

The Triumph of Simplicity

How simple services are reshaping databases and the enterprise

“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

Orchestra.io is a service that combines the best of NoSQL into a simple HTTP-based service
Previously, I worked for Basho, the makers of Riak

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

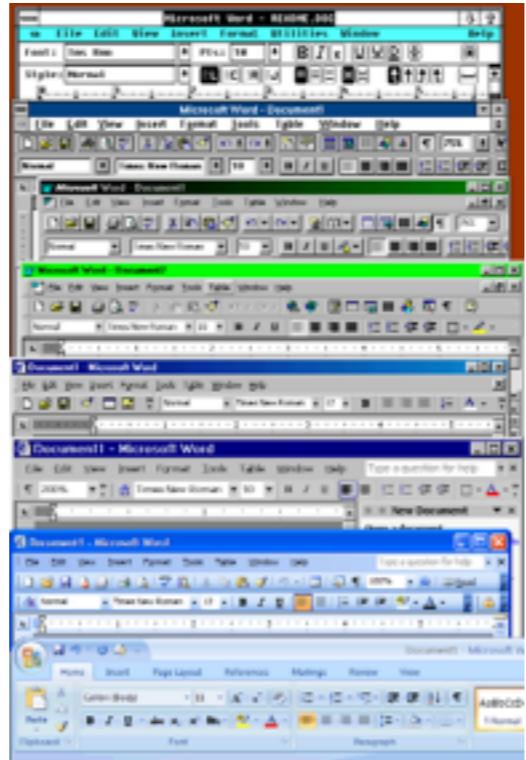


E.W. Dijkstra

*“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.”*

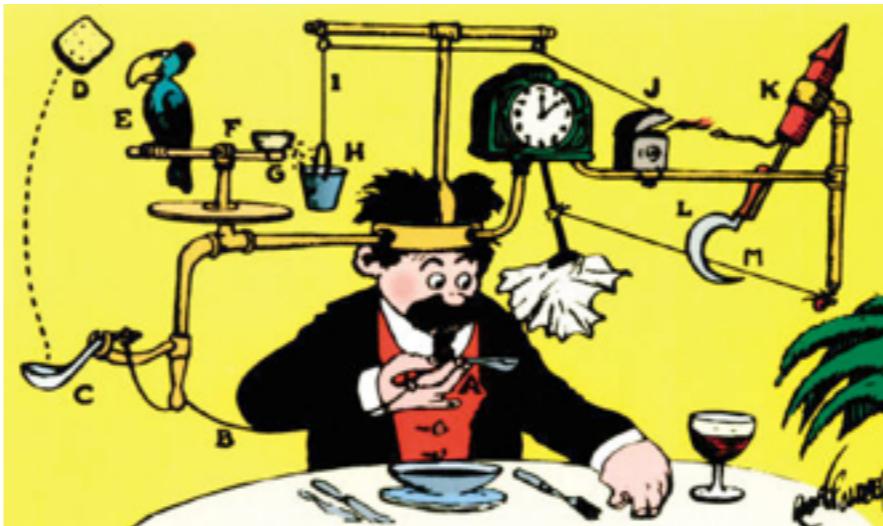
<http://www.cs.utexas.edu/users/EWD/transcriptions/EWD08xx/EWD896.html>

Dijkstra Algorithm
Semaphores
Proponent of Structured programming
Read some of Dijkstra's speeches, they are indictments of the computing industry



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)

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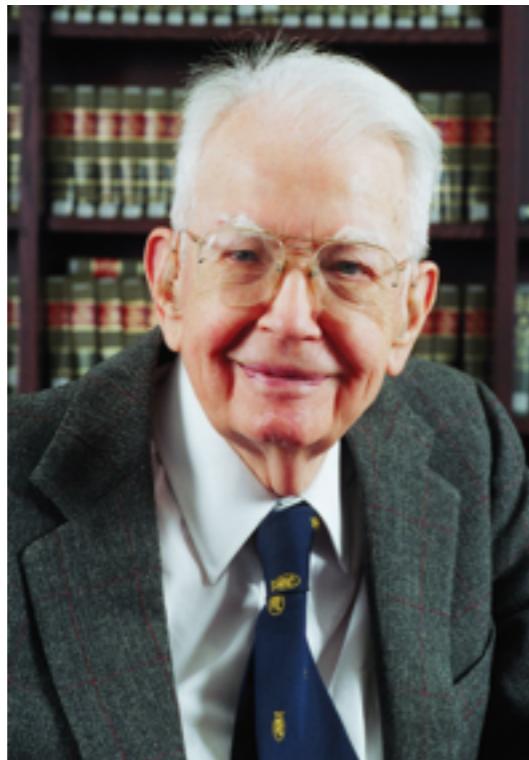
SELECT SUM(offerTotal) as theOfferTotal, SUM(lienTotal) AS theLienTotal, SUM(CLVtotal) AS theCLVtotal,
SUM(estGrossProfitTotal) AS theESTGPtotal FROM (( SELECT COALESCE(SUM(COALESCE(offerAmount, 0)), 0) AS
offerTotal, COALESCE(SUM(COALESCE(amount, 0) COALESCE(legalFees, 0) COALESCE(costs, 0)), 0) AS
lienTotal, COALESCE(SUM(((amount legalFees costs) * (1 (rateOfInterest / 100) *
(FLOOR((UNIX_TIMESTAMP(NOW()) - UNIX_TIMESTAMP(dateOfAttachment)) / 400) / 3 )))), 0) AS CLVtotal,
COALESCE(SUM(((amount legalFees costs) * (1 (rateOfInterest / 100) * (FLOOR((UNIX_TIMESTAMP(NOW()) -
UNIX_TIMESTAMP(dateOfAttachment)) / 400) / 3 )) - 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 ( , 0, ) 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 1 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)) /
400) 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)) / 400) / 3 )))), 0) AS CLVtotal, COALESCE(SUM(((amount legalFees
costs) * (1 (rateOfInterest / 100) * (FLOOR((UNIX_TIMESTAMP(NOW()) - UNIX_TIMESTAMP(dateOfAttachment)) /
400) / 3 )) - 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 ( , 0, ) 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 1 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)) / 400) 0 AND rateOfInterest 0 ) ) AS theBigTable;

```

Some guy got his rocks off over this query

There is a quiet revolution in
progress

1. open source
2. cloud
3. apis



Ronald Coase

“... a firm will tend to expand until the costs of organizing an extra transaction within the firm become equal to the costs of carrying out the same transaction by means of an exchange on the open market or the costs of organizing in another firm.”

<http://www3.nccu.edu.tw/~jsfeng/CPECII.pdf>

Nobel Prize in Economics
Died at 102, last month (2/9/13)
“The Nature of the Firm” (1937)

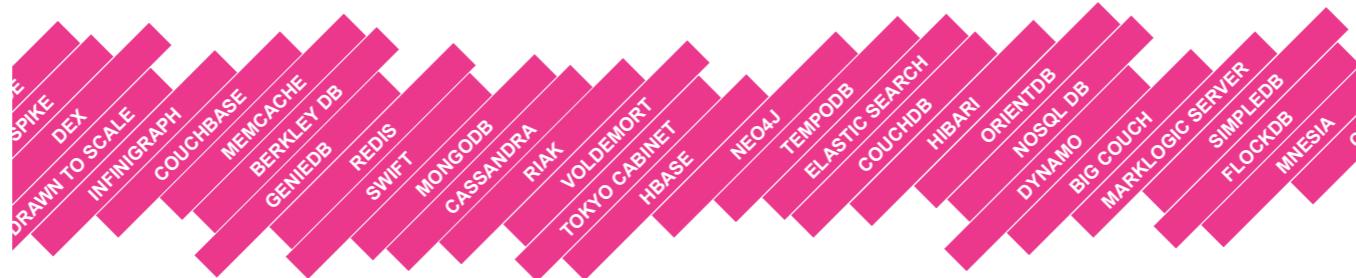
**Functions that organizations
formerly did themselves are now
sourced externally**

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

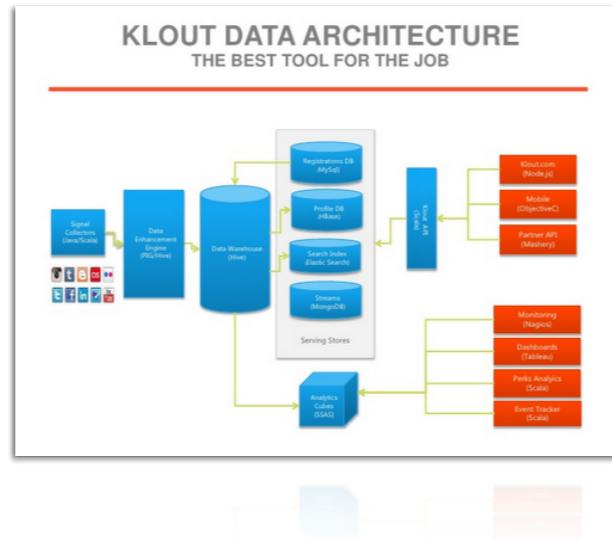
	Key-Value	Search	Geo	Graph/ Relation	Event
<i>Scale-up</i>	BerkleyDB CouchDB MongoDB MySQL	SOLR Sphinx	PostGIS MongoDB SOLR	neo4j	MySQL
<i>Scale-out</i>	Riak Cassandra	elasticsearch	elasticsearch	titan	HBase

The database paradox of choice:



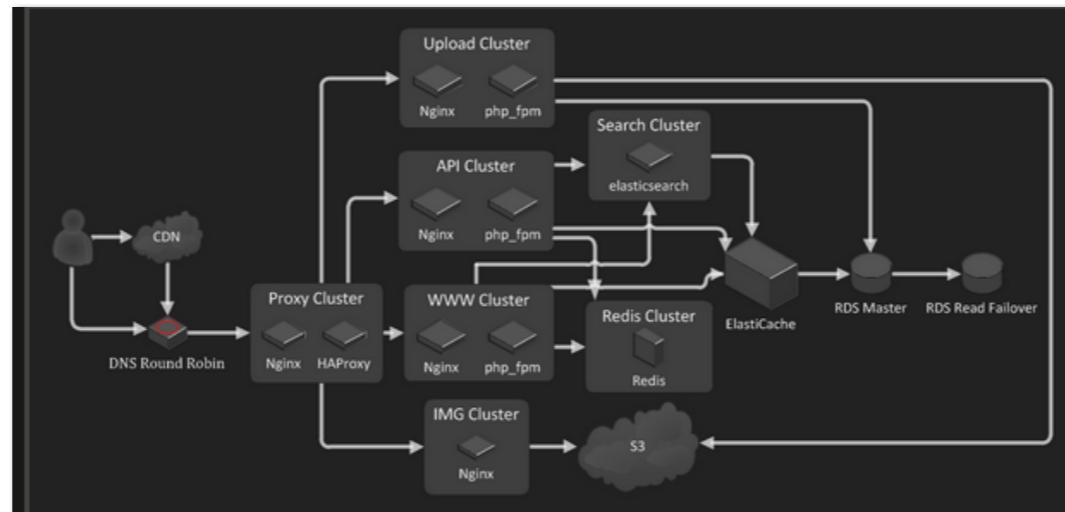
Choice has brought complexity

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

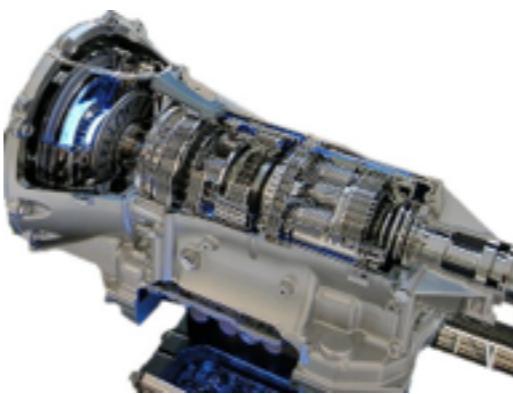
Who Owns Complexity?

“...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

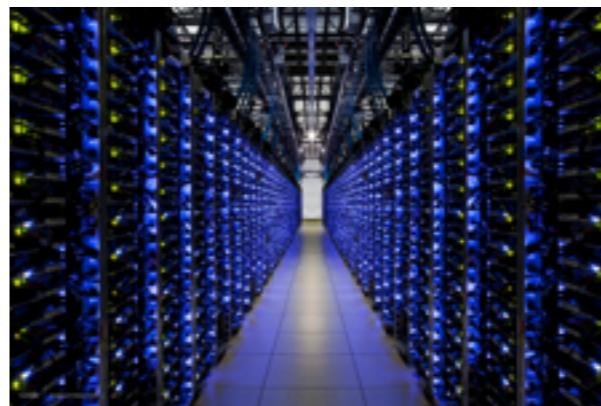


Reiterate the car example

Simple

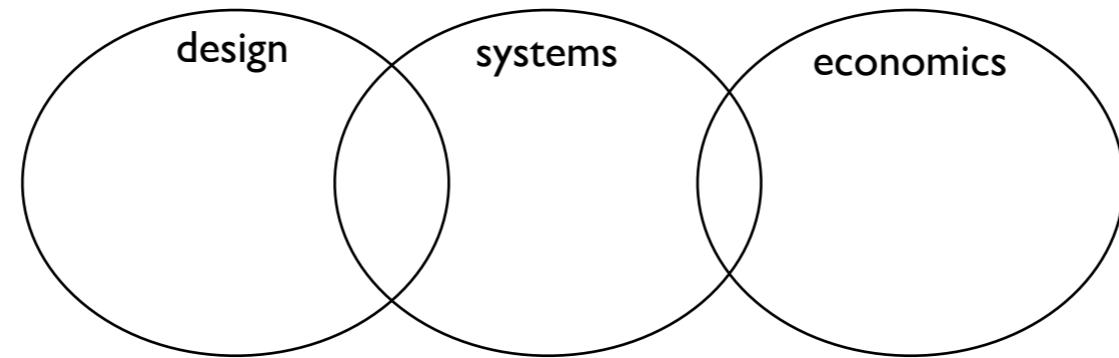


Complex



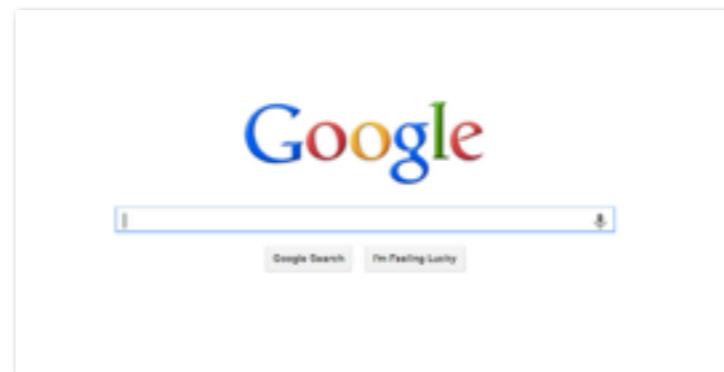
The ultimate in simplicity of interface vs complexity of systems

The Value of Simplicity Varies Across Domains



Simple or complex?

design



Simple or complex?

systems



economics

Simple or complex?

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

Source: eMarketer

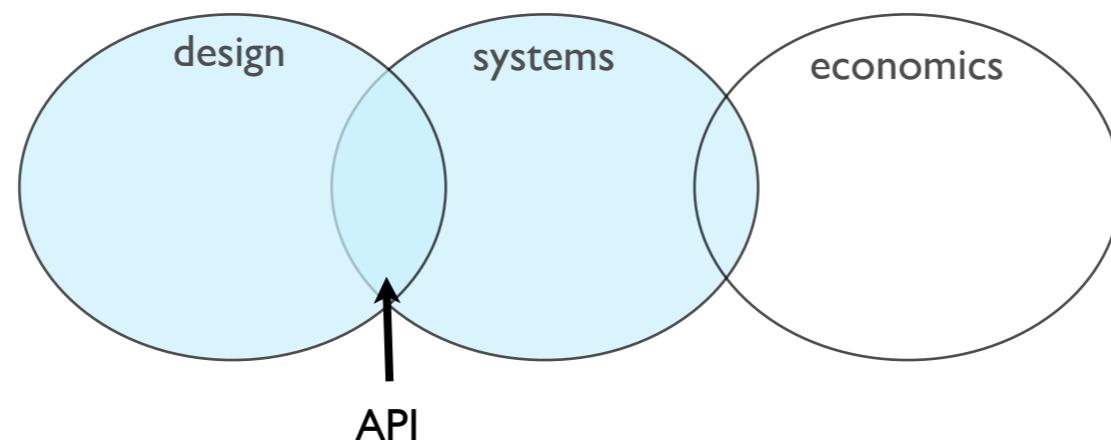
Design -> Systems -> Economics Alignment is low for Google

It's high for Amazon

It's moderate for Apple

It's high for LinkedIn

It's low for Twitter



expose utility, hide complexity

The other overlap

Introducing: Leverage

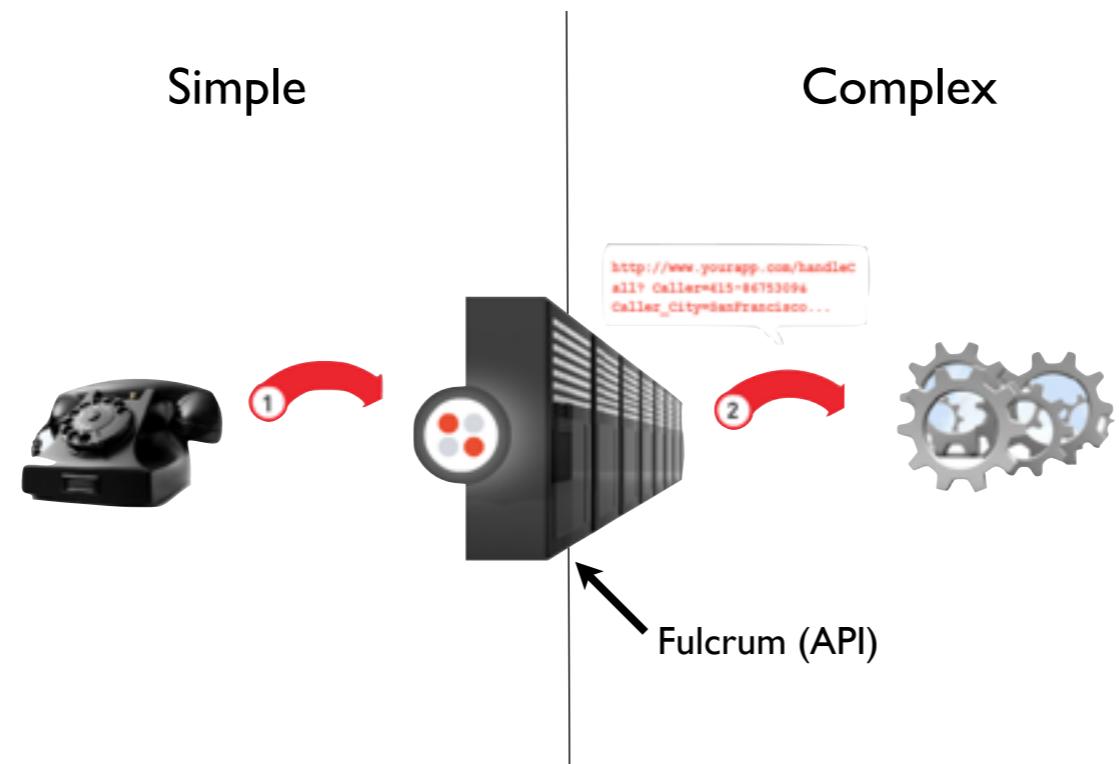


Man lifting a stone
with a lever

when a complex system has a simple interface

Ógood simplicity is complexity disguised, not complexity deniedÓ

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



Twilio shifts the headache and complexity of systems to a 3rd party

Simple

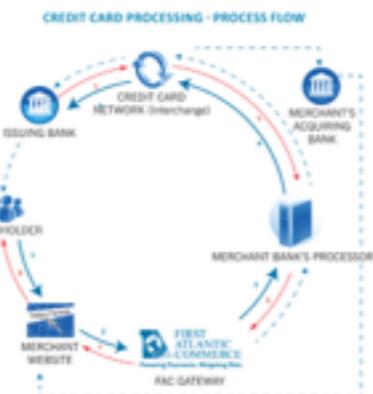


PayPal

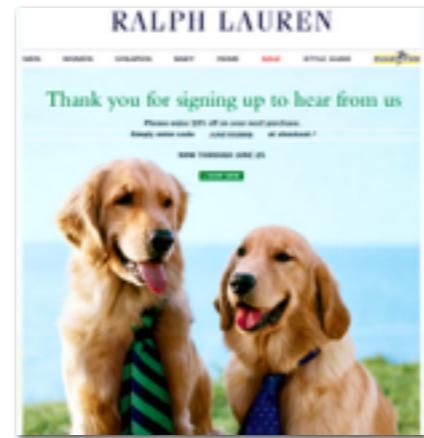
stripe



Complex



Simple



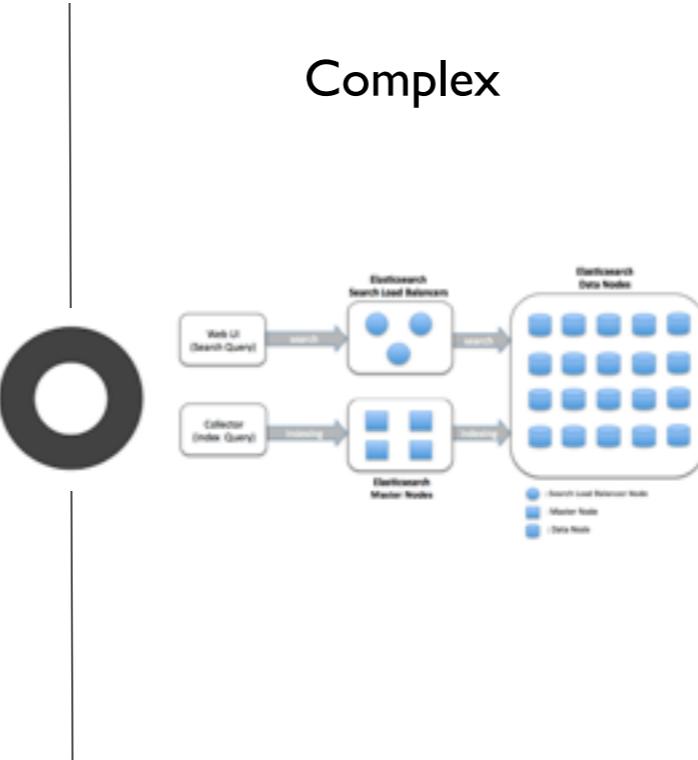
Complex



Simple

author:Dijkstra AND year:[1 0 TO 1]

Complex

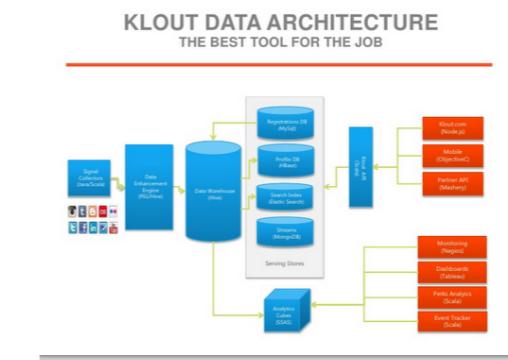


This doesn't represent the supporting infrastructure (monitoring, metrics collection, log aggregation, request tracing, etc)

Simple



Complex



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

**Orchestrate.io is a HTTP REST
service that unifies 5 common
query types**

Key/Value

Full-text Search

Graph

Time-ordered events

Geolocation

LIVE DEMO!!!!!!

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