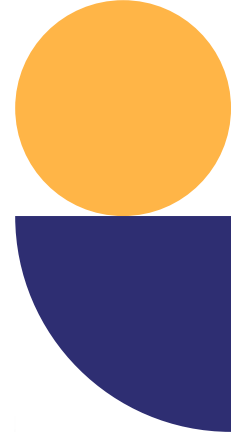


Business Intelligence untuk mendukung Pengambilan Keputusan dari Data Kependudukan



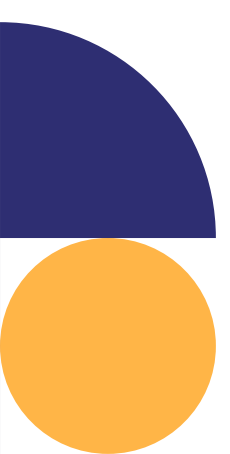


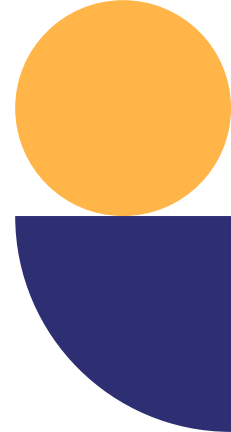
IBNU HABIBIE

Education:

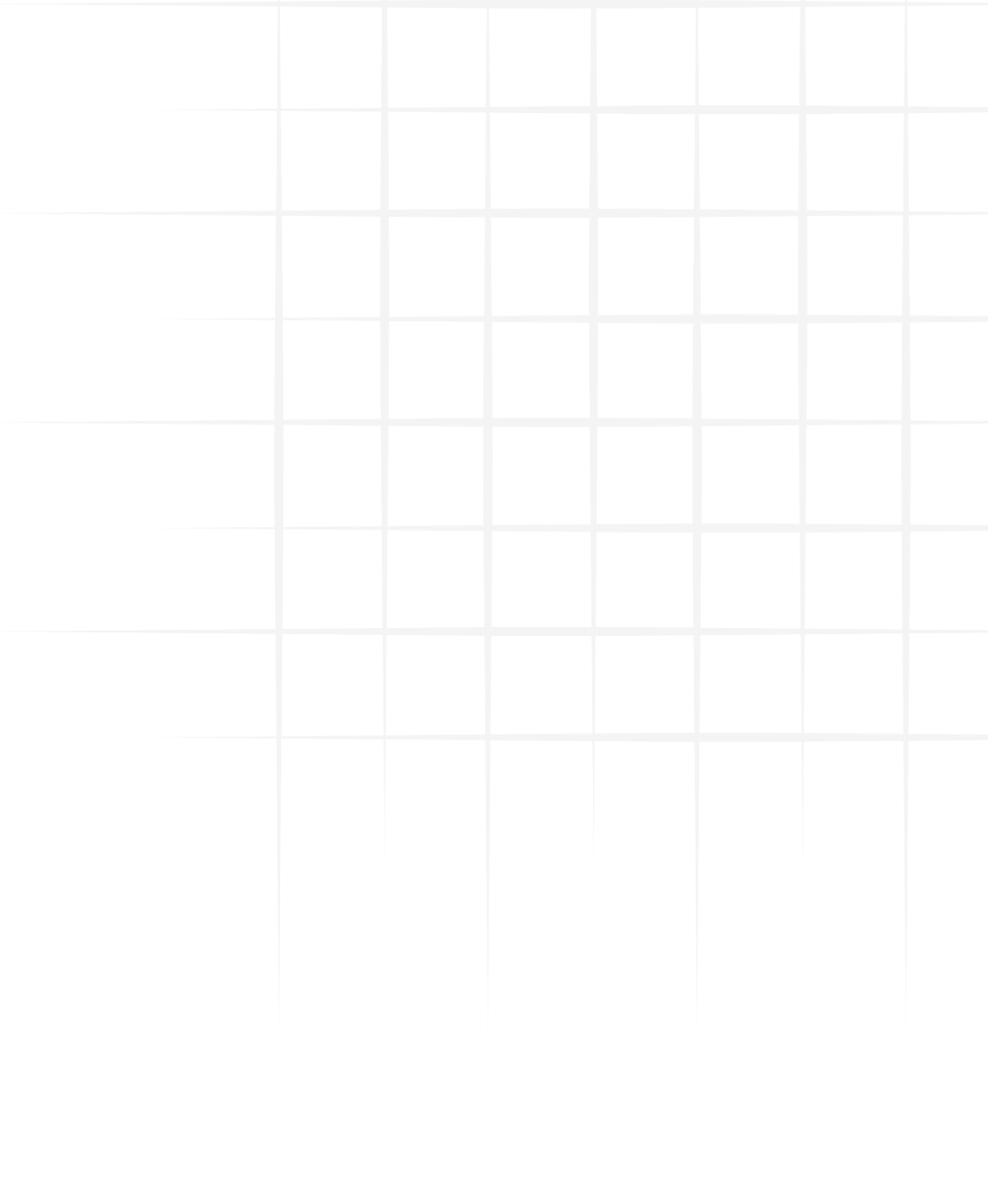
- S1 – Teknologi Informasi USU – 2014

Work Experiences:

- Senior Business Intelligence Analyst at Esco Lifesciences
 - Senior Business Intelligence Analyst at Wings Group
 - Business Intelligence Consultant at Wilmar Group
- 

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- 
- History of BI
 - BI Framework
 - Use Case: Dashboard Data Kependudukan
 - BI in the era of AI

Agenda



Business Intelligence:

Data Mining and Data Warehousing

 Operational vs Decision Support System

 What is Business Intelligence

 Overview of Data Mining

 Data Warehousing



Business Intelligence

Operational vs Decision Support System

Operational Systems

- Support day to day transactions
- Contain current, “up to date” data
- Examples: customer orders, inventory levels, bank account balances

Decision Support Systems

- Support strategic decision making
- Contain historical, “summarized” data
- Examples: performance summary, customer profitability, market segmentation

Business Intelligence

Operational vs Decision Support System

Example of an Operational Application: Order Entry

Dynamics 365 Business Central

SALES ORDER

10042 · The Bike Master Herlev

Process Release Posting Prepare Order Request Approval Print/Send Navigate Show Attached More options

General

Customer No.12300

Customer NameThe Bike Master Herlev

WLL-TS

AddressManufacturing St

Address 2

CityHerlev

Post CodeDK-2730

Country/Region CodeDK

Contact No.

Contact Phone No.

Contact Fax No.

Contact E-Mailjens@bikemaster.dk

Contact Role

Phone No.

Emailjens@bikemaster.dk

ContactDaniel Andersen

No. of Archived Versions

Document Date06-04-2019

Posting Date06-04-2019

Order Date06-04-2019

Due Date20-04-2019

Requested Delivery Date

Promised Delivery Date

External Document No.

Row Reference

Salesperson Code2885

Campaign No.

Opportunity No.

Responsibility Center

Assigned User ID

StatusOpen

WHD DESCRIPTION

Attachments

Documents

Sell-to Customer Sales History

0	0	2
0	0	0
4	4	0
0		

Customer Details

Customer No.12300

NameThe Bike Master Herlev

Phone No.

Emailjens@bikemaster.dk

Fax No.

Credit Limit (LCY)0.00

Available Credit (LCY)0.00

Payment Terms Code14 DAYS

ContactDaniel Andersen

Lines

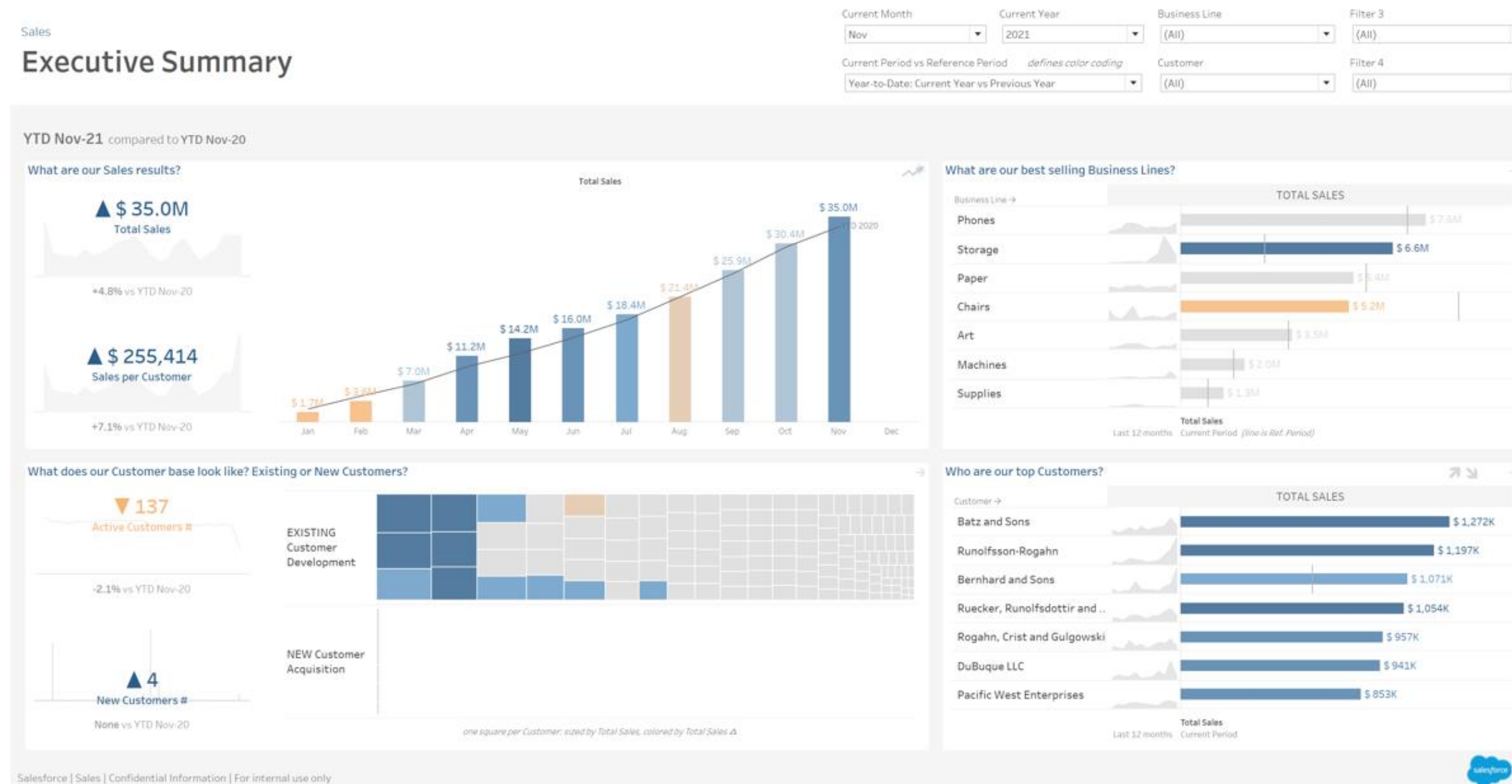
Manage Line Order Footer options

TYPE	NO.	LOCATION CODE	QUANTITY	QTY TO ASSEMBLE TO ORDER	RESERVED QUANTITY	UNIT OF MEASURE CODE	UNIT PRICE EXCL. VAT	LINE AMOUNT EXCL. VAT	LINE DISCOUNT %
------	-----	---------------	----------	--------------------------	-------------------	----------------------	----------------------	-----------------------	-----------------

Business Intelligence

Operational vs Decision Support System

Example of a DSS Application: Annual performance summary



What is Business Intelligence?



- **Collecting** and **refining** information from many sources
- **Analyzing** and **presenting** the information in useful ways
- So **people** can make better business **decisions**



What is Data Mining?



- Using a combination of **artificial intelligence** and **statistical** analysis to analyze **data**
- And discover useful **patterns** that are “**hidden**” there



Sample Data Mining Application



- **Direct Marketing** – identify which prospects should be included in a mailing list
- **Market segmentation** – identify common characteristics of customers who buy same products
- **Customer churn** – Predict which customers are likely to leave your company for a competitor •
Market Basket Analysis – Identify what products are likely to be bought together



What is a Data warehouse?

- A collection of data from multiple sources
 - » within the company
 - » outside the company
- Usually includes data relevant to the entire enterprise
- Usually includes summary data and historical data as well as current operational data
- Usually requires “cleaning” and other integration before use
- Therefore, usually stored in separate databases from current operational data



What is a Data mart?



A subset of a data warehouse focused on a particular subject or department

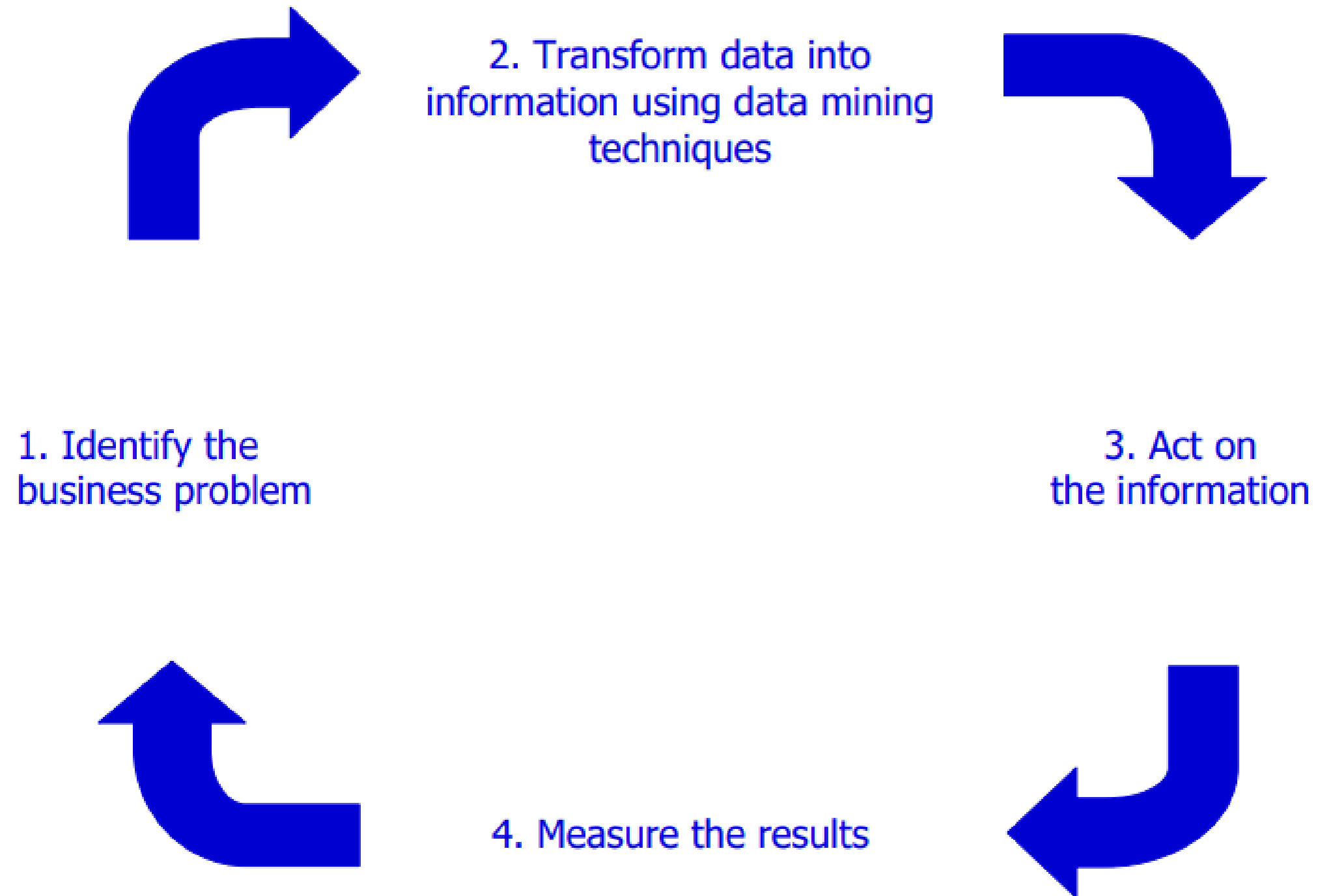


Data Warehousing Consideration

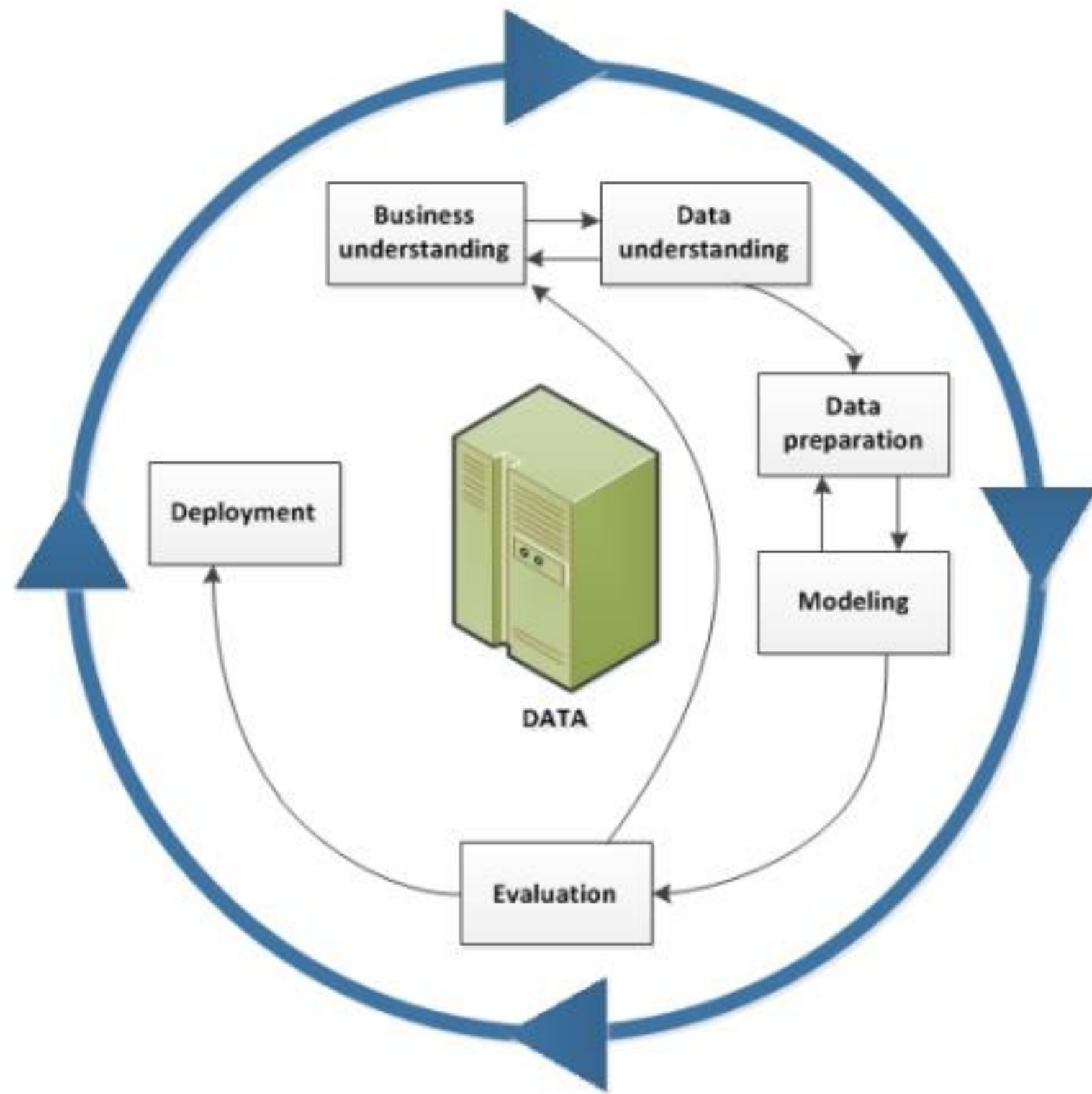
- What data to include?
- How to reconcile inconsistencies?
- How often to update



BI Life Cycle



BI Life Cycle: CRISP-DM



Cross-Industry Standard Process for Data Mining





Use Case: Dashboard Data Kependudukan



Data Source



- Data Total Penduduk Kota berdasarkan Wajib KTP
- Data Pekerjaan per Kecamatan – Kelurahan



Objective



Executive Summary

- Bagaimana komposisi laki-laki dan perempuan per kecamatan?
- Kecamatan mana memiliki sex ratio tertinggi?
- Kelurahan mana yang memiliki populasi terbesar?
- Apakah terdapat pola perbedaan gender antarwilayah?
- Berapa kontribusi setiap kecamatan terhadap total penduduk?



Objective



Pekerjaan

- Wilayah dengan jumlah penduduk belum/tidak bekerja paling besar.
- Kecamatan dengan konsentrasi pelajar tinggi yang membutuhkan layanan berbasis sekolah.
- Wilayah dengan konsentrasi pekerjaan informal.
- Perbedaan struktur pekerjaan antara laki-laki dan perempuan.
- Wilayah yang dapat menjadi target program pelatihan atau pemberdayaan ekonomi.



Modeling

- Data Cleaning

	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R
1	NAMA KECAMATAN	NAMA KELURAHAN	BELUM TIDAK		MENGURUS RUMAH		PELAJAR		PENSIUNAN		PEGAWAI NEGERI		TENTARA NASIONAL		KEPOLISIAN		PERDAGANGA	
2			LK	PR	LK	PR	LK	PR	LK	PR	LK	PR	LK	PR	LK	PR	LK	PR
3	JUMLAH TOTAL	KOTA SURABAYA	23.435	14.835	265	142.707	37.018	9.532	11.634	3.222	19.413	3.802	9.661	41	3.661	68	1.660	377
4	KECAMATAN	KARANG PILANG	508	246	1	3.066	934	203	616	123	622	114	729	1	137	2	57	17
5	KELURAHAN	KARANG PILANG	62	31	1	390	95	21	59	2	27	4	370	1	8	-	20	4
6	KELURAHAN	KEBRAON	151	70	-	1.180	378	78	267	65	280	59	173	-	62	-	13	6
7	KELURAHAN	KEDURUS	192	85	-	1.124	318	77	275	55	295	48	142	-	60	2	21	6
8	KELURAHAN	WARU GUNUNG	103	60	-	372	143	27	15	1	20	3	44	-	7	-	3	1
9	KECAMATAN	WONOCOLO	522	288	10	3.547	1.010	254	525	176	790	165	189	-	126	5	44	14
10	KELURAHAN	SIDOSERMO	105	50	-	550	188	33	56	25	133	30	24	-	12	-	8	5
11	KELURAHAN	BENDUL MERISI	121	66	2	744	216	69	139	49	156	39	52	-	8	1	22	2
12	KELURAHAN	MARGOREJO	85	40	-	528	133	39	70	33	104	23	25	-	39	-	1	-
13	KELURAHAN	JEMUR WONOSARI	110	68	5	955	252	70	132	45	195	37	41	-	41	4	10	3
14	KELURAHAN	SIWALANKERTO	101	64	3	770	221	43	128	24	202	36	47	-	26	-	3	4

Modeling

- Data Cleaning

Query Settings

PROPERTIES

Name

WNI_Berdasarkan_Pekerjaan_Jenis (2)

All Properties

APPLIED STEPS

FilePath

Workbook

AvailableSheets

CandidateSheets

SelectedSheet

NonBlankRows

NonBlankColumns

RowsBeforeHeader

HeaderRowPosition

DataFromHeader

PromotedHeaders

OriginalColumnNames

RenameLocationColumns

AddRowNumber

AddKecamatan

FillDownKecamatan

AddKelurahan

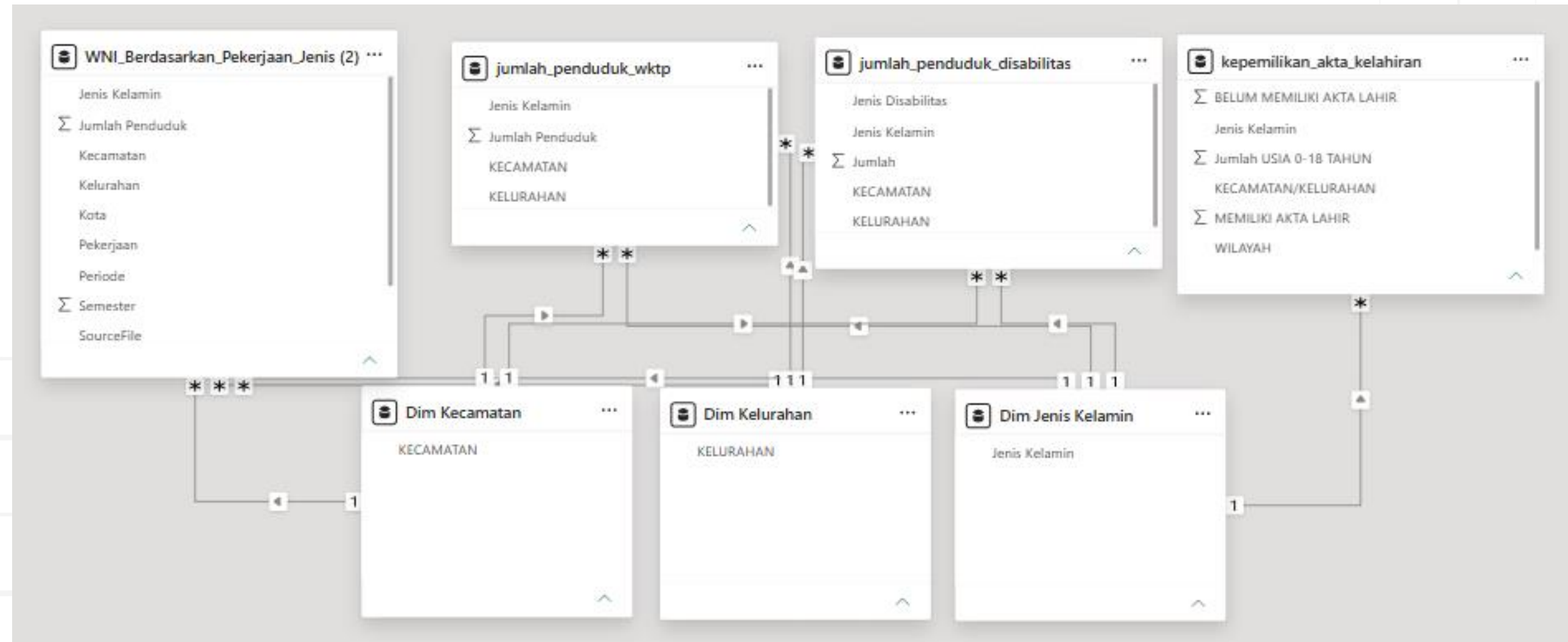
FillDownKelurahan

DetailRows

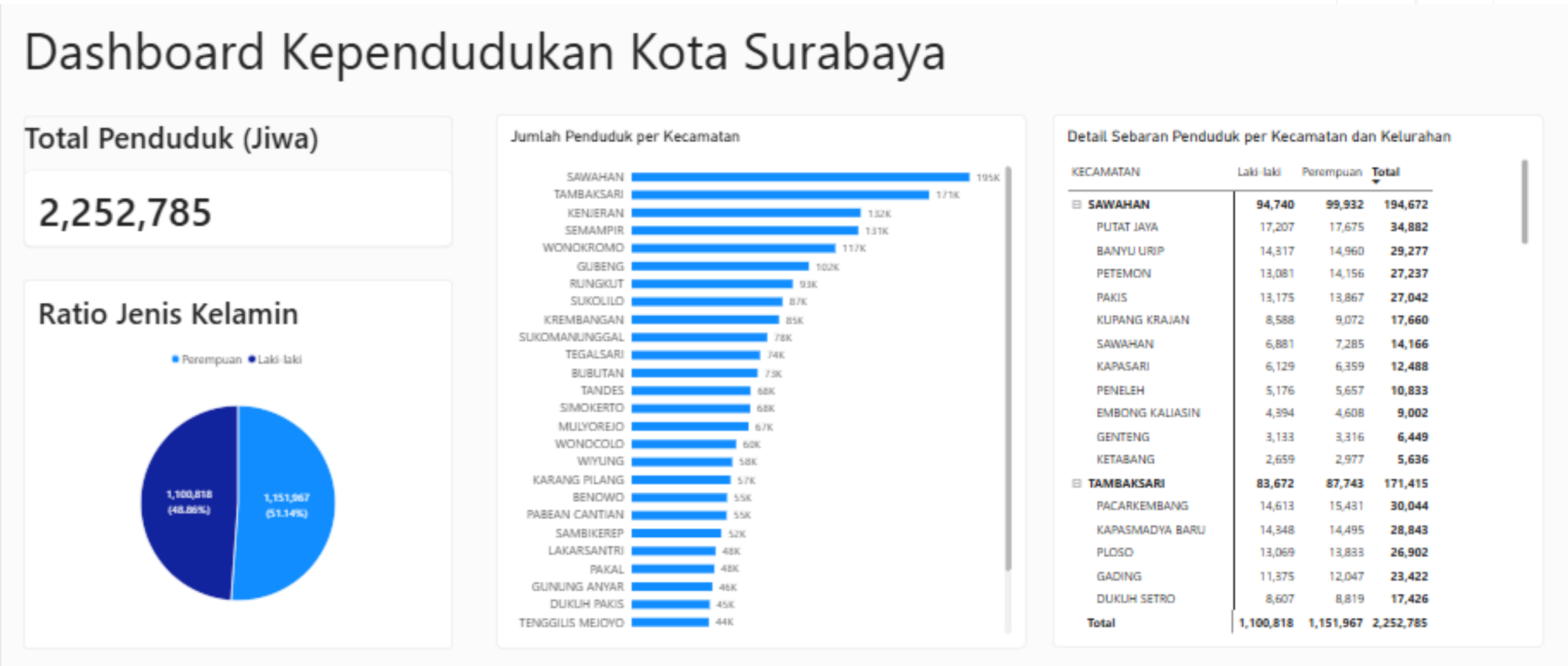
A ^B _C Kecamatan	1	A ^B _C Kelurahan	2	A ^B _C Pekerjaan	3	A ^B _C Jenis Kelamin	4
ASEM ROWO		ASEM ROWO		AKUNTAN		Laki-laki	
ASEM ROWO		ASEM ROWO		AKUNTAN		Perempuan	
ASEM ROWO		ASEM ROWO		ANGGOTA BPK		Laki-laki	
ASEM ROWO		ASEM ROWO		ANGGOTA BPK		Perempuan	
ASEM ROWO		ASEM ROWO		ANGGOTA DPD		Laki-laki	
ASEM ROWO		ASEM ROWO		ANGGOTA DPD		Perempuan	
ASEM ROWO		ASEM ROWO		ANGGOTA DPR RI		Laki-laki	
ASEM ROWO		ASEM ROWO		ANGGOTA DPR RI		Perempuan	
ASEM ROWO		ASEM ROWO		ANGGOTA DPRD KABUPATEN K...		Laki-laki	
ASEM ROWO		ASEM ROWO		ANGGOTA DPRD KABUPATEN K...		Perempuan	
ASEM ROWO		ASEM ROWO		ANGGOTA DPRD PROVINSI		Laki-laki	
ASEM ROWO		ASEM ROWO		ANGGOTA DPRD PROVINSI		Perempuan	
ASEM ROWO		ASEM ROWO		ANGGOTA KABINET KEMENTER...		Laki-laki	
ASEM ROWO		ASEM ROWO		ANGGOTA KABINET KEMENTER...		Perempuan	
ASEM ROWO		ASEM ROWO		ANGGOTA MAHKAMAH KONST...		Laki-laki	
ASEM ROWO		ASEM ROWO		ANGGOTA MAHKAMAH KONST...		Perempuan	
ASEM ROWO		ASEM ROWO		APOTEKER		Laki-laki	



Setting Relationship



Dashboard



Dashboard

Dashboard Kependudukan Kota Surabaya

Ratio Penduduk Bekerja vs Belum Bekerja



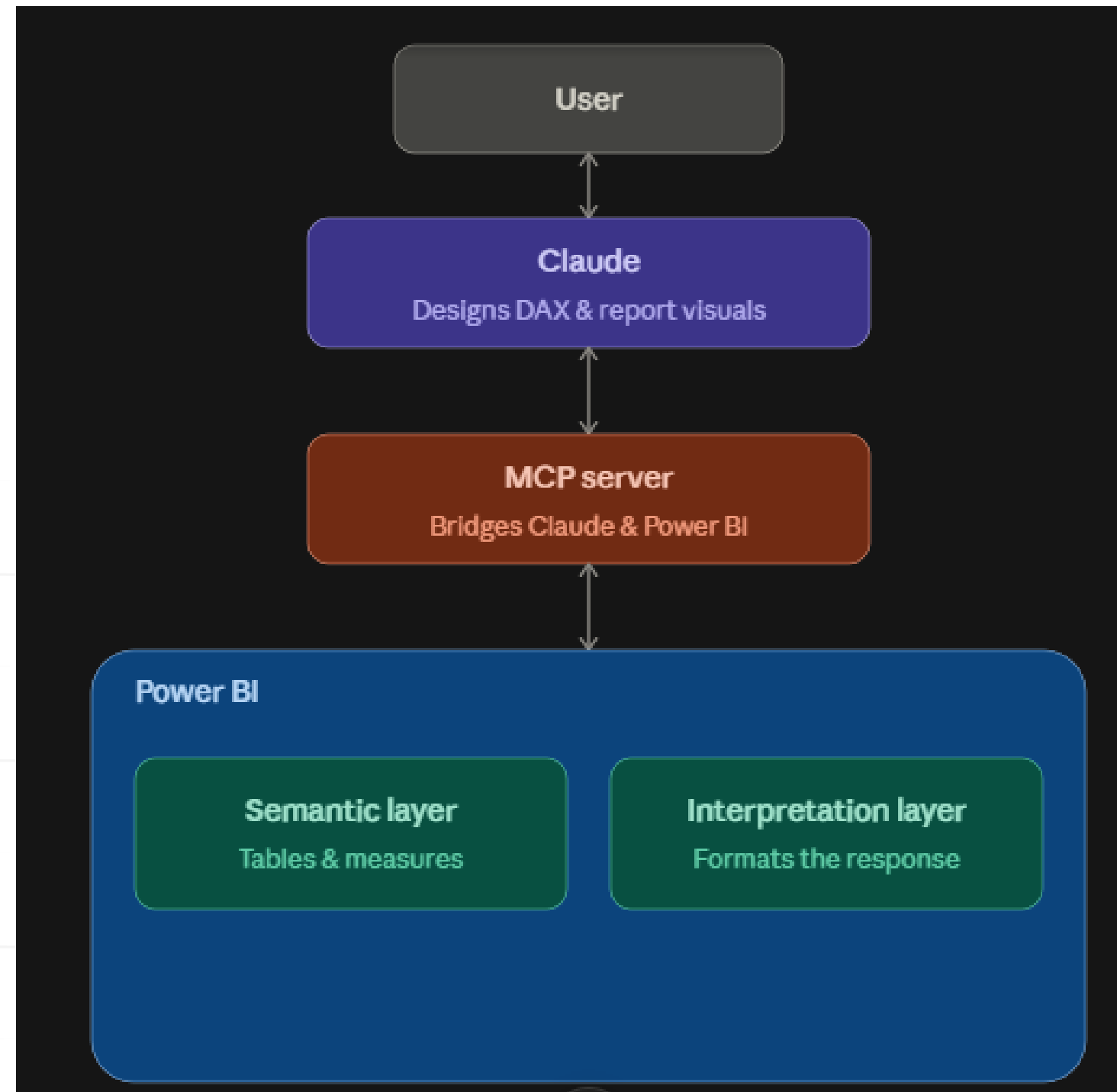
Top 10 Pekerjaan Terbanyak Berdasarkan Gender

Pekerjaan	Laki-laki	Perempuan	Total
KARYAWAN SWASTA	508,026.00	48,186.00	556,212.00
MENGURUS RUMAH TANGGA	265.00	142,707.00	142,972.00
WIRASWASTA	103,630.00	15,260.00	118,890.00
PELAJAR MAHASISWA	37,018.00	9,532.00	46,550.00
BELUM TIDAK BEKERJA	23,435.00	14,835.00	38,270.00
PEGAWAI NEGERI SIPIL	19,413.00	3,802.00	23,215.00
PENSIUNAN	11,634.00	3,222.00	14,856.00
GURU	5,990.00	3,847.00	9,837.00
TENTARA NASIONAL INDONESIA	9,661.00	41.00	9,702.00
PEDAGANG	4,568.00	1,199.00	5,767.00
Total	723,640.00	242,631.00	966,271.00

Sebaran Pekerjaan per Kecamatan

Kecamatan	BELUM TIDAK BEKERJA	GURU	KARYAWAN SWASTA	MENGURUS RUMAH TANGGA	PEDAGANG	PEGAWAI NEGERI SIPIL	PELAJAR MAHASISWA	PENSIUNAN	TENTARA NASIONAL
TAMBAKSARI	4,416.00	680.00	43,449.00	11,225.00	407.00	1,850.00	3,252.00	907.00	
SAWAHAN	3,456.00	582.00	37,949.00	11,020.00	508.00	1,433.00	2,750.00	690.00	
SEMAMPIR	2,876.00	341.00	29,475.00	10,290.00	206.00	432.00	2,694.00	582.00	
KENJERAN	1,778.00	480.00	32,625.00	7,724.00	227.00	805.00	2,913.00	532.00	
WONOKROMO	2,043.00	659.00	28,483.00	7,913.00	427.00	1,687.00	2,371.00	938.00	
GUBENG	1,318.00	520.00	26,366.00	6,590.00	273.00	1,907.00	2,062.00	946.00	
RUNKUT	768.00	512.00	22,895.00	4,333.00	158.00	1,452.00	1,981.00	866.00	
KREMBANGAN	2,838.00	270.00	20,145.00	6,146.00	65.00	594.00	2,145.00	328.00	
SUKOLOLO	1,182.00	488.00	19,107.00	4,544.00	119.00	1,397.00	2,533.00	687.00	
SUKOMANUNGGAL	1,204.00	263.00	19,440.00	4,898.00	290.00	524.00	1,625.00	369.00	
TEGALSARI	766.00	226.00	20,419.00	5,778.00	222.00	467.00	1,434.00	354.00	
BUBUTAN	1,044.00	255.00	19,044.00	5,556.00	354.00	644.00	1,466.00	413.00	
SIMOKERTO	1,781.00	215.00	16,803.00	5,670.00	186.00	259.00	1,434.00	165.00	
TANDES	1,042.00	435.00	17,456.00	4,278.00	110.00	965.00	1,527.00	768.00	
MULYOREJO	933.00	287.00	15,885.00	3,910.00	135.00	714.00	1,753.00	422.00	
WONOCOLO	810.00	329.00	13,814.00	3,557.00	169.00	955.00	1,264.00	701.00	
PABEAN CANTIAN	1,474.00	153.00	13,022.00	4,551.00	380.00	275.00	1,141.00	200.00	
KARANG PILANG	754.00	369.00	13,973.00	3,067.00	110.00	736.00	1,137.00	739.00	
WIYUNG	609.00	286.00	14,686.00	2,882.00	148.00	724.00	1,156.00	341.00	
BENOWO	505.00	273.00	14,575.00	2,792.00	78.00	483.00	1,054.00	175.00	
SAMBIKEREK	442.00	219.00	13,747.00	2,793.00	137.00	408.00	858.00	359.00	
LAKARSANTRI	846.00	197.00	12,767.00	2,584.00	49.00	311.00	1,137.00	234.00	
GENTENG	792.00	146.00	11,414.00	3,490.00	150.00	283.00	960.00	143.00	
PAKAL	489.00	329.00	12,480.00	2,167.00	102.00	497.00	856.00	243.00	
DUKUH PAKIS	619.00	150.00	10,836.00	2,905.00	159.00	281.00	989.00	294.00	
GLUNG ANYAR	610.00	261.00	11,679.00	2,089.00	94.00	634.00	808.00	537.00	
TENGGILIS MEJOYO	481.00	161.00	11,223.00	2,522.00	101.00	431.00	595.00	464.00	
Total	38,270.00	9,837.00	556,212.00	142,972.00	5,767.00	23,215.00	46,550.00	14,856.00	

BI in the era of AI



BI in the era of AI

- "I have Orders, Customers, and Products tables. Write the DAX for a Customers[Lifetime Value] measure."
- "My model is slow — here's my table sizes and relationships. Where are the likely performance bottlenecks?"
- "Write test cases to validate that my [Total Sales] measure matches source data at the yearly grain."
- "I want to show sales trend, top 5 products, and regional breakdown on one page. Suggest a layout and which visual types fit each."





“AI success isn’t really an AI problem. It’s a data problem, and a traditional software problem.”

Book : Fair Game

Rob Collie, a former Microsoft engineering leader and founding engineer of Power BI



Q & A



Thank You.

