

# The Triumph of Simplicity

How database complexity will be replaced by simple services

*“Life is really simple, but we insist on making it complicated.”*

*-Confucius*

**Who am I?**

HELLO,

MY NAME

IS

IAN PLOSKER

---

# Co-founder & CTO



@dstroyallmodels

[about.me/ian.plosker](http://about.me/ian.plosker)

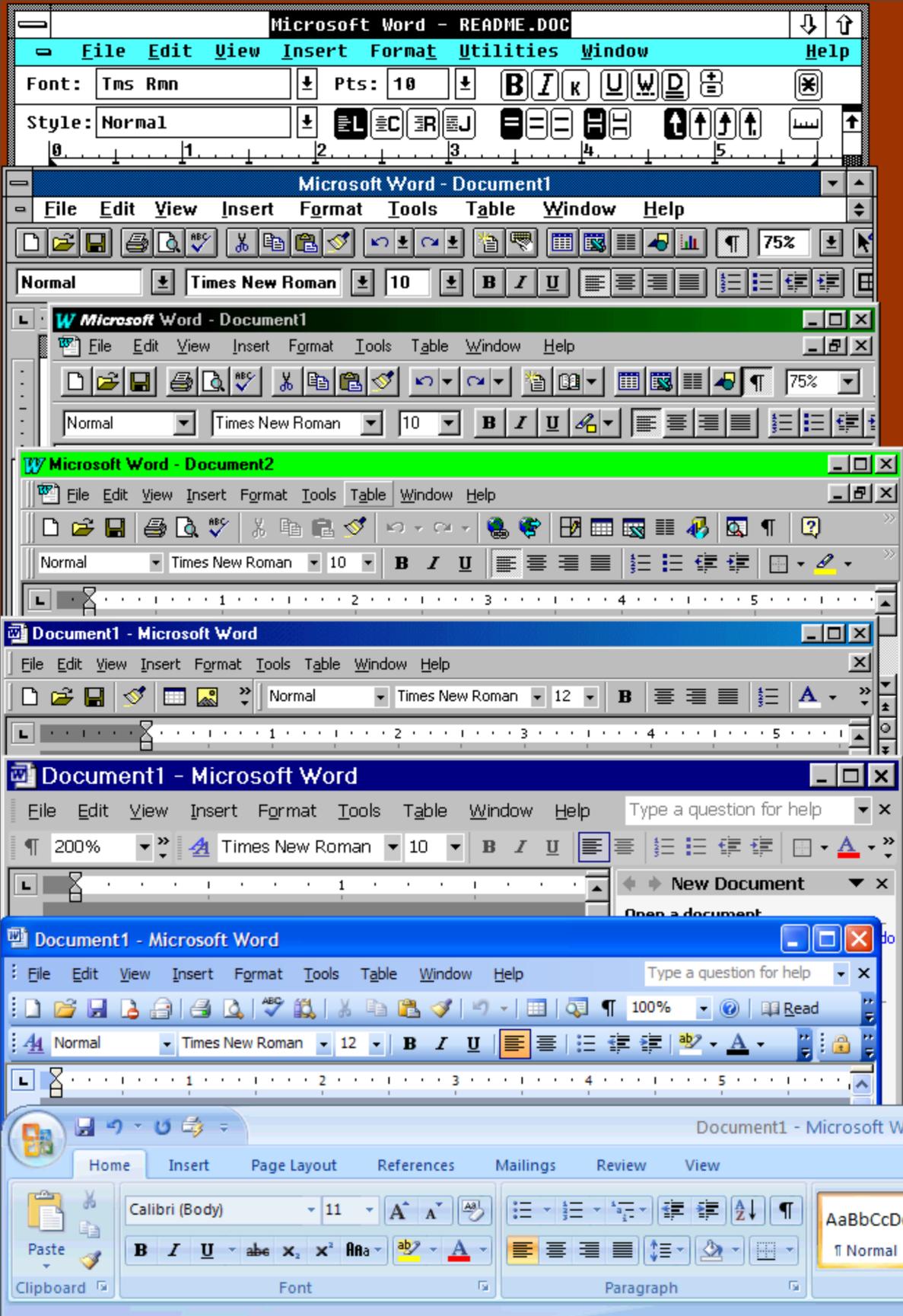
Our goal is to make storing and  
querying so easy, you don't need  
databases



# E.W. Dijkstra

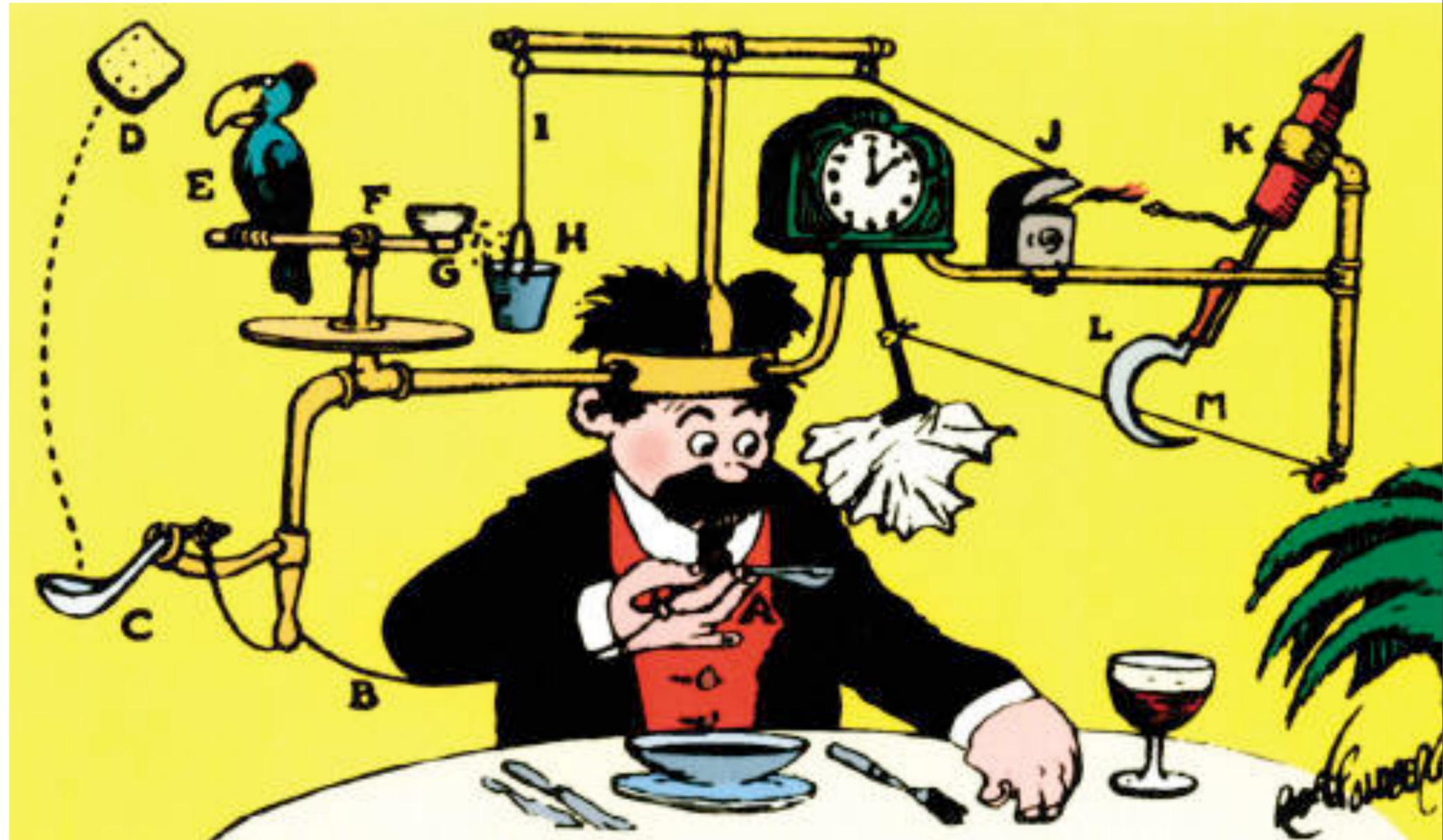
*“Simplicity is a great virtue but it requires hard work to achieve it and education to appreciate it. And to make matters worse: complexity sells better.”*

<http://www.cs.utexas.edu/users/EWD/transcriptions/EWD08xx/EWD896.html>



Some people believe that complexity is how value is added

# We fetishize complexity



<http://www.cs.utexas.edu/users/EWD/transcriptions/EWD08xx/EWD898.html>

"... many a programmer derives a major part of his professional excitement from not quite understanding what he is doing, from the daring risks he takes and from the struggle to find the bugs he should not have introduced in the first place." -Dijkstra

Increasingly, people seem to misinterpret complexity as sophistication, which is baffling --- the incomprehensible should cause suspicion rather than admiration. Possibly this trend results from a mistaken belief that using a somewhat mysterious device confers an aura of power on the user -- Niklaus Wirth (Pascal)

```

SELECT SUM(offerTotal) as theOfferTotal, SUM(lienTotal) AS theLienTotal, SUM(CLVtotal) AS theCLVtotal,
SUM(estGrossProfitTotal) AS theESTGPTtotal FROM (( SELECT COALESCE(SUM(COALESCE(offerAmount, 0)), 0) AS
offerTotal, COALESCE(SUM(COALESCE(amount, 0) + COALESCE(legalFees, 0) + COALESCE(costs, 0)), 0) AS
lienTotal, COALESCE(SUM(((amount + legalFees + costs) * (1 + (rateOfInterest / 100) *
(FLOOR((UNIX_TIMESTAMP(NOW())) - UNIX_TIMESTAMP(dateOfAttachment)) / 86400) / 365))))), 0) AS CLVtotal,
COALESCE(SUM(((amount + legalFees + costs) * (1 + (rateOfInterest / 100) * (FLOOR((UNIX_TIMESTAMP(NOW())) -
UNIX_TIMESTAMP(dateOfAttachment)) / 86400) / 365))) - COALESCE(offerAmount, 0))), 0) AS estGrossProfitTotal
FROM lienTable AS theLienTable, propertyTable, property_lien, stateInterestTable, data, judgementLienTable
WHERE theLienTable.lienID = property_lien.lienID AND propertyTable.propertyID = property_lien.propertyID AND
propertyTable.state = stateInterestTable.state AND theLienTable.lienID = judgementLienTable.lienID AND
theLienTable.lienStatusID IN (65, 70, 75) AND data.id = (SELECT data.id FROM lienTable, data, data_lien
WHERE lienTable.lienID = data_lien.lienID AND data_lien.id = data.id AND category = 15 AND lienTable.lienID
= theLienTable.lienID ORDER BY data.id DESC LIMIT 1) AND dateOfAttachment != 0 AND UNIX_TIMESTAMP(NOW()) >
UNIX_TIMESTAMP(dateOfAttachment) AND FLOOR((UNIX_TIMESTAMP(NOW()) - UNIX_TIMESTAMP(dateOfAttachment)) /
86400) > 0 AND rateOfInterest > 0 ) UNION ( SELECT COALESCE(SUM(COALESCE(offerAmount, 0)), 0) AS offerTotal,
COALESCE(SUM(COALESCE(amount, 0) + COALESCE(legalFees, 0) + COALESCE(costs, 0)), 0) AS lienTotal,
COALESCE(SUM(((amount + legalFees + costs) * (1 + (rateOfInterest / 100) * (FLOOR((UNIX_TIMESTAMP(NOW())) -
UNIX_TIMESTAMP(judgementDate)) / 86400) / 365))))), 0) AS CLVtotal, COALESCE(SUM(((amount + legalFees +
costs) * (1 + (rateOfInterest / 100) * (FLOOR((UNIX_TIMESTAMP(NOW()) - UNIX_TIMESTAMP(dateOfAttachment)) /
86400) / 365))) - COALESCE(offerAmount, 0))), 0) AS estGrossProfitTotal FROM lienTable AS theLienTable,
propertyTable, property_lien, stateInterestTable, data, judgementLienTable WHERE theLienTable.lienID =
property_lien.lienID AND propertyTable.propertyID = property_lien.propertyID AND propertyTable.state =
stateInterestTable.state AND theLienTable.lienID = judgementLienTable.lienID AND theLienTable.lienStatusID
IN (65, 70, 75) AND data.id = (SELECT data.id FROM lienTable, data, data_lien WHERE lienTable.lienID =
data_lien.lienID AND data_lien.id = data.id AND category = 15 AND lienTable.lienID = theLienTable.lienID
ORDER BY data.id DESC LIMIT 1) AND COALESCE(dateOfAttachment, 0) = 0 AND judgementDate != 0 AND
UNIX_TIMESTAMP(NOW()) > UNIX_TIMESTAMP(judgementDate) AND FLOOR((UNIX_TIMESTAMP(NOW()) -
UNIX_TIMESTAMP(judgementDate)) / 86400) > 0 AND rateOfInterest > 0 ) ) AS theBigTable;

```

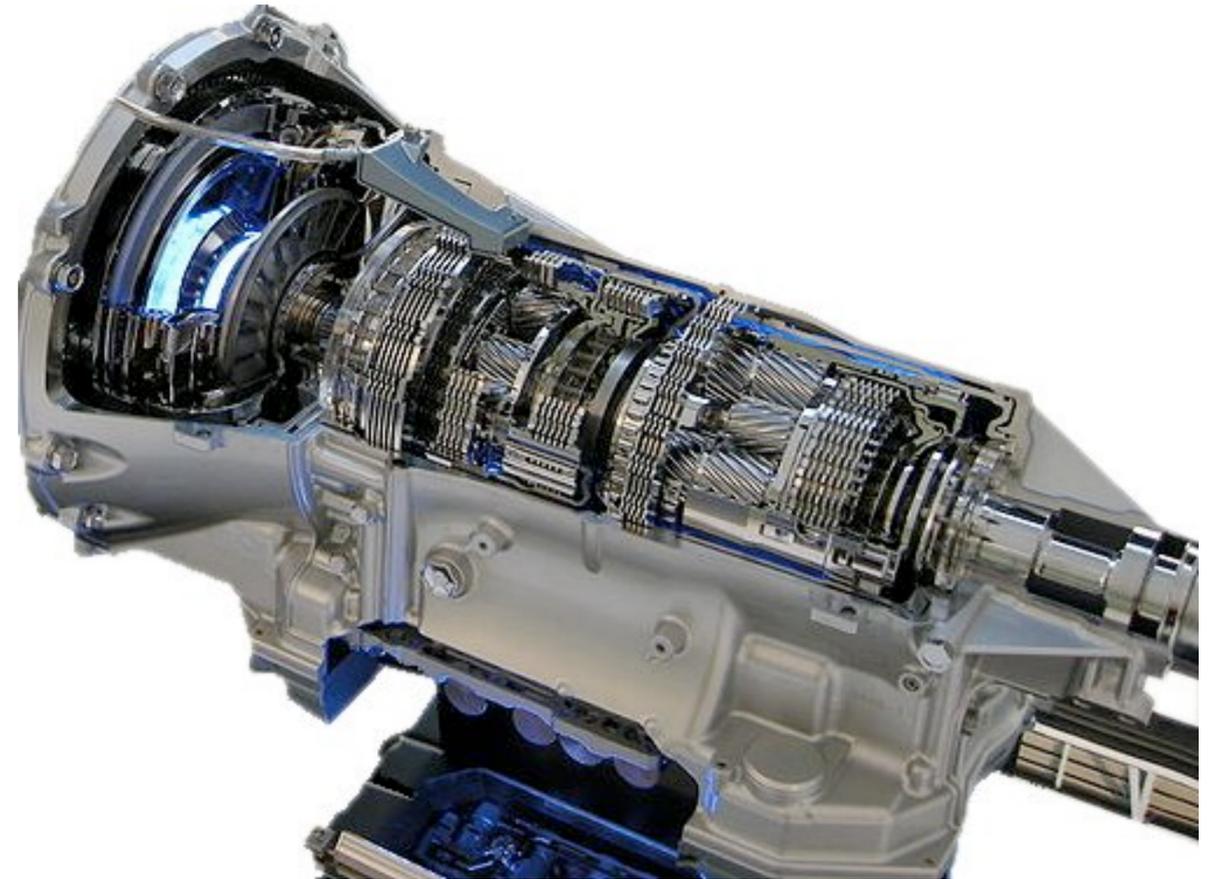
# Who Owns Complexity?

“... making something “simpler” is often a case of relocating complexity, rather than eliminating it from the user-technology relationship. For example, from the driver’s perspective, a manual-shift transmission is more complex than an automatic transmission. But from an overall systems perspective, the automatic transmission is equally or even more complex.”

# Simple



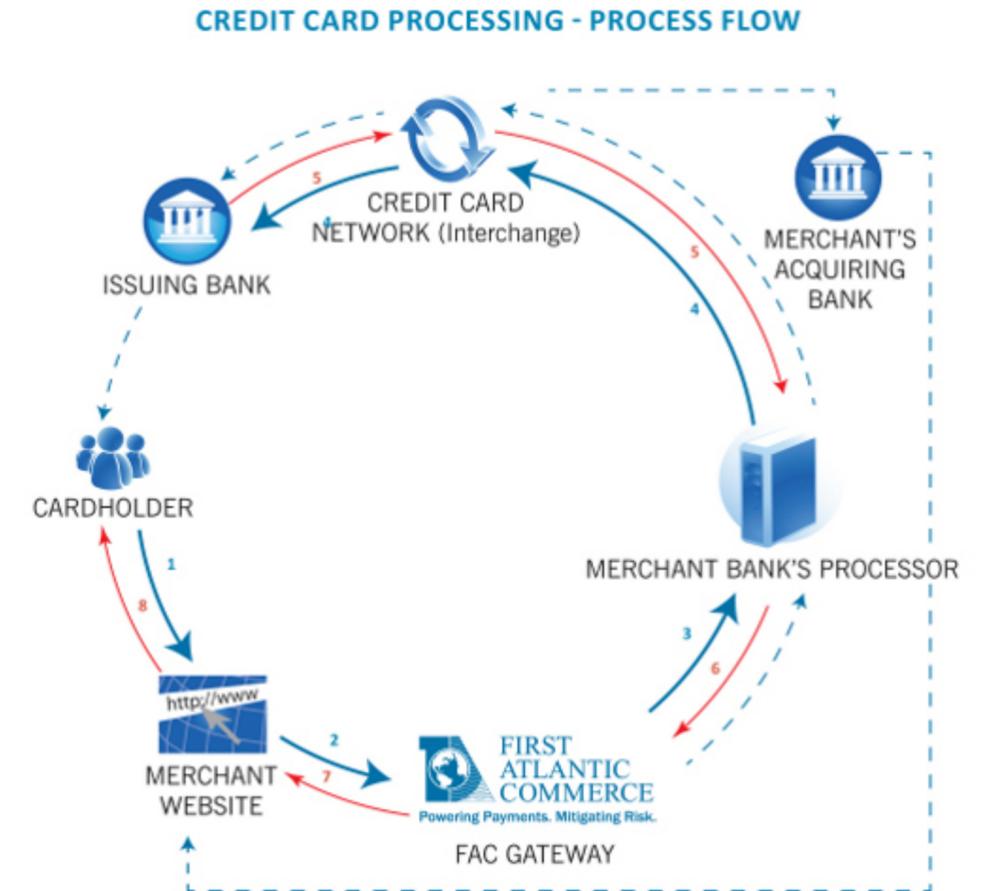
# Complex



# Simple



# Complex



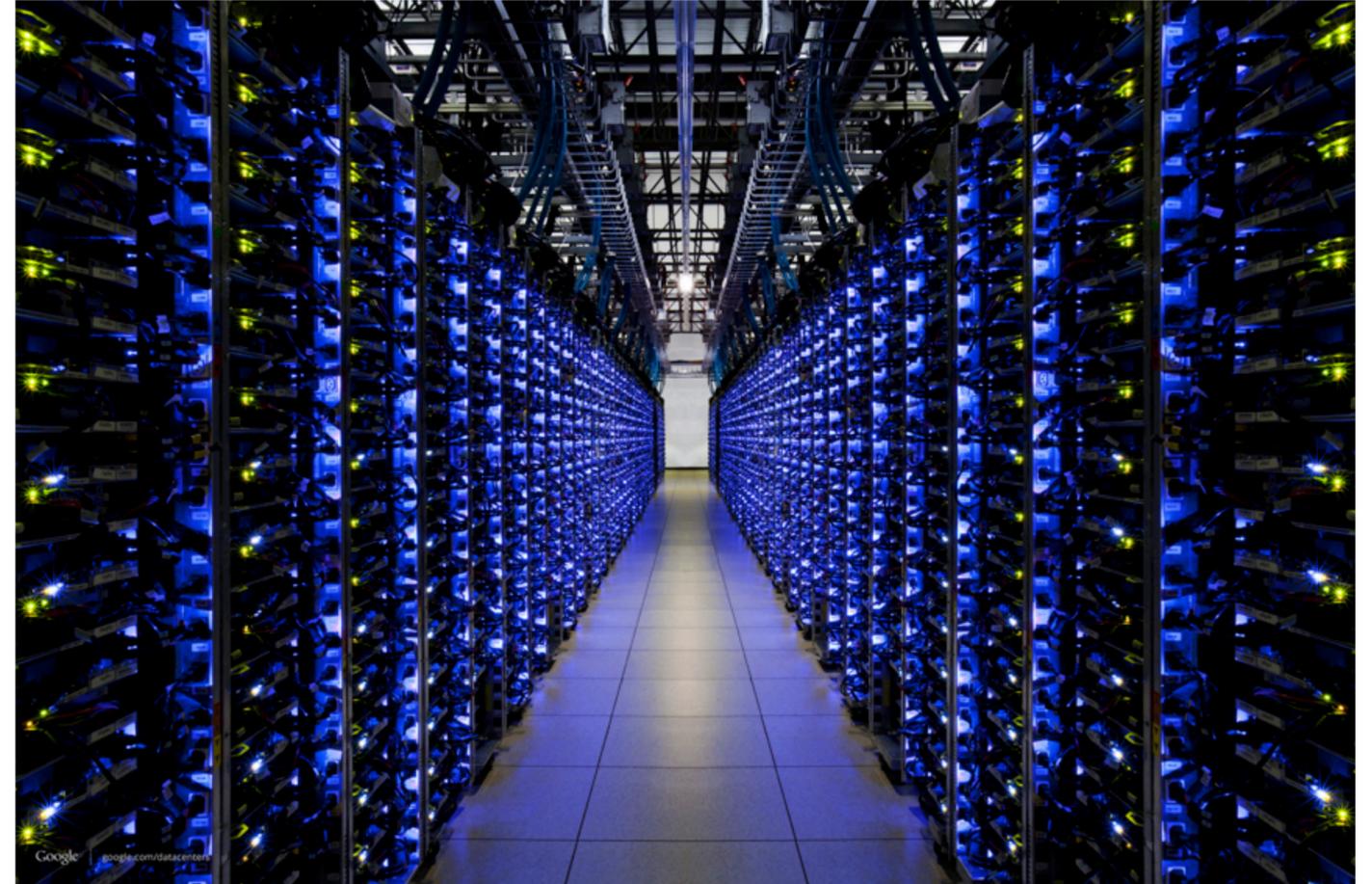
# Simple

Google

Google Search

I'm Feeling Lucky

# Complex



# Simple

```
aws ec2 run-instances --image-id ami-  
c3b8d6aa --count 2 --instance-type  
t1.micro --key-name MyKeyPair --  
security-groups MySecurityGroup
```

# Complex



# Simple

# Complex



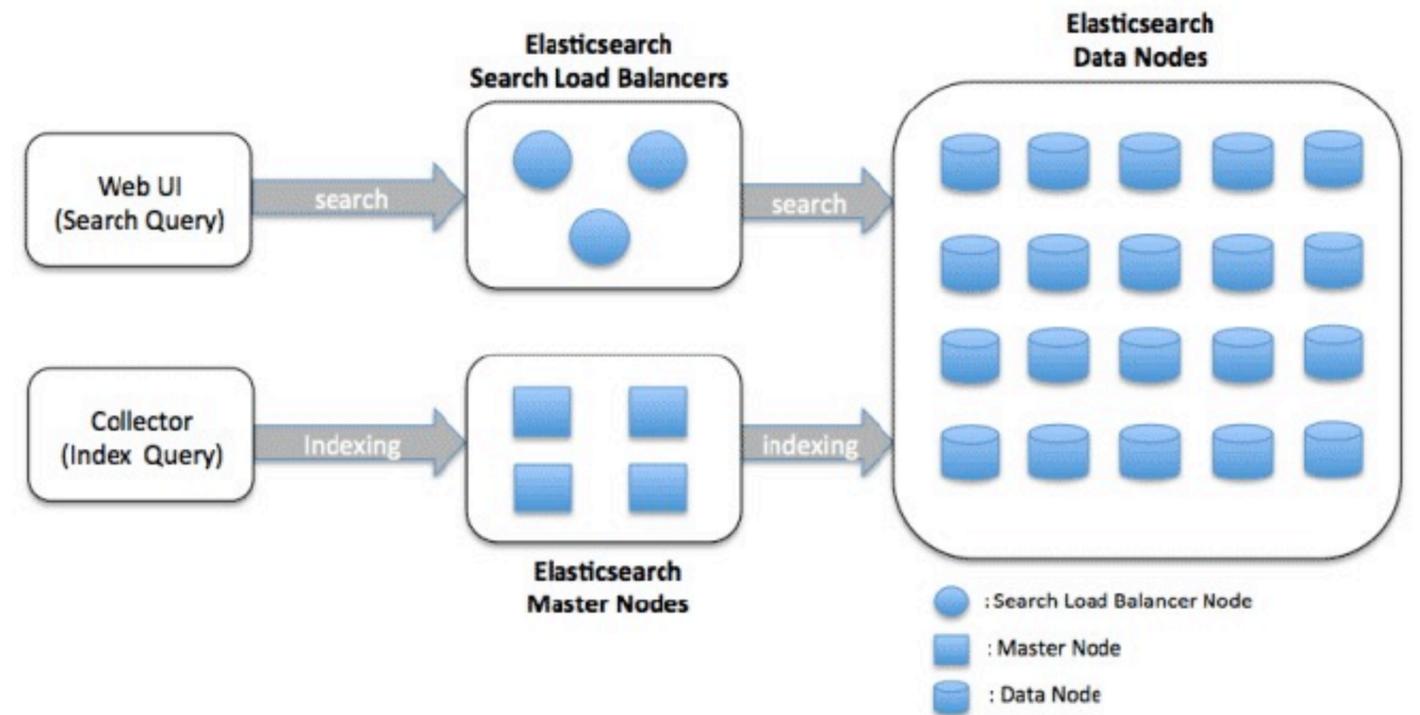
```
http://www.yourapp.com/handleC  
all? Caller=415-8675309&  
Caller_City=SanFrancisco...
```



# Simple

author:Dijkstra AND year:[1970 TO 1985]

# Complex

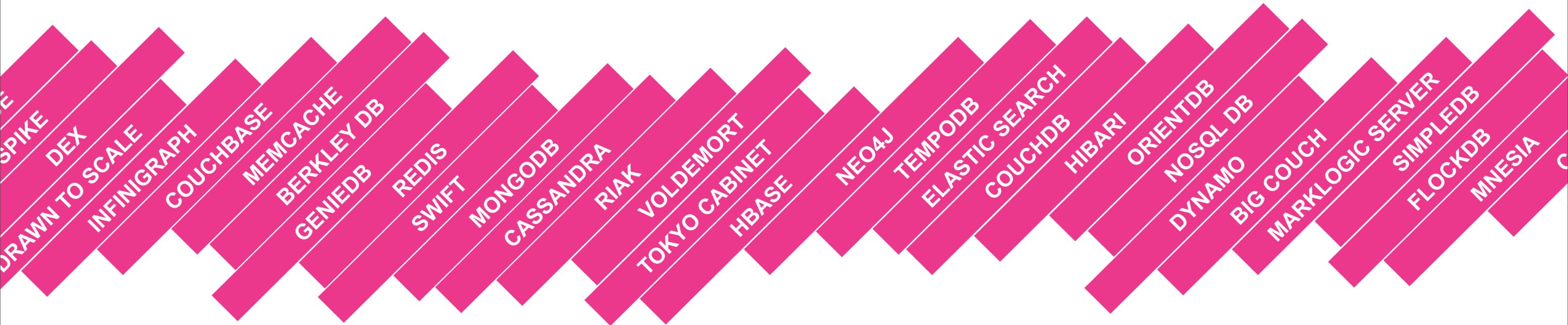


**Let's talk databases**

Databases in 2005



# Databases in 2013



**25** databases in production today that didn't exist 7 years ago

How many people run a NoSQL DB?  
How many are thinking about it?  
How many would like to?  
Cassie? MongoDB? Riak?

# ONLINE QUERY TYPES

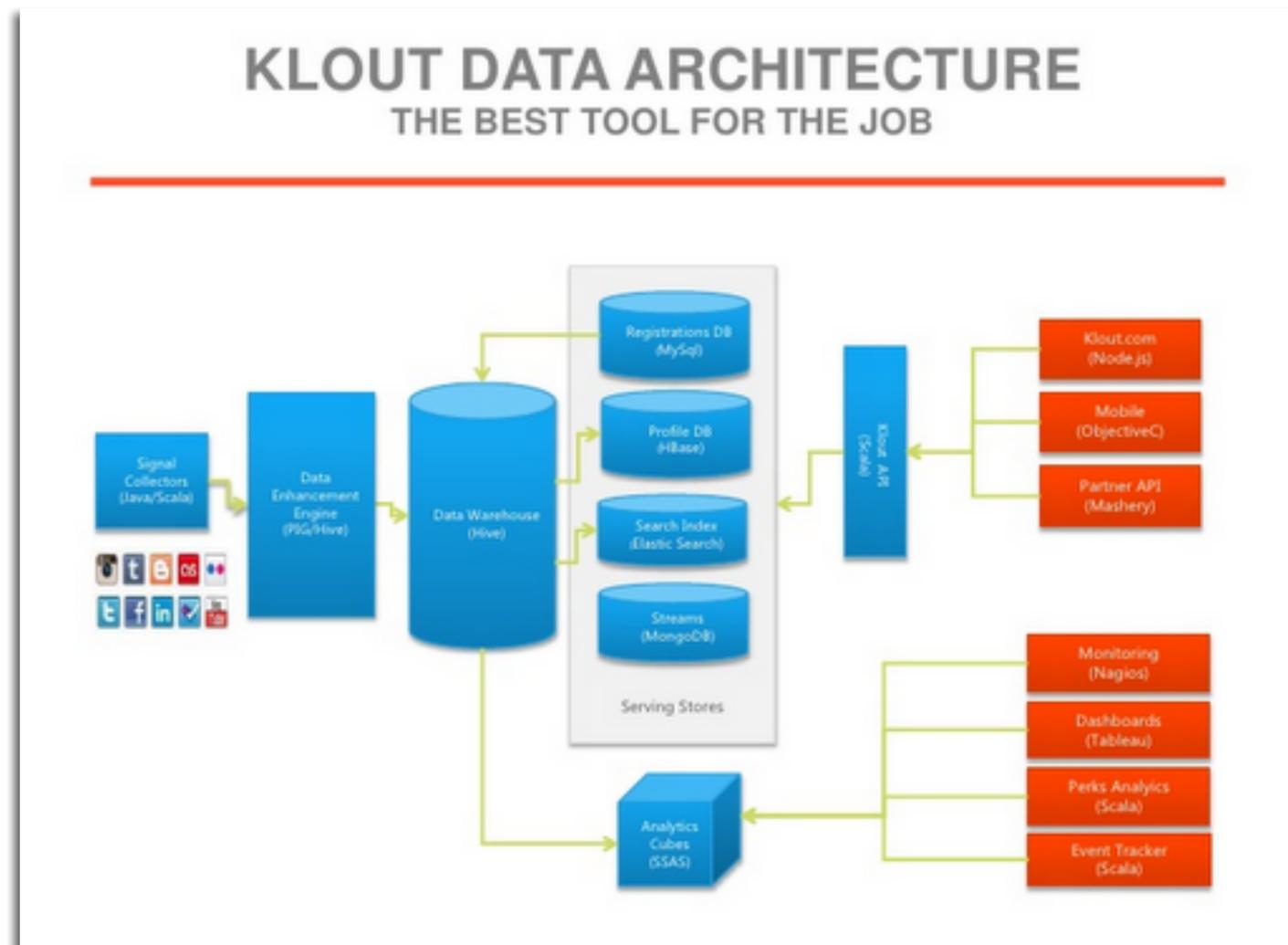
	<b>Key-Value</b>	<b>Search</b>	<b>Geo</b>	<b>Graph/ Relation</b>	<b>Event</b>
<i>Scale-up</i>	BerkleyDB CouchDB MongoDB MySQL	SOLR Sphinx	PostGIS MongoDB SOLR	neo4j	MySQL
<i>Scale-out</i>	Riak Cassandra	elasticsearch	elasticsearch	titan	HBase

# The database paradox of choice:



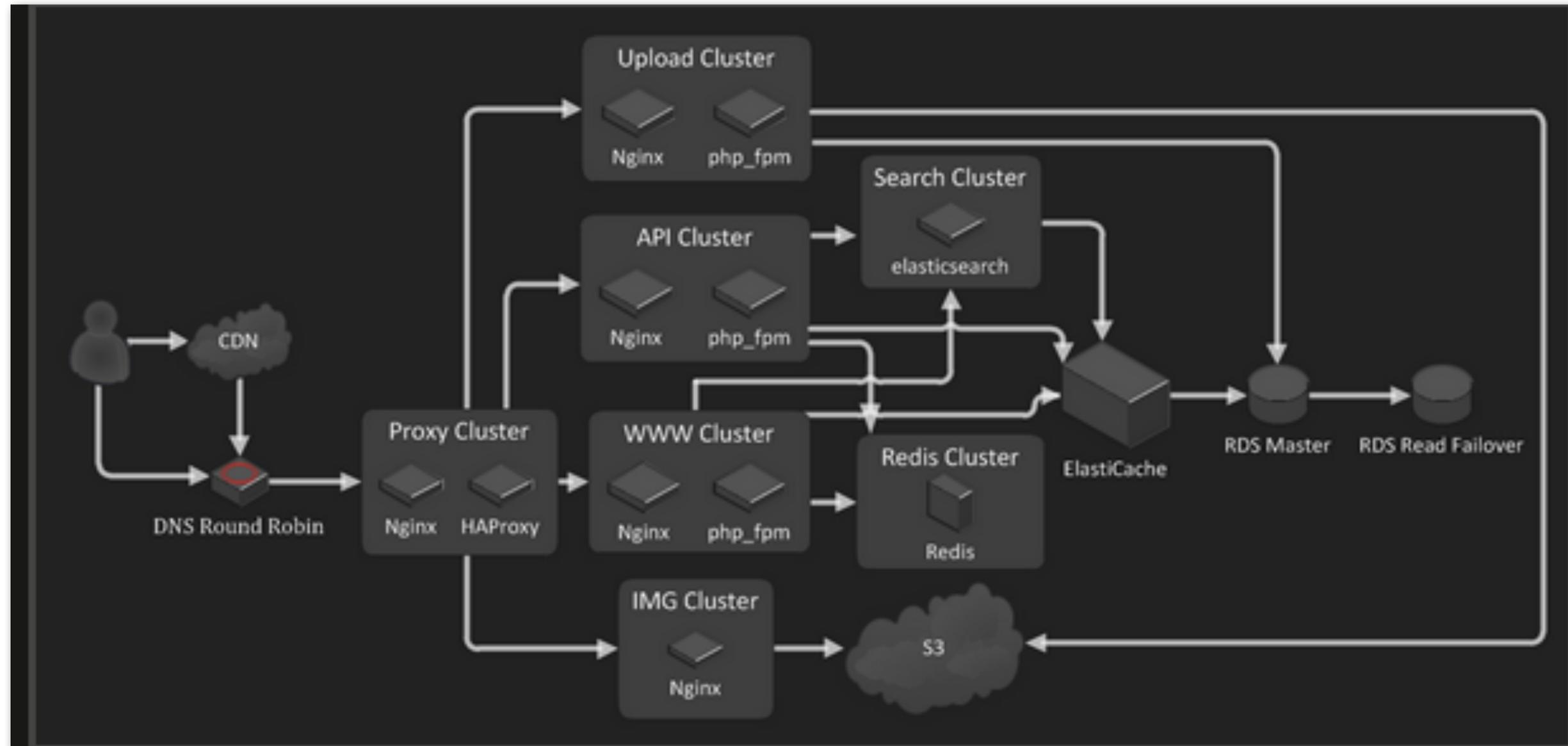
Choice has brought complexity

# Klout's Data Architecture



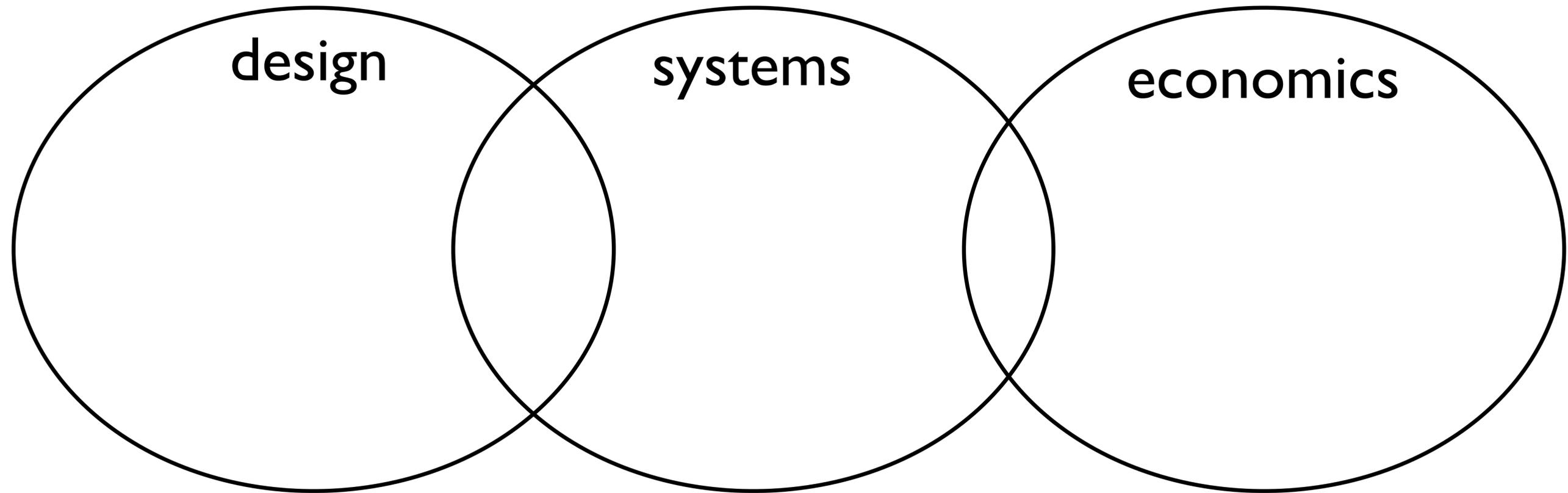
1. Hbase
2. MySQL
3. ElasticSearch
4. MongoDB

# Imgur's Data Architecture



1. Hbase 2. ElasticSearch 3. MySQL 4. Memcache 5. Redis 6. HAproxy

# The Value of Simplicity Varies Across Domains

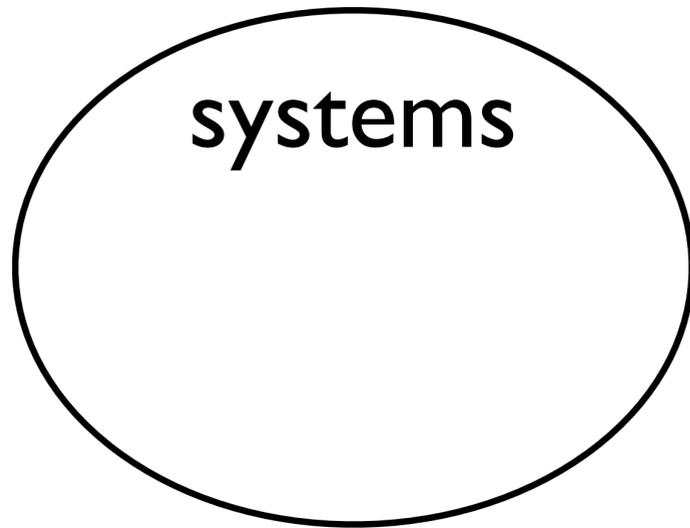
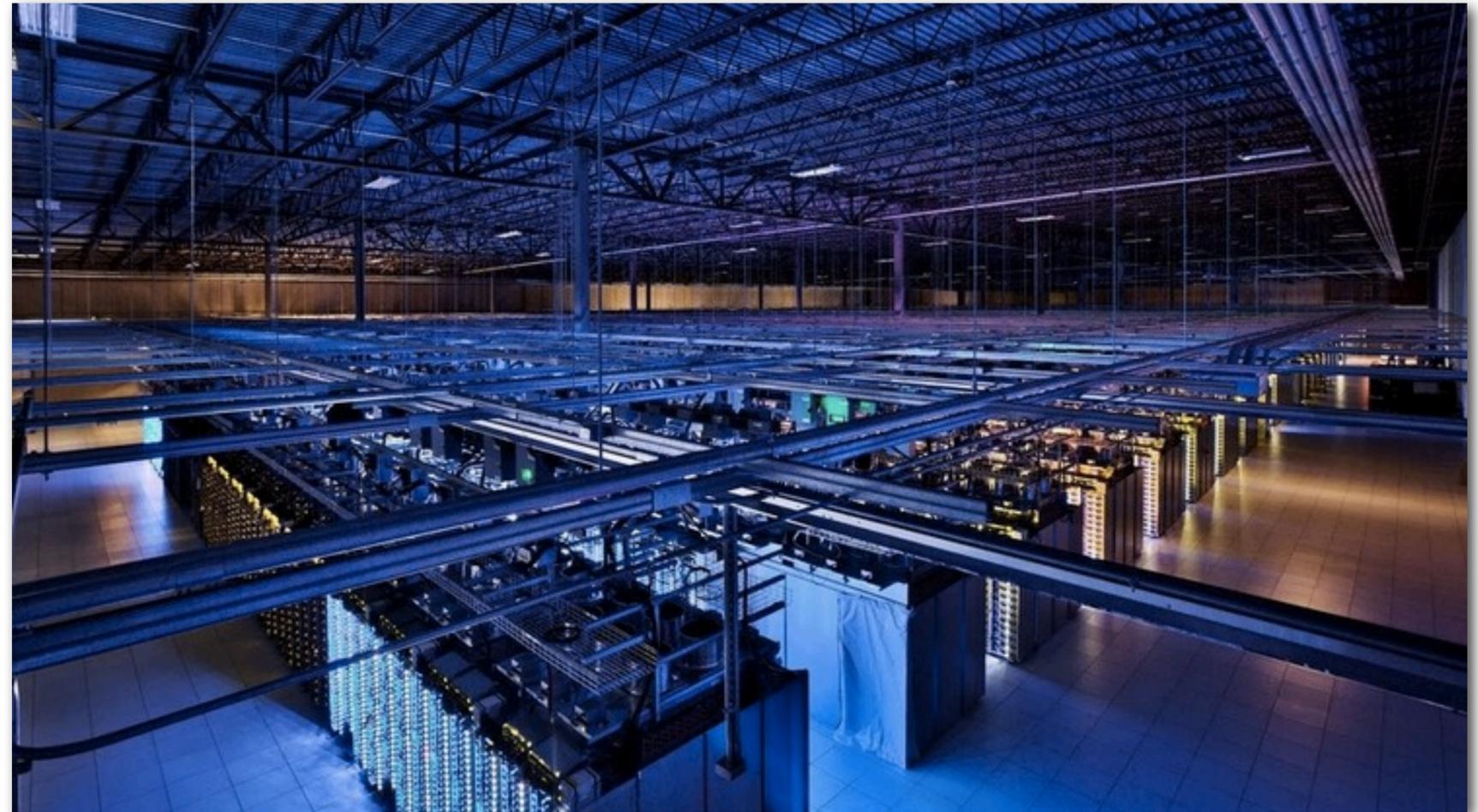


# Simple or complex?

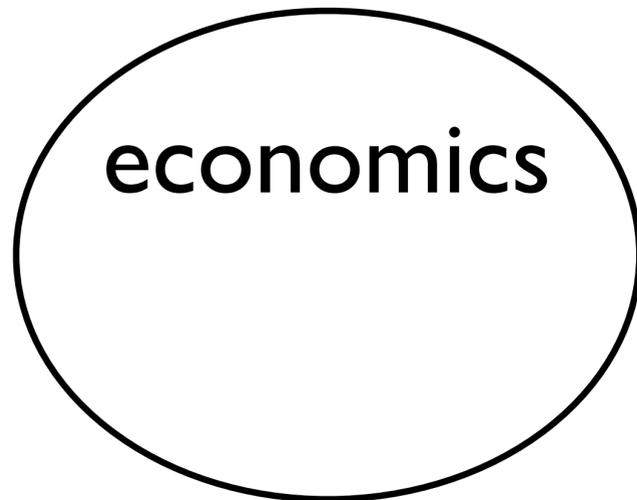
design



Simple or complex?

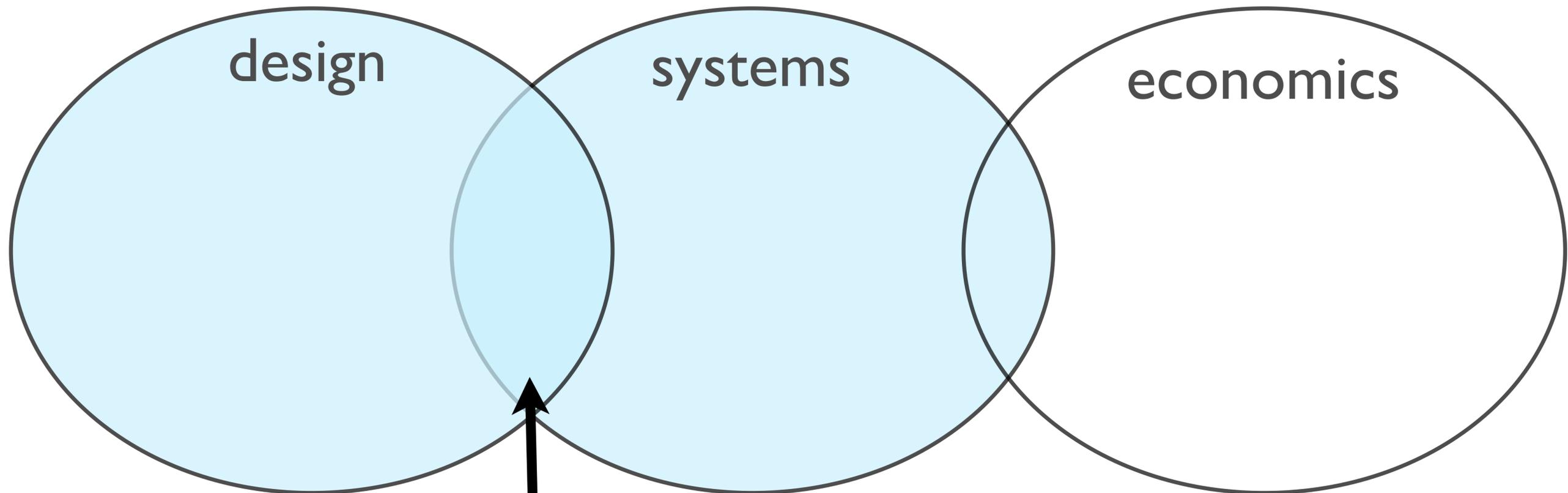


# Simple or complex?



Net Digital Ad Revenue Share worldwide						
	2011		2012		2013	
	Share (percent)	Revenue (\$ bn)	Share (percent)	Revenue (\$ bn)	Share (percent)	Revenue (\$ bn)
<b>Google</b>	32.08	27.72	31.46	32.73	32.84	38.62
<b>Facebook</b>	3.65	3.15	4.11	4.28	5.41	6.36
<b>Yahoo!</b>	3.95	3.41	3.37	3.51	2.97	3.50
<b>Microsoft</b>	2.60	2.25	2.46	2.56	2.49	2.92
<b>IAC</b>	1.01	0.87	1.26	1.32	1.37	1.62
<b>AOL</b>	1.17	1.01	1.02	1.06	0.94	1.11
<b>Amazon</b>	0.48	0.42	0.59	0.61	0.71	0.84
<b>Twitter</b>	0.16	0.24	0.28	0.38	0.50	0.58
<b>Pandora</b>	0.28	0.14	0.36	0.29	0.49	0.58
<b>LinkedIn</b>	0.18	0.16	0.25	0.26	0.32	0.38
<b>Millennial Media</b>	0.05	0.04	0.07	0.07	0.10	0.12
<b>Other</b>	54.40	47.02	54.77	56.98	51.85	60.97
<b>Total (USD in billions)</b>	<b>\$86.43</b>		<b>\$104.04</b>		<b>\$117.60</b>	

Source: eMarketer



API

expose utility, hide complexity

# Introducing: Leverage



FULCRUM

Man lifting a stone  
with a lever

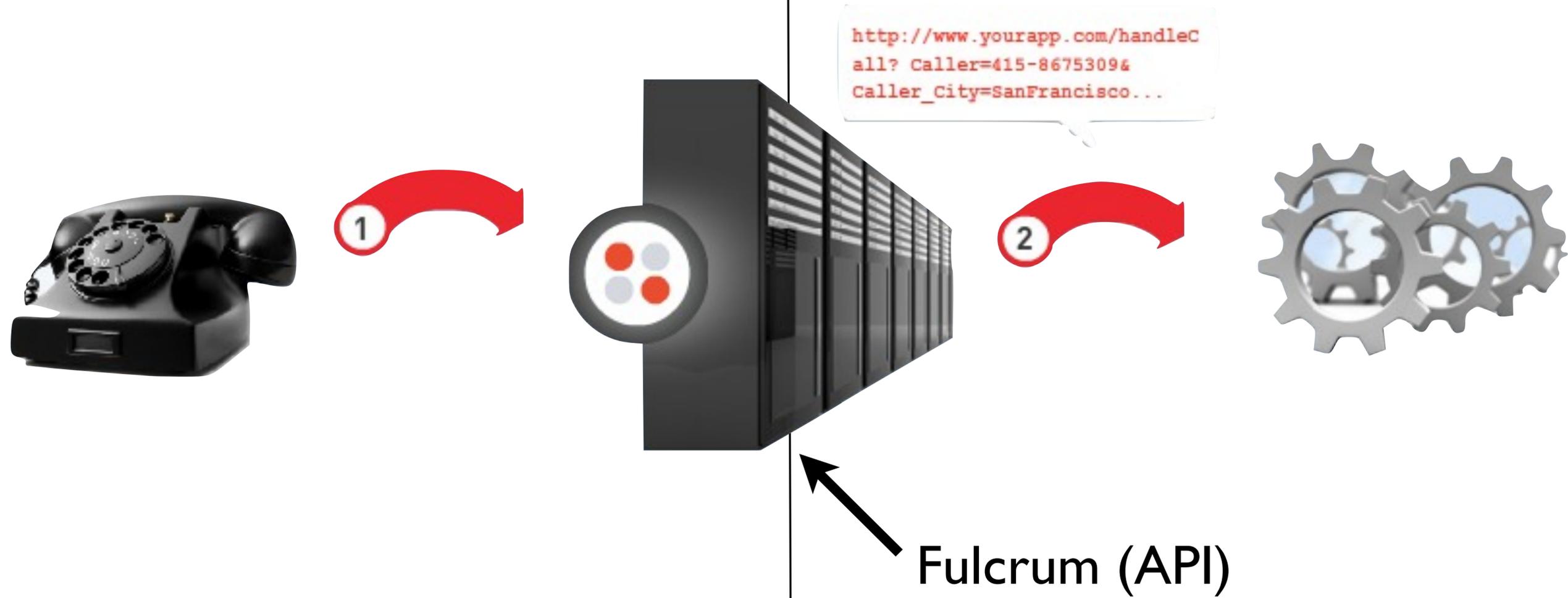
when a complex system has a simple interface

"good simplicity is complexity disguised, not complexity denied"

"The Complexity of Simplicity," Kris Jordan, Dec 4, 2009, <http://www.newmediacampaigns.com/page/simple-design-is-complex>

# Simple

# Complex



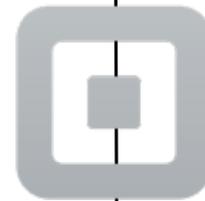
# Simple

# Complex



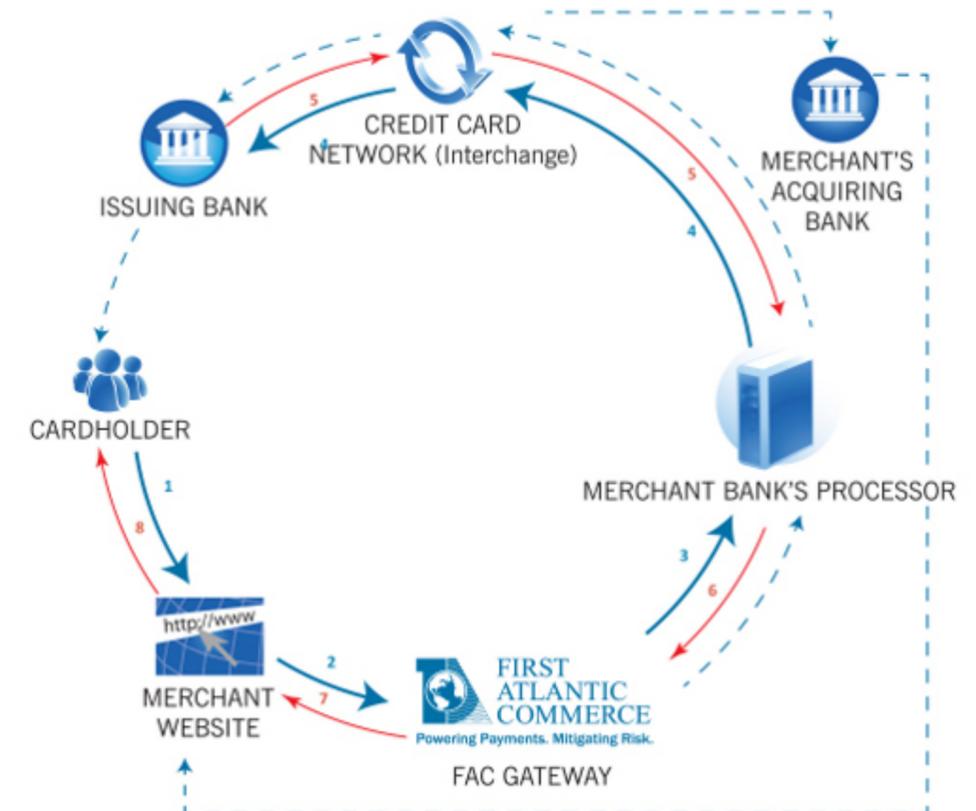
PayPal™

stripe

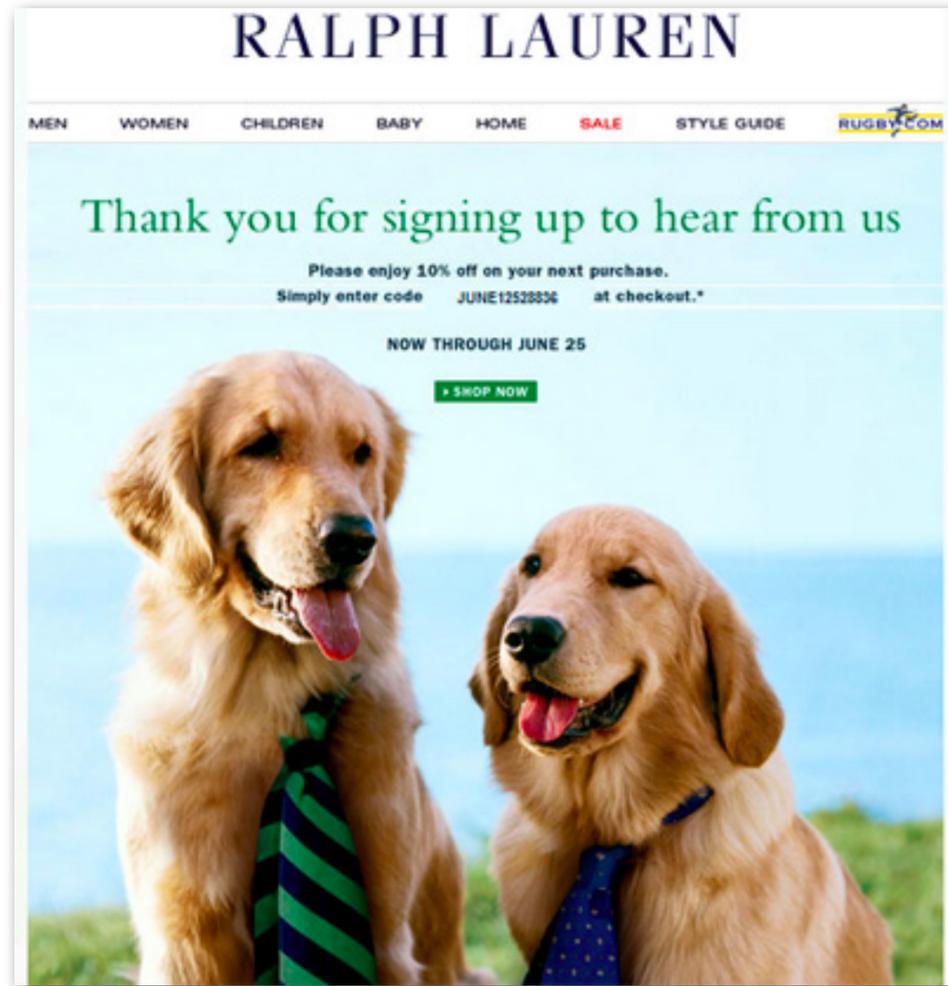


Square

CREDIT CARD PROCESSING - PROCESS FLOW



# Simple



# Complex

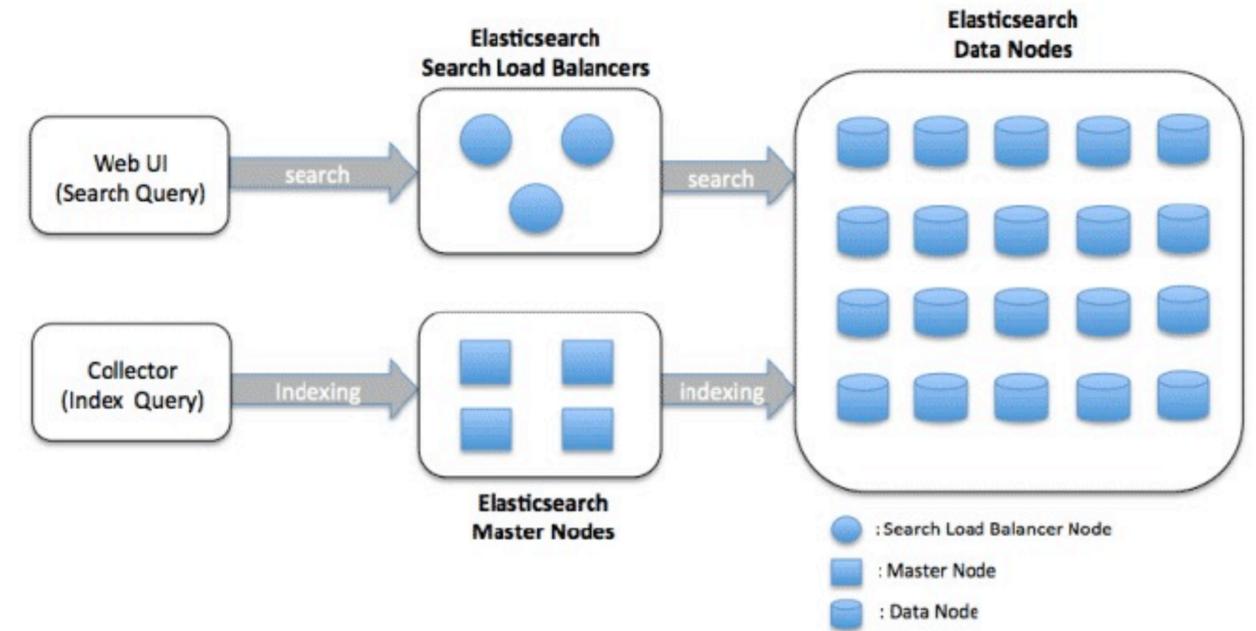


# Simple

# Complex



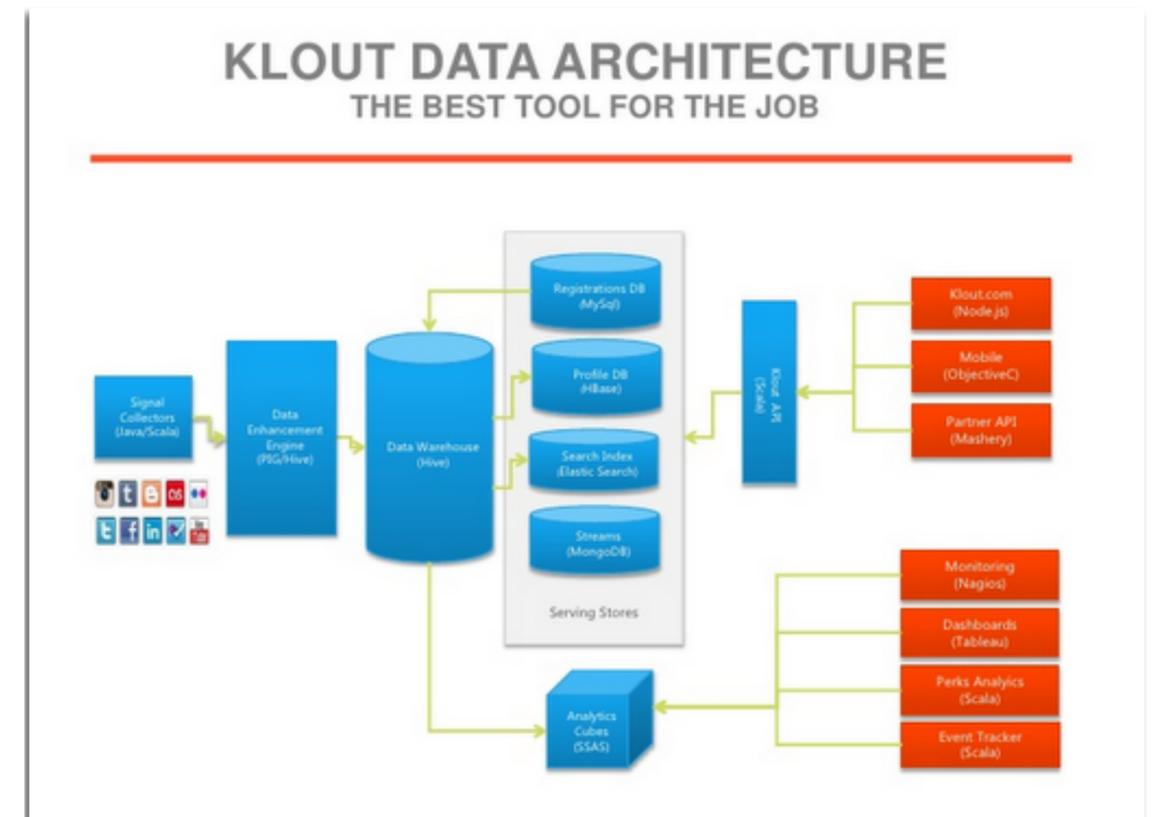
author:Dijkstra AND year:[1970 TO 1985]



# Simple

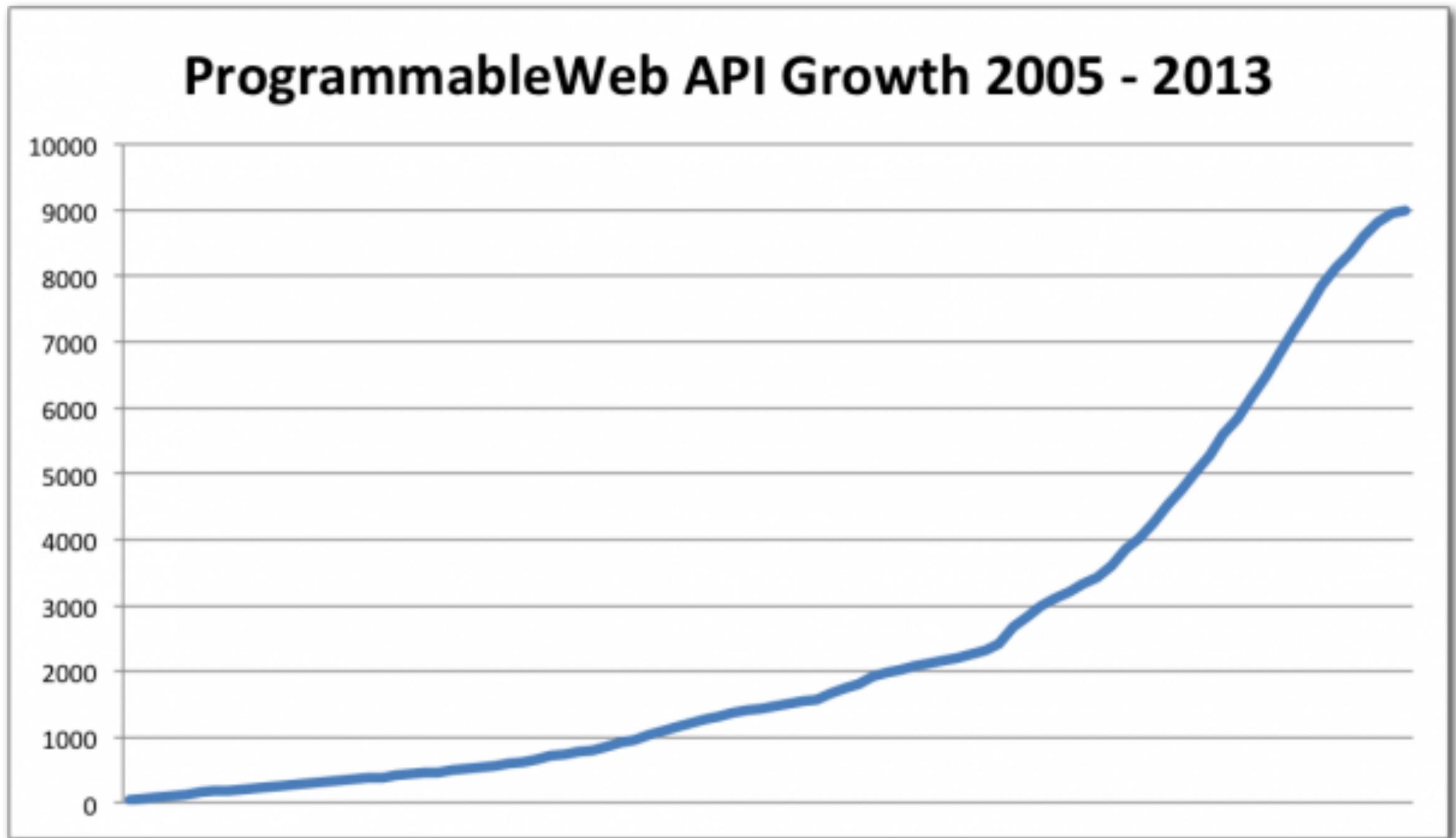


# Complex



This doesn't represent the supporting infrastructure (monitoring, metrics collection, log aggregation, request tracing, etc)

# API Growth



# Where does your business provide value?

Simple

Complex



Ease of use

Leverage

Economies of Scale



# Simplicity

h/t @AntonyFalco

---

Simplicity is arriving at a conclusion that in retrospect, appears inevitable.

--Francis Pedreza

Simple things should be simple and complex things should be possible. -- Alan Kay (OO)

Simplicity and elegance are unpopular because they require hard work and discipline to achieve and education to be appreciated.

-- Edsger W. Dijkstra