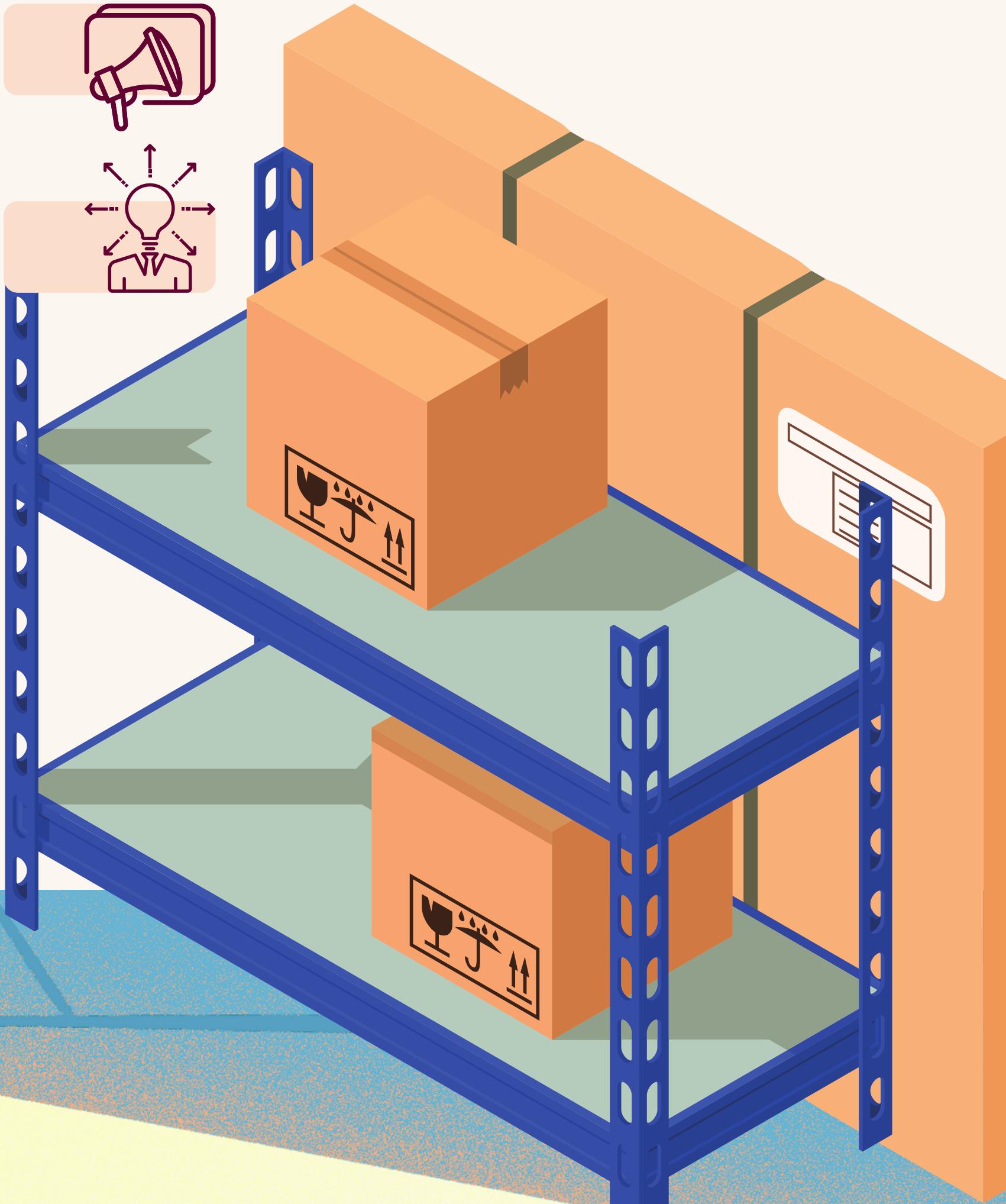


# **Unit Akademik**

## **Misi 1 Desain Konseptual dan Logical**

**Oleh:**  
**Kelompok 2**

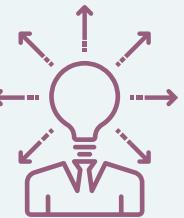
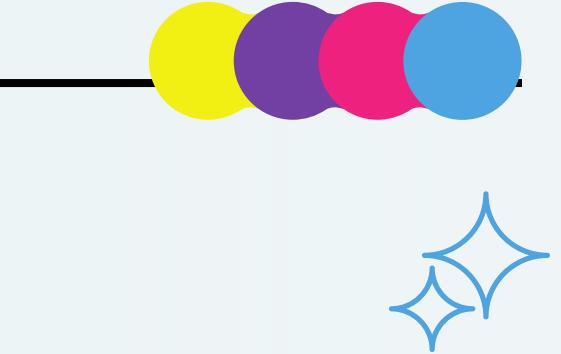
- 1. Abit Ahmad Oktarian (122450042)**
- 2. Tesalonika Hutajulu (123450033 )**
- 3. Sarah Wasti (123450057)**
- 4. Rahmah Gustriana Deka (123450102)**



# Step 1:

## Bussiness Requirement

### (Identifikasi Stakeholders)



#### Pengguna Utama Data Mart

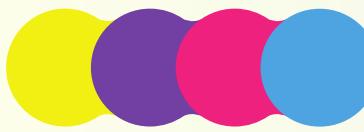
- Kepala Unit Akademik
- Kepala Program Studi (Kaprodi)
- Staff Administrasi Akademik
- Biro Perencanaan & IT Support (DBA)
- Dosen (pengguna agregat)
- Unit Penerimaan Mahasiswa Baru (PMB)



#### Decision Makers

- Rektor/Wakil Rektor Bidang Akademik
- Dekan Fakultas/Pembantu Dekan
- Ketua Program Studi
- Kepala Biro Akademik
- Tim Perencana dan Pengembangan Institusi





# Analisis Proses Bisnis



## Proses Bisnis

- Penerimaan Mahasiswa Baru: Pendaftaran, seleksi, registrasi, dan input data
- Perkuliahan & Pengajaran: Penjadwalan, presensi, dosen pengampu, KKN, dan KP
- Evaluasi Akademik: Penilaian, transkrip, IPK, dan penyebaran kuisioner
- Kelulusan & Status: Skripsi, Sidang, Yudisium, seta Mutasi/Drop-Out

## KPI Operasional Akademik

- Kehadiran dosen dan mahasiswa
- Distribusi nilai tiap mata kuliah (A–E)
- Jumlah mahasiswa yang mengulang mata kuliah
- Waktu tempuh studi (lama studi)

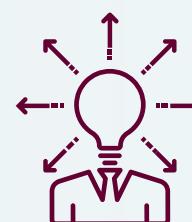
## Key Performance Indicators

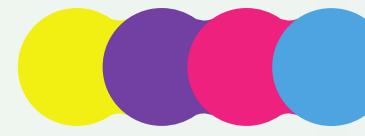
### KPI Tingkat Institusi

- Jumlah mahasiswa aktif per tahun akademik
- Tren penerimaan mahasiswa baru per tahun
- Drop-out rate per angkatan

### KPI Tingkat Program Studi

- Rata-rata IPK per semester dan angkatan
- Tingkat kelulusan teat waktu
- Rasio dosen:mahasiswa per prodi
- Persentase mahasiswa mengambil SKS optimal





## Fact\_Enrollment

- Average Grade per course/program/instructor/semester
- Pass Rate berdasarkan nilai kelulusan
- Attendance Rate rata-rata per course/instructor/semester
- Course Enrollment Count = jumlah mahasiswa per mata kuliah
- Student Load = total SKS yang diambil per semester
- Instructor Teaching Load = jumlah kelas yang diajar
- Instructor Performance = nilai rata-rata mahasiswa per dosen
- Course Difficulty = mata kuliah dengan nilai rendah & fail rate tinggi



## Fact\_Graduation

- Graduation Count per tahun/per program
- On-Time Graduation Rate ( $\leq 4$  tahun)

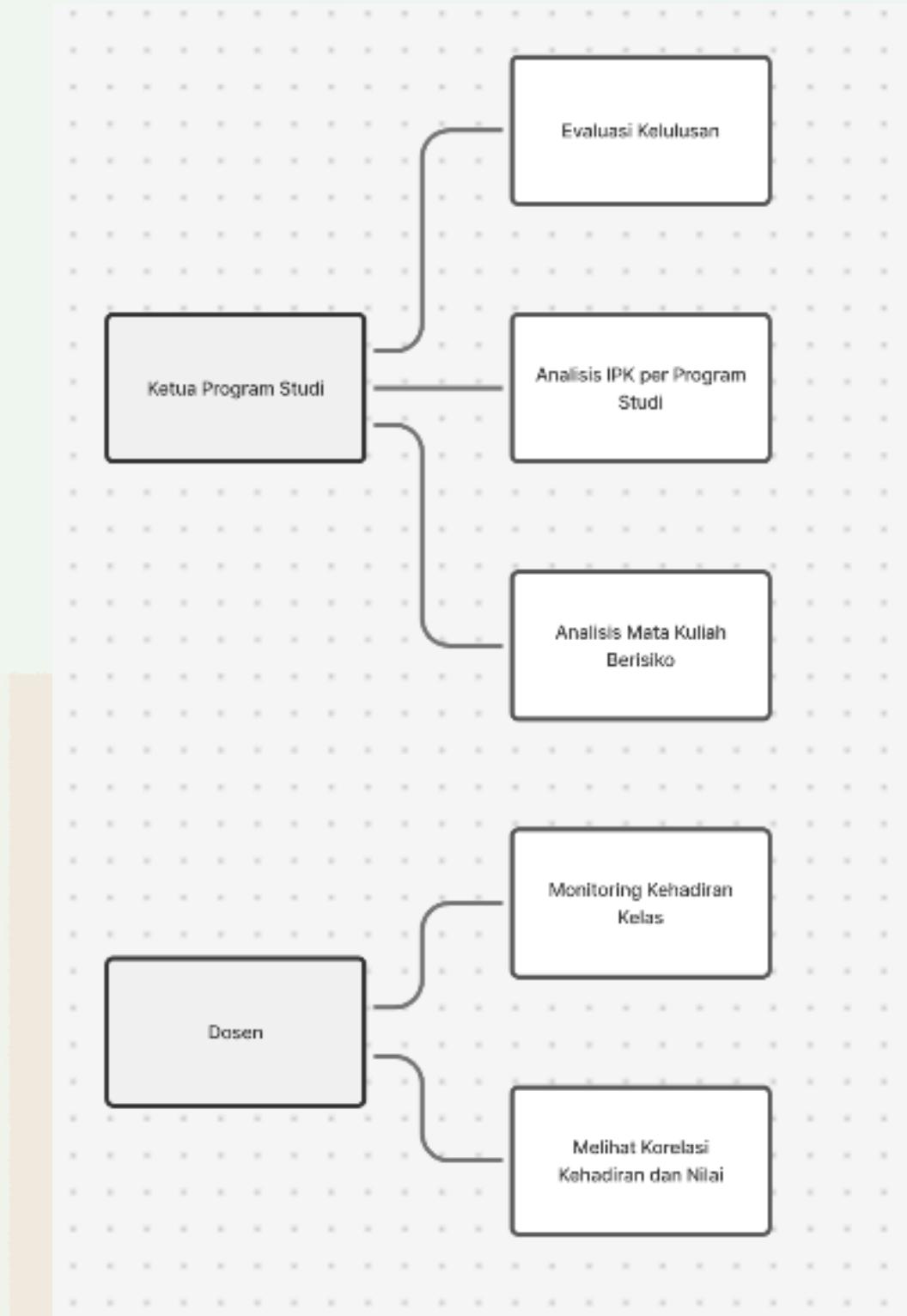
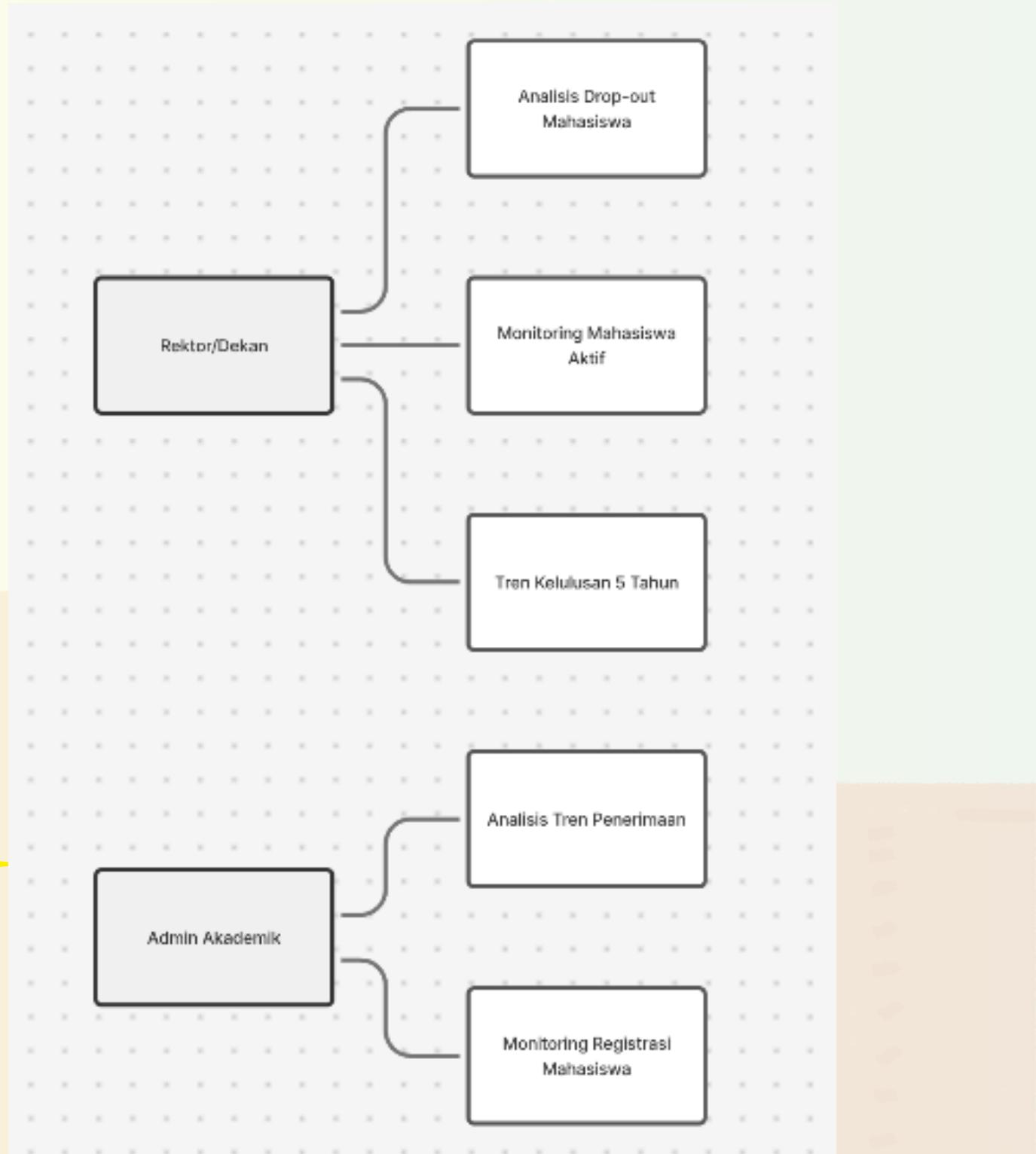
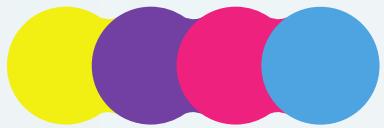
## Fact\_Admission

- New Students Count (diterima/daftar ulang)
- Admission Conversion Rate per jenis/jalur masuk
- Admission Score Distribution (rata-rata skor per jalur)

## Gabungan Fakta - Dimensi

- Retention Rate (mahasiswa tetap aktif tiap semester)
- Dropout Rate (tidak muncul lagi di enrollment & tidak lulus)
- Enrollment Trend Over Time berdasarkan DateKey/SemesterKey

# use case diagram



# Step 2:

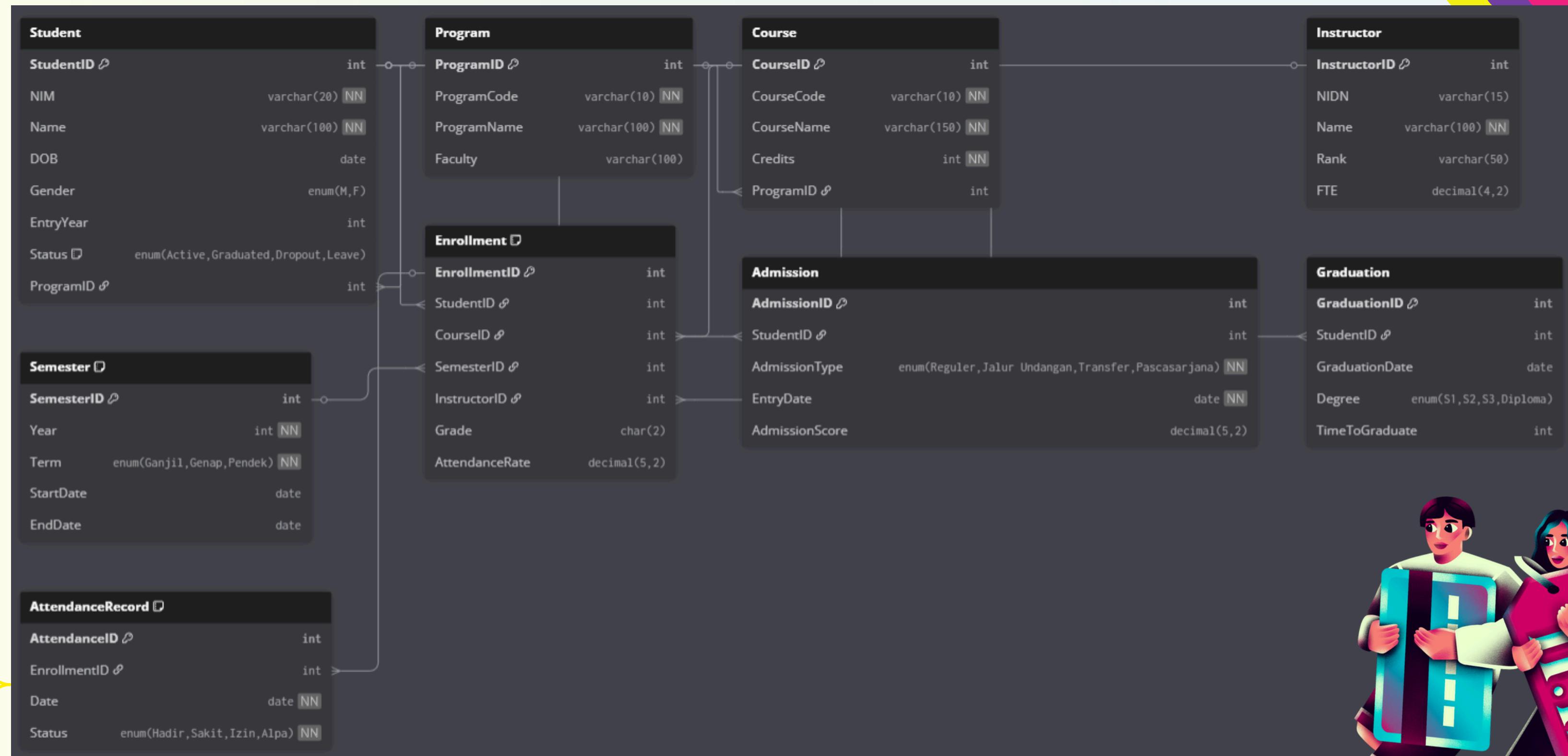
## Data Source Identification



Sumber	Tipe	Contoh Struktur	Volume (Est)	Frekuensi
SIAKAD (OLTP)	SQL Server	Students, Enrollments, Grades	100k rows	Real-time / Harian
ABSENSI	CSV/Excel	(student_id, date, status)	50k rows	Daily
Dosen HR	SQL/CSV	Instruktur, jabatan, FTE	5k rows	Bulanan
Penerimaan	API/DB	Pendaftar, nilai seleksi	20k rows	Saat Registrasi
Manual Excel	Excel	Beasiswa, cuti, catatan khusus	Kecil	Sporadis



# Step 3: Conceptual Design - ERD



# Step 4: Logical Design - Dimensional Model

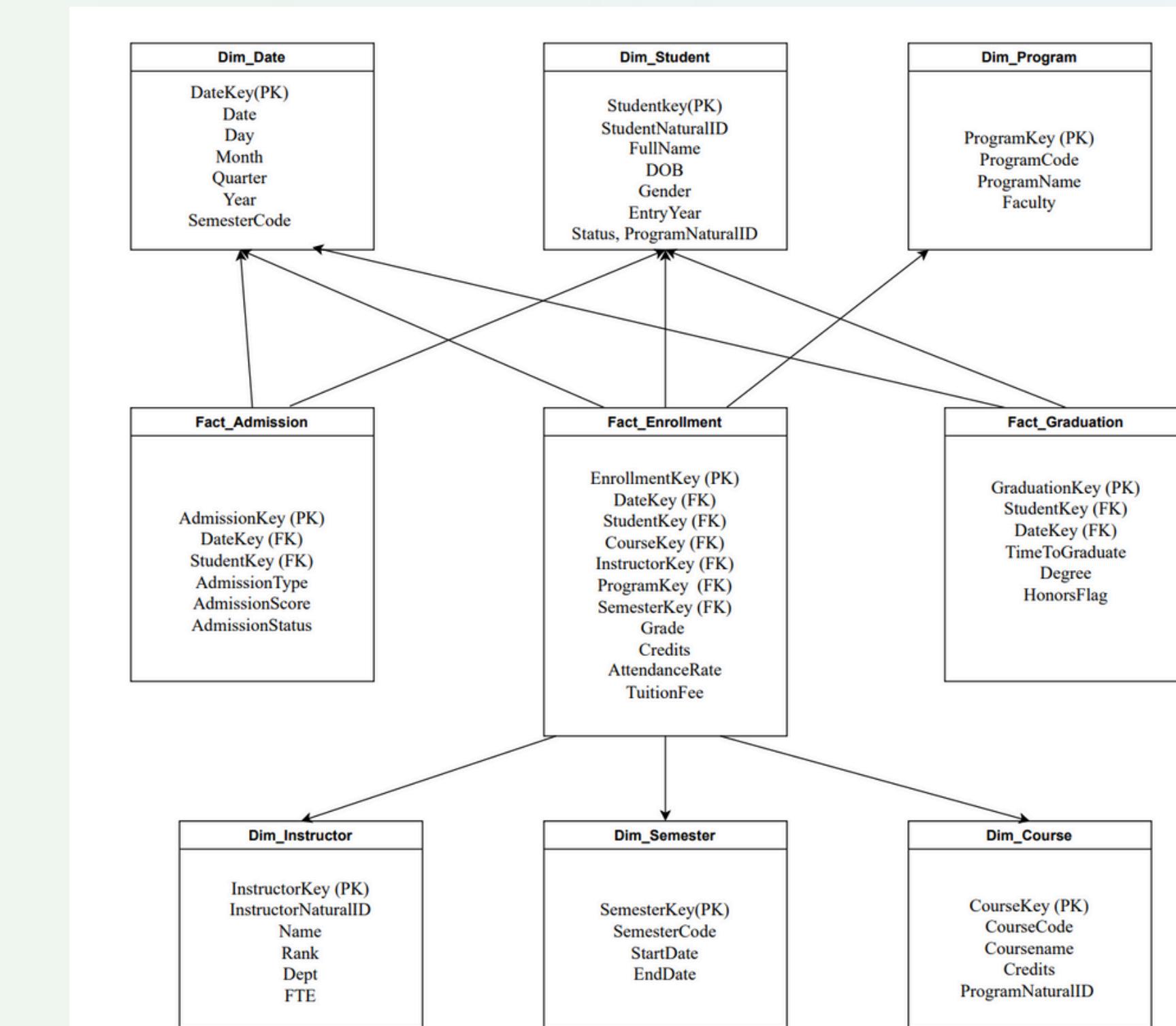


## Step 4: Desain Logikal (Star Schema)

### Model Dimensi

Model ini menggunakan Star Schema untuk menghubungkan tabel Fakta dan Dimensi.

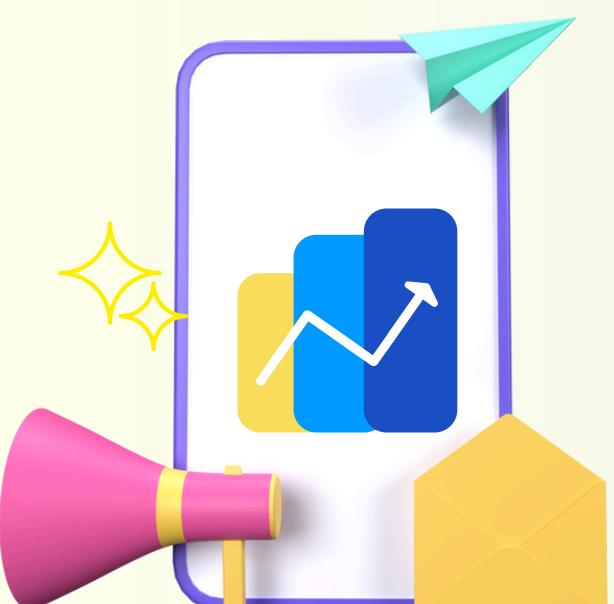
- Tabel Fakta (Enrollment, Admission, Graduation) berada di tengah, berisi \*measures\* numerik.
- Tabel Dimensi (Student, Course, Date, Program, dll) mengelilingi fakta, berisi atribut deskriptif.
- Desain ini mengoptimalkan \*query\* untuk kebutuhan analitik dan pelaporan (OLAP).



# Step 5: Data Dictionary & Repository



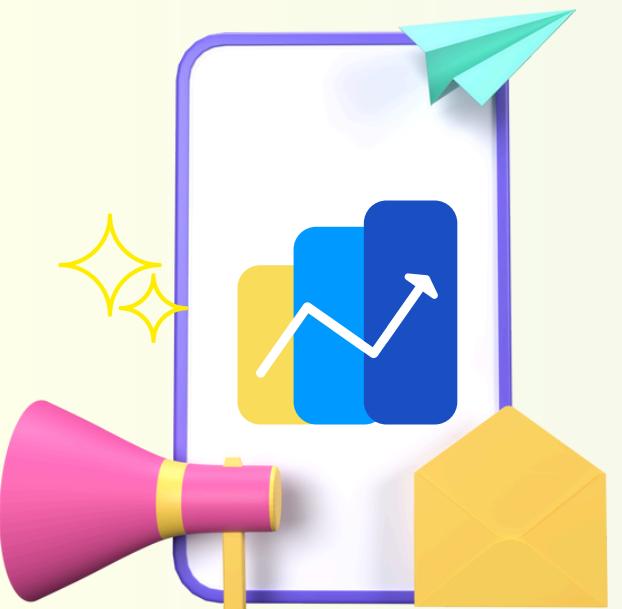
Table	Column	Data Type	PK/FK	Description	Business Rule
Fact_Enrollment	EnrollmentKey	INT	PK	Surrogate key unik untuk setiap record enrollment	Di-generate di warehouse (bukan dari OLTP)
Fact_Enrollment	DateKey	INT	FK → Dim_Date	Tanggal proses enroll atau aktivitas akademik	Harus cocok dengan Dim_Date
Fact_Enrollment	StudentKey	INT	FK → Dim_Student	Mahasiswa yang melakukan enrollment	Mandatory, tidak boleh NULL
Fact_Enrollment	CourseKey	INT	FK → Dim_Course	Mata kuliah yang diambil	Mandatory
Fact_Enrollment	InstructorKey	INT	FK → Dim_Instructor	Pengajar mata kuliah	Dapat bernilai NULL bila tidak ada instruktur
Fact_Enrollment	ProgramKey	INT	FK → Dim_Program	Program studi yang menaungi mata kuliah	Secara logis harus sesuai dengan Course.ProgramNaturalID



# Step 5: Data Dictionary & Repository



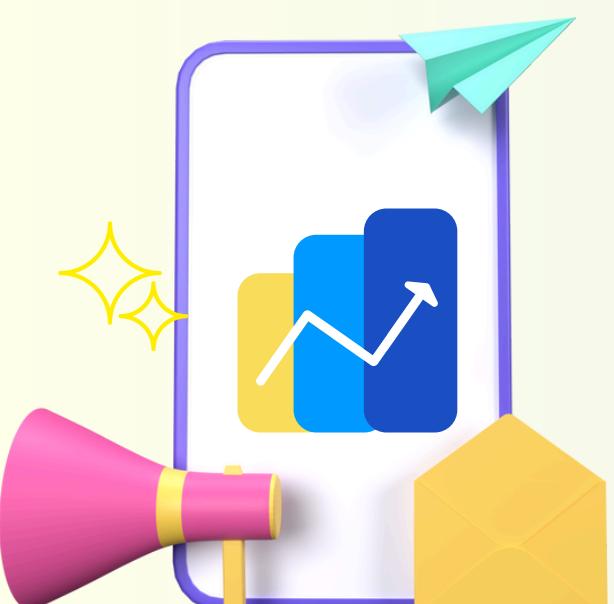
Table	Column	Data Type	PK/FK	Description	Business Rule
Fact_Admission	AdmissionKey	INT	PK	Surrogate key	Auto-generated
Fact_Admission	DateKey	INT	FK → Dim_Date	Tanggal pendaftaran	Mandatory
Fact_Admission	StudentKey	INT	FK → Dim_Student	Mahasiswa yang mendaftar	Mandatory
Fact_Admission	AdmissionType	VARCHAR	-	Jalur masuk (SNBP, UTBK, Mandiri)	FIXED value list
Fact_Admission	AdmissionScore	DECIMAL(5, 2)	-	Nilai seleksi masuk	Range tergantung kebijakan
Fact_Admission	AdmissionStatus	VARCHAR	-	Diterima / Tidak diterima	FIXED: Accepted / Rejected



# Step 5: Data Dictionary & Repository



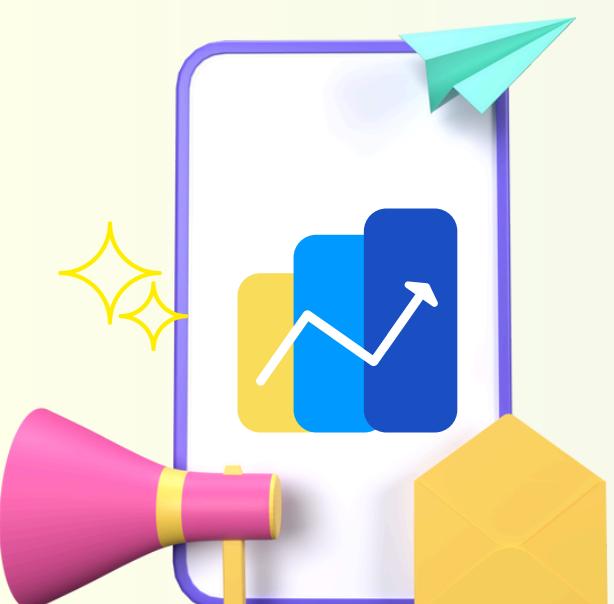
Table	Column	Data Type	PK/FK	Description	Business Rule
Fact_Graduation	GraduationKey	INT	PK	Surrogate key	Generated in DW
Fact_Graduation	StudentKey	INT	FK → Dim_Student	Mahasiswa yang lulus	1 row per mahasiswa
Fact_Graduation	DateKey	INT	FK → Dim_Date	Tanggal kelulusan	Mandatory
Fact_Graduation	TimeToGraduate	INT	-	Lama studi dalam semester	$\geq 0$
Fact_Graduation	Degree	VARCHAR	-	Jenis gelar (S1, D3)	FIXED LIST
Fact_Graduation	HonorsFlag	BOOLEAN	-	Lulus dengan predikat atau tidak	TRUE/FALSE



# Step 5: Data Dictionary & Repository



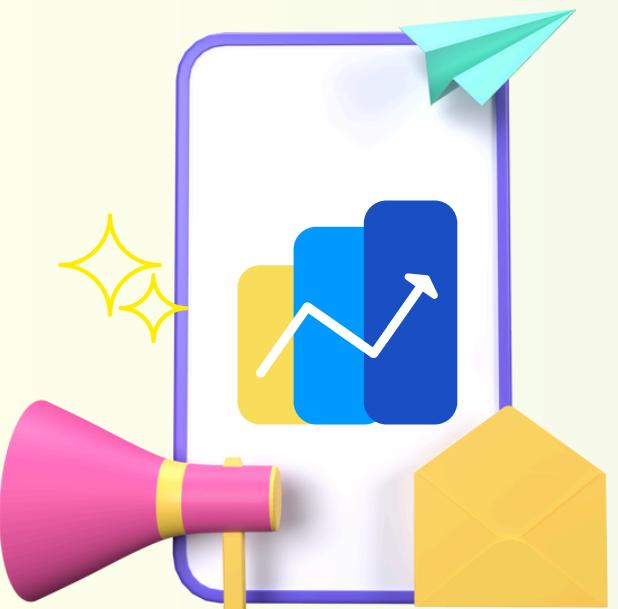
Table	Column	Data Type	PK/FK	Description	Business Rule
Dim_Date	DateKey	INT	PK	Surrogate key (YYYYMMDD)	Unique
Dim_Date	Date	DATE	-	Tanggal lengkap	Mandatory
Dim_Date	Day	INT	-	Tanggal (1–31)	Auto-derived
Dim_Date	Month	INT	-	Bulan (1–12)	Auto-derived
Dim_Date	Quarter	INT	-	Kuartal (1–4)	Auto-derived
Dim_Date	Year	INT	-	Tahun	Auto-derived
Dim_Date	SemesterCode	VARCHAR	-	Semester (Gasal/Genap)	Derived dari Month



# Step 5: Data Dictionary & Repository



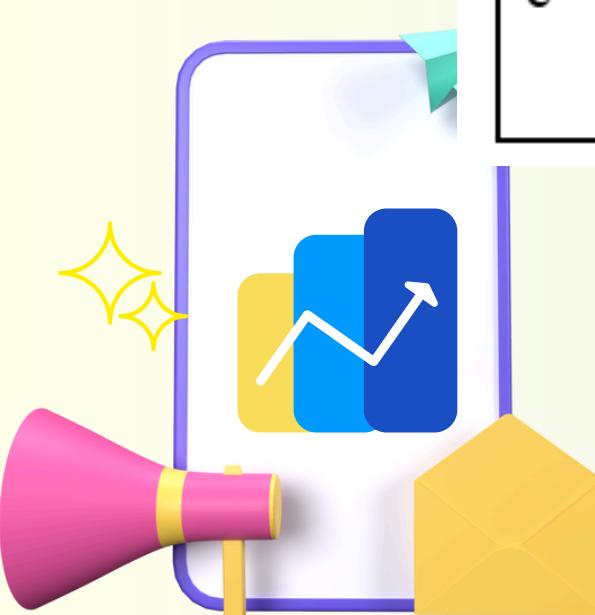
Table	Column	Data Type	PK/FK	Description	Business Rule
Dim_Student	StudentKey	INT	PK	Surrogate key	Mandatory
Dim_Student	StudentNaturalID	VARCHAR	-	NIM mahasiswa	Unique per mahasiswa
Dim_Student	FullName	VARCHAR	-	Nama lengkap	Tidak boleh NULL
Dim_Student	DOB	DATE	-	Tanggal lahir	Optional
Dim_Student	Gender	CHAR(1)	-	Jenis kelamin (M/F)	FIXED LIST
Dim_Student	EntryYear	INT	-	Tahun masuk	Mandatory
Dim_Student	Status	VARCHAR	-	Aktif / Cuti / Lulus / Drop-out	FIXED ENUM
Dim_Student	ProgramNaturalID	INT	FK?	ID prodi asli pada OLTP	Harus sinkron dengan Dim_Program



# Step 5: Data Dictionary & Repository



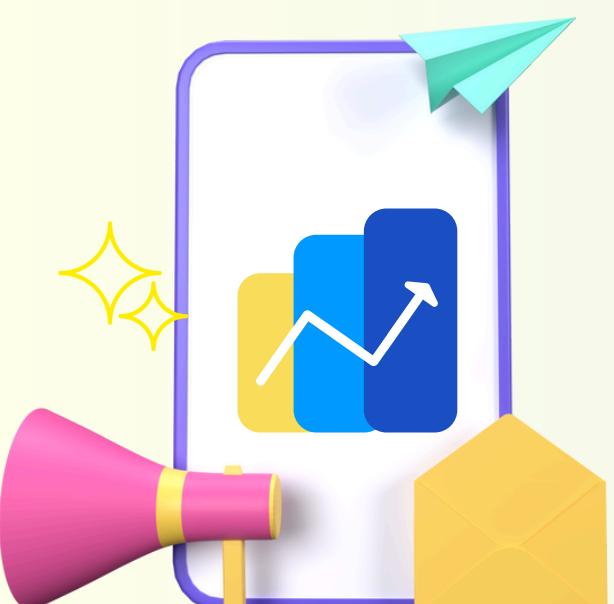
Table	Column	Data Type	PK/FK	Description	Business Rule
Dim_Course	CourseKey	INT	PK	Surrogate key	Mandatory
Dim_Course	CourseCode	VARCHAR	-	Kode mata kuliah	Unique
Dim_Course	CourseName	VARCHAR	-	Nama mata kuliah	Tidak boleh NULL
Dim_Course	Credits	INT	-	SKS	$\geq 0$
Dim_Course	ProgramNaturalID	INT	-	Prodi penyelenggara	Harus dengan <u>Dim_Program</u>



# Step 5: Data Dictionary & Repository



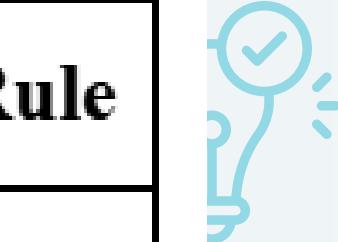
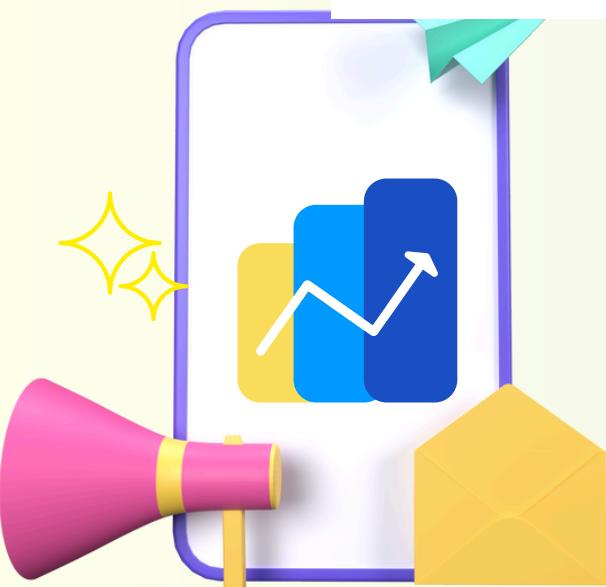
Table	Column	Data Type	PK/FK	Description	Business Rule
Dim_Instructor	InstructorKey	INT	PK	Surrogate key	Mandatory
Dim_Instructor	InstructorNaturalID	VARCHAR	-	ID asli dosen (NIDN)	Unique
Dim_Instructor	Name	VARCHAR	-	Nama dosen	Mandatory
Dim_Instructor	Rank	VARCHAR	-	Jabatan (Guru Besar, Lektor, Kaprodi, dll)	FIXED LIST
Dim_Instructor	Dept	VARCHAR	-	Departemen/Fakultas	Optional
Dim_Instructor	FTE	DECIMAL(3,2)	-	Beban mengajar (0-1)	0-1



# Step 5: Data Dictionary & Repository



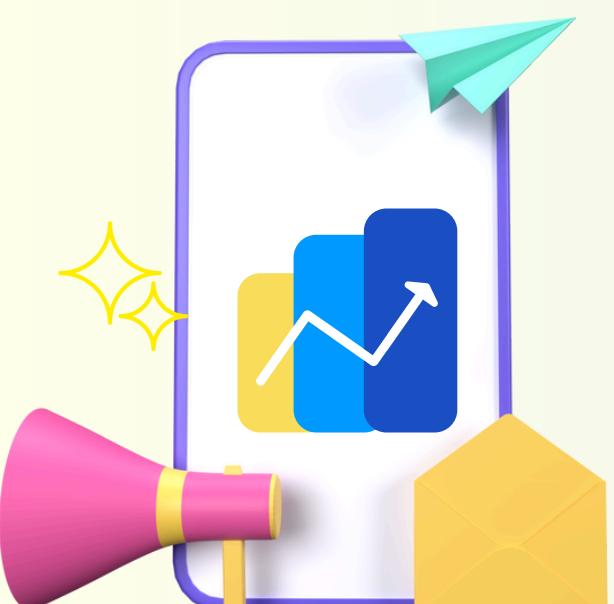
Table	Column	Data Type	PK/FK	Description	Business Rule
Dim_Program	ProgramKey	INT	PK	Surrogate key	Mandatory
Dim_Program	ProgramCode	VARCHAR	-	Kode program studi	Unique
Dim_Program	ProgramName	VARCHAR	-	Nama program <u>studi</u>	Mandatory
Dim_Program	Faculty	VARCHAR	-	Fakultas	Optional



# Step 5: Data Dictionary & Repository



Table	Column	Data Type	PK/FK	Description	Business Rule
Dim_Semester	SemesterKey	INT	PK	Surrogate key	Mandatory
Dim_Semester	SemesterCode	VARCHAR	-	Kode semester (20241, 20242)	Unique
Dim_Semester	StartDate	DATE	-	Tanggal mulai semester	Mandatory
Dim_Semester	EndDate	DATE	-	Tanggal akhir semester	Mandatory



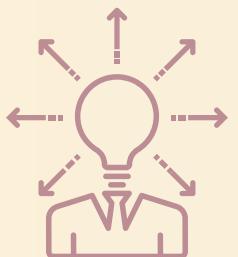
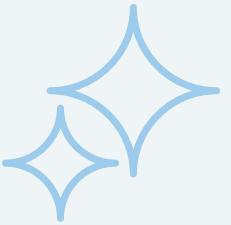
# 6. Github Repository



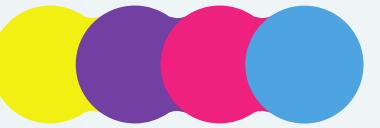
The screenshot shows a GitHub team interface. At the top, the navigation bar includes 'sains-data / Teams / Data Warehouse 2025 Gasal / PergudanganData2025-Kelompok 2-Akademik'. The 'Repositories' tab is selected, showing 2 repositories. A notification message states: 'The AKADEMIK-TubesDW-Kelompok02 repository was added to this team'. Below this, the 'Repositories with direct access' section lists two repositories:

Repository	Last Updated	Role
sains-data/AKADEMIK-TubesDW-Kelompok02	1 minute ago	Role: Admin
sains-data/Data-Warehouse-2025-Gasal	4 days ago	Role: Read

At the bottom, the footer links include: © 2025 GitHub, Inc., Terms, Privacy, Security, Status, Community, Docs, Contact, Manage cookies, and Do not share my personal information.



# 6. Github Repository



sains-data / AKADEMIK-TubesDW-Kelompok02

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README.md Update README.md 3 minutes ago

README

AKADEMIK-TubesDW-Kelompok02

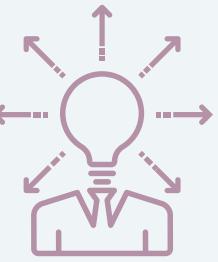
ahsiapp

TUBES PERGUDANGAN DATA -  
AKADEMIK - KELOMPOK 02

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# Thank You

## Q And A Session

