



Transformasi Digital

Dr. Mardhani Riasetiawan
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Intro

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Head of Computer System & Network Research Labs (skj.mipa.ugm.ac.id)
Lead Researcher in UKARA.AI
Lead Researcher Cloud & Grid Technology – cloud.wg.ugm.ac.id, gamabox.id

Department of Computer Science & Electronics
FMIPA UGM



Founder & CEO
DalaTech, *Strategic Digital Transformation Services*



Co-Founder & CTO
Widya Analytic, www.widya-analytic.com

Digital Transformation (a journey...)

2009 – 2010

PETRONAS

Digital data preservation for long term use and access

2013 – 2015

PERTAMINA (Persero)

Integrated Data Management for Upstream

2017 – 2018

ESDM RI

Integrated Data Management for Na

2018 – 2020

PERTAMINA HULU ENERGI

Corporate Data Management System

Digital Transformation

010110
001101
101010

Data



Cloud



Analytics

Transformasi Digital

Humanless

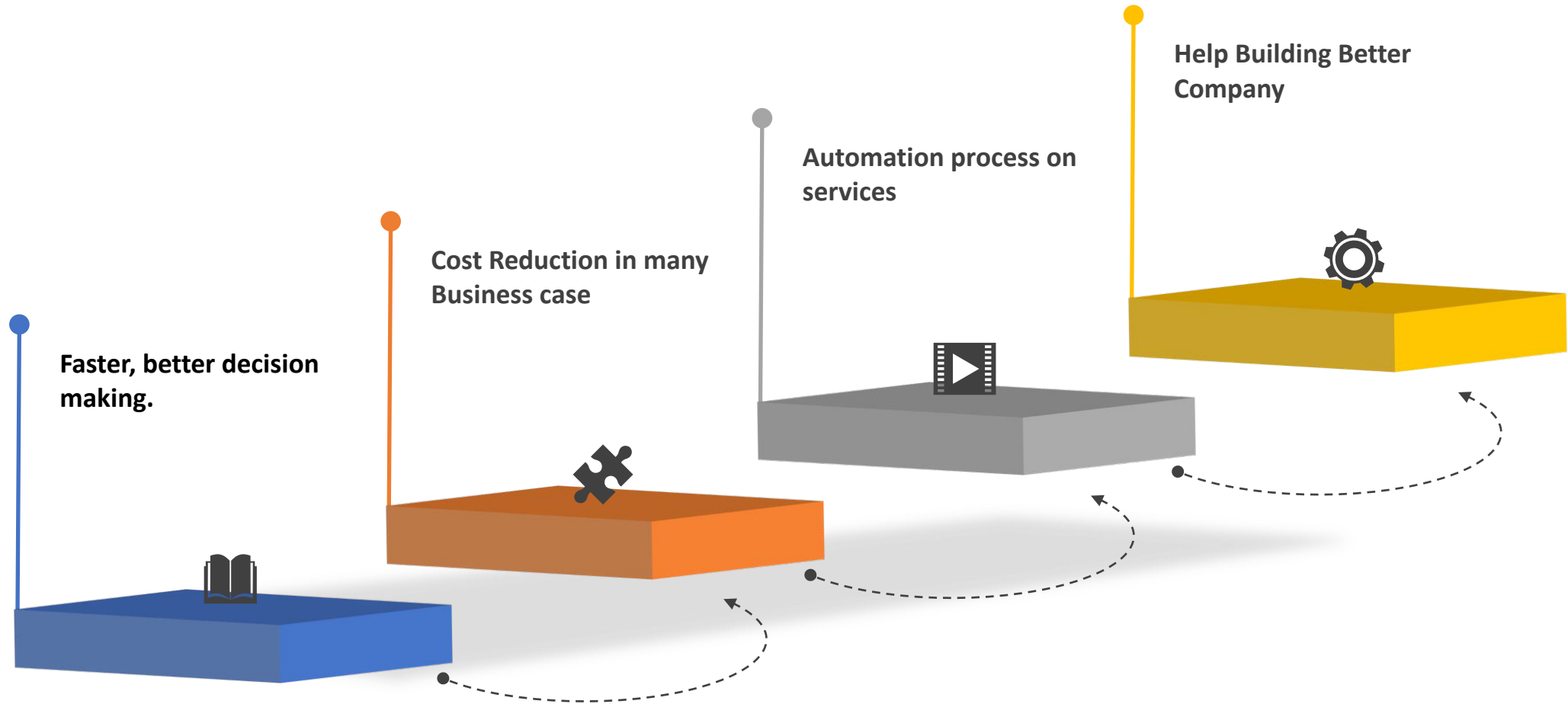
Precise

Fast

Reliable

Manageable

Perspectives



REVOLUSI INDUSTRI 4

Sistem cerdas dan autonomous yang saling terhubung, menyatukan dunia nyata dan virtual

REVOLUSI INDUSTRI 3

Otomasi proses produksi dengan komputer dan Programmable Logic Control

REVOLUSI INDUSTRI 2

Produksi massal dengan lini perakitan dan tenaga listrik

REVOLUSI INDUSTRI 1

Mekanisasi industri menggunakan mesin bertenaga air dan uap

Industri 4.0



Direction

Data Besar

Berorientasi pada kumpulan dengan jumlah baris data dan aggregate **volume** yang besar.

Memerlukan kemampuan komputasi khusus untuk mengolahnnya.

Data Semesta

Berorientasi pada data yang memiliki sumber bervariasi **(Variety)**, berjenis/tipe berlainan **(veracity)**, data mengalir secara terus menerus atau berpaket **(velocity)** dan memiliki nilai khusus **(value)**

Maha Data

Data menjadi andalan tunggal (??)

01

VOLUME

- Kumpulan data yang dijumlahkan jadi besar
- Kumpulan data berukuran besar

02

VARIETY

- Data berbagai jenis tipe dan variasi

03

VERACITY

- Data yang memiliki sifat tertentu (rahasia, dan lainnya)

04

VELOCITY

- Data yang dihasilkan secara real time atau batch

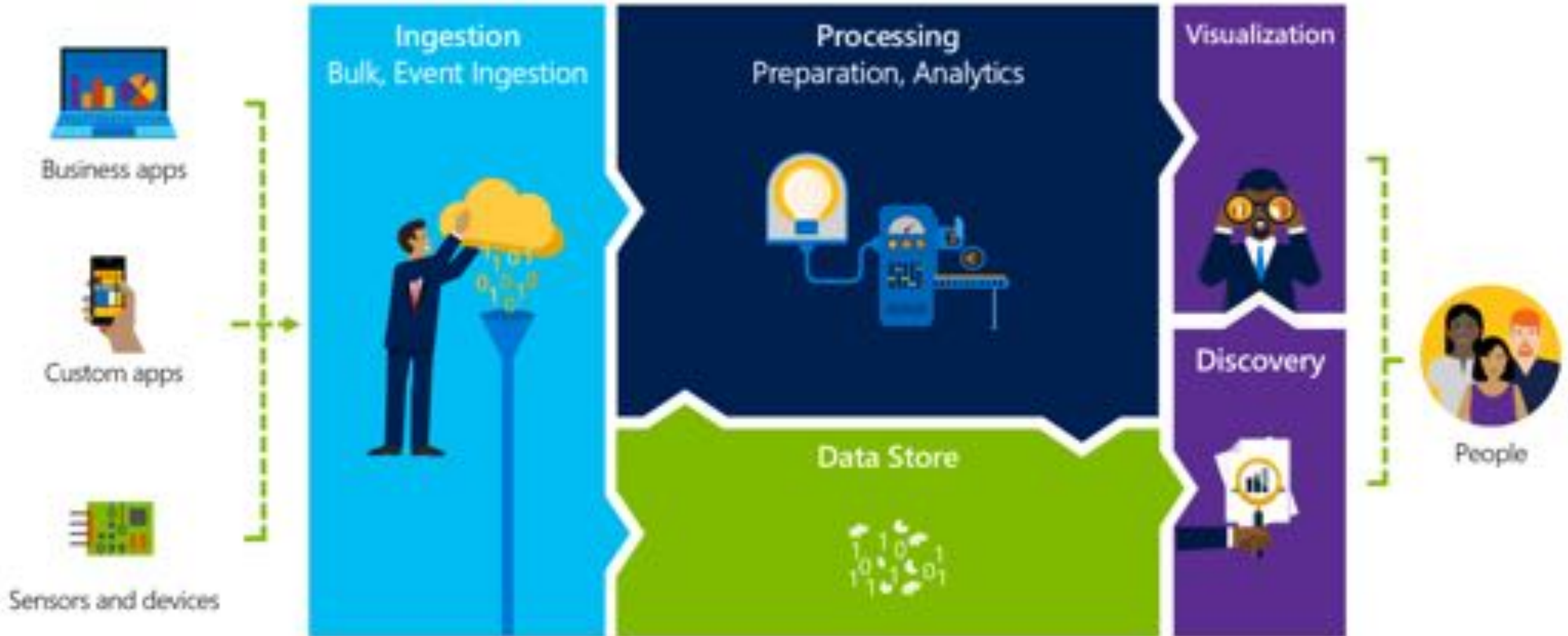
05

VALUE

- Data bernilai di masa depan
- Data yang dapat bertaut satu sama lain











Flow



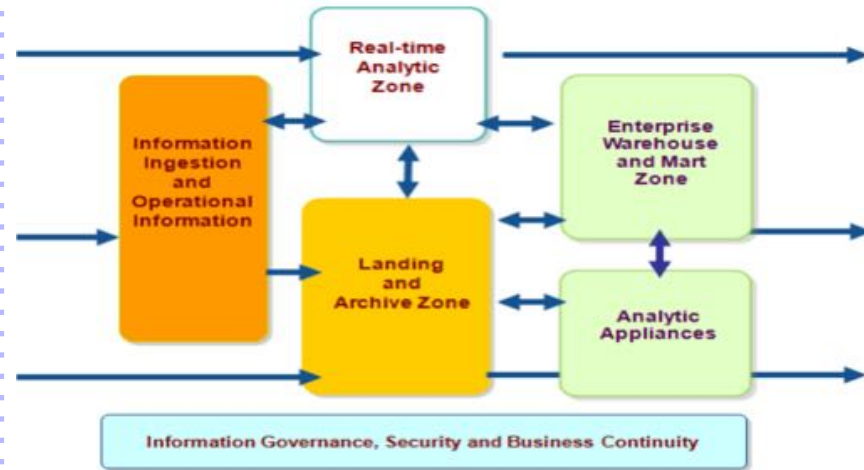
Big Data Process

All Data Sources:
application, share
folder, DB, projects

-  Streaming Data
-  Text Data
-  Applications Data
-  Time Series
-  Geo Spatial
-  Video & Image
-  Relational
-  Social Network

Big Data Platform
Capabilities

- Information Ingest
- Real Time Analytics
- Warehouse & Data Marts
- Analytic Appliances



Advanced
Analytics /
New Insights

- Cognitive**
Learn Dynamically?
- Prescriptive**
Best Outcomes?
- Predictive**
What Could Happen?
- Descriptive**
What Has Happened?
- Exploration and Discovery**
What Do You Have?

New / Enhanced
Applications

- Watson 
- Alerts 
- Automated Process 
- Case Management 
- Analytic Applications 
- Cloud Services 
- ISV Solutions 

services

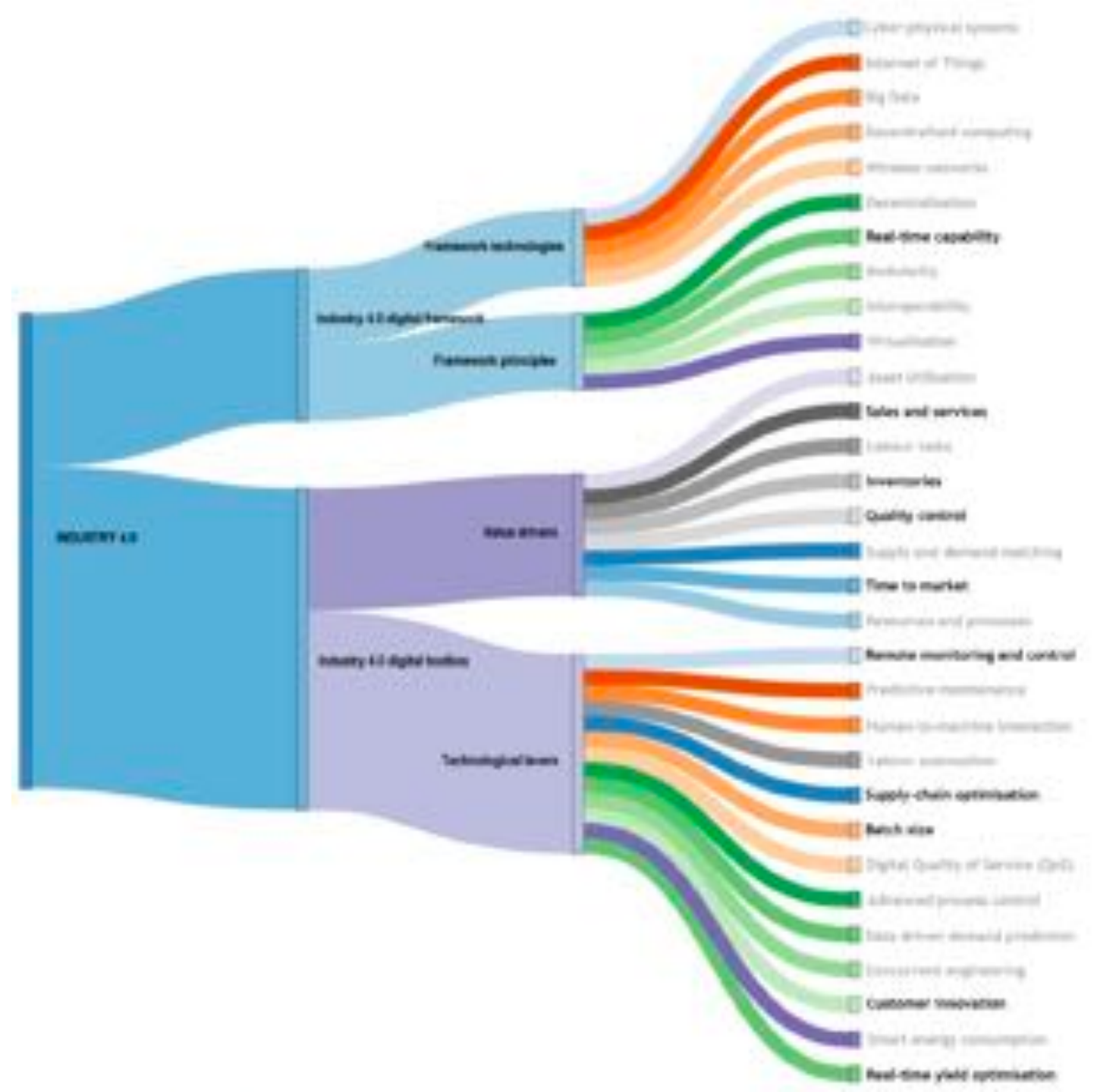
services

services



Quick Win Strategies

RoadMap





Digital Talents

MODERN DATA SCIENTIST

Data Scientist, the sexiest job of 21st century requires a mixture of multidisciplinary skills ranging from intersection of mathematics, statistics, computer science, communication and business. Finding a data scientist is hard. Finding people who understand who a data scientist is, is equally hard. So here is a little cheat sheet on who the modern data scientist really is.

MATH & STATISTICS

- ☆ Machine learning
- ☆ Statistical modeling
- ☆ Experiment design
- ☆ Bayesian inference
- ☆ Supervised learning: decision trees, random forests, logistic regression
- ☆ Unsupervised learning: clustering, dimensionality reduction
- ☆ Optimization: gradient descent and variants



PROGRAMMING & DATABASE

- ☆ Computer science fundamentals
- ☆ Scripting language e.g. Python
- ☆ Statistical computing package e.g. R
- ☆ Databases: SQL and NoSQL
- ☆ Relational algebra
- ☆ Parallel databases and parallel processing
- ☆ MapReduce concepts
- ☆ Hadoop and Hive/Pig
- ☆ Custom reducers
- ☆ Experience with xaaS like AWS

DOMAIN KNOWLEDGE & SOFT SKILLS

- ☆ Passionate about the business
- ☆ Curious about data
- ☆ Influence without authority
- ☆ Hacker mindset
- ☆ Problem solver
- ☆ Strategic, proactive, creative, innovative and collaborative

COMMUNICATION & VISUALIZATION

- ☆ Able to engage with senior management
- ☆ Story telling skills
- ☆ Translate data-driven insights in decisions and actions
- ☆ Visual art design
- ☆ R packages like ggplot or lattice
- ☆ Knowledge of any of visualization tools e.g. Flare, D3.js, Tableau

MarketingDistillery.com is a group of practitioners in the area of e-commerce marketing. Our fields of expertise include marketing strategy and optimization, customer tracking and on-site analytics, predictive analytics and econometrics, data warehousing and big data systems, marketing channel insights in Paid Search, SEO, Social, CRM and brand.



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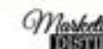
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Strategy & culture - If strategy and culture aren't right, it leads to digitisation of services

Process & innovation - without these, incoherent action occurs.

Technology - rarely the differentiator technology does enable Digital Transformation and it is therefore vital that the right technology is embraced.



Staff & customer engagement - If engagement with stakeholders is wrong, it leads to resistance

=
**DIGITAL
TRANSFORMATION**

Data & analytics - used for insights and evidence based decision making, without it there is simply stagnation

Trivia

Visualize
Problems

“Patern”
Problems

“Linked”
Problems

Deep Problems



Event, Activities,
Projects

Development &
ecosystem

Talents

Human Resources

- ❑ Workers
- ❑ Do it

Human Assets

- ❑ Brain - idea
- ❑ Collectivity
- ❑ Integrity
- ❑ growth



Human Capital

- ❑ Essential component of company
- ❑ Capital = assets



Problems

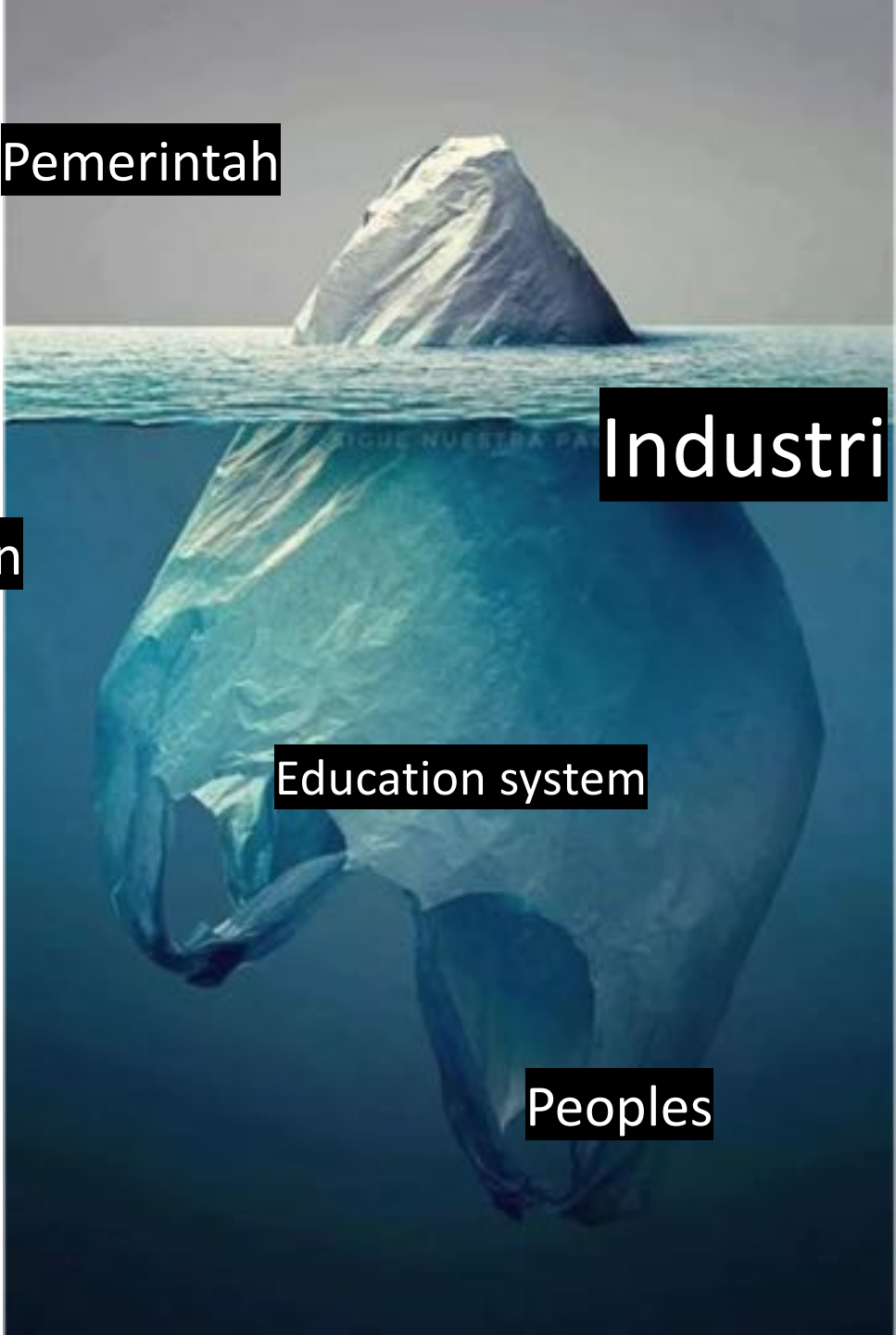
Pemerintah

Industri

Perusahaan Rintisan

Education system

Peoples



Problem landscape

Government

- ❑ Roles
- ❑ Ecosystem → mostly on system
- ❑ Protection (BPJS, Tenaga Kerja, etc)
- ❑ Promoting
- ❑ Unsufficient cordination on program (Ministry, units, etc)
 - ❑ Kominfo Digital Talents
 - ❑ Kemendag
 - ❑ others...

Industry

- ❑ Industrial selfish
- ❑ High expectation on education system
- ❑ Close source
- ❑ Less approach
- ❑ Industrial standard pressure

Problem landscape

Start Up

- ❑ High dream
- ❑ Disruptive for business but not for talents
- ❑ Less salary high skills
- ❑ Less development
- ❑ Very customise environment

Education

- ❑ Formal orientation
- ❑ Tight curriculum
- ❑ Un-upgraded lecturer
- ❑ Un-updated materials
- ❑ Close with science, far from riel need

Problem landscape

Talents

- ❑ Individual
- ❑ Superhero thinks
- ❑ Less learning paths
- ❑ Instants
- ❑ Applied orientation, very low in basics
- ❑ Less softskill

#3 Kebutuhan Industri

- Predictive maintenance or condition monitoring
- Warranty reserve estimation
- Propensity to buy
- Demand forecasting
- Process optimization
- Telematics

Manufacturing



- Predictive inventory planning
- Recommendation engines
- Upsell and cross-channel marketing
- Market segmentation and targeting
- Customer ROI and lifetime value

Retail



- Alerts and diagnostics from real-time patient data
- Disease identification and risk stratification
- Patient triage optimization
- Proactive health management
- Healthcare provider sentiment analysis

Healthcare and Life Sciences



- Aircraft scheduling
- Dynamic pricing
- Social media – consumer feedback and interaction analysis
- Customer complaint resolution
- Traffic patterns and congestion management

Travel and Hospitality



- Risk analytics and regulation
- Customer Segmentation
- Cross-selling and up-selling
- Sales and marketing campaign management
- Credit worthiness evaluation

Financial Services



- Power usage analytics
- Seismic data processing
- Carbon emissions and trading
- Customer-specific pricing
- Smart grid management
- Energy demand and supply optimization

Energy, Feedstock, and Utilities



Multidisciplinary Research

(Computer Science + Human Engineering + Cognitive Science + Psychology)

Information Visualization

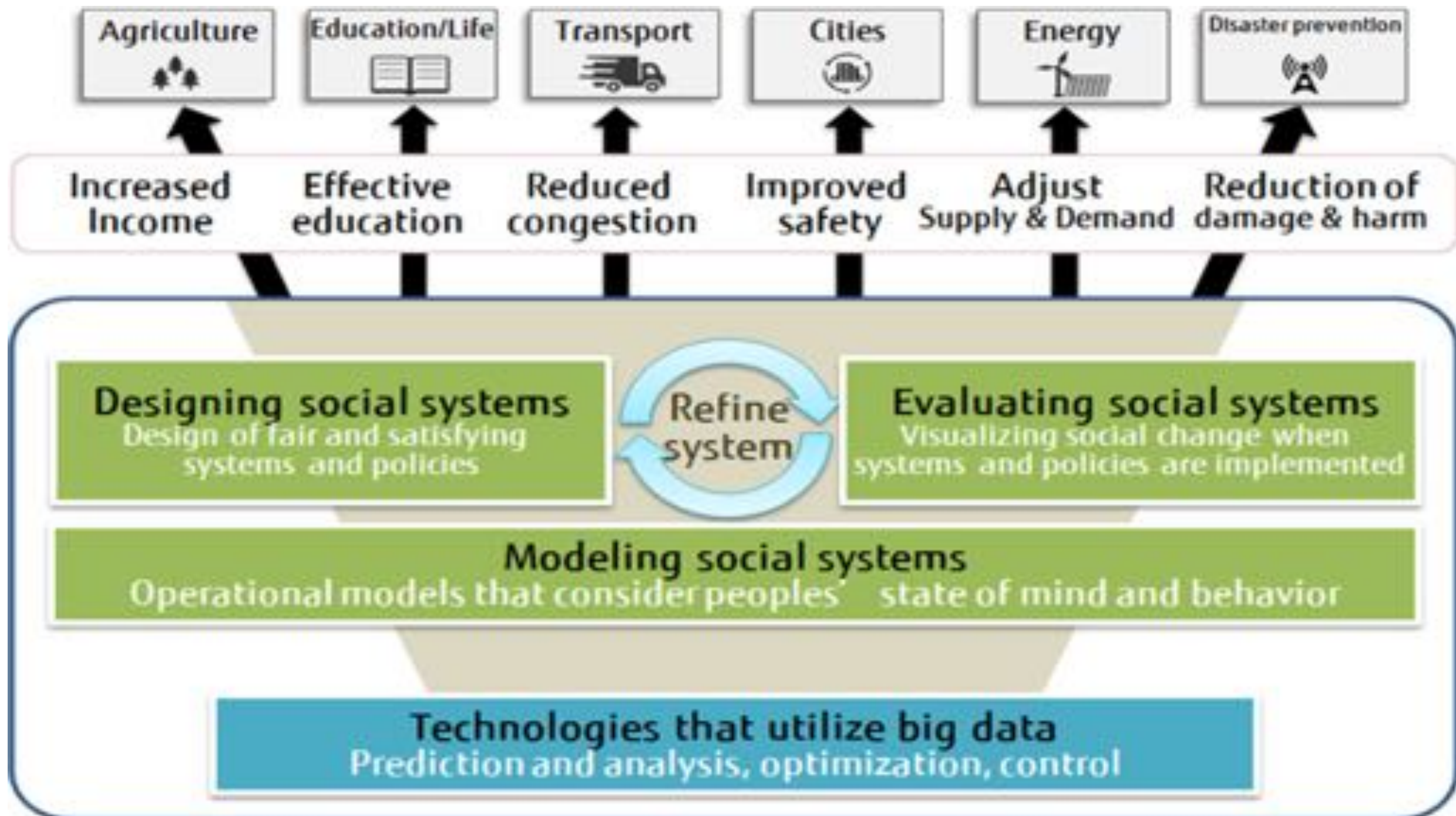
- Visual Representation
- Recordkeeping, Sensemaking, and Storytelling
- Collaboration Support
- Data Labeling, Editing, and Annotation
- Design Study
- Exploration Method in VR/AR

Visual Big Data Analysis

- Precision Medicine
- Personal(Mobile) Data
- Bio Informatics
- Transportation
- Disaster/Safety
- Smart City
- Crime

Human-Centered

- Cognition and Perception
- Task and Requirements Analysis
- Qualitative and Quantitative Evaluation
- Novel Evaluation Methods
- Insight Provenance



Agriculture



Education/Life



Transport



Cities



Energy



Disaster prevention



Increased
Income

Effective
education

Reduced
congestion

Improved
safety

Adjust
Supply & Demand

Reduction of
damage & harm

Designing social systems
Design of fair and satisfying
systems and policies

Refine
system

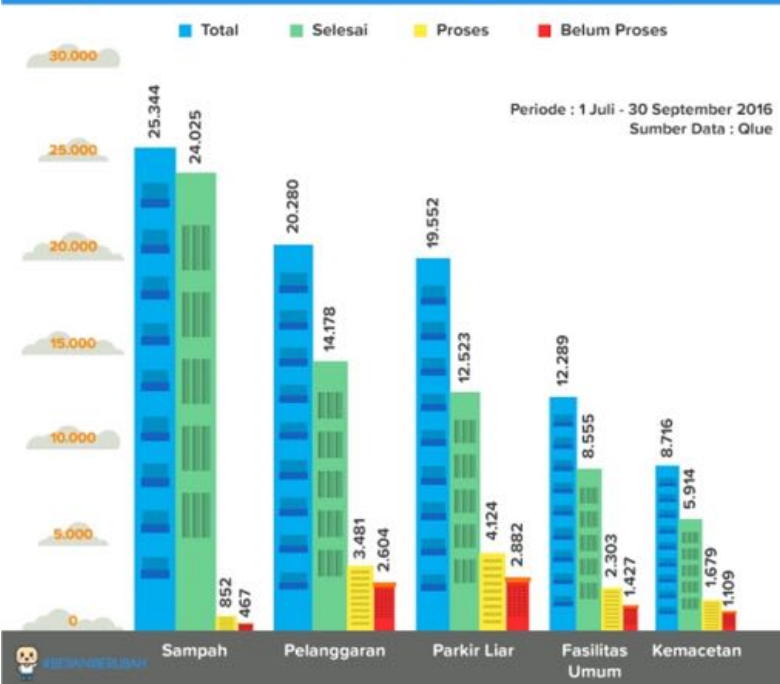
Evaluating social systems
Visualizing social change when
systems and policies are implemented

Modeling social systems
Operational models that consider peoples' state of mind and behavior

Technologies that utilize big data
Prediction and analysis, optimization, control

#4 Studi Kasus

qlue Jumlah Laporan Per Kategori Qlue



"Reports from the field will be dispatched to nearby officers and accepted on dashboard"

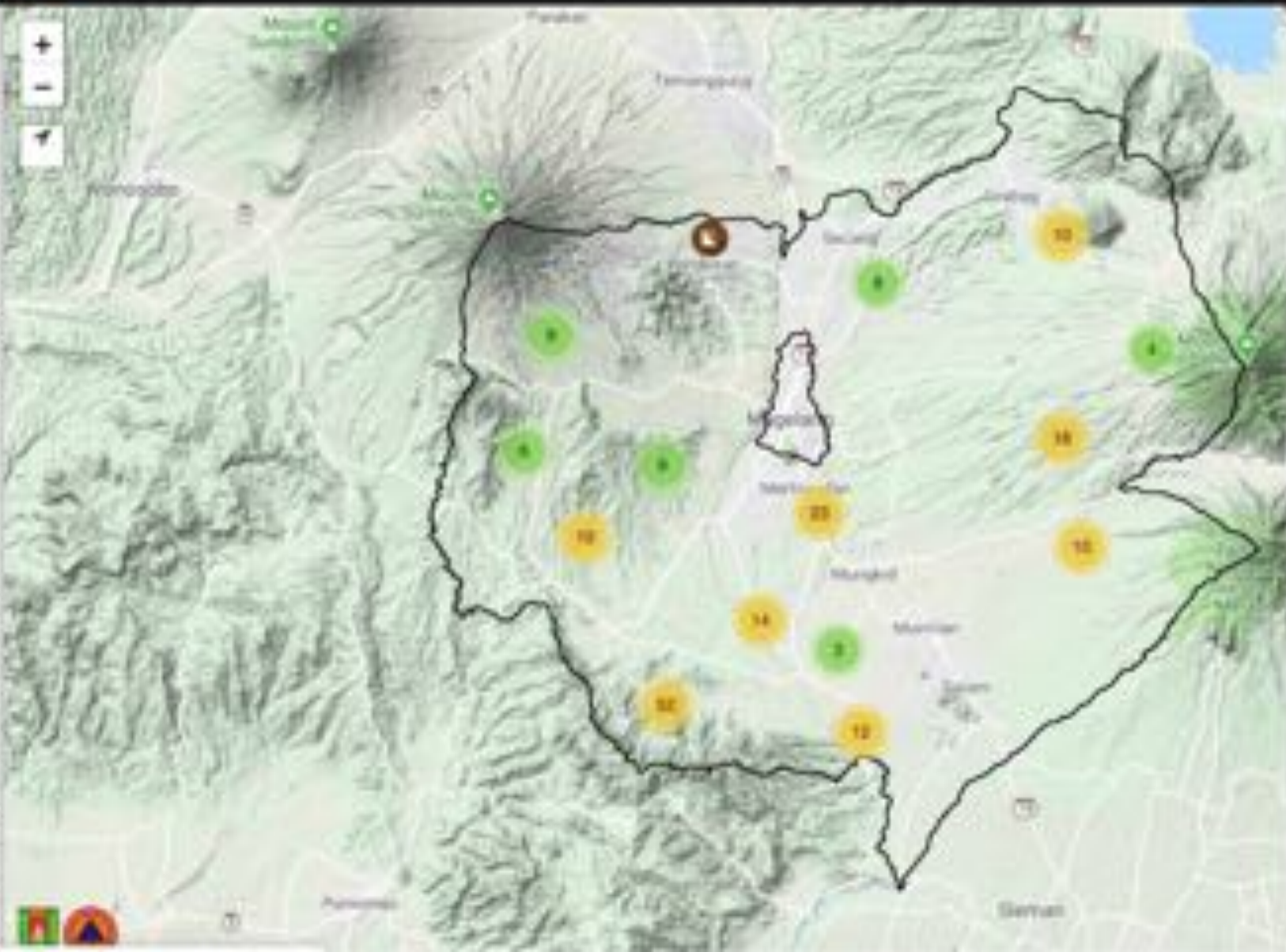
"Dashboard will create comprehensive analysis, our AI also have the ability to provide resource allocation to detect issues"

Pantauan Bencana

Kejadian Bencana

Filter Sort

2019-04-16	>
2019-04-15	>
2019-04-11	>
2019-04-11	>
2019-04-11	>
2019-04-11	>
2019-04-11	>
2019-04-11	>
2019-04-11	>
2019-04-11	>
2019-04-11	>
2019-04-11	>
2019-04-10	>
2019-04-06	>
2019-04-06	>
2019-04-06	>



- Basemap**
 - Google Streets
 - OpenStreetMap
 - Google Satellite
 - Google Hybrid
 - Google Terrain
- Kejadian Bencana**
 - Longsor
 - Banir
 - Banir Lahar
 - Gempabumi
 - Cuaca Ekstrem
 - Kebakaran Hutan/Lahan
 - Kebakaran Gedung/Perumahan
 - Kecelakaan
 - Letusan Gunungapi
 - Kejadian lain
- Layer**
 - Data Kabupaten
 - Batas Desa
 - Perbukit Kecamatan
 - Desa Tangguh Bencana
 - Laju Lintas (Traffic)
 - IVD
 - Hunian Tetap
- Peta Bahaya**
 - Bahaya Banir
 - Bahaya Banir Bandang
 - Bahaya Cuaca Ekstrem
 - Bahaya Gempabumi

London

51.51 N, 0.13 W

Wed 24 Apr @ 21:29:08

[Go to Map](#) - [Go to Grid](#) - [Change City](#)

Weather Station (CASA Team)



Weather (METAR)



London City

Calm 0 C

Traffic Cameras (TrL)



Stoke Newington Rd/Evering Rd



Tube Line Status (TrL)



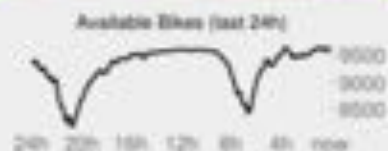
Bakerloo	Good Service
Central	Good Service
Circle	Good Service
District	Good Service
H&C	Good Service
Jubilee	Good Service
Metropolitan	Good Service
Northern	Good Service
Piccadilly	Good Service
Victoria	Good Service
W&C	Good Service
Overground	Good Service
TfL Rail	Good Service
DLR	Good Service
Trams	Good Service

LONDON CYCLE Hire (TrL)



4.3 % Stations Full 4.5 % Stations Empty

9611 Bikes Available 332 Bikes or Dock(s) Faulty



In Service (TrL)



7181 London Buses

377 Underground Trains

Air Pollution (DEFRA)



$\mu\text{g}/\text{m}^3$ 24h avg	Ozone	NO ₂	SO ₂	PM _{2.5}	PM ₁₀
Bloomsbury					
Marylebone Rd					
N Kensington					

Bicycles (LBH)



Goldsmiths' Row

4321

yesterday

Stocks (YAHOO)



FTSE 100 Index
(0%)

Traffic Cameras (Two at Random) (TrL)



Holloway Rd/Nth Rupert Rd



A20 Lee High Rd/Lampstead Rd



BBC London News (BBC)



Harlesden murder: Man dies after high street stabbing · How virtual reality may help Grenfell survivors 'let go of emotions' · Cyclist's appeal after thief thwarts sixth round-the-world attempt

OpenStreetMap Updates (OSM)



#livingmap-waltham-0319 · New cycleway (mostly from imagery, needs survey) · #livingmap-waltham-0319 · Added more details (various) · Deleted "Post Office" (file double) · corrected postcode in Barking



102 Mio Transaction 24% of national e-Money Transaction Share
820 Payment Device Terminals Rp. 343 M Payment Settlement



Time Series Comparison



Audit Trail Development



Origin-Destination



Sentimen Analytic, NLP



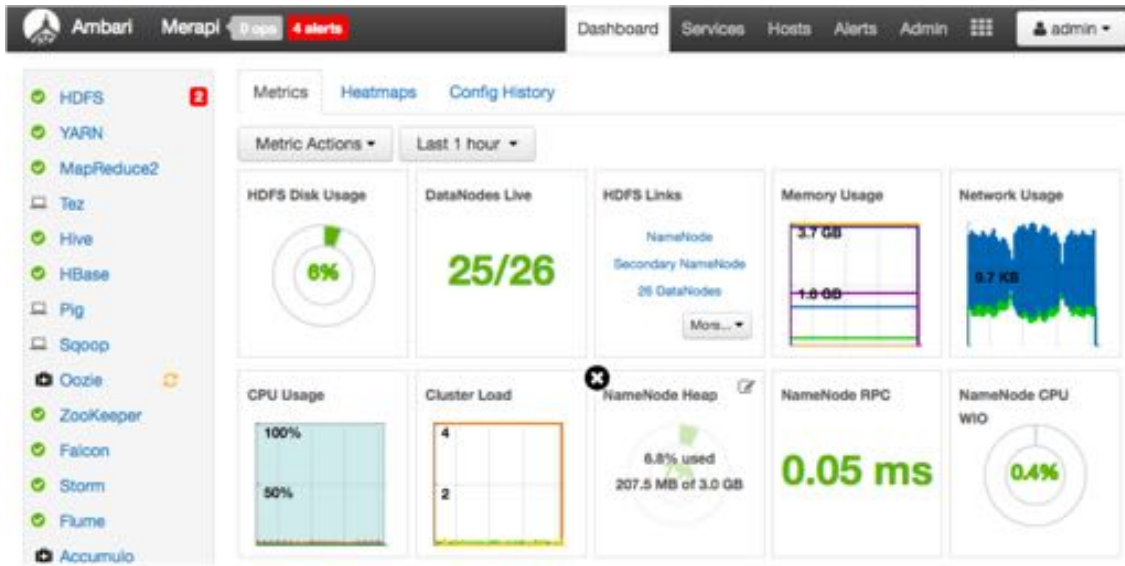
DB Size 470 GB

DB Size +14G /month

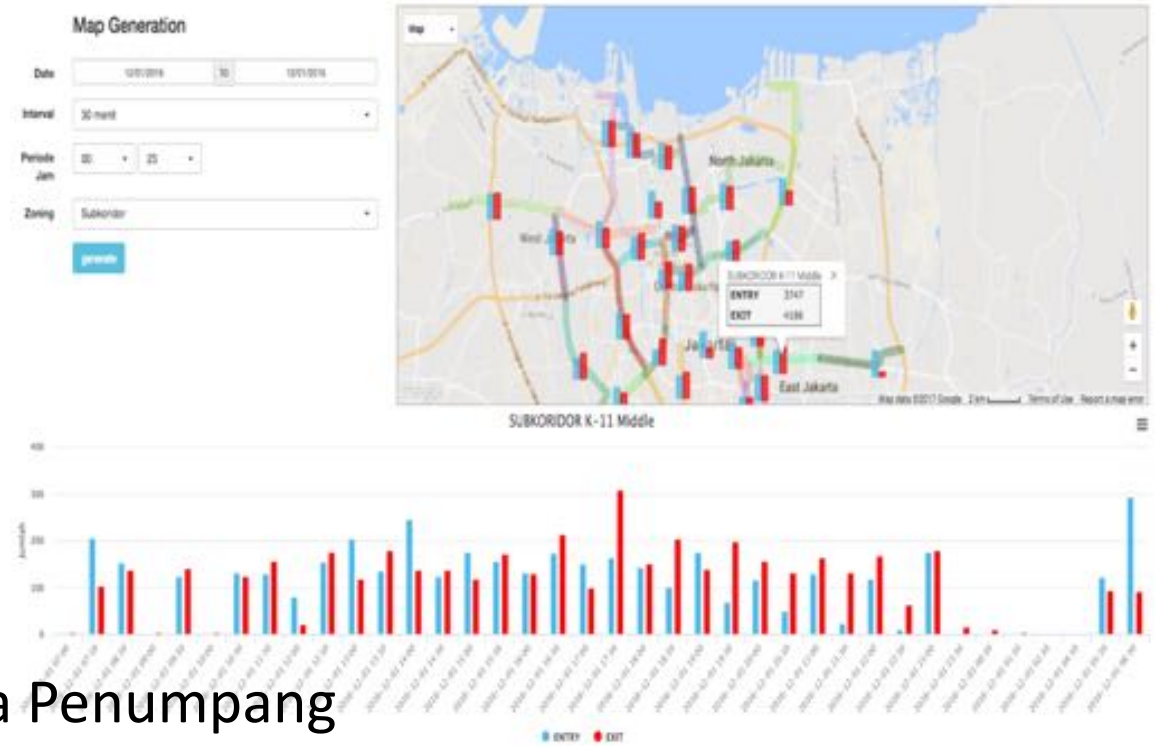
Avg 287K trx/day

TransJakarta

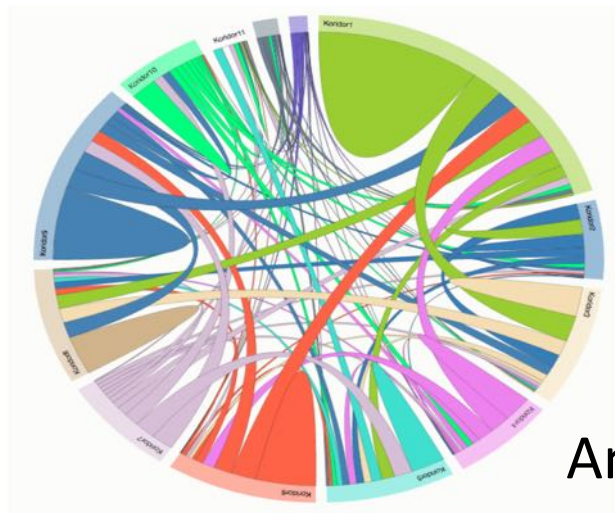




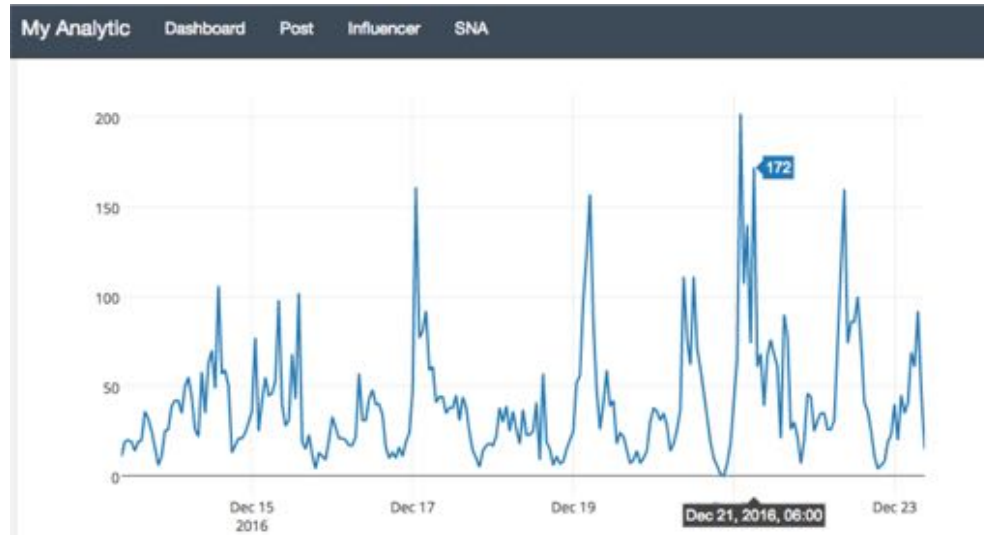
Big data 25 server cluster



Peta & Pola Penumpang



Analisis O-D



Social Media Dashboard

[Analytical] & [CREATIVE]



WE ARE HIRING



FINANCE

■ KUALIFIKASI

- D3/S1 Akuntansi/Manajemen/Ekonomi
- Mengetahui dan mampu menyusun laporan keuangan
- Memahami sistem akuntansi
- Jujur, teliti dan bertanggung jawab
- Mampu bekerja dalam tim
- Mau ditempatkan di Yogyakarta

■ JOB DESC

- Input daily transaction
- Membuat laporan keuangan bulanan dan tahunan
- Membuat dan mengelola kebutuhan operasional perusahaan

BUSINESS DEV.

■ KUALIFIKASI

- Minimal D3 semua jurusan
- Usia max. 28 tahun
- Min. 1 tahun berpengalaman dalam marketing sales B2B dan B2C
- Jujur, teliti dan bertanggung jawab
- Bersedia ditempatkan di Yogyakarta
- Bersedia ditugaskan ke luar kota

■ JOB DESC

- Melakukan riset pasar
- Presentasi produk kepada klien
- Berpartisipasi dalam expo
- Melakukan deal hingga closing dengan client

INFO



Kirimkan CV dan portofolio kalian ke hr@widya-analytic.com dengan subject : posisi - nama lengkap

WIDYA ANALYTIC

Pogung Baru CF, Jln. Pogung Kidul, Mat. Sleman, Yogyakarta

PERIODE
PENDAFTARAN
hingga

6 MARET
2020

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