LiveRamp

Making 100 Petabytes Relevant: How LiveRamp Enables People-Based Identity

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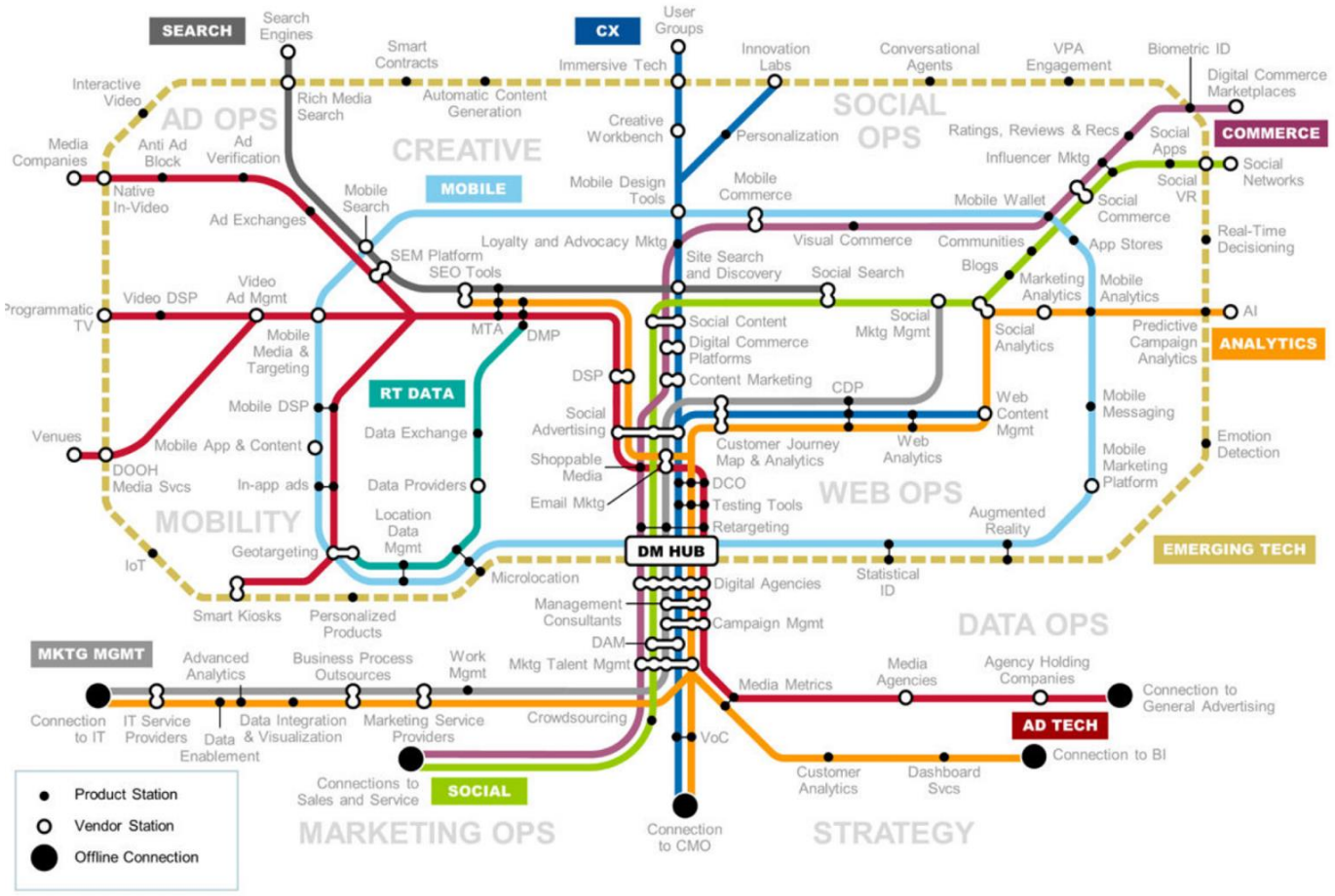
Booth #235

A world where
CONNECTED DATA
makes every
EXPERIENCE
EXCEPTIONAL
LiveRamp

Thousands of Vendors Focused on Applications, We Operate the Rails



Seamlessly connecting data across the ecosystem

- LiveRamp
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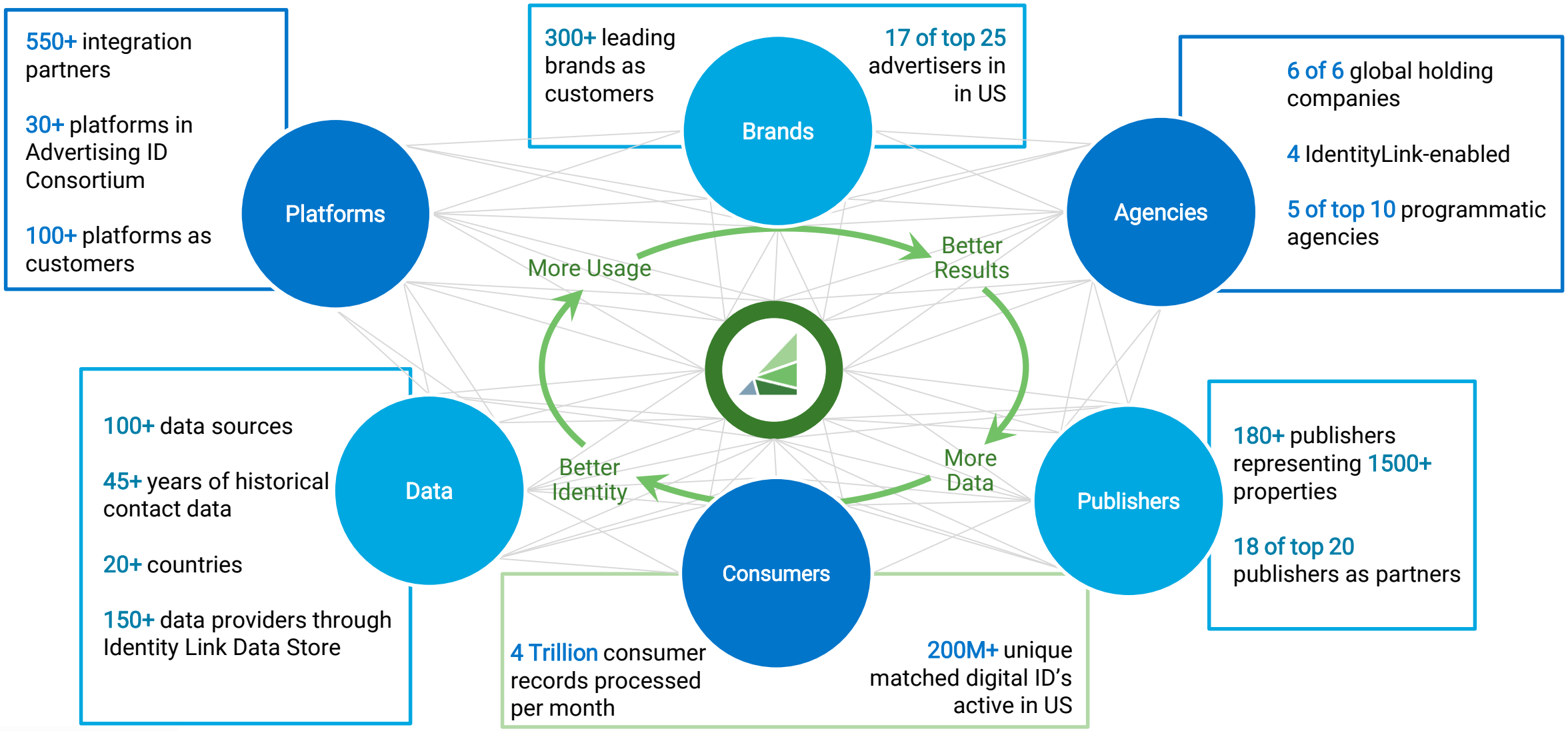
Our Scale


550+ integration partners
30+ platforms in Advertising ID Consortium
100+ platforms as customers
Platforms
300+ leading brands as customers
17 of top 25 advertisers in in US
Brands
6 of 6 global holding companies
4 IdentityLink-enabled
5 of top 10 programmatic agencies
Agencies
More Usage
Better Results
Better Identity
More Data
100+ data sources
45+ years of historical contact data
20+ countries
150+ data providers through Identity Link Data Store
Data
Consumers
180+ publishers representing 1500+ properties
18 of top 20 publishers as partners
Publishers
4 Trillion consumer records processed per month
200M+ unique matched digital ID's active in US

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Identity Resolution and LiveRamp

Some of Our Clients' Challenges

Delivering Best-in-Class Customer-Centric Experiences

Building Customer Journeys based on Behavioral Data

Linking In-Store Transactions with Digital Media Spend

Increasing ROI and Efficiency of Digital Media Spend

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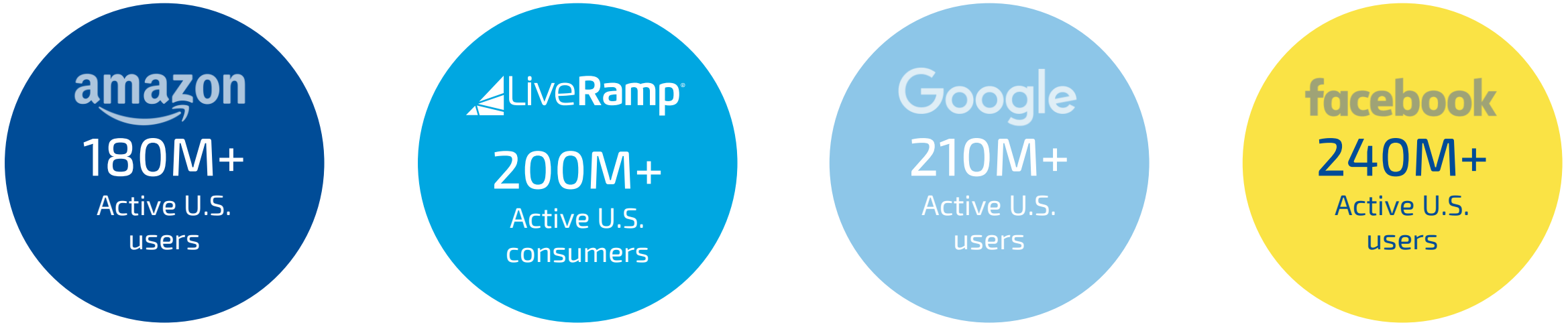
Companies are Investing in People-Based Marketing



Leading Omnichannel Identity Graph

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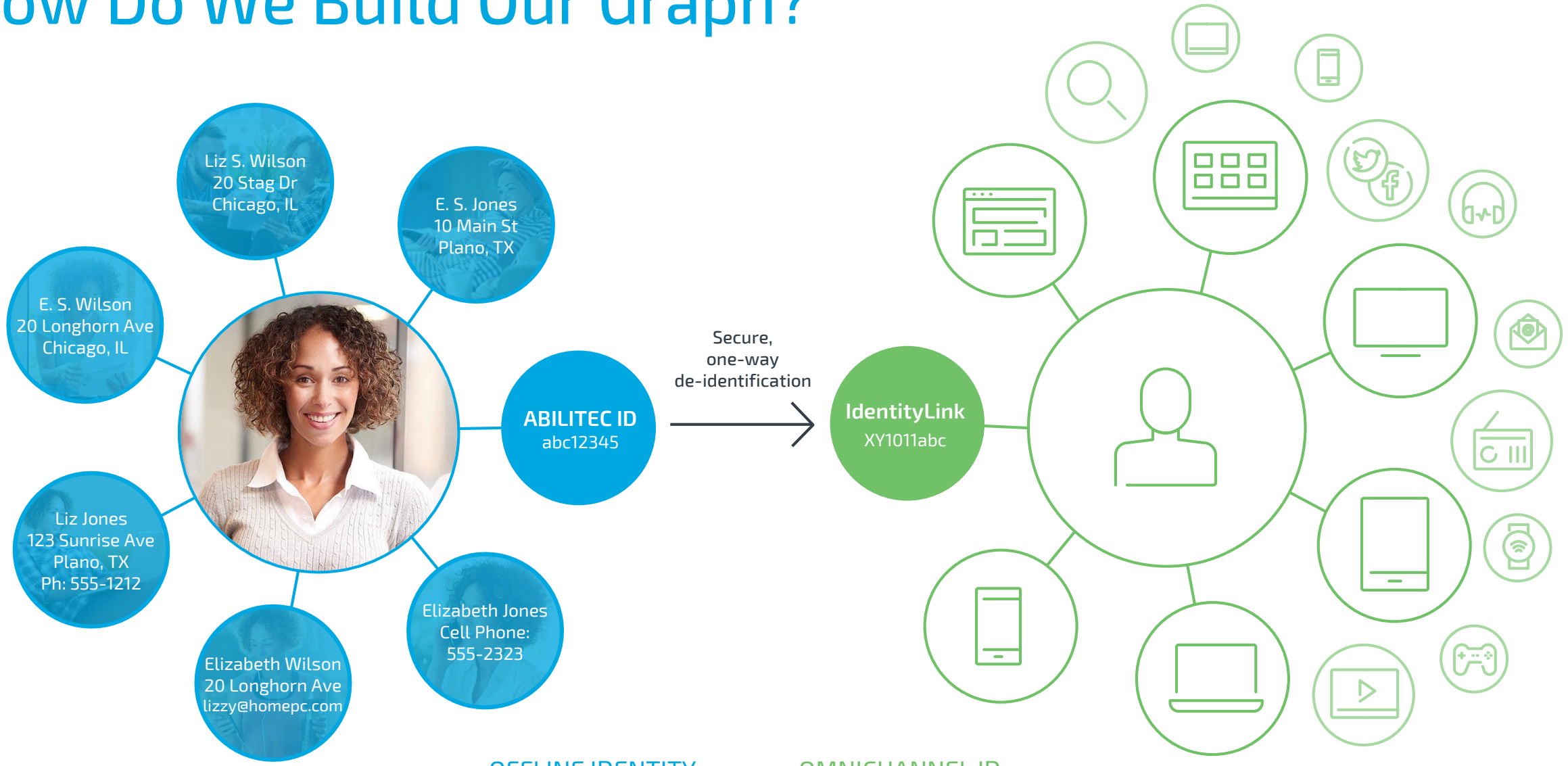
IDENTITY GRAPH
200M+ People in US

How Do We Build Our Graph?



LiveRamp Enables People-Based Marketing

Targeting

With LiveRamp, use people-based targeting strategies to increase the effectiveness, efficiency, and reach of your marketing campaigns

Measurement

With LiveRamp and people-based measurement, identify actionable new insights and increase the accuracy of your measurement/ analytics

Personalization

Use LiveRamp to send customer data to content optimization platforms for real-time personalization to increase relevancy and achieve higher sales conversions

Data Strategy

With LiveRamp, leverage our data store for augmenting your first-party data with second- or third- party people-based data to improve measurement, targeting, or personalization

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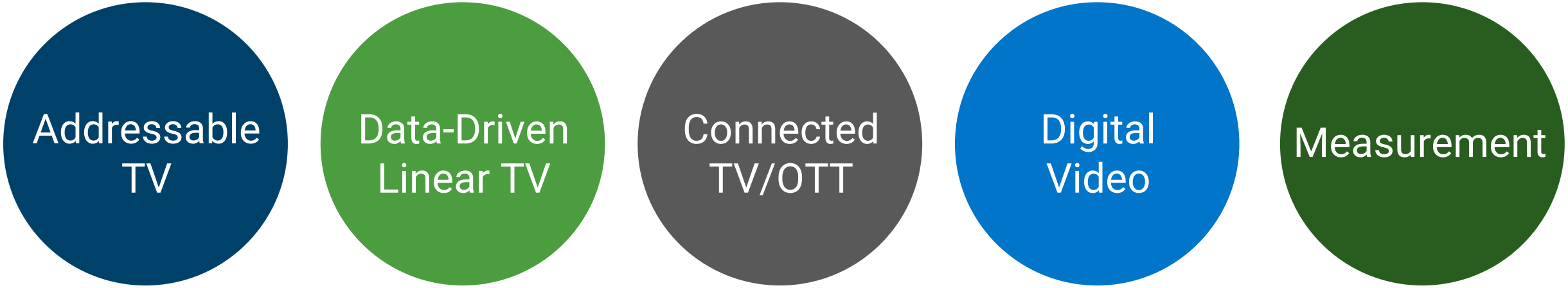
LiveRamp Powers the Future of Advanced TV



LiveRamp Advanced TV Ecosystem Partners

CADREON · turner · FREEWHEEL A COMCAST COMPANY · iSpot.tv · Adobe Marketing Cloud · one2one MEDIA · Roku · MODI MEDIA · CROSS SCREEN MEDIA

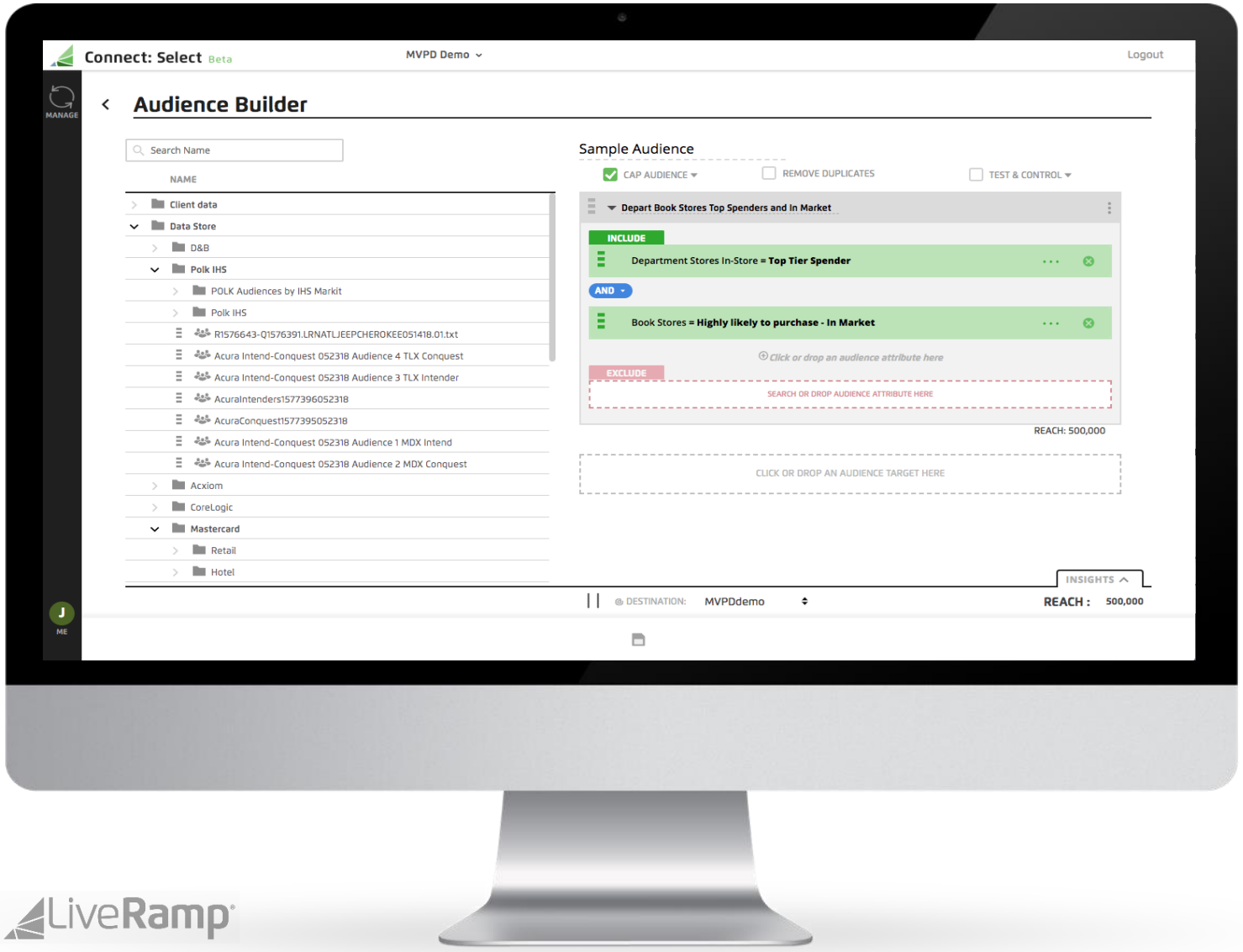
FOURTHWALLMEDIA · viacom · COMCAST · dish NETWORK · NBCUniversal · videology · alphonso · Discovery CHANNEL · clypd · verizon

sorenson MEDIA · FOX · hulu · mediaocean · CROSS MEDIAWORKS · DataXu · D+M Data Plus Math · VIZIO · amc · TRUOPTIK

SAMBA TV · SIMULMEDIA · Charter Spectrum · Aol. · sling · SAMSUNG · videoamp · COX · TVISION INSIGHTS

INVIDI · A+E NETWORKS · scrippsnetworks interactive · at&t · SIX ONE ZERO FIVE · comScore · nielsen · TiVo · altice · INNOVID

Addressable TV



Our Progress

Most mature advanced TV segment

Integrated with **ALL** MVPDs

Adoption building rapidly – YTD LiveRamp enabled campaigns up 100% YoY

COMCAST DIRECTV Charter dish COX verizon

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Data-Driven Linear

Our Progress

Agreements complete with **every major network**

Programmers become people-based platforms

Consortiums forming to simplify DDL sales and maximize reach

NBC abc turner ESPN

viacom FOX CBS

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Connected TV / OTT

Our Progress

Significant progress building TV IDs into ID graph

Three of top five programmers adopting TV graph for CTV/OTT targeting and measurement

Recognized as **THE** enabler to drive people-based CTV

Roku hulu SAMSUNG

Largest Independent Marketplace of People

150+ Data Providers

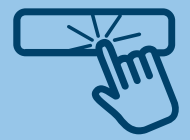
Demo

B2B

Purchase

In-Market

Behavioral



Geolocation

Common Identity Underpins Data Store

Ethical Data

Unique Data

Easy To Use

Flexible Setup

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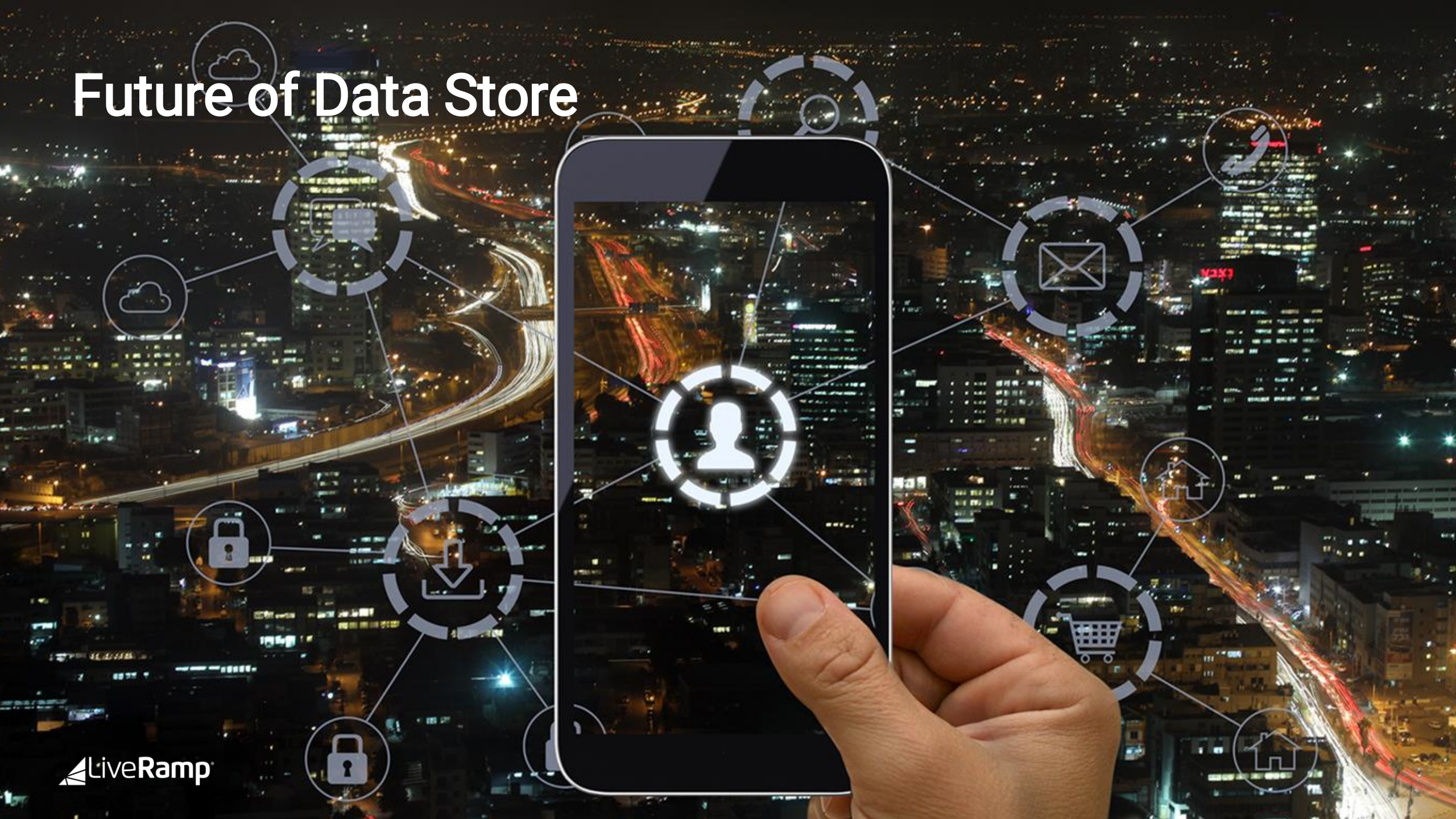
Future of Data Store



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A Global Network Effect

Global partnerships will drive rapid revenue and brand growth in new regions

6 of 6 global agency holding companies

5 of 6 top global social platforms

3 of 4 largest credit card issuers

3 of 5 largest consumer electronics brands

3 of 5 largest global hotel brands

5 of 10 top EU retailers

3 of 10 global automotive manufacturers

Near 100% coverage of global ad tech ecosystem

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FINISH LINE

Significant ROAS Increase for Finish Line

Google Customer Match Data

LiveRamp

LiveRamp's Google Customer Match Data Append Delivers Significant ROAS increase for Finish Line

Challenge

Finish Line, a national retailer, wanted to engage prior purchasers searching for footwear online.

Solution

Using LiveRamp's Google Customer Match Data Append for Product Listing Ads, Finish Line was able to dramatically increase their match rate (+200%) resulting in significantly more customers to target.

Results

For people-targeted segments vs. standard search:

- 70% lift in ROAS
- 235% increase in CTR

Offline Audiences Delivers Significant ROAS Increase for a Leading Bank

People-Based Activation

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People-Based Activation of Offline Audiences Delivers Significant ROAS Increase

Challenge

A leading bank was looking to expand its direct mail and email campaigns to reach customers online to increase the efficiency of their marketing programs.

Solution

- The bank built a prospect file using a proprietary model
- They partnered with LiveRamp to activate the majority of that audience after holding out a control segment
- They than launched an online advertising campaign (search and display) that was in-market for 30 days

Results

For people-based targeted segments that were exposed vs. standard segments:

- 150% increase in net new checking accounts
- 40% increase in ROI based on customer lifetime value

Digital advertising is very large & fragmented
DATA PROVIDERS
SEARCH
ADDRESSABLE TV
MOBILE
VIDEO
MEDIA PLATFORMS
DATA MANAGEMENT
MEASUREMENT
PERSONALIZATION
slice INTELLIGENCE
Scanbuy
twentyci
The Weather Company
sharethis
weather alpha
SPECIALISTS MARKETING SERVICES
targetsmart
PEERLOGIX
MAXPOINT
spotright
STIRISTA
POWERLYTICS
MADISON LOGIC
IRi
LIVE NATION
SKYHOOK
SYMPHONY HEALTH
ONESIGNAL
NinthDecimal
CROSSIX
SavingStar
pacific data partners
Alliant
DATA TRUST
EPSILON
SAMBA TV
zipscene
CoreLogic
KANTAR WORLDPANEL
connexity
PUSHSPRING
bombora
cuebiq
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AdfireHealth
Placed
ALC digital
ASL marketing
BusinessWatch NETWORK
Mobiquity networks
Lifescript
Wiland
DATAMYX
BRIDGE
#Home
TransUnion
180 bylwo
SSI
ownerIQ
COMPASS
RallyPoint
L2
NetWise Data
affinity solutions
webbula
infogroup
crosspixel
TruSignal
AmeriBase
Ethnic Technologies
kiip
33across
factual
dun & bradstreet
KANTAR MILLWARD BROWN
DATA company
DELUXE
FRECKLE
Gravy
acxiom
InfoScout
AnalyticsIQ
V12DATA
pitney bowes
hivewyre
AffinityAnswers
PCH / MEDIA
vertical MASS
AuDIGENT
FOURSQUARE
unacast
HG DATA
Datastream Group, Inc
MERITDIRECT
Nielsen Catalina SOLUTIONS
AUDIENCES BY ZIFF DAVIS
WINDFALL
QUALIA
LEAP
twine
Marin SOFTWARE
Google AdWords
DoubleClick Search
Kenshoo
NBCUniversal
turner
SIMULMEDIA
dish
VIZIO
COMCAST
scrippsnetworks
Spectrum
AT&T
VIACOM
iSpot.tv
adlucent
jumpshot
MediaAlpha
Google Customer Match
COX
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FreeWheel
hulu
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FOX
Roku
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TIVO
CLARITAS
nielsen
mastercard
GBG
ibotta
KANTAR MILLWARD BROWN
factual
dun & bradstreet
acxiom
IBM
Optimizely
ORACLE
sociomantic
Sizmek
TEALIUM
thunder
BEYABLE
Jivox
netmining
IGNITIONONE
DEMANDBASE
TASTY
criteo
CXENSE
monetate
flashtalking
Qubit
REVJET
ADOBE
salesforce DMP
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4INFO
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Perfect Audience
Meteora
NinthDecimal
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adelphic
PUSHSPRING
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sharethis
pocketmath
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spotad
pinsight media
UberMedia
GroundTruth
criteo
pandora
Placed
linkingmobile
ubimo
VERVE
PRECISION MARKET INSIGHTS FROM VERIZON
AppLift
sito
polymorph
eyereturn marketing
Tapjoy
AERSERV
GO2MOBI
PLACECAST
shopkick
Sizmek
RUN
Spotify
Taptica
Yieldmo
BRIDGE
CROSS INSTALL
aki
PlaceIQ
GIMBAL
140 Proof
Simplifi
INMOBI
adgear
tapfwd
FOURSQUARE
SUNDAY SKY
RhythmOne
sharethis
vidzoomp
MASS²
eyeview
TubeMogul
pk4 media
bigtheatre
loopMe
adgear
XAXIS
Aol.
ADCOLONY
YuMe
TREMOR VIDEO
VISTO
INNOVID
Vungle
DynAdmic
virool
GIANTMEDIA
yieldbot
wyng
ebay
Aol.
accuen
RhythmOne
BEESWAX
rubicon
numberly
Microsoft
ADARA
sharethis
Valassis
dataxu
AdRoll
amazon
DoubleClick Bid Manager
BuzzFeed
bluekai
SOCIAL CODE
LinkedIn
AppNexus
Sekindo
centro
AMOBEE
Pinterest
facebook
Simplifi
CIX
24/7 MEDIA
DIGILANT
REVJET
BrightRoll
dstillery
ownerIQ
FLUENT
LiveIntent
MAGNETIC
SOLVE media
YAHOO!
ADventori
flipp
PULSEPOINT
Terminus
Affectv
credit karma
Yieldmo
OpenX
ReTargeter
Tradelab
Undertone
AGILONE
advert serve
eyereturn
cardlytics
ADIANT
NATIVO
adform
SPONGECELL
exponential
yp marketing solutions
Sizmek
myThings
PERFORMANCE HORIZON
QuinStreet
resonate
Rakuten
theTradeDesk
zebestof
DistroScale
STEELHOUSE
YellowHammer
DoubleClick Search
Tab99la
IPINYOU
ADTHEORENT
PARSEC
IGNITIONONE
INFECTIOUS MEDIA
connexity
drawbridge
choozle
PULPO MEDIA
4Cite
MARKETONE
adswizz
Huddled Masses
VISTARMEDIA
MARTINI
mediarithmics
Zemanta
XAXIS
leaf GROUP
StackAdapt
keplergroup
MediaMath
dataxu
AMOBEE
ensighten
ORACLE DATA CLOUD
zipline dmp
comScore
visualIQ
ConversionLogic
quantcast
KOCHAVA
CROSSIX
NinthDecimal
Google
facebook
APT
CMOLABS
MARKETING EVOLUTION
AffinityAnswers
KANTAR MILLWARD BROWN
acxiom
lifto36i
PlaceIQ
Q1Media
sito
eyereturn marketing
SAFEGRAPH
FORESEE
mediarithmics
EPSILON
MOAT
ANALYTIC PARTNERS
MAASSMEDIA
Visible MEASURES
POWERLYTICS
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looker
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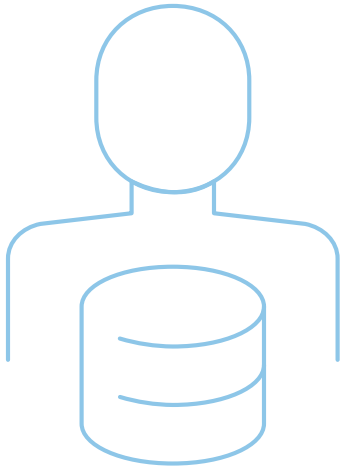
latentview
ownerIQ
AMOBEE
Ovative/group
CONVERTRO
adometry



X

ADARA · sharethis · BuzzFeed · rubicon · SOCIAL CODE · AERSERV · ebay
Twitter · DoubleClick Bid Manager · AppNexus · bluekai · centro · Valassis · dataxu
MediaMath · facebook · Simplifi · Sekindo · BrightRoll · AMOBEE · VIANT
Pinterest · LiveIntent · DIGILANT · 24/7 MEDIA · YAHOO! · dstillery · ownerIQ
MERITDIRECT · PULSEPOINT · MAGNETIC · REVJET · affectv · ADventori · flipp
eXponential · eyereturn · ReTargeter · SOLVE media · credit karma · Yieldmo
Rakuten · yp marketing solutions · cardlytics · Terminus · Undertone · AGILONE · advertserve
YellowHammer · DoubleClick Search · Sizmek · Tradelab · adform · NATIVO · SPONGECELL
PARSEC · AppLift · ADIANT · zebestof · PERFORMANCE HORIZON · QUINSTREET
GO2MOBI · connexity · Taboola · myThings · Tapjoy · DistroScale · STEELHOUSE
polymorph · theTradeDesk · numberly · ADTHEORENT · INFECTIOUS MEDIA
IPINYOU · IGNITION ONE · BEESWAX · drawbridge · sito

300+ Million US Consumers

Hundreds of platforms

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Batch Processing Stack

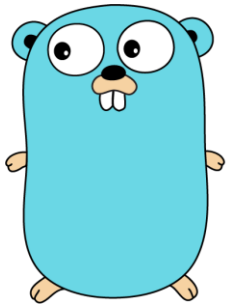
3-5 PB processed daily

~150k batch jobs per day

Real-time Stack

Peak ~200k requests/second

100 - 200 ms latency



Golang

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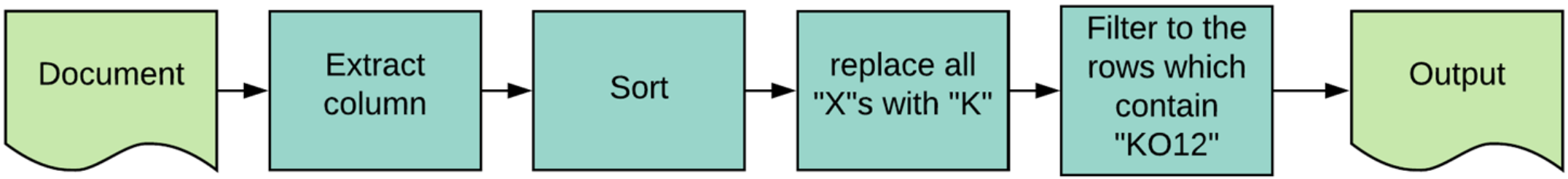
Microservices & large scale batch processing don't, strictly speaking, like each other


Document
Extract column
Sort
replace all "X"s with "K"
Filter to the rows which contain "KO12"
Output

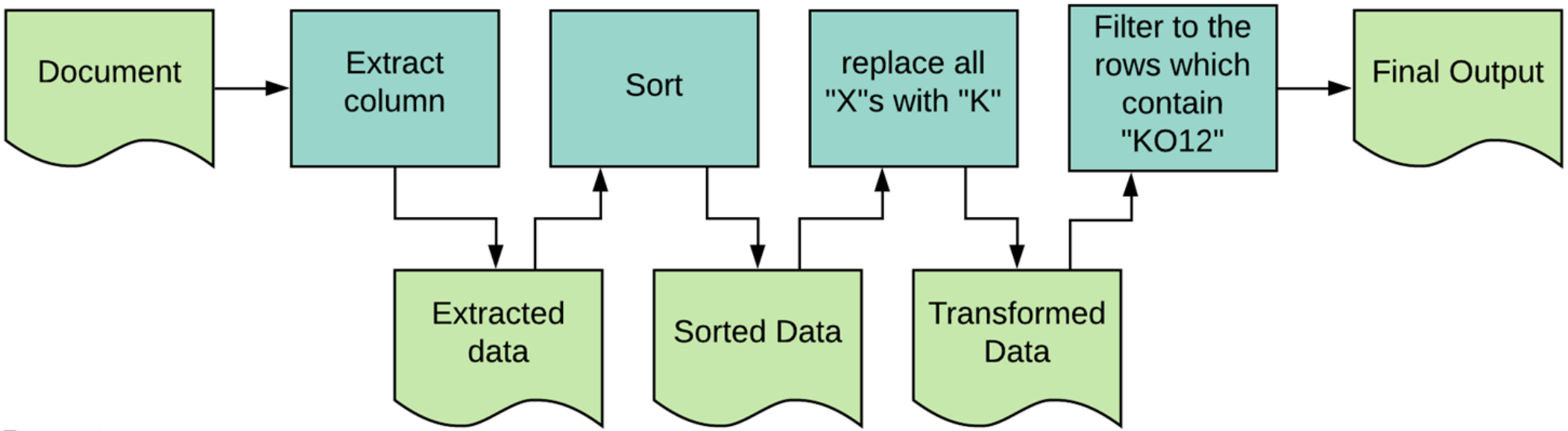
On the commandline

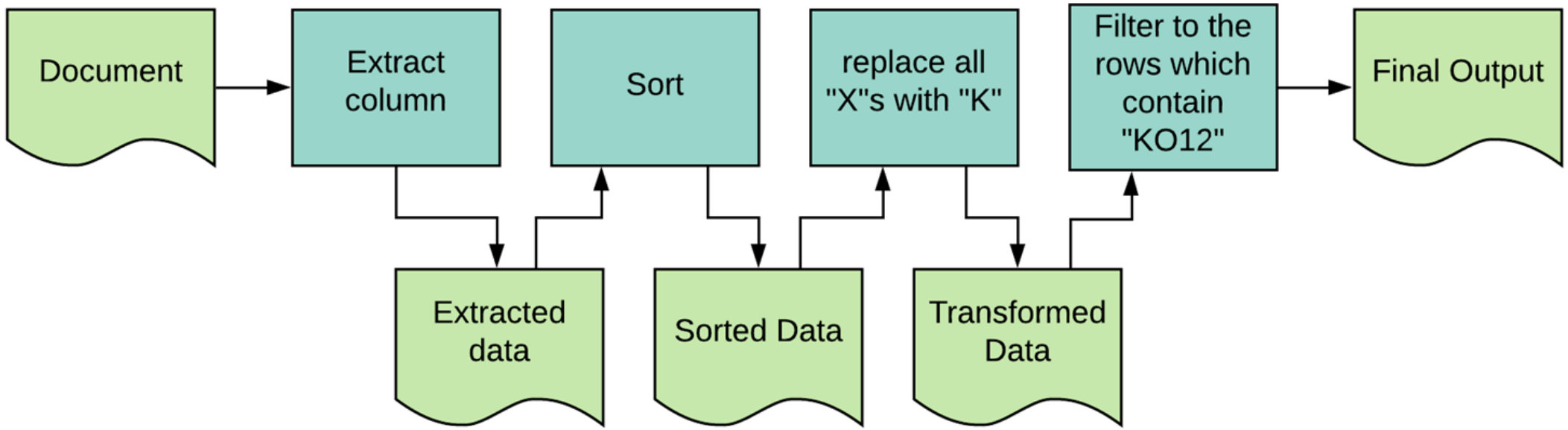
```
cat document.txt | awk '{print $1}' | sort | sed "s/X/E" | grep "KO12" > output.txt
```

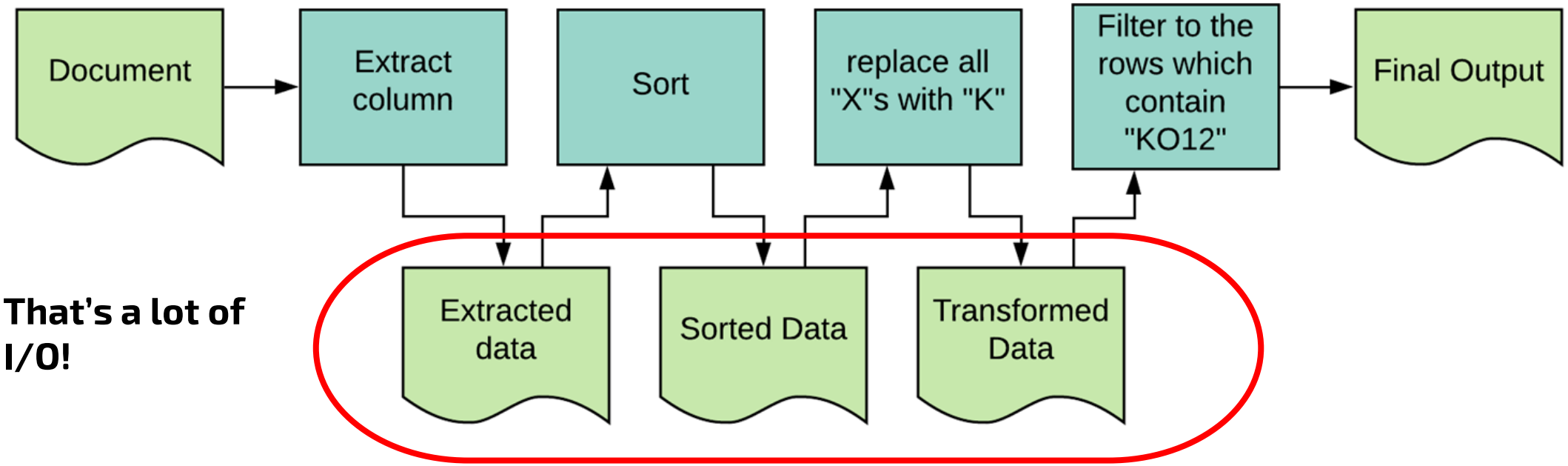
On the commandline

```
cat document.txt | awk '{print $1}' | sort | sed "s/X/E" | grep "KO12" > output.txt
```

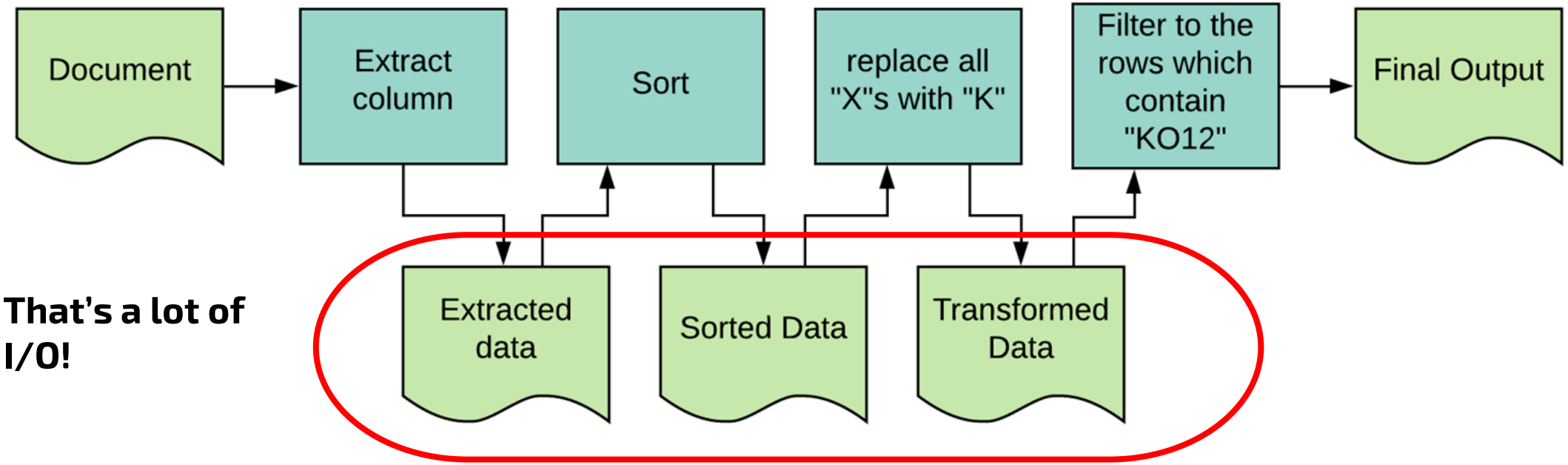
As a batch process




Document
Extract column
Sort
replace all "X"s with "K"
Filter to the rows which contain "KO12"
Final Output
Extracted data
Sorted Data
Transformed Data



That's a lot of I/O!



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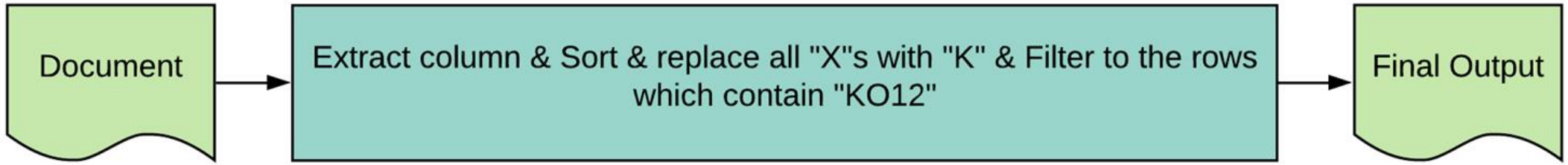
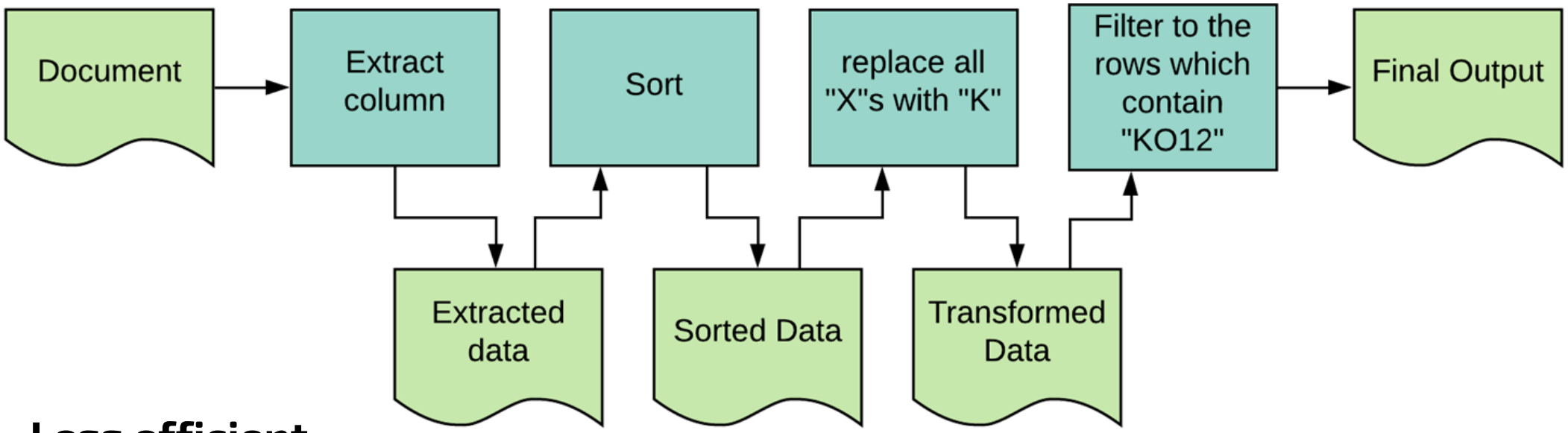
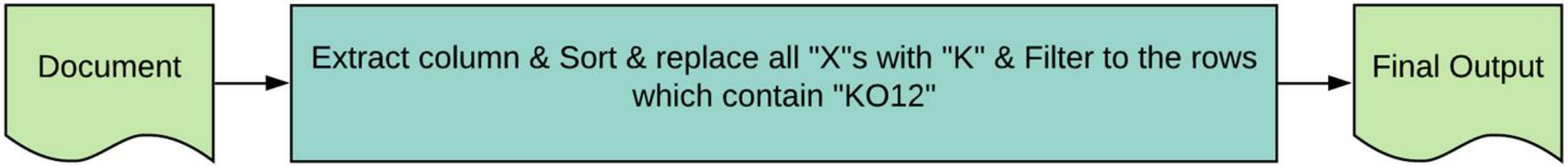




Less efficient
More modular/Microservice-y

More efficient
Less modular/Microservice-y



The Composition Problem

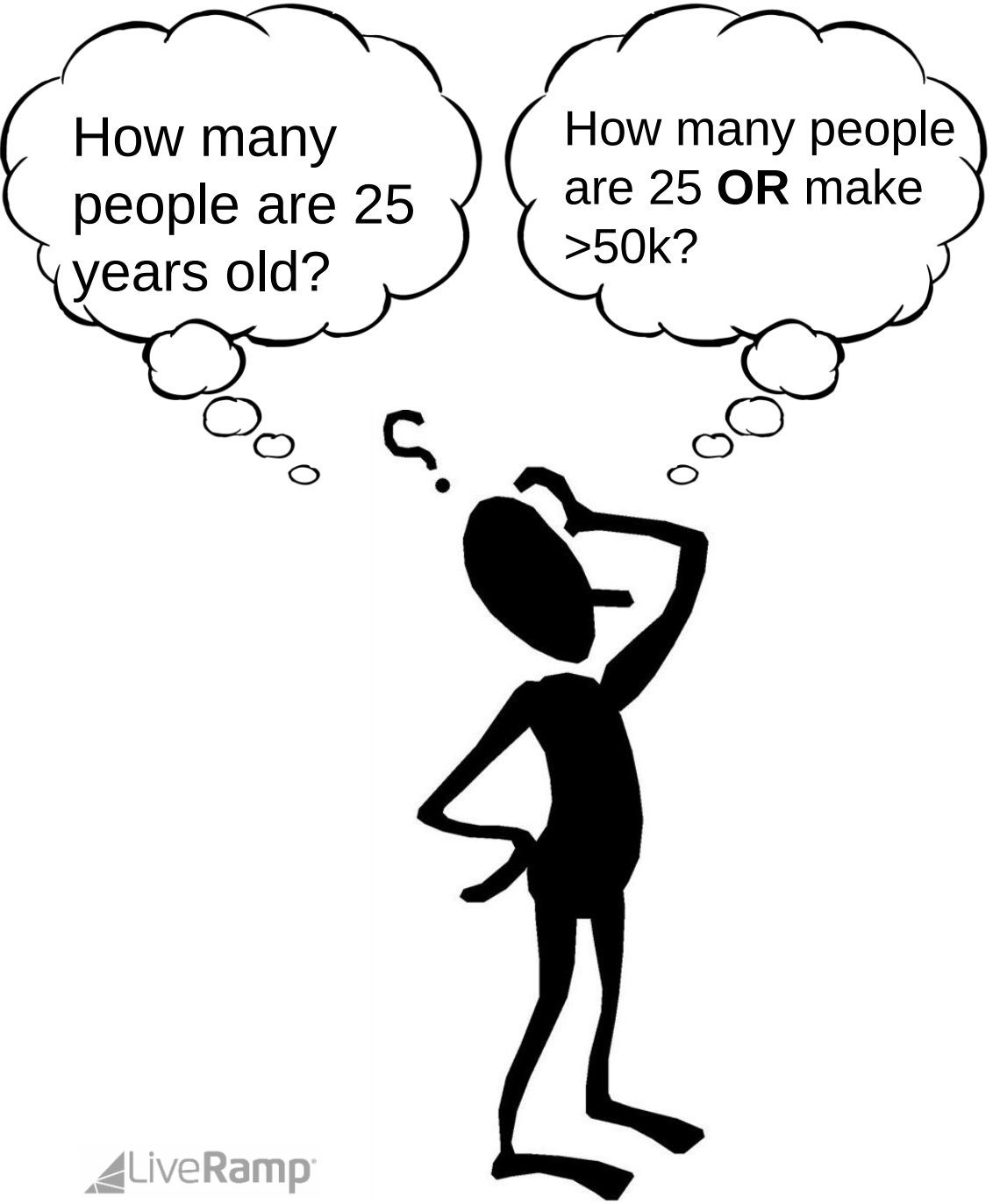
At scale, there is a significant tradeoff between modularity and performance

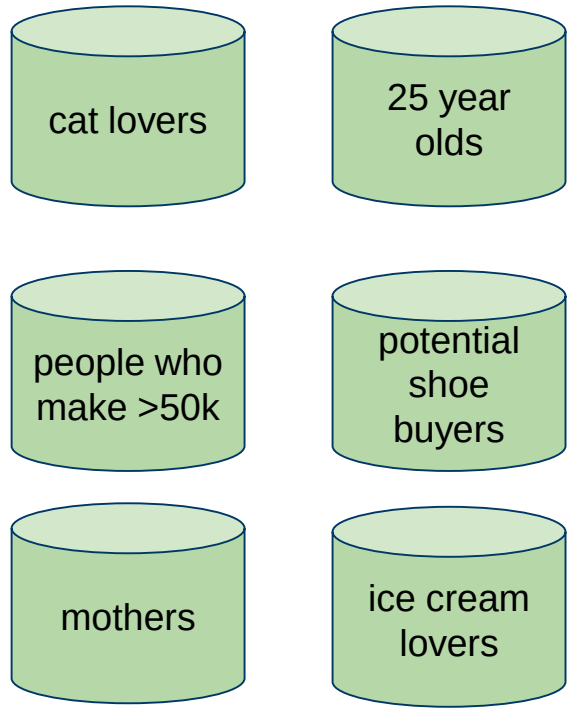
~~The Composition Problem~~

~~At scale, there is a significant tradeoff between modularity and performance~~

Microservices & large scale batch processing don't, strictly speaking, like each other

Real-time interactions over petabytes of data require ingenuity...sometimes even *math*


How many people are 25 years old?
How many people are 25 **OR** make >50k?


cat lovers
25 year olds
people who make >50k
potential shoe buyers
mothers
ice cream lovers

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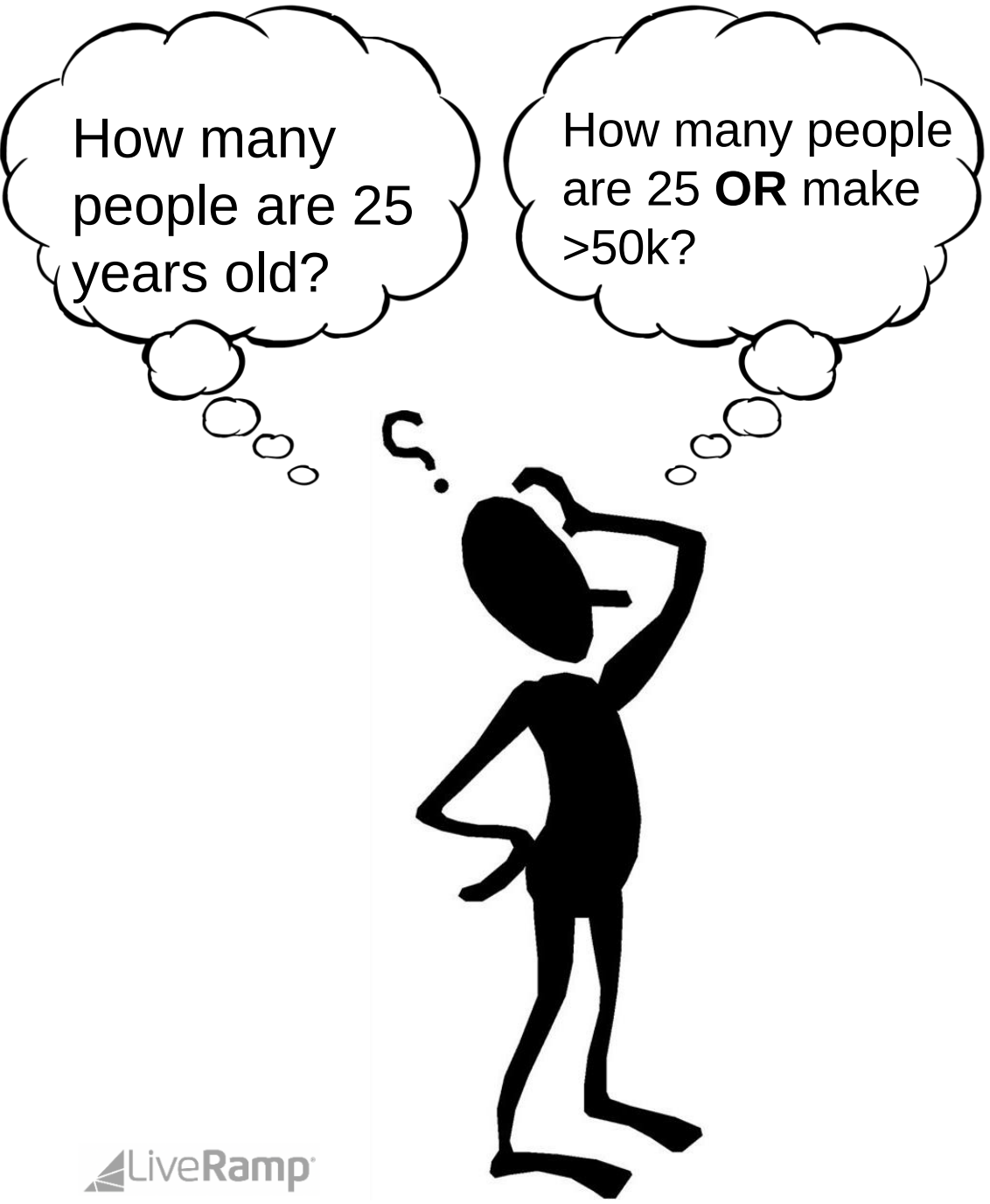
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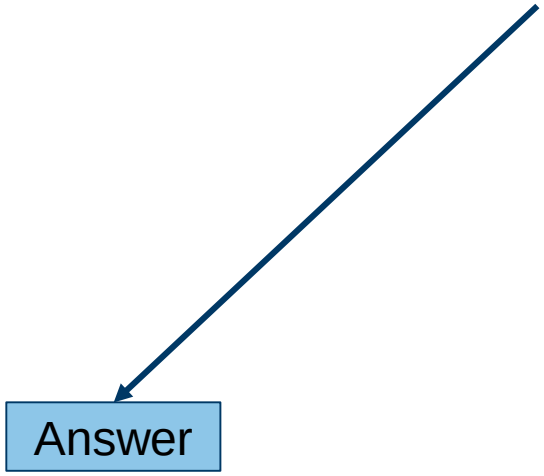
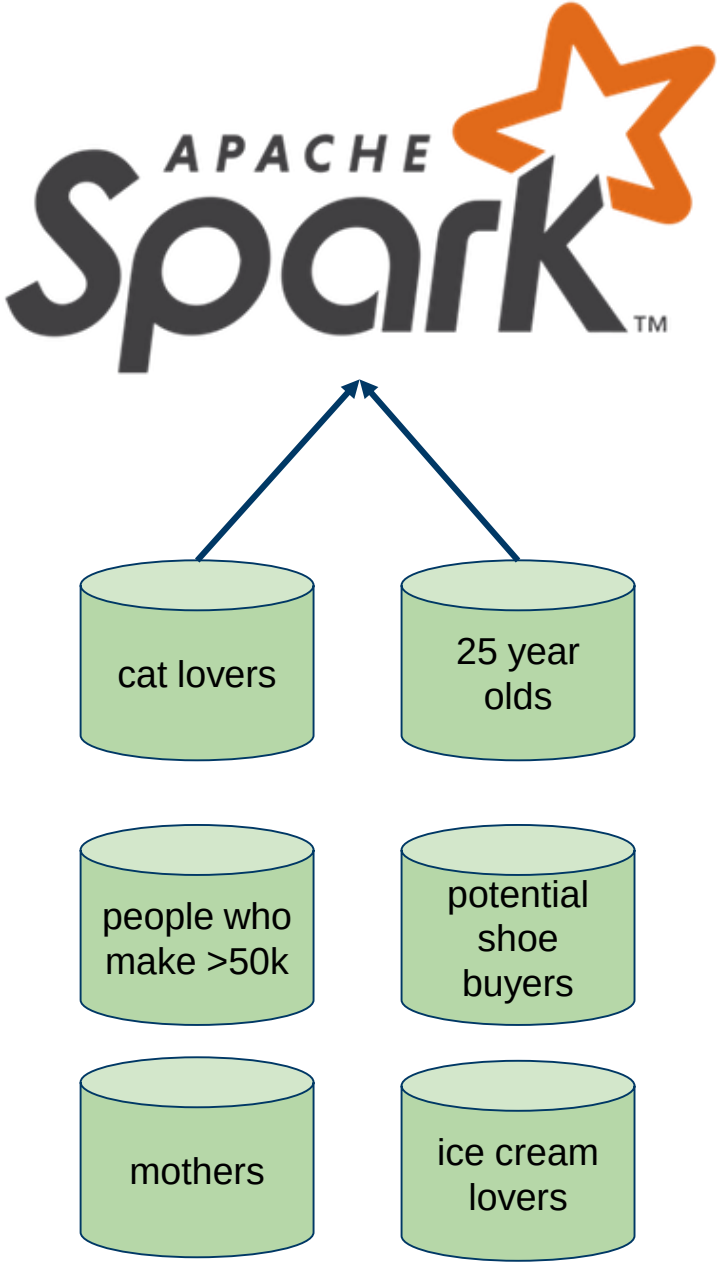
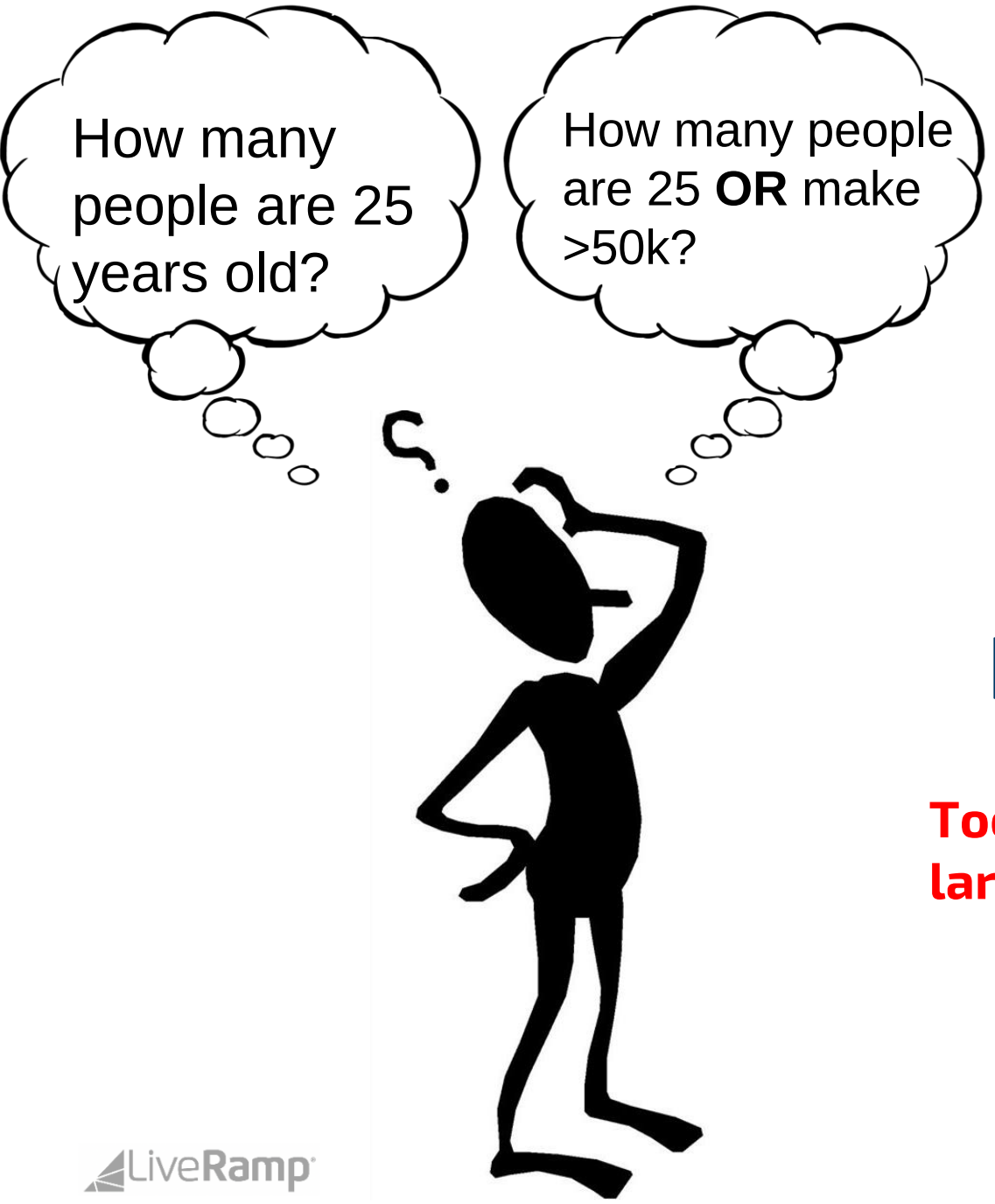
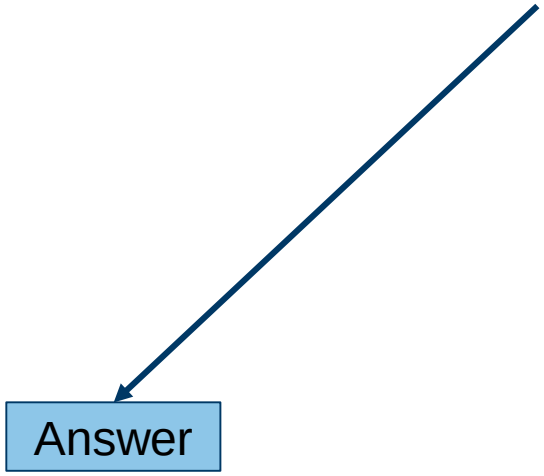
How many people are 25 OR make >50k?


Answer

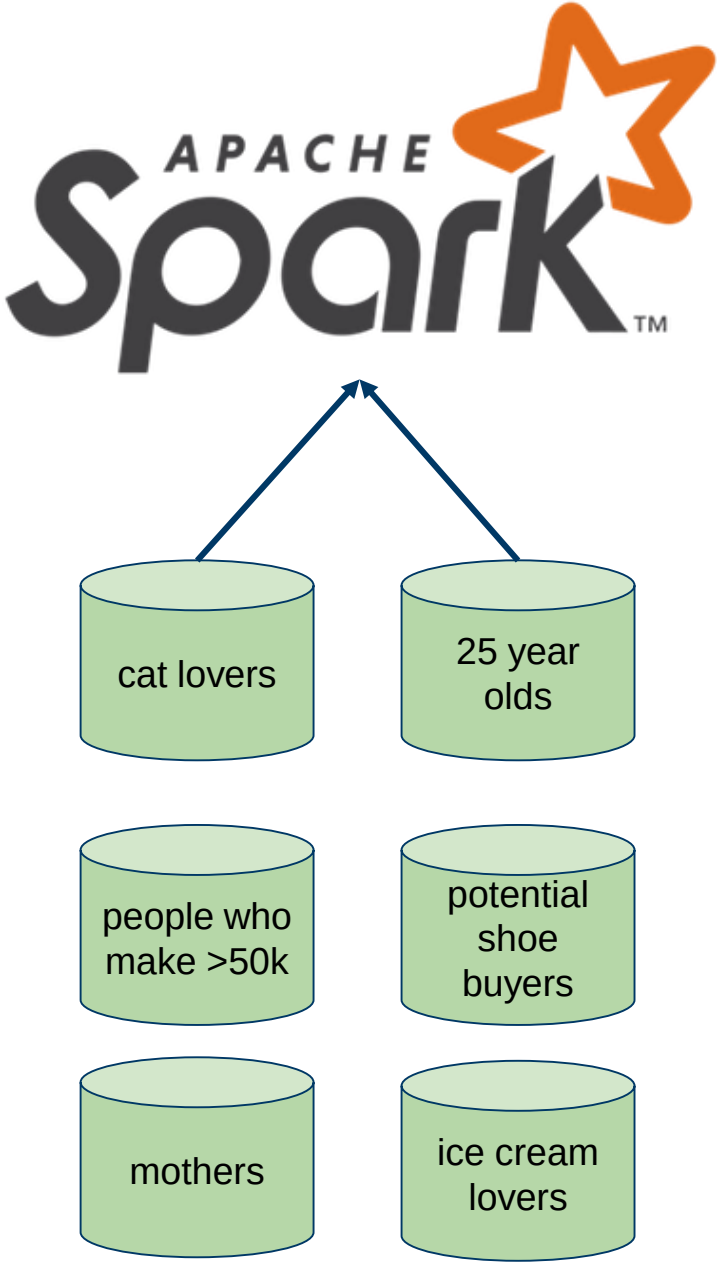

APACHE
Spark
cat lovers
25 year olds
people who make >50k
potential shoe buyers
mothers
ice cream lovers

LiveRamp





Too slow for large datasets!



LiveRamp

Enabling snappy & quick interactions with large datasets

- At scale, interacting with original data is too slow, so we create smaller derived data that is fast to query:
  - Sampling
  - Clever encoding
    - Bitsets
    - Dictionary encoding
  - Probabilistic data structures
    - Bloom filters
    - HyperLogLog, HyperMinHash

Real-time interactions over petabytes of data require ingenuity...sometimes even *math*

Carpool Your Data

space required to transport 60 people

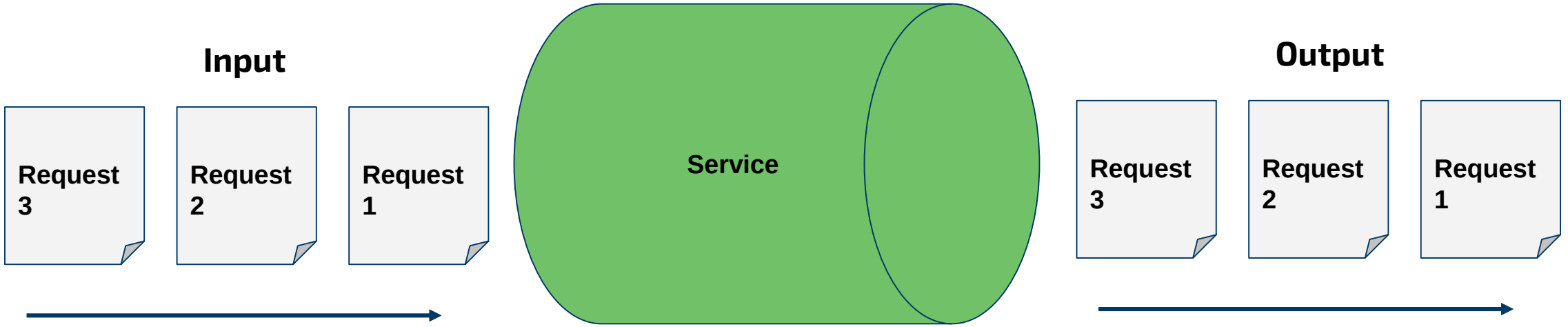
car

bus

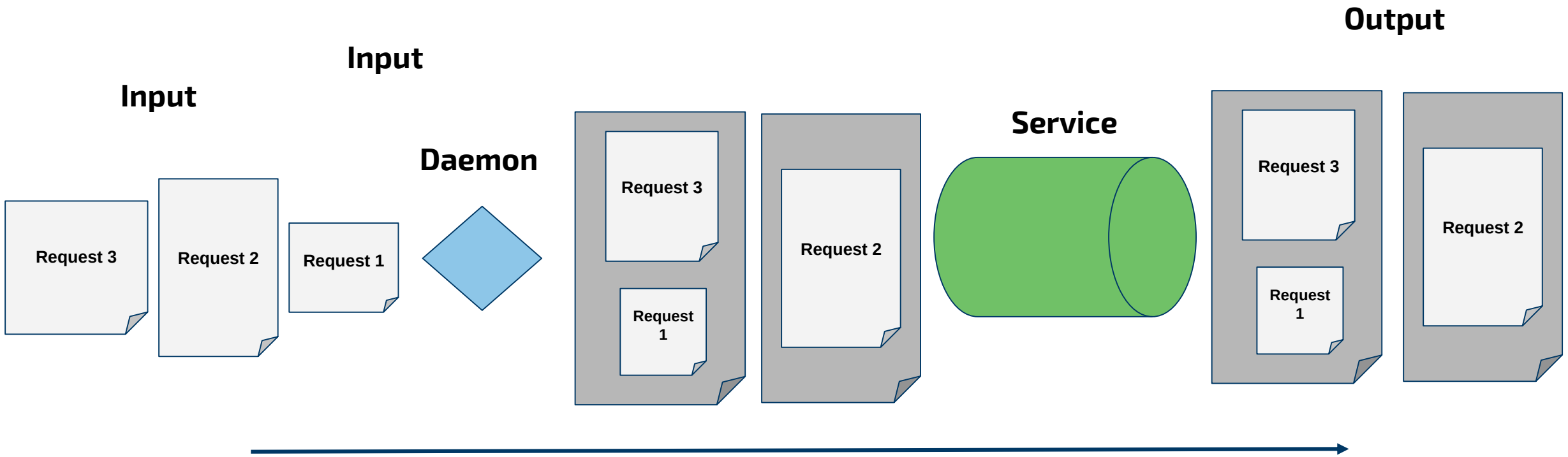
bicycle

(Poster in city of Muenster Planning Office, August 2001) Credit: PressOffice City of Munster, Germany

LiveRamp



Input order is the same as output order
Every Request gets 1 batch job



Input & Output order might differ
Requests get batched to optimize performance

Carpool Your Data

spec:
containers:
- name: hello-world
image: hello-world-a
resources:
limits:
cpu: 2
memory: 4500Mi

```
spec:
  containers:
    - name: hello-world
      image: hello-world-a
      resources:
        limits:
          cpu: 2
          memory: 4500Mi
          networking: 4MB/S
```

Orchestration Frameworks ≠ Intensive Networking

Workaround do exists though they break abstraction layers

Anti-Affinity

Node Sizing

Kernel Tuning

Sharing Bandwidth Is Tough

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Booth #235

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