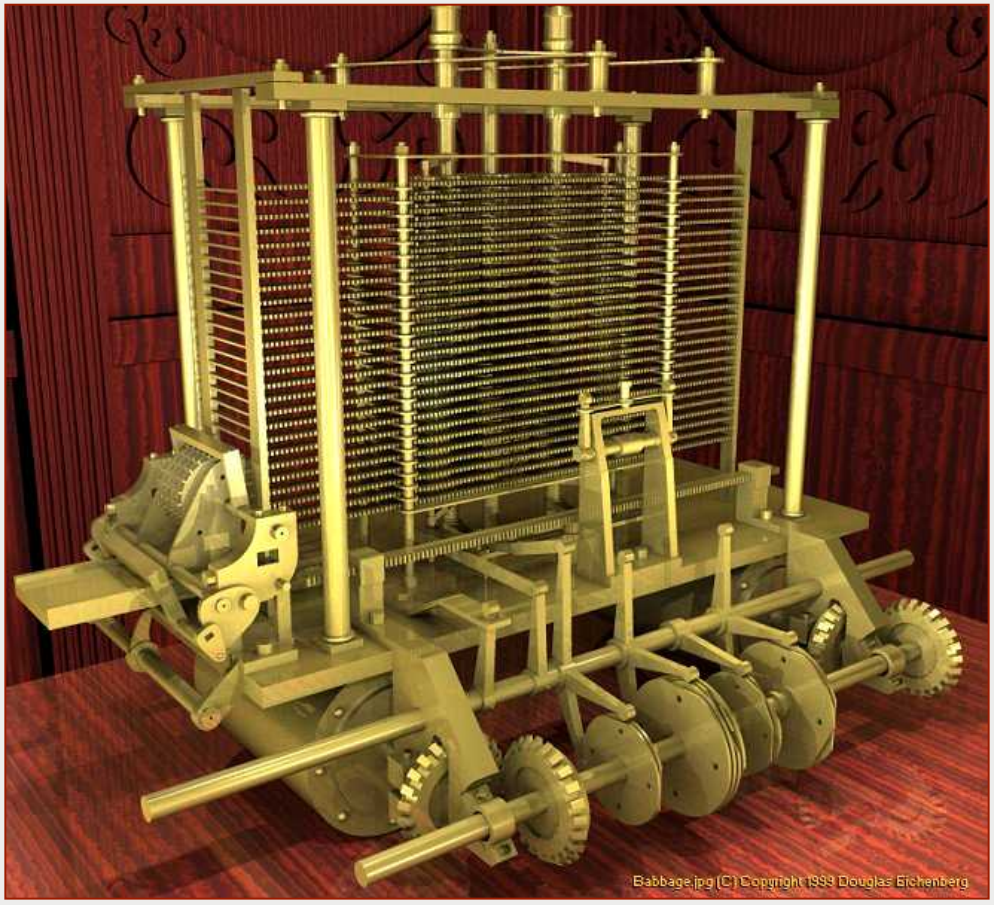
Source: The Agile Executive - Enterprise Software Innovator's Dilemma

- Tipikus NOSQL előnyök
  - Flexibilis adatmodell
  - Könnyű programozhatóság
  - Skálázhatóság
  - Hibatűrés
  - Open source
  - Alacsony költségszint



Source: Google

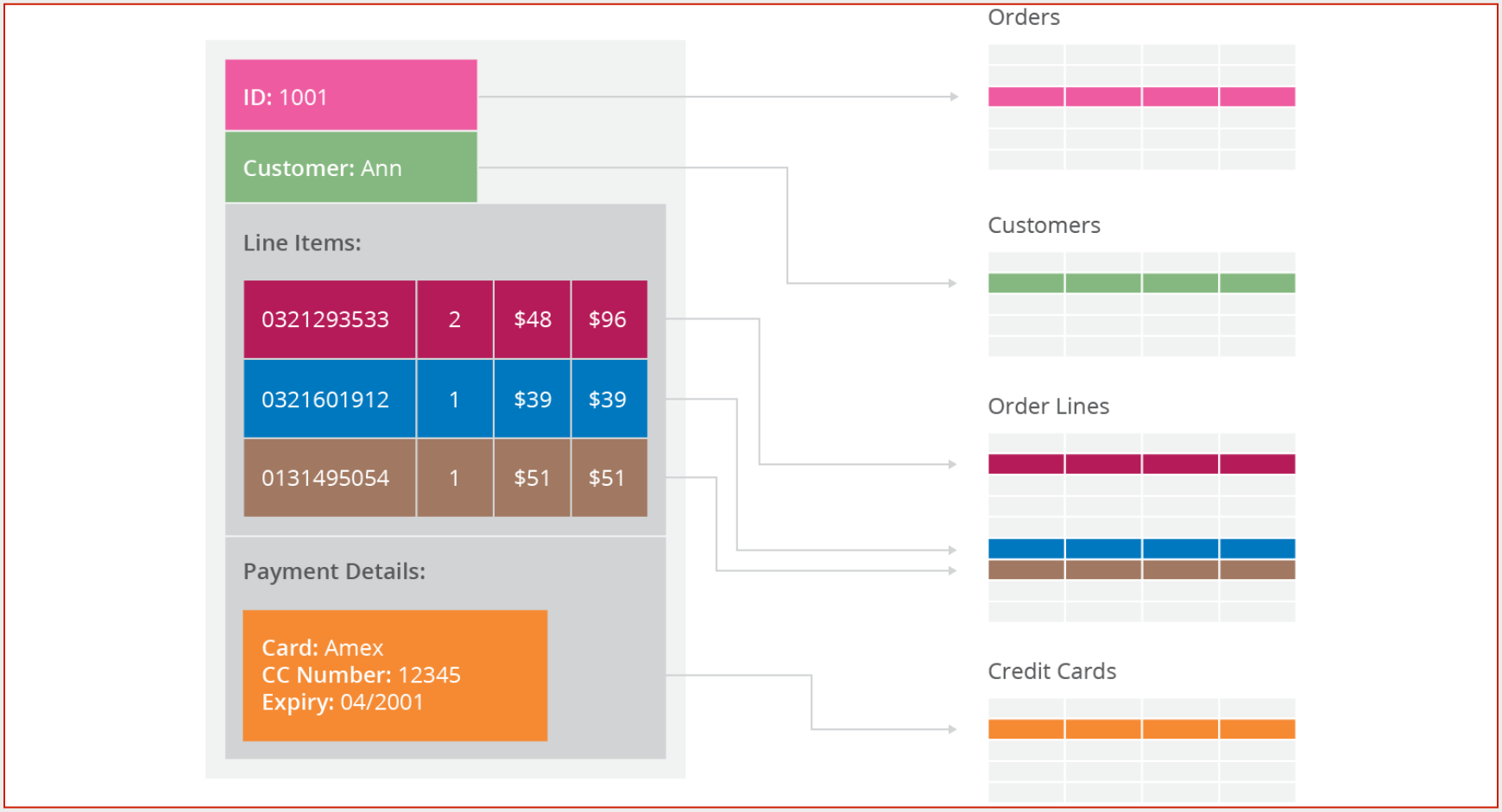
- NOSQL mára
  - Több tucatnyi különböző termék
  - Számos különböző adatmodell
  - Egyedi lekérdezési módszerek (API)
  - Széles körű használatban



A NOSQL világa

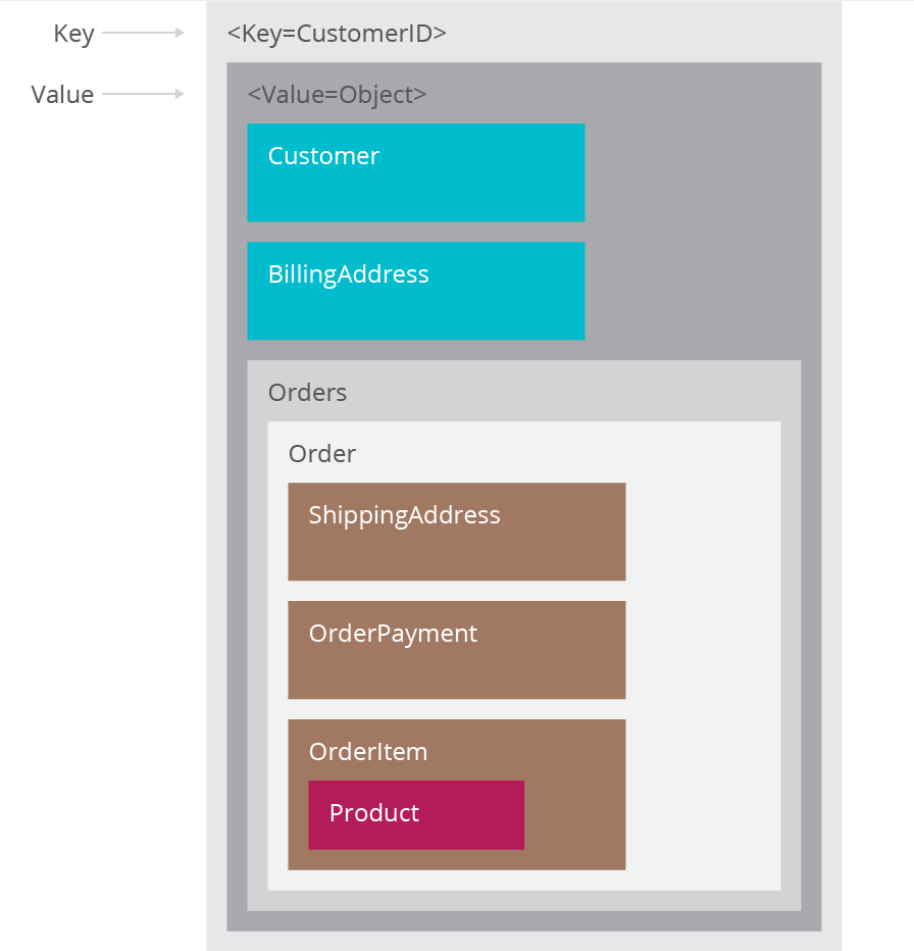
- NOSQL adatmodellek
  - Kulcs-érték
  - Dokument
  - Gráf
  - Oszlopcsalád

Relációs adatmodell



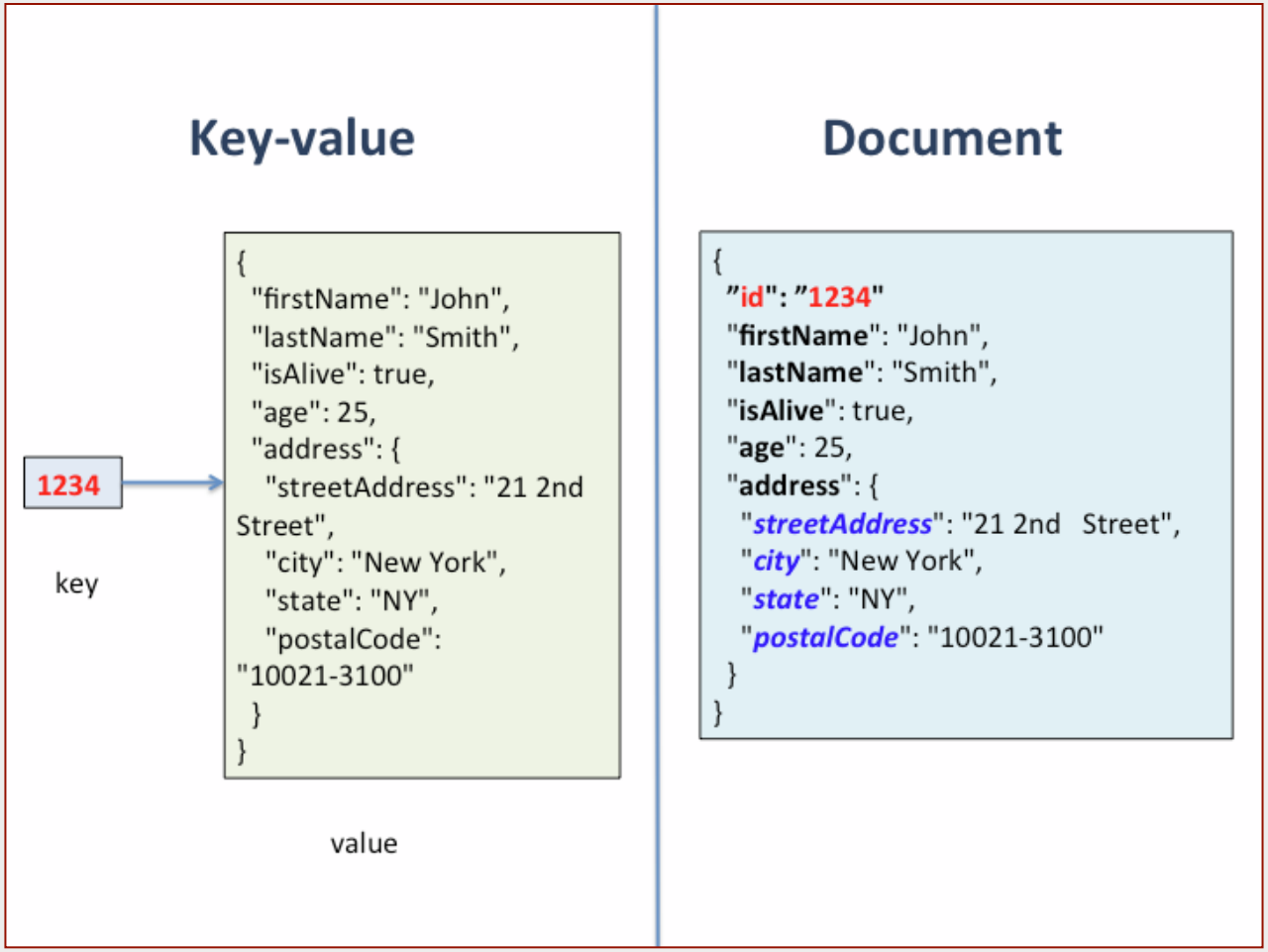
Source: Pramod Sadalage, ToughtWorks – NOSQL Databases: An Overview

Kulcs-érték



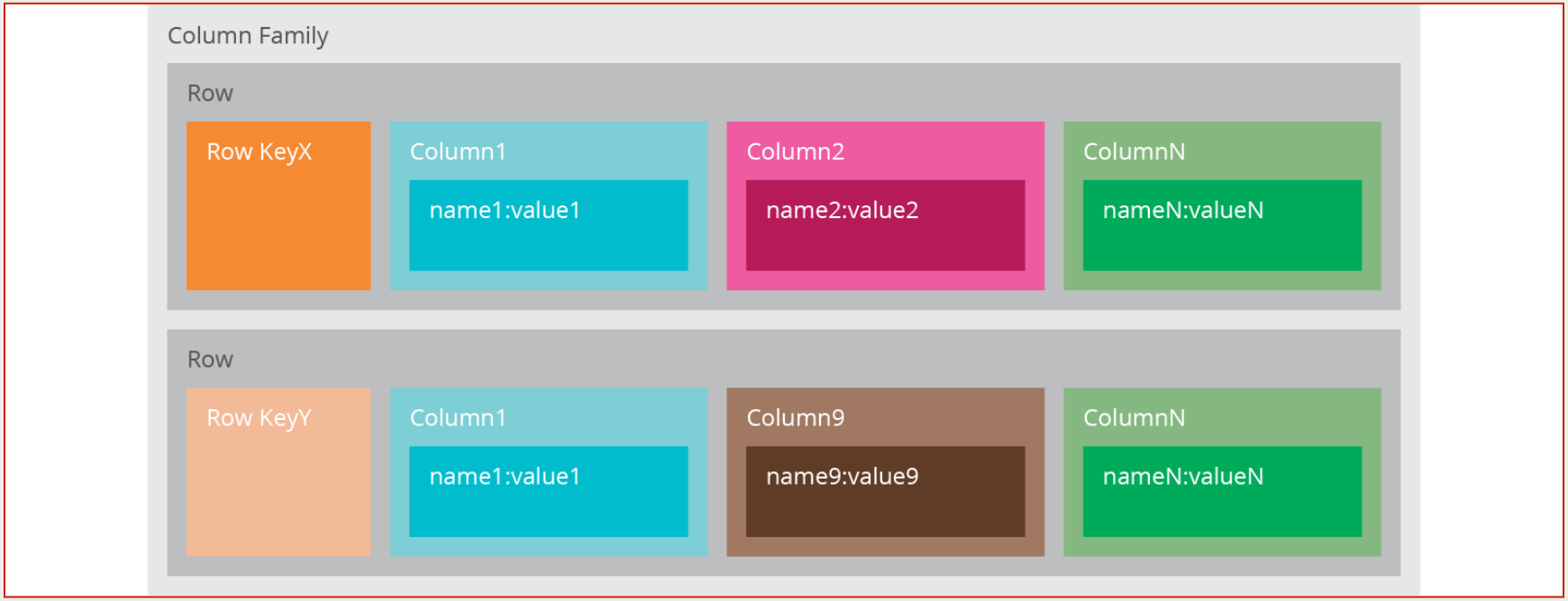
Source: Pramod Sadalage, ToughtWorks – NOSQL Databases: An Overview

Kulcs-érték



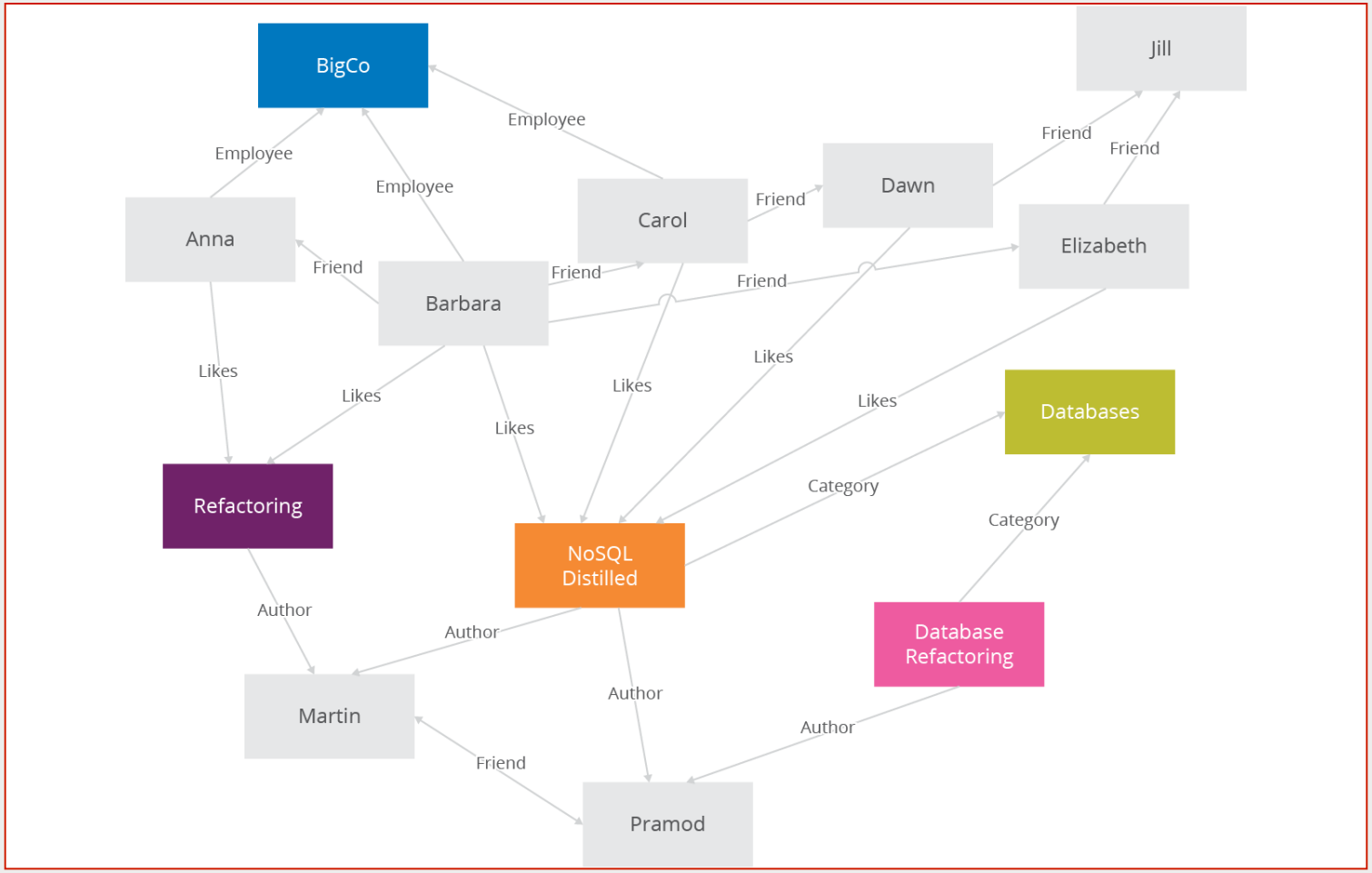
Source: Ricardo Bravo, BigData blog

Oszlopcsaládok



Source: Pramod Sadalage, ToughtWorks – NOSQL Databases: An Overview

Gráf adatbázisok

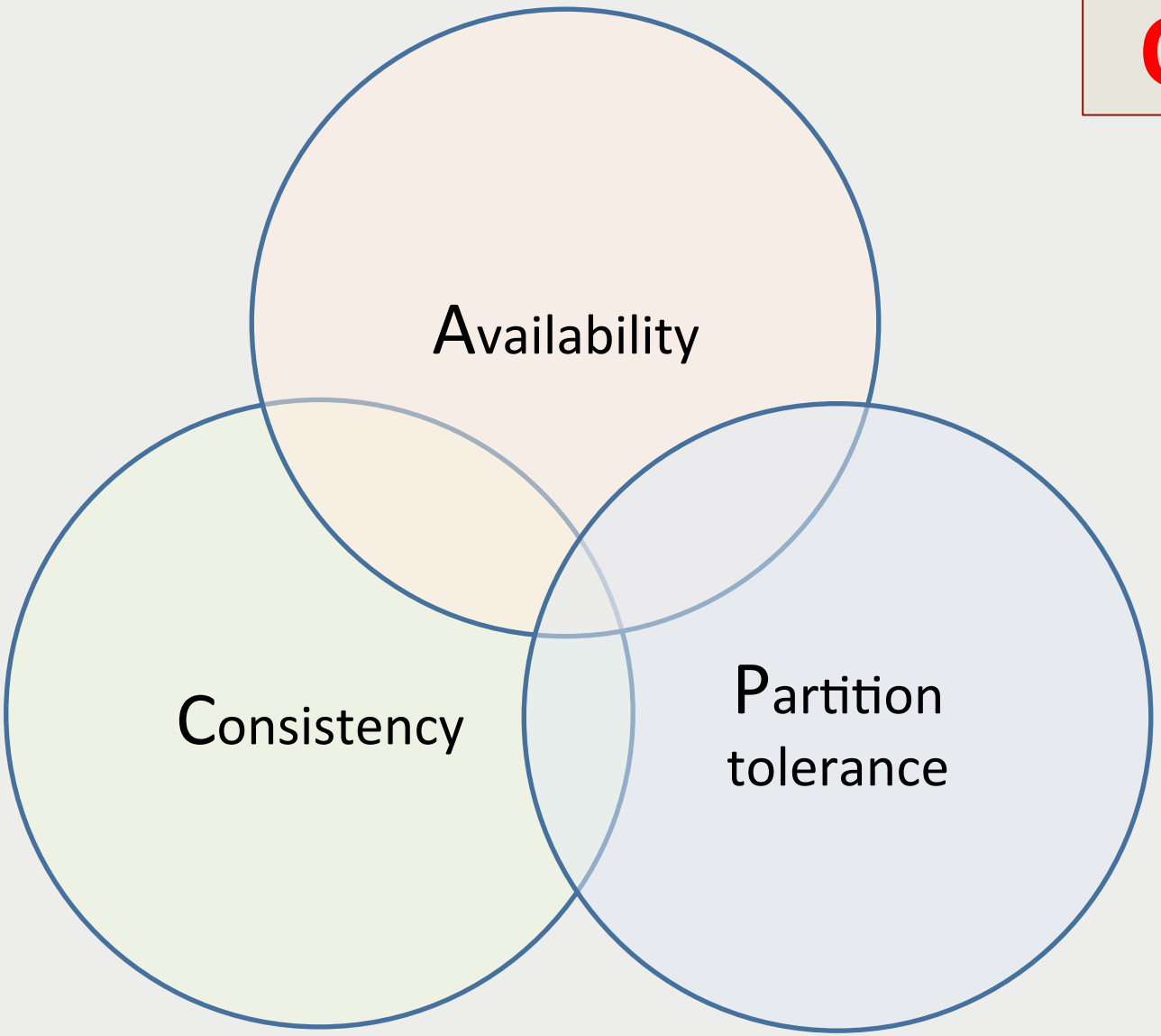


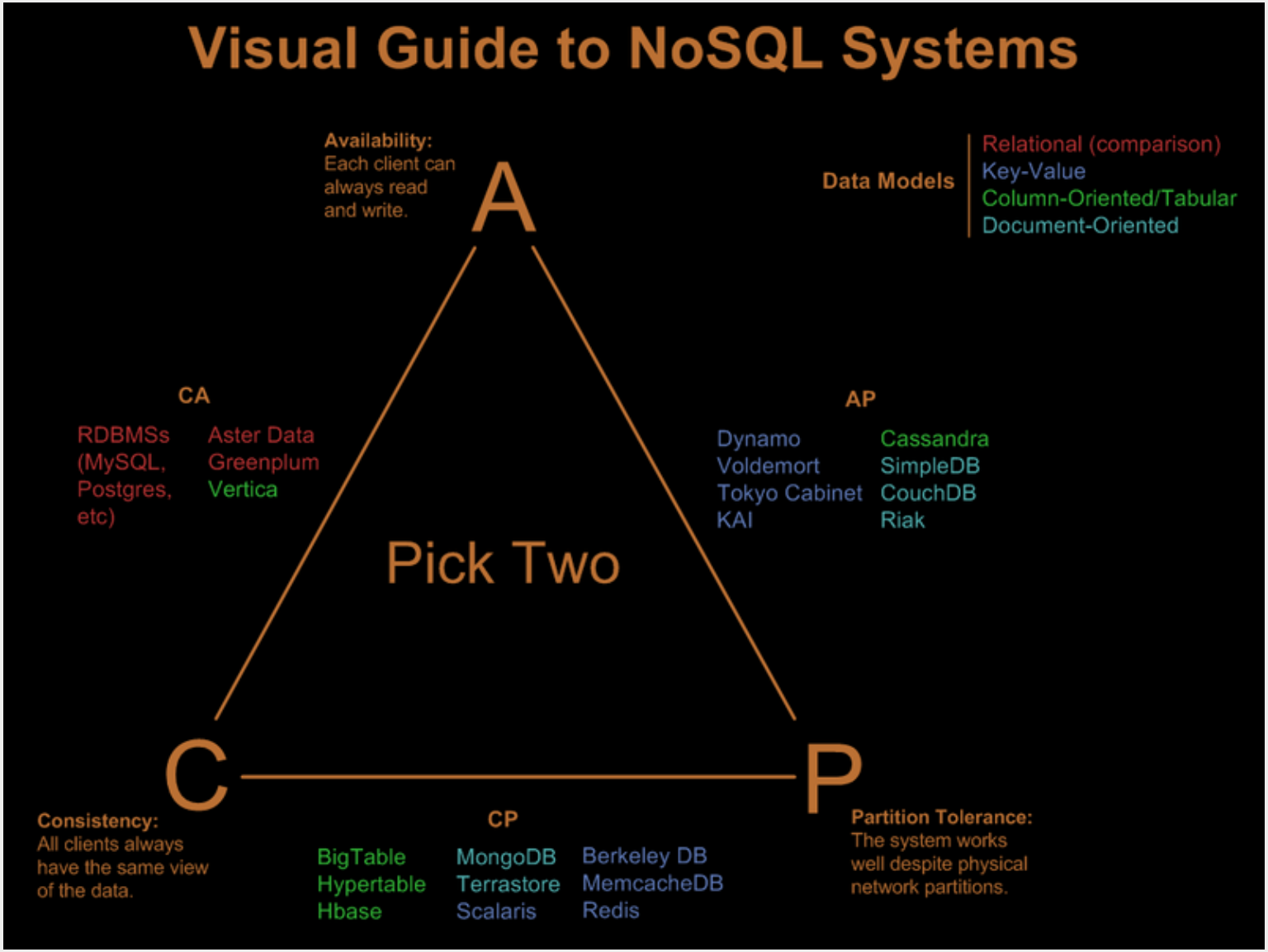
Source: Pramod Sadalage, ToughtWorks – NOSQL Databases: An Overview

CAP

- Mit várunk el egy adatbázistól?
  - Legyen mindig elérhető
  - Az adatok legyenek konzisztensek
  - Legyen hibatűrő

CAP

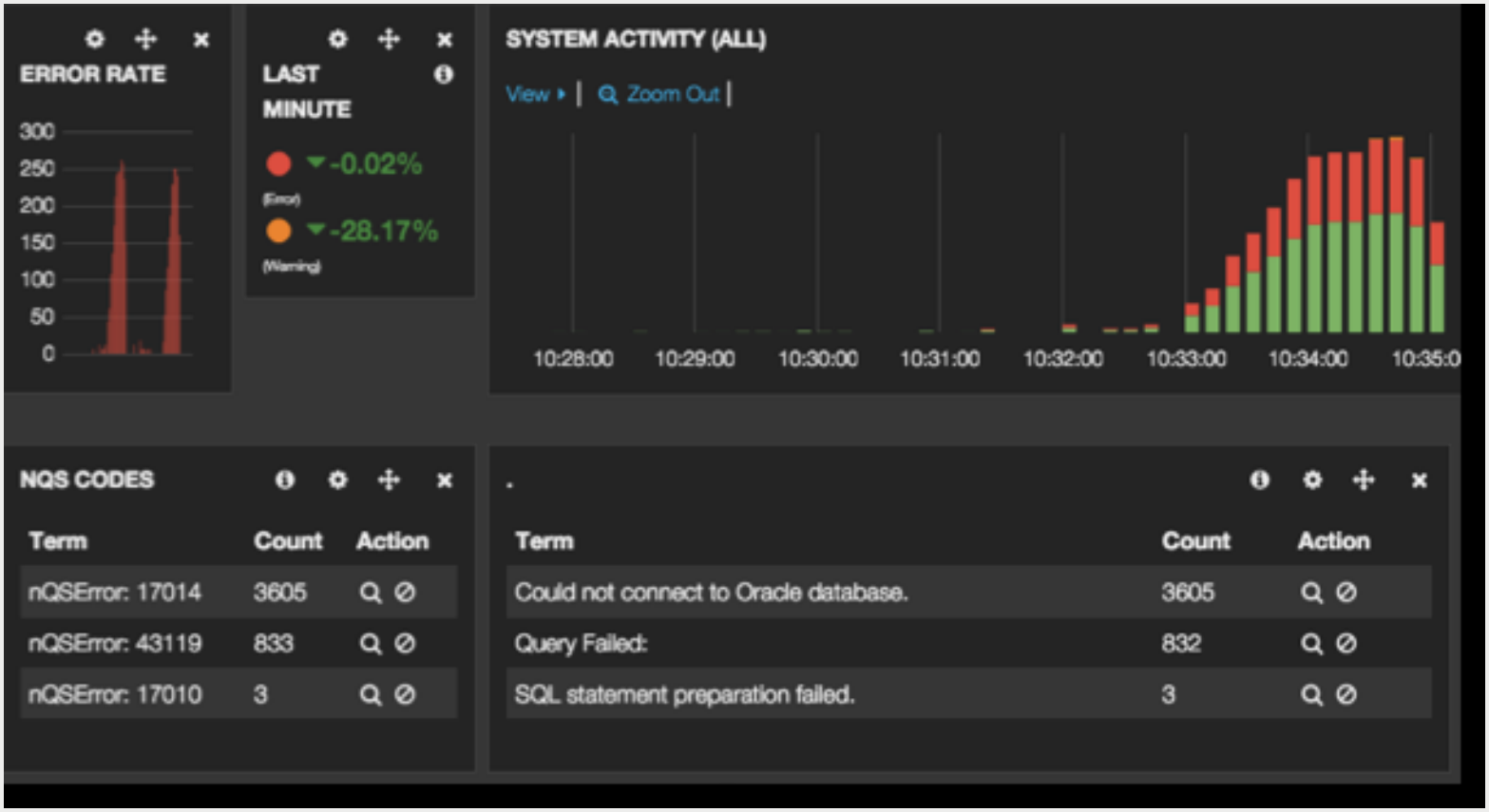




Source:Nathan Hurst - Visual Guide to NoSQL Systems (2010)

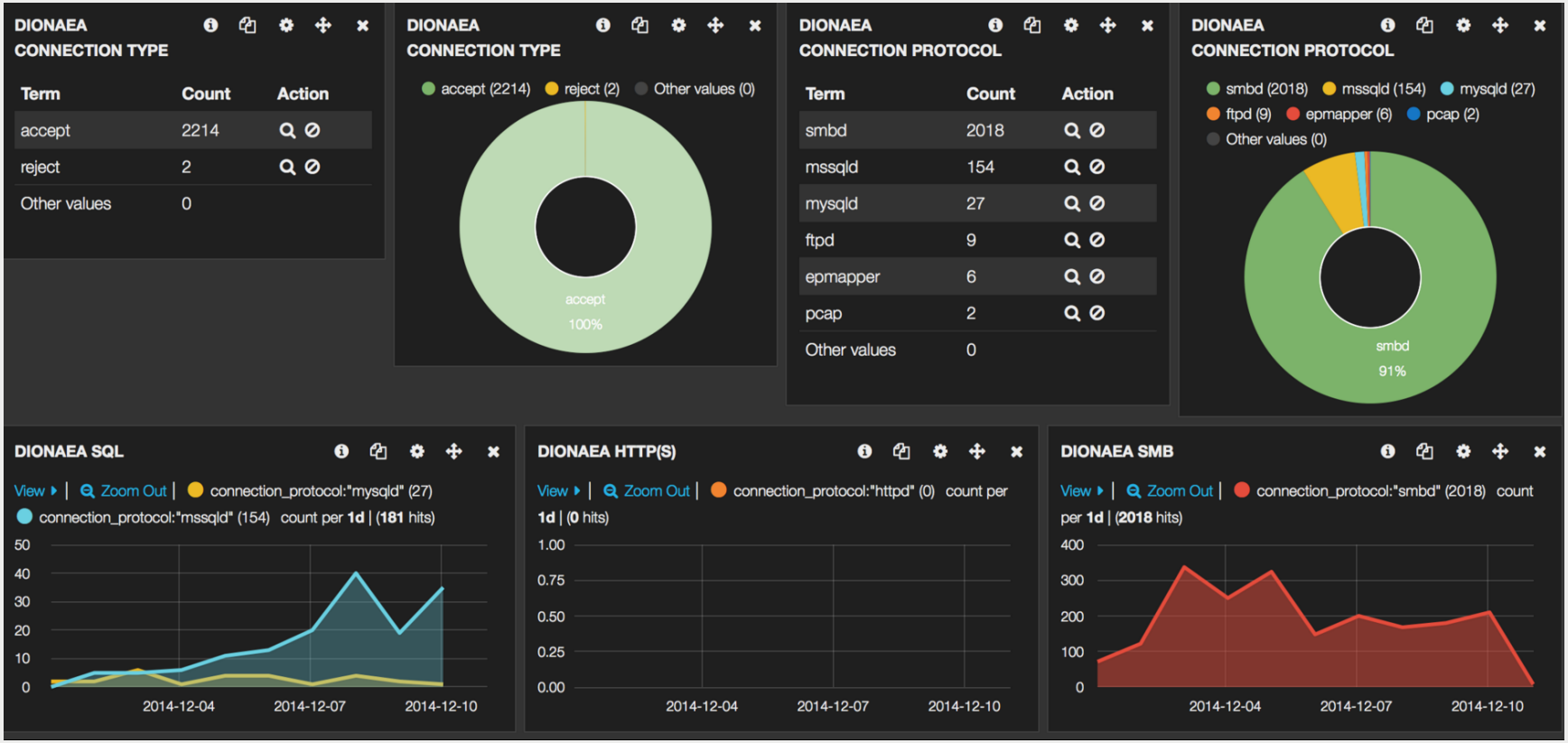
- Érdekességek
  - Hibrid modellek
    - Gráf-dokument kombinált adatbázis
  - NEWSQL
    - SQL a NOSQL motorokhoz
    - A NOSQL és SQL házasítása

LSE

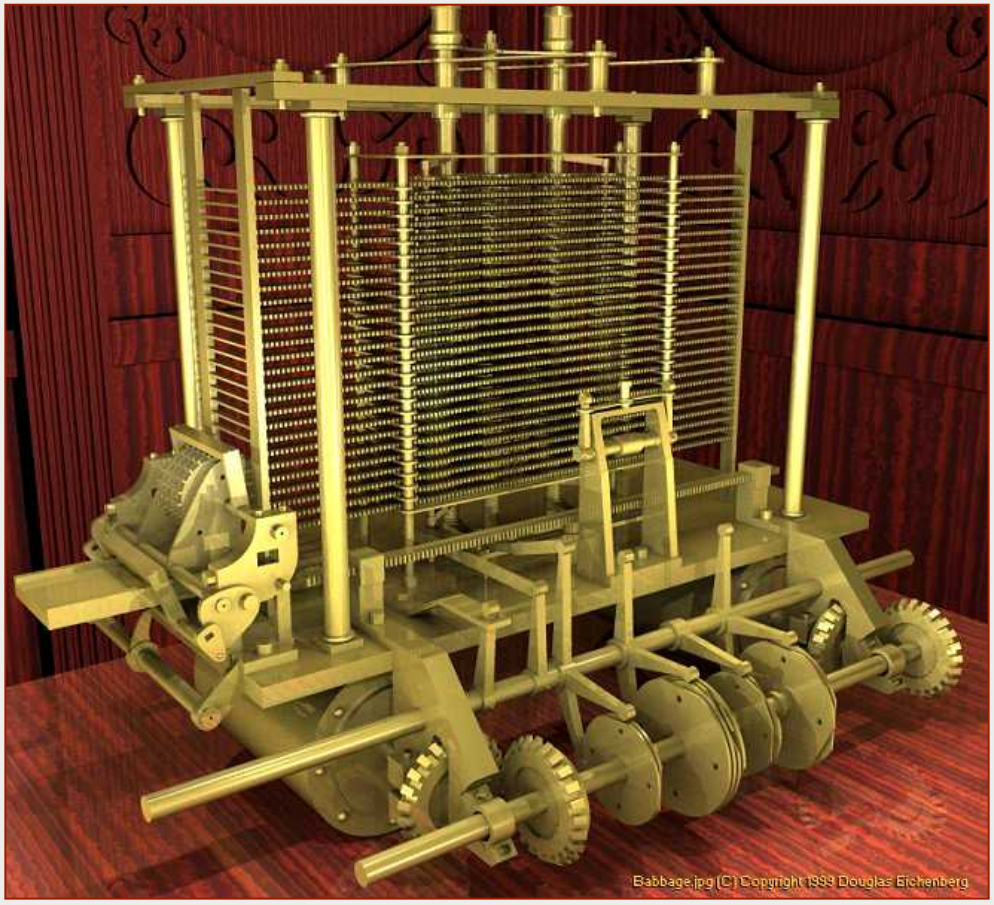


Source:rittmanmead.com

- LSE
  - Lucene
  - SOLR
  - ElasticSearch
- A jó keresőmotor
  - Skálázható és hibatűrő
  - Rugalmas (mindenevő)
  - Közel valós idejű indexelés



Source:VanImpe.eu



Kitekintés a NOSQL piacra

- Elemzői vélemények
- Skill index
- Népszerűség

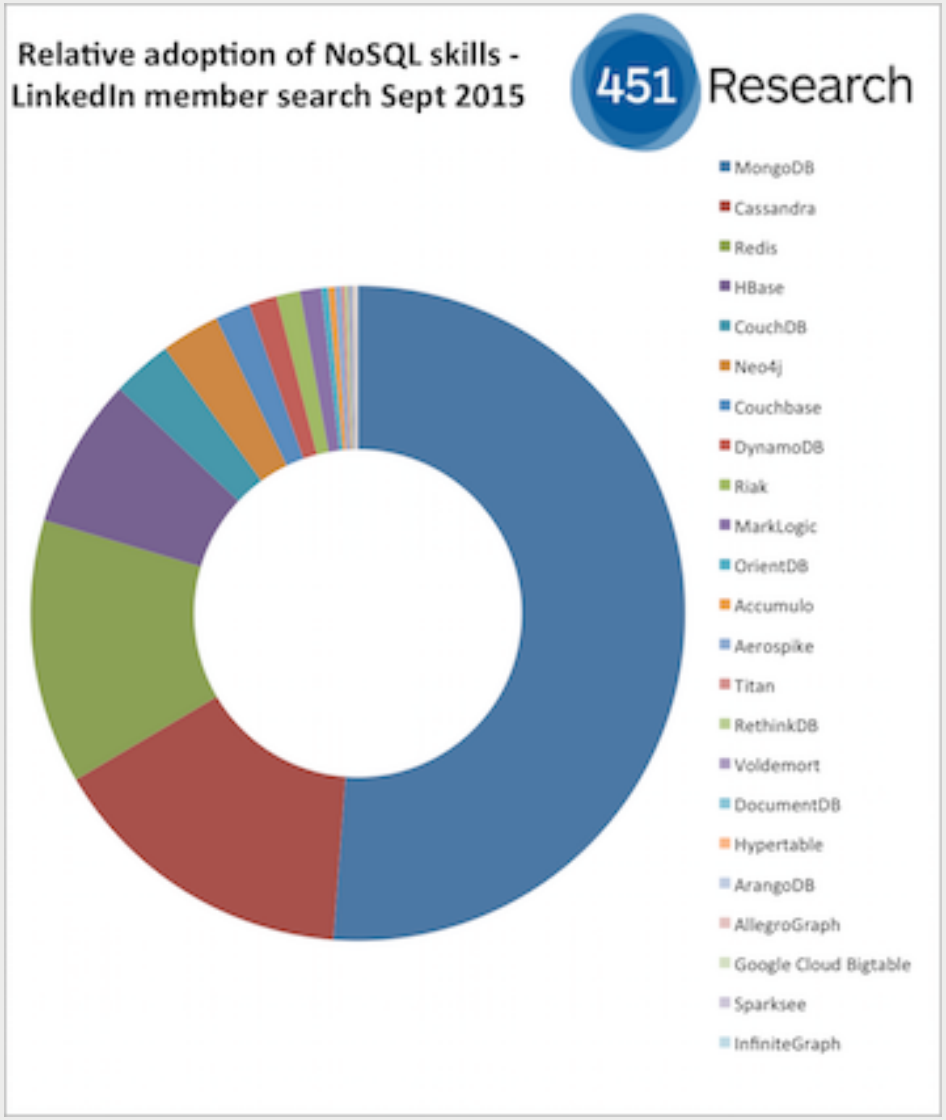
Elemzői vélemény

Source: Gartner Magic Quadrant for Operational Database Management Systems, Oct 2015

Elemzői vélemény

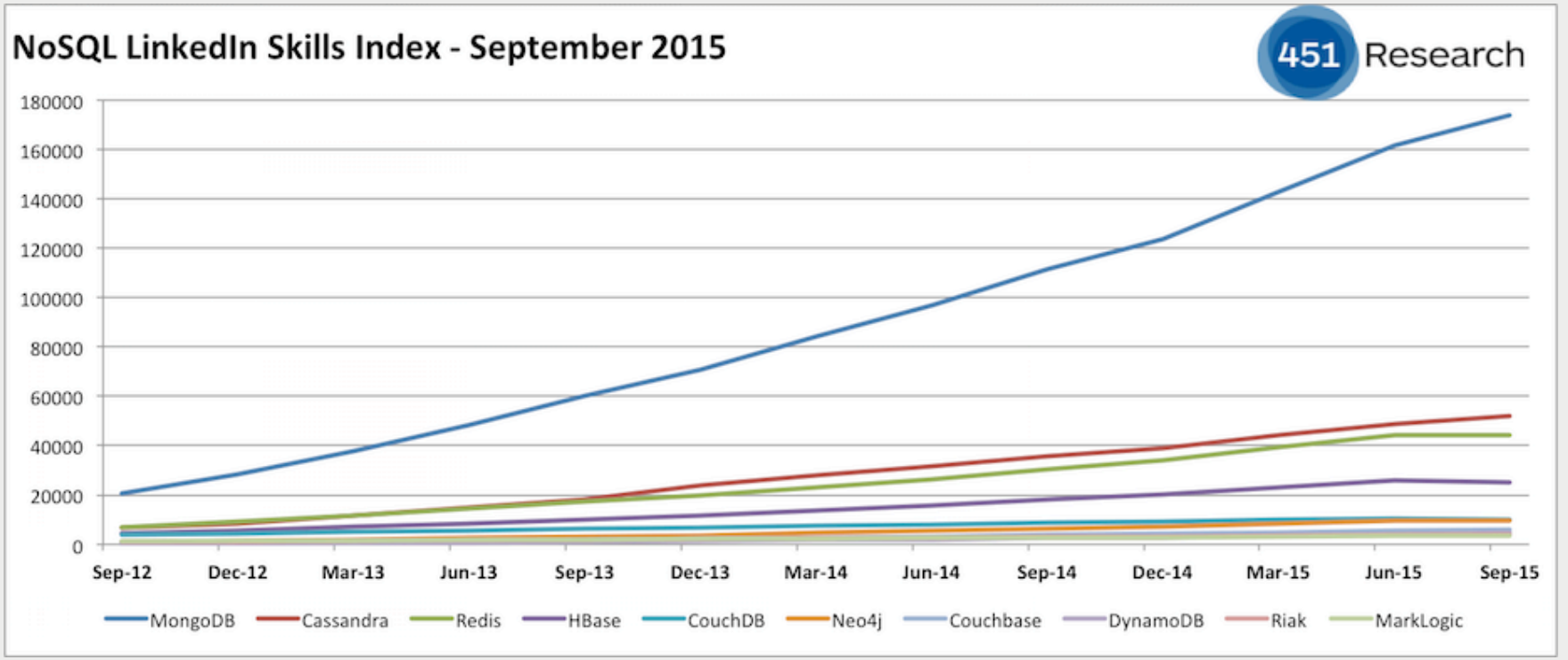
Source: Gartner Magic Quadrant for Operational Database Management Systems, Oct 2015

Skills Index



Source: 451 Research, NoSQL LinkedIn Skills Index – September 2015

Skills Index



Source: 451 Research, NoSQL LinkedIn Skills Index – September 2015

Népszerűség

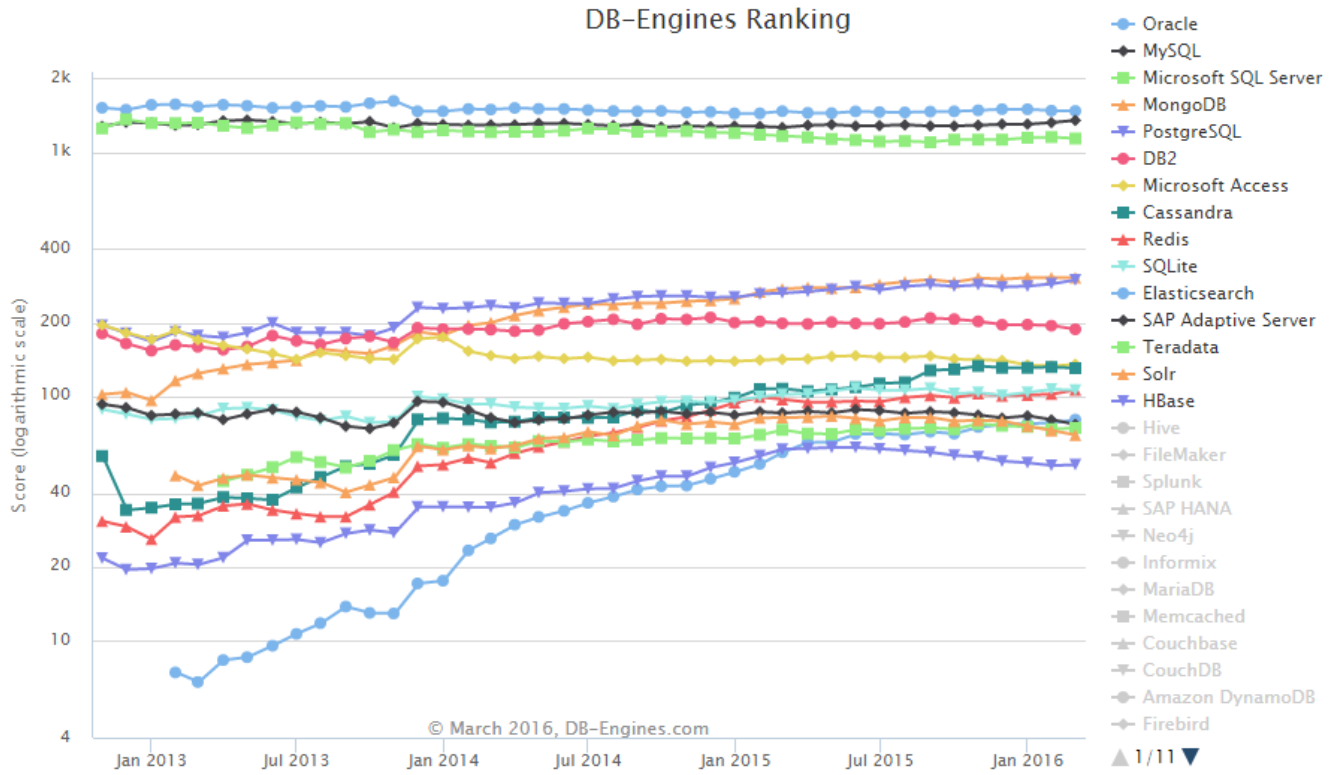
DB-Engines Ranking - Trend Popularity

The DB-Engines Ranking ranks database management systems according to their popularity.

Read more about the method of calculating the scores.

Rank	Trend	System	Score	Change
1		Oracle	1560	+ 27
2	↑	MySQL	1342	+ 47
3	↓	SQL Server	1278	- 40
4		PostgreSQL	174	- 3
5		MS Access	161	- 8
6		DB2	155	- 4

ranking table
March 2016



Source:db-engines.com

Ranking of Key-value Stores

52 systems in ranking, March 2016

Rank Mar 2016	Rank Feb 2016	Rank Mar 2015	DBMS	Database Model	Score Mar 2016	Score Feb 2016	Score Mar 2015
1.	1.	1.	Redis	Key-value store	106.22	+4.14	+9.17
2.	2.	2.	Memcached	Key-value store	29.24	+0.31	-6.27
3.	3.	3.	Amazon DynamoDB	Multi-model	22.23	+0.42	+7.35
4.	4.	4.	Riak KV	Key-value store	12.10	-0.53	-0.71
5.	↑ 6.	↑ 6.	Hazelcast	Key-value store	6.81	+0.26	+1.06
6.	↓ 5.	↓ 5.	Ehcache	Key-value store	6.70	-0.32	-1.11
7.	7.	↑ 10.	OrientDB	Multi-model	6.66	+0.24	+3.39
8.	8.	↑ 11.	Aerospike	Key-value store	4.09	+0.12	+1.92
9.	9.	↓ 7.	Berkeley DB	Key-value store	3.44	-0.23	-0.42
10.	10.	↓ 9.	Oracle Coherence	Key-value store	3.38	-0.14	-0.00
11.	11.	↓ 8.	Amazon SimpleDB	Key-value store	2.91	-0.00	-0.51
12.	12.	↑ 13.	Oracle NoSQL	Key-value store	2.53	+0.01	+0.52
13.	13.	↓ 12.	Infinispan	Key-value store	2.14	-0.02	+0.11
14.	↑ 15.	↑ 16.	ArangoDB	Multi-model	1.68	+0.23	+0.84
15.	↓ 14.	↓ 14.	LevelDB	Key-value store	1.61	-0.03	+0.13

Source:db-engines.com

Ranking of Document Stores

39 systems in ranking, March 2016

Rank Mar 2016	Rank Feb 2016	Rank Mar 2015	DBMS	Database Model	Score Mar 2016	Score Feb 2016	Score Mar 2015
1.	1.	1.	MongoDB	Document store	305.33	-0.27	+30.32
2.	2.	↑ 3.	Couchbase	Document store	25.80	+0.41	+2.62
3.	3.	↓ 2.	CouchDB	Document store	23.38	-0.16	-4.53
4.	4.	4.	Amazon DynamoDB	Multi-model	22.23	+0.42	+7.35
5.	5.	5.	MarkLogic	Multi-model	9.36	+0.04	-0.94
6.	6.	↑ 9.	OrientDB	Multi-model	6.66	+0.24	+3.39
7.	↑ 8.	↑ 12.	RethinkDB	Document store	5.14	+0.33	+3.79
8.	↓ 7.	↓ 6.	RavenDB	Document store	5.06	+0.12	-1.53
9.	9.	↓ 7.	Cloudant	Document store	4.63	+0.15	+0.82
10.	10.	↓ 8.	GemFire	Document store	3.84	-0.03	+0.38
11.	11.	↓ 10.	Virtuoso	Multi-model	2.82	-0.17	-0.00
12.	↑ 14.	↑ 14.	PouchDB	Document store	2.17	+0.24	+1.32
13.	13.	↑ 18.	Microsoft Azure DocumentDB	Document store	2.17	+0.04	+1.47
14.	↓ 12.	↓ 11.	Datameer	Document store	2.00	-0.16	+0.58
15.	15.	15.	ArangoDB	Multi-model	1.68	+0.23	+0.84

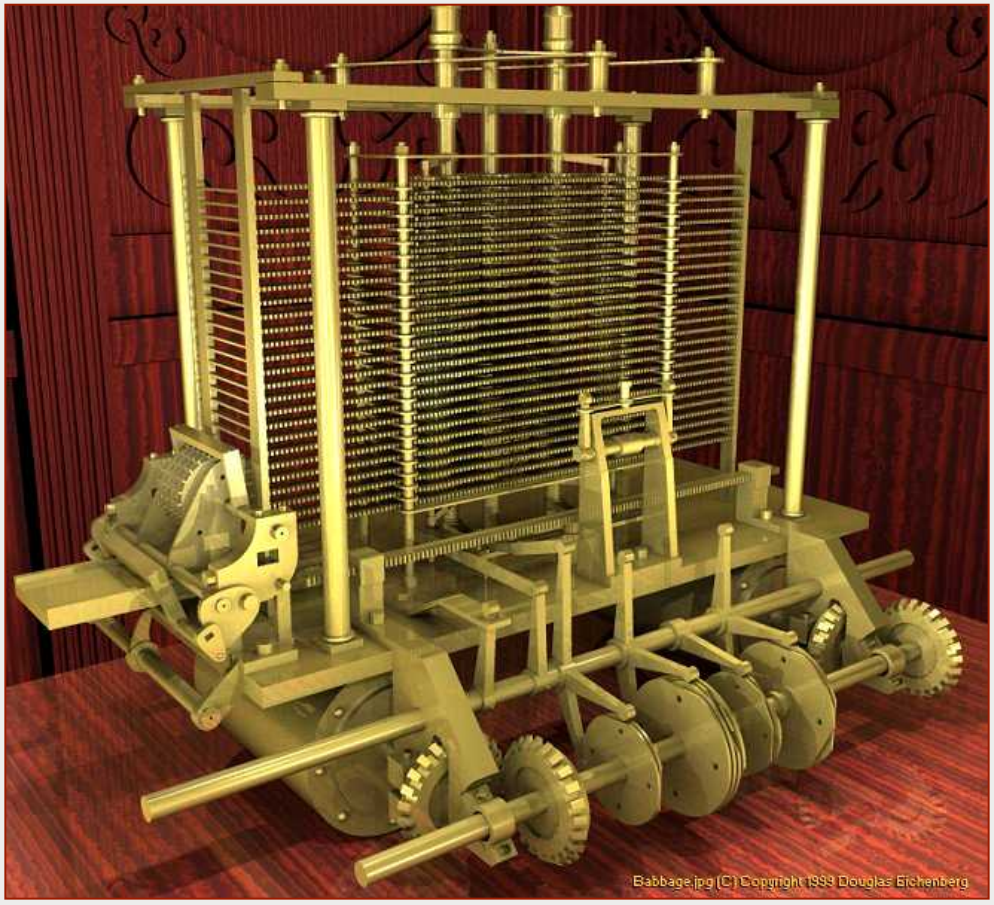
Source:db-engines.com

Ranking of Graph DBMS

20 systems in ranking, March 2016

Rank Mar 2016	Rank Feb 2016	Rank Mar 2015	DBMS	Database Model	Score Mar 2016	Score Feb 2016	Score Mar 2015
1.	1.	1.	Neo4j	Graph DBMS	32.36	+0.07	+4.73
2.	2.	↑ 3.	OrientDB	Multi-model	6.66	+0.24	+3.39
3.	3.	↓ 2.	Titan	Graph DBMS	5.29	-0.06	+1.36
4.	4.	4.	Virtuoso	Multi-model	2.82	-0.17	-0.00
5.	5.	↑ 6.	ArangoDB	Multi-model	1.68	+0.23	+0.84
6.	6.	↑ 7.	Giraph	Graph DBMS	0.87	-0.11	+0.05
7.	7.	↑ 8.	AllegroGraph	Multi-model	0.65	-0.01	-0.08
8.	8.	↑ 14.	Stardog	Multi-model	0.59	+0.05	+0.45
9.	9.	↑ 10.	Sqrrl	Multi-model	0.32	-0.01	+0.06
10.	10.	↓ 9.	InfiniteGraph	Graph DBMS	0.29	-0.02	+0.02
11.	11.	↓ 5.	Sparksee	Graph DBMS	0.19	-0.01	-0.78
12.	12.	↑ 16.	GlobalsDB	Multi-model	0.16	-0.01	+0.16
13.	13.	↑ 15.	HyperGraphDB	Graph DBMS	0.16	-0.01	+0.13
14.	↑ 15.	↓ 12.	InfoGrid	Graph DBMS	0.14	-0.00	-0.01
15.	↓ 14.	↓ 13.	FlockDB	Graph DBMS	0.14	-0.01	-0.00

Source:db-engines.com



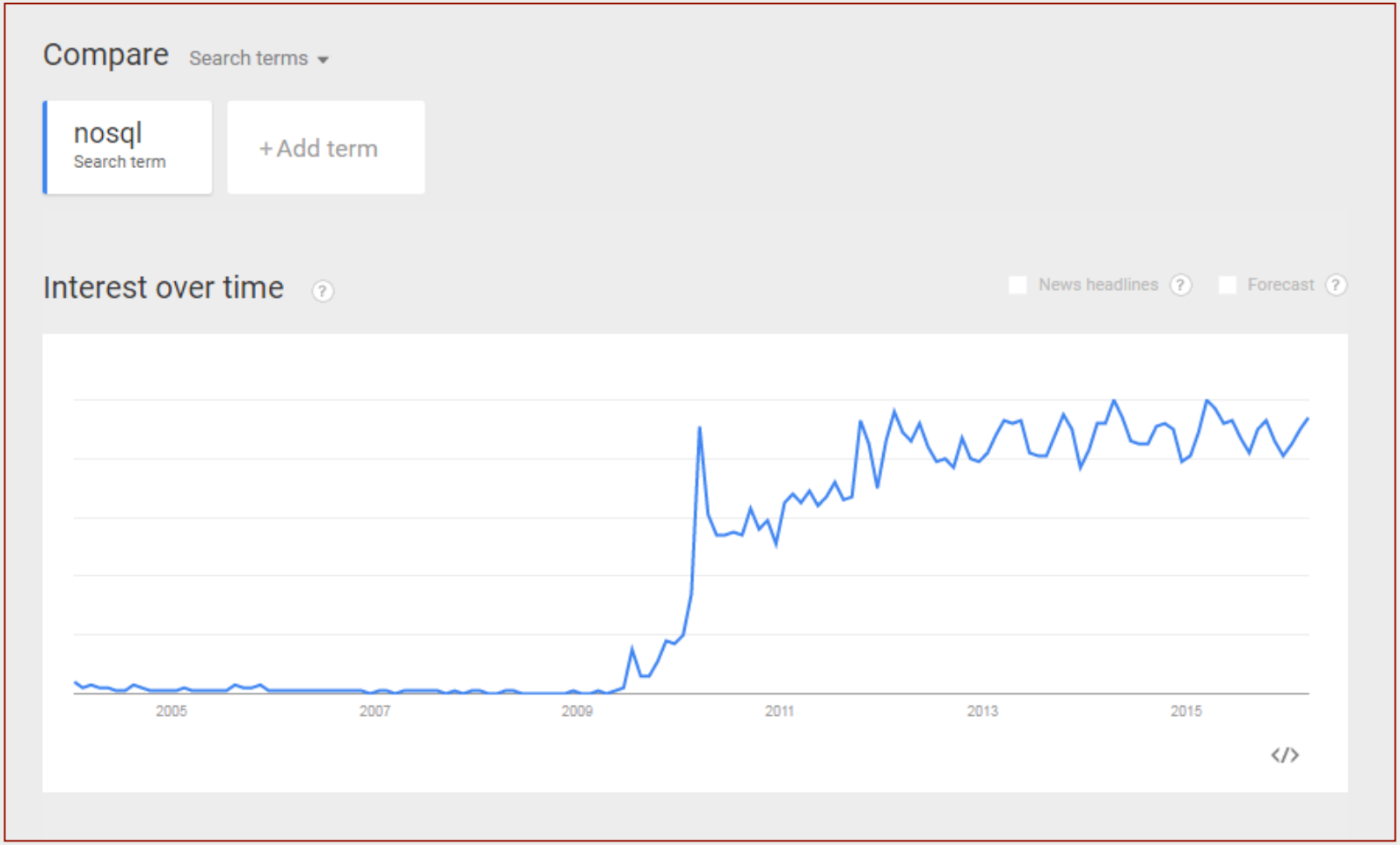
Hazai helyzet

Hazai helyzet

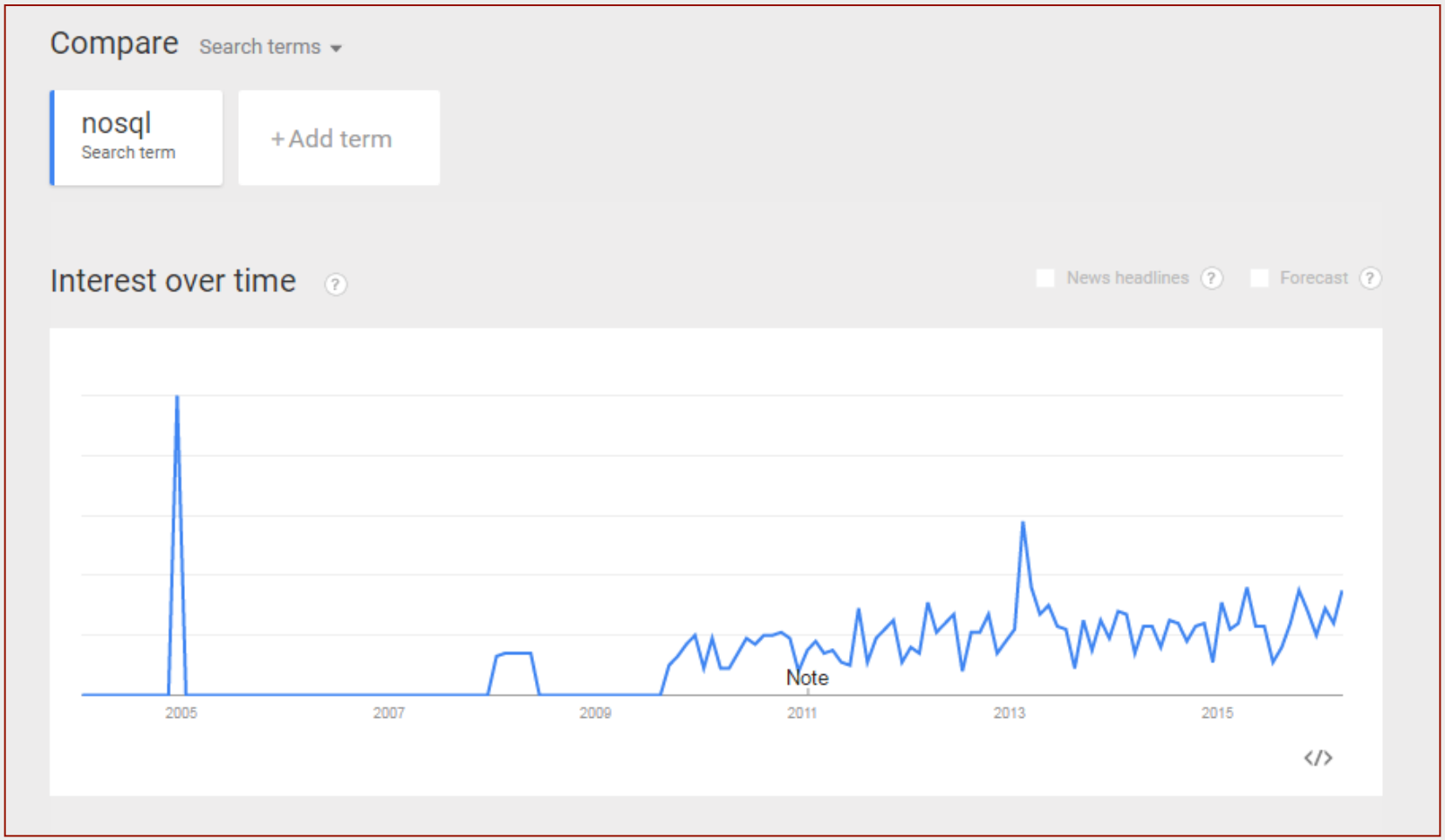
- Milyen a hazai NOSQL helyzet?
  - Google?
  - Skills?
  - Valami más?

Hazai helyzet

Google



Source: Google



Source: Google

Hazai LinkedIn skills

369 results for NoSQL

Hungary × Reset

369

Tamás IZSÁK 1st
System Engineer at NISZ National Infocommunications Service Company Limited by Shares
Hungary area • Information Technology and Services
141 shared connections • Similar • 500+

Message

István Hidegkuti 1st
Senior systems engineer
Hungary area • Information Technology and Services
12 shared connections • Similar

Message

Summary: Since 1995, my area of expertise is systems...) **NoSQL** - document and key value storages (mongodb...

Bence Arato YOU
Managing director at BI Consulting
Hungary area • Information Technology and Services
Similar • 500+

Edit

Current: Program Chair at Budapest **NOSQL** Forum

Marton Trencseni 1st
Data Engineer at Facebook
London, United Kingdom • Internet
47 shared connections • Similar • 500+

Message

Current: Data Engineer at Facebook
Past: Director of Data Analytics at Prezi
Data Engineer, Tech Lead at Prezi
Founder at Scalien

Source:nosqltrek.hu

MongoDB

823 results for **mongodb**

Hungary × Reset

832

Tamás IZSÁK 1st
System Engineer at NISZ National Infocommunications Service Company Limited by Shares
Hungary area • Information Technology and Services
141 shared connections • Similar • 500+

István Simó 1st
Senior DBA at EPAM Systems
Hungary area • Information Technology and Services
25 shared connections • Similar • 228

Peter Ableda 1st
Customer Operations Engineer at Cloudera
Hungary area • Information Technology and Services
20 shared connections • Similar • 261

Máté Gulyás 1st
Co-founder, CTO at Enbrite.ly
Hungary area • Internet
51 shared connections • Similar • 500+

Andras Barthazi 1st
Head of Integrations/API at Emarsys, Creator of escherauth.io
Hungary area • Internet
42 shared connections • Similar • 500+

Redis

256 results for **redis**

256

Hungary × Reset

Gergely Hodicska 1st
VP of Engineering at Ustream, Inc.
Hungary area • Internet
90 shared connections • Similar
Message

István Hidegkuti 1st
Senior systems engineer
Hungary area • Information Technology and Services
12 shared connections • Similar
Message

Past: Senior System Design Engineer at Replise ..., nginx, mta, mysql, mongodb, **redis**, memcached... (mysql, mongodb, **redis**, solr)

Zoltán Szász 2nd
Product Owner of syslog-ng Store Box at BalaBit IT Security
Hungary area • Information Technology and Services
17 shared connections • Similar
Connect

Summary: Professional creed: Agile; Scrum; Pair... ; MongoDB; Memcache; **Redis**; Doctrine ORM, Propel ORM...

Tamas Geschitz 2nd
software developer at Kasra
Hungary area • Information Technology and Services
2 shared connections • Similar
Connect

Summary: ...solutions, like MongoDB, **Redis** etc. My extensive... (MongoDB, **Redis**, Memcached), C programming.

Source:nosqltrek.hu

57 results for **neo4j**

Hungary × Reset

57

Endre Adam 1st
Business Development & Solution Architect
Hungary area • Information Technology and Services
57 shared connections • Similar

Message

Janos Szendi-Varga 1st
Chief Architect at Nextent Informatics Co.
Hungary area • Information Technology and Services
28 shared connections • Similar • 500+

Message

Gábor Döbrei 1st
Nodejs developer at ClipDis
Hungary area • Computer Software
10 shared connections • Similar • 252

Summary: I'm happily married since 2012. In my free time... and programming - as it's my hobby. I'm a co-organizer of **Neo4j**...

Message

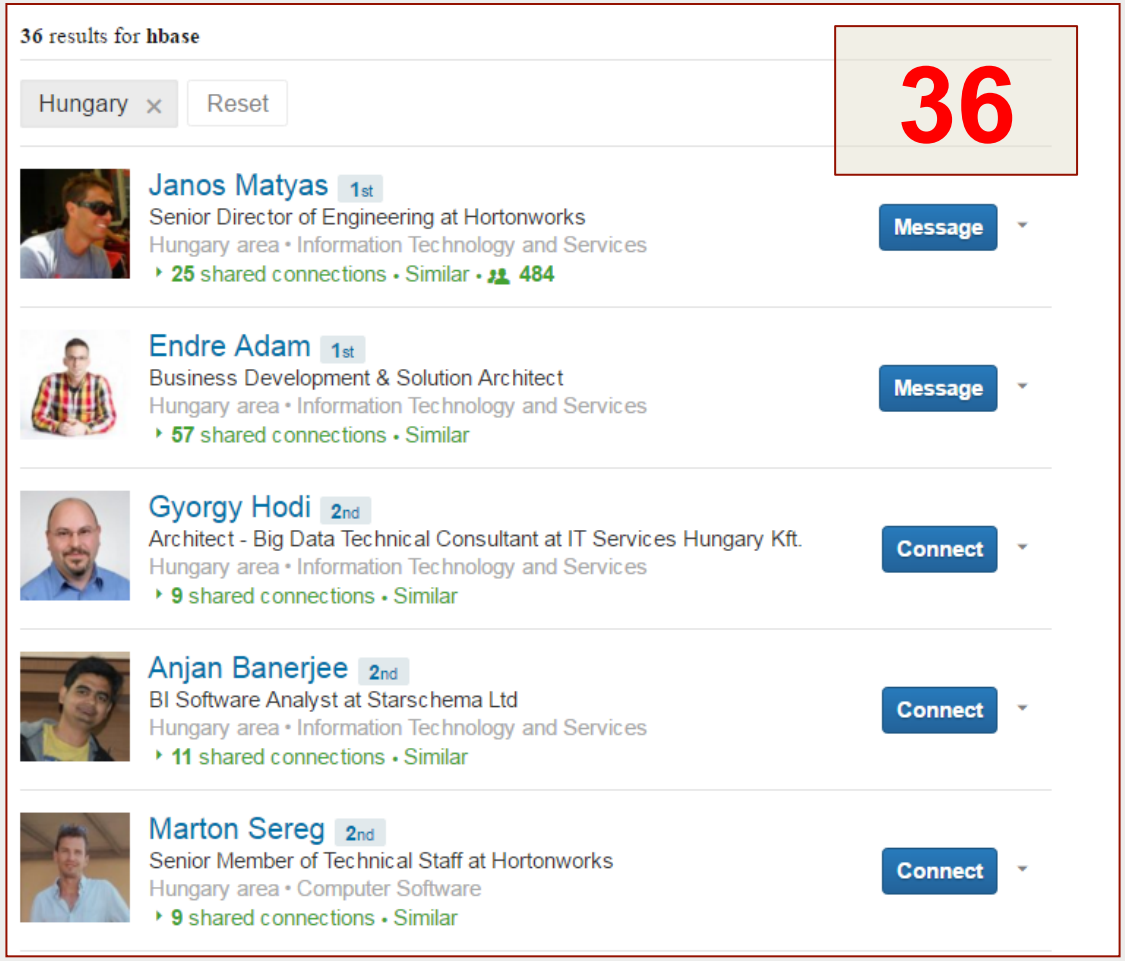
Péter Márton 2nd
Co-founder, CTO at RisingStack
Hungary area • Information Technology and Services
10 shared connections • Similar

Connect

Adam Dezsi 2nd
Java developer at ShiwaForce.com Inc.
Hungary area • Information Technology and Services
3 shared connections • Similar

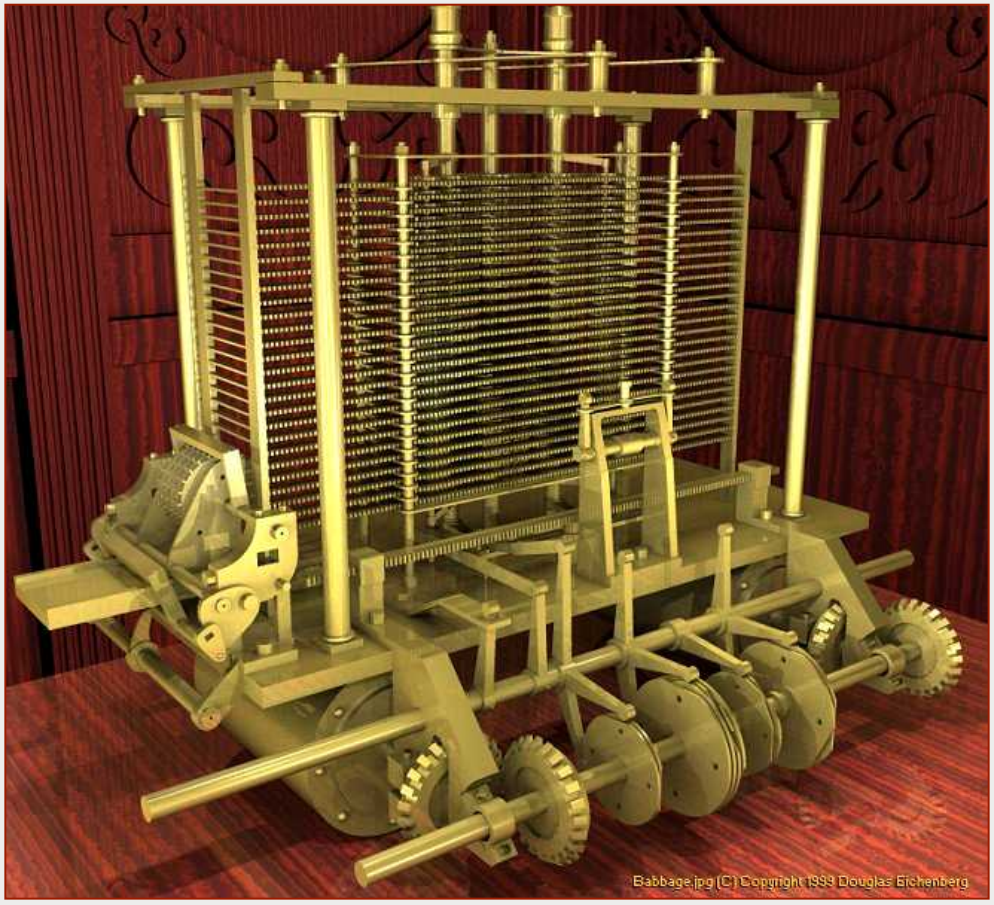
Connect

Source:nosqltrek.hu



Source:nosqltrek.hu

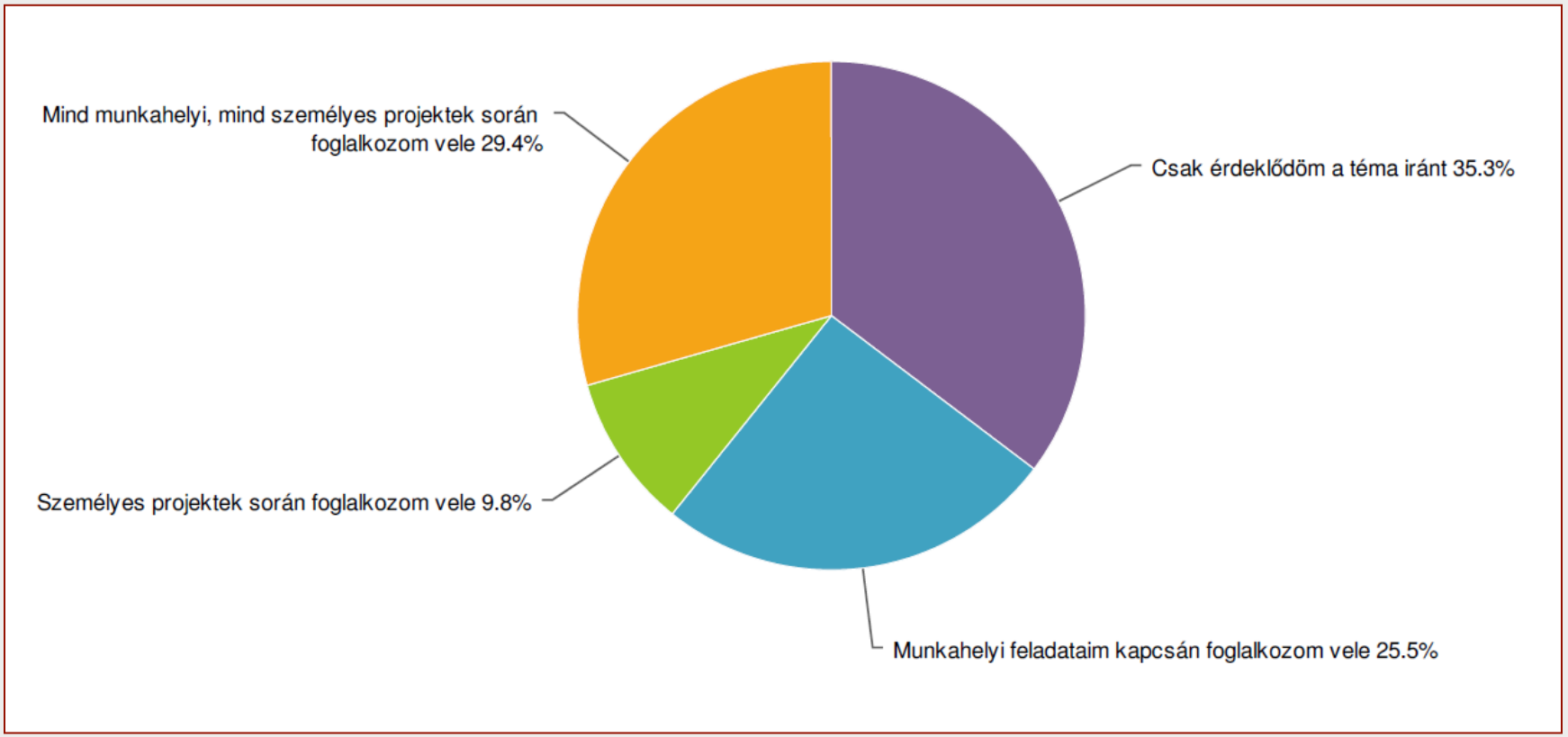
Valami más?



NOSQL-TREK 2016

- Kutatáscsaládunk legújabb tagja
  - NOSQL-TREK
  - DW-TREK (adattárházak és big data) május
  - BI-TREK (üzleti intelligencia) szeptember
- Első online adatfelvétel 2016. márciusában
- 51 válaszadó

Kapcsolat a NOSQL technológiákkal



Source:nosqltrek.hu

Kapcsolat a NOSQL technológiákkal

Value	Percent	
Csak érdeklődöm a téma iránt	35.3%	
Munkahelyi feladataim kapcsán foglalkozom vele	25.5%	
Személyes projektek során foglalkozom vele	9.8%	
Mind munkahelyi, mind személyes projektek során foglalkozom vele	29.4%	

Source:nosqltrek.hu

Milyen régóta?

Value	Percent	
Kevesebb, mint 1 éve	42.0%	
1 éve	14.0%	
2 éve	20.0%	
3 éve	8.0%	
4 éve	4.0%	
5 vagy több éve	12.0%	
		Total

Source:nosqltrek.hu

Hazai helyzet

NOSQL techológiák

Szoftverek ismertsége

4. Mennyire ismeri Ön a következő szoftvereket? Amennyiben valamelyik szoftvert egyáltalán nem ismeri, akkor a megfelelő sort üresen is hagyhatja. A lista végére Ön is felvehet újabb szoftvereket.

	Egyáltalán nem ismerem		Már hallottam róla		Valamennyire ismerem		Jól ismerem		Total	
AeroSpike	39	81.3%	9	18.8%	0	0.0%	0	0.0%	48	100%
Cassandra	4	8.3%	29	60.4%	11	22.9%	4	8.3%	48	100%
CouchBase	22	44.9%	22	44.9%	3	6.1%	2	4.1%	49	100%
ElasticSearch	15	31.9%	23	48.9%	3	6.4%	6	12.8%	47	100%
MongoDb	3	5.9%	20	39.2%	17	33.3%	11	21.6%	51	100%
MemCached	22	46.8%	17	36.2%	3	6.4%	5	10.6%	47	100%
Neo4j	14	28.6%	22	44.9%	9	18.4%	4	8.2%	49	100%
Redis	16	31.4%	21	41.2%	6	11.8%	8	15.7%	51	100%
Riak	28	57.1%	16	32.7%	4	8.2%	1	2.0%	49	100%
SolR	23	47.9%	13	27.1%	7	14.6%	5	10.4%	48	100%

Source:nosqltrek.hu

NOSQL vs. hagyományos

5. Az Ön véleménye szerint hogyan viszonyulnak a NOSQL eszközök a hagyományos adatbázisokhoz?

	Lényegesen rosszabbak	Valamennyivel rosszabbak	Hasonlóak	Valamennyivel jobbak	Lényegesen jobbak	Responses
Árazás, költségek	1 2.2%	2 4.3%	20 43.5%	13 28.3%	10 21.7%	46
Rugalmasság	1 2.2%	2 4.4%	5 11.1%	21 46.7%	16 35.6%	45
Rendelkezésre állás	1 2.2%	9 20.0%	22 48.9%	6 13.3%	7 15.6%	45
Skálázhatóság	1 2.2%	1 2.2%	8 17.4%	18 39.1%	18 39.1%	46
Teljesítmény	2 4.4%	7 15.6%	12 26.7%	16 35.6%	8 17.8%	45
Könnyű tanulhatóság	5 11.1%	16 35.6%	16 35.6%	6 13.3%	2 4.4%	45
Fejlesztés hatékonyság	1 2.2%	16 34.8%	16 34.8%	8 17.4%	5 10.9%	46
Üzemeltetés egyszerűsége	1 2.2%	15 32.6%	21 45.7%	6 13.0%	3 6.5%	46

Source:nosqltrek.hu

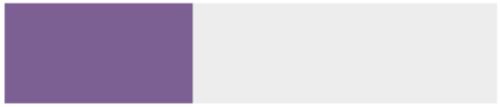
Hazai rendszerek

Adatok mennyisége

Value	Percent	
0-100 GB	36.4%	
100-1000 GB	27.3%	
1-10 TB	18.2%	
10-100 TB	13.6%	
100+ TB	4.6%	

Source:nosqltrek.hu

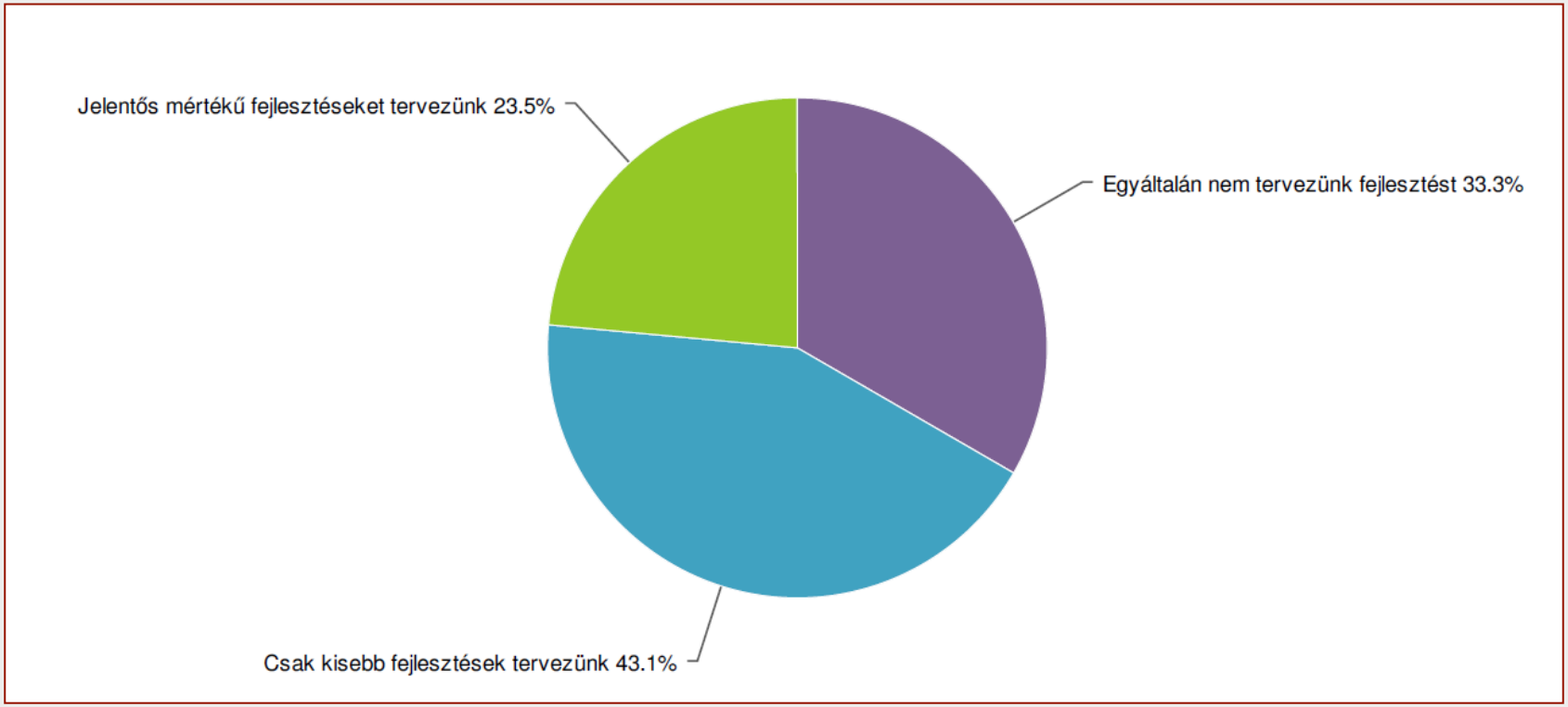
Felhasználók száma

Value	Percent	
1-50	38.1%	
51-200	23.8%	
201-500	4.8%	
501-1000	4.8%	
1000+	28.6%	

Source:nosqltrek.hu

Várható fejlesztések

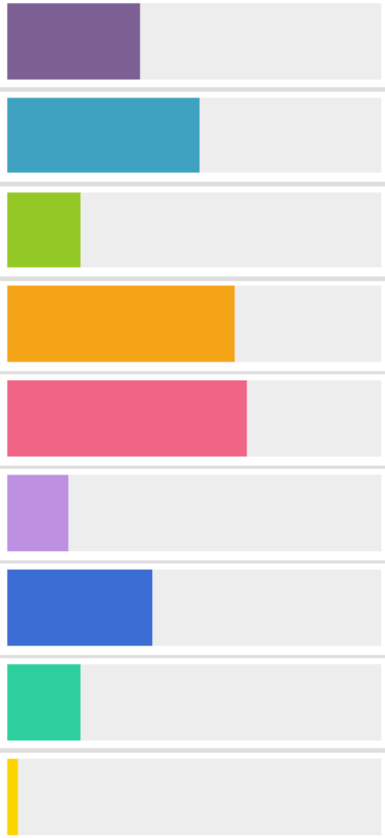
Fejlesztési tervek



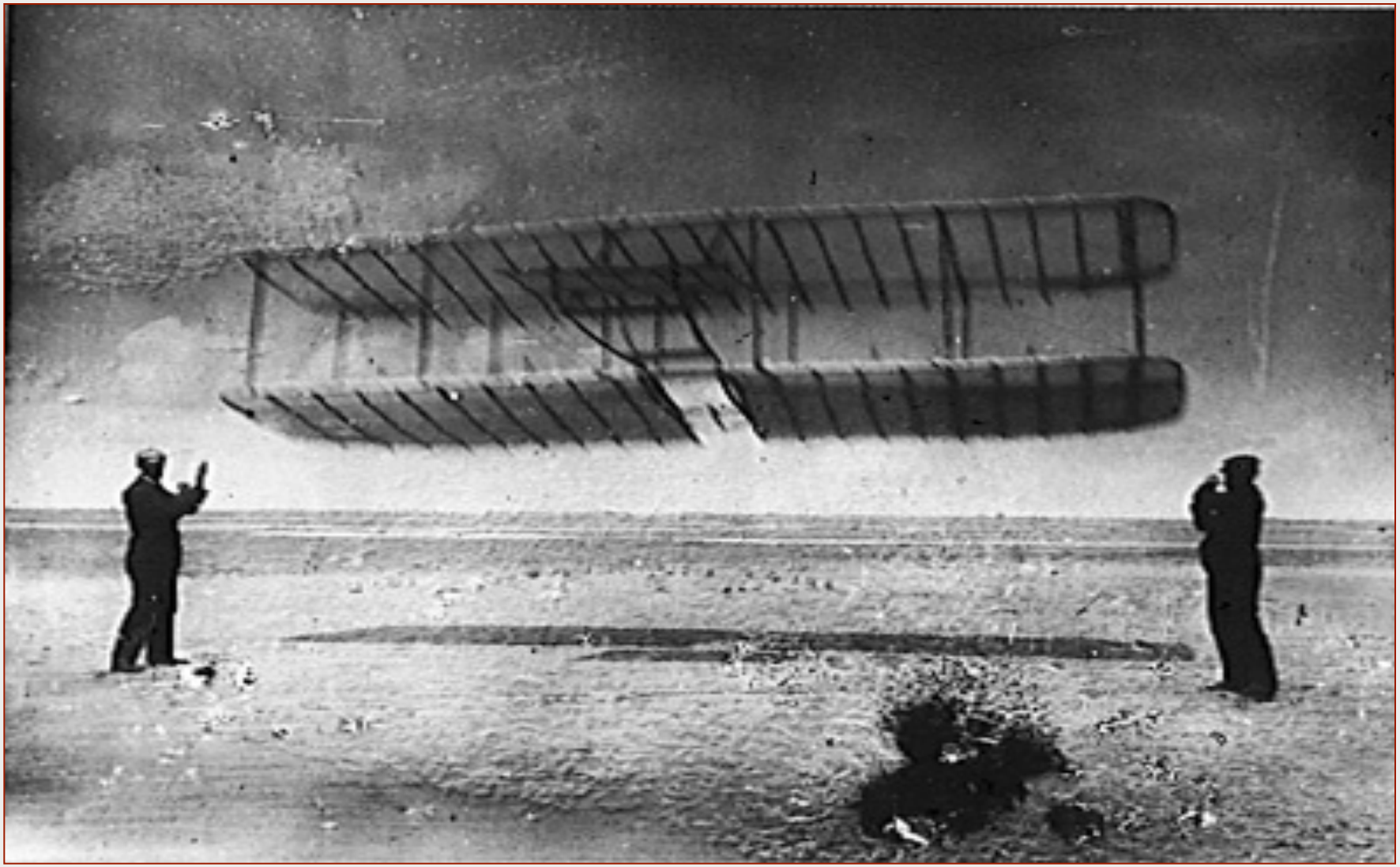
Source:nosqltrek.hu

Fejlesztéstől várt előnyök

Value	Percent
Árazás, költségek	35.5%
Rugalmasság	51.6%
Rendelkezésre állás	19.4%
Skálázhatóság	61.3%
Teljesítmény	64.5%
Könnyű tanulhatóság	16.1%
Fejlesztés hatékonyság	38.7%
Üzemeltetés egyszerűsége	19.4%
Egyéb (adja meg)	3.2%



Source:nosqltrek.hu



A jövő most kezdődik