

AI Take-Home Assignment: Chunk → Graph Architecture (Graph RAG Ready)

Context

You will receive 3 text chunks (check appendix) about a company (think: prospectus/annual report excerpts). Your task is to build a general-purpose graph construction pipeline that can translate these chunks into a Graph RAG-ready knowledge graph and output a Mermaid graph (TD) that is pasteable into Mermaid.

This is not a one-off script for these 3 chunks. The system must be reusable: when we later feed new chunks from a totally different company or new chunks from the same company, the graph should expand meaningfully (if not perfectly).

Goal

Build an architecture that:

1. Extracts entities, attributes, and events from chunks.
2. Creates typed relationships with defensible/neutral verbs.
3. Produces a deterministic graph structure that expands with more chunks.
4. Outputs:
 - (A) Graph JSON (nodes + edges + provenance)
 - (B) Mermaid graph TD text (paste-ready)
5. (Optional/Bonus): Retrieves relevant information/chunks based on the user query

You may use an LLM for extraction, but the system must be robust even if the LLM output varies slightly.

Required Output (must match) – USING THE 3 CHUNKS PROVIDED BELOW

1) Graph JSON (Graph RAG-ready)

2) Mermaid (paste-ready)

Generate Mermaid code that follows this pattern:

Starts with: `graph TD`

Uses node declarations with readable labels (HTML `
` allowed)

Uses edges with verbs: `A -->|relation| B`

Includes Sources nodes and connects at least core nodes to sources via `described_in`

Includes Events when present (timeline-ish) and connects `Company -->|has_event| Event`

Keeps verbs neutral (avoid over-claiming)

Important: The Mermaid output must be generated from the graph JSON (not hand-written).

Core Requirements

A) Generalization (no hardcoding)

Do not hardcode:

company name

products/services names

years

relationship pairs specific to the provided chunks

The 3 chunks may guide your ontology choices, but the code must handle unseen companies/structures.

B) Expandability

When new chunks arrive, the graph should:

- add new nodes/edges

- update attributes with provenance

- avoid duplicating the same entity under small name variations

- preserve stable IDs as much as possible

C) Relationship design

Use a small controlled relation set (extendable), e.g.:

- `operates`, `offers`, `enabled_by`, `supported_by`

- `includes`, `integrated_surface`, `executed_via`

- `acquired`, `has_event`, `launched`, `described_in`

Map free-text relations into this controlled set with fallback:

- `related_to` when unsure (but try not to overuse)

Implementation Guidance (you choose)

You may implement in Python (preferred)

You should structure the code like an actual mini-library:

- `extract()` → candidate entities/relations/events per chunk

- `build_graph()` → produce graph JSON

- `render_mermaid()` → Mermaid text from graph JSON

'retrieve_chunks()' → Retrieves chunks based on user query.

Provide a “mock mode” that runs without external calls (optional but bonus)

Deliverables: Source code repo (zip or link)

Example Output Expectation

```
graph TD
```

```
%% =====
```

```
%% Core Entities
```

```
%% =====
```

```
Swiggy["Company: Swiggy Limited<br/><b>Tags/Attributes</b>: Strategy=High-frequency  
Hyperlocal Commerce; Culture=Innovation-led DNA"]
```

```
Platform["Platform: Consumer Convenience Platform<br/><b>Tags/Attributes</b>:  
Principle=Convenience-first; ValueProps=Fast delivery, Quality & assortment;  
Capability=Personalised recommendations"]
```

```
Food["Service: Food Delivery"]
```

```
Dining["Service: Dining Out & Events"]
```

```
Grocery["Service: Grocery & Household Items"]
```

```
Hyperlocal["Service: Other Hyperlocal Services"]
```

```
RestPartners["Partner: Restaurant Partners"]
```

```
MerchPartners["Partner: Merchant Partners"]
```

```
BrandPartners["Partner: Brand Partners"]
```

```
DeliveryPartners["Partner: Delivery Partners"]
```

```
Tech["Capability: Technology<br/><b>Tags/Attributes</b>: Asset=Reusable tech stack  
(quick, low-cost innovation)"]
```

```
Analytics["Capability: Analytics"]
```

```
Fulfilment["Capability: Fulfilment"]
```

```
Membership["Capability: Membership (Swiggy One)"]
```

%% =====

%% Products / Offerings

%% =====

Instamart["Product: Swiggy Instamart
Attributes: launch_year=2020; scale=124 cities (as of 31-Mar-2025)"]

Genie["Product: Swiggy Genie
Attributes: launch_year=2020"]

Minis["Product: Swiggy Minis
Attributes: launch_year=2022"]

Mall["Product: Swiggy Mall
Attributes: launch_year=2023; integrated_with=Instamart"]

Bolt["Feature: Bolt (10-min Food Delivery)
Attributes: launch_year=2024"]

Scenes["Product: Swiggy Scenes (Events & Experiences)
Attributes: launch_year=2024"]

SNACC["Product: SNACC
Attributes: launch_year=2025"]

Pyng["Product: Pyng
Attributes: launch_year=2025"]

QuickBites["Product: Quick Bites"]

CreditCard["Product: Co-branded Credit Card (HDFC)
Attributes: launch_year=2023"]

%% =====

%% Acquisitions

%% =====

Dineout["Acquisition Target: Dineout
Attributes: acquired_year=2022"]

Lynk["Acquisition Target: Lynk
Attributes: acquired_year=2023; stake=100%"]

%% =====

%% Events / Timeline (tagged)

%% =====

E2013["Event: Incorporation (2013)
Tags: Corporate"]

E2014["Event: Launch Food Delivery (2014)
Tags: Launch, Pioneer"]

E2015["Event: First major fundraise (2015)
Tags: Fundraise"]

E2019["Event: Food delivery scale to 500+ cities (2019)
Tags: Milestone, Scale"]

E2020["Event: Launch Instamart & Genie (2020)
Tags: Launch, Pioneer(Quick Commerce)"]

E2021["Event: Launch Swiggy One (2021)
Tags: Launch"]

E2022["Event: Acquire Dineout + Launch Minis + Instamart expands (2022)
Tags: Acquisition, Launch, Scale"]

E2023["Event: Launch Credit Card + Acquire Lynk + Launch Mall (2023)
Tags: Launch, Acquisition"]

E2024["Event: Public listing + Bolt + Scenes + 5.7M members (2024)
Tags: Listing, Launch, Milestone"]

E2025["Event: 120M users + Launch SNACC & Pyng (2025)
Tags: Milestone, Launch"]

%% =====

%% Core Structure

%% =====

Swiggy -->|operates| Platform

Platform -->|offers| Food

Platform -->|offers| Dining

Platform -->|offers| Grocery

Platform -->|offers| Hyperlocal

Platform -->|supported_by| RestPartners

Platform -->|supported_by| MerchPartners

Platform -->|supported_by| BrandPartners

Platform -->|supported_by| DeliveryPartners

Platform -->|enabled_by| Tech

Platform -->|enabled_by| Analytics

Platform -->|enabled_by| Fulfilment

Platform -->|enabled_by| Membership

%% Product mapping (neutral verbs; not over-claiming)

Grocery -->|executed_via| Instamart

Hyperlocal -->|includes| Genie

Hyperlocal -->|includes| Minis

Grocery -->|integrated_surface| Mall

Food -->|feature| Bolt

Dining -->|events_experiences_surface| Scenes

%% Membership benefits (keep it light; still useful)

Membership -->|benefits_across| Food

Membership -->|benefits_across| Grocery

Membership -->|benefits_across| Dining

Membership -->|includes| QuickBites

Membership -->|includes| CreditCard

%% Acquisitions as company actions

Swiggy -->|acquired| Dineout

Swiggy -->|acquired| Lynk

Dineout -->|expanded_surface| Dining

%% Timeline modeled as Events (tagged)

%% =====

Swiggy -->|has_event| E2013

Swiggy -->|has_event| E2014

Swiggy -->|has_event| E2015

Swiggy -->|has_event| E2019

Swiggy -->|has_event| E2020

Swiggy -->|has_event| E2021

Swiggy -->|has_event| E2022

Swiggy -->|has_event| E2023

Swiggy -->|has_event| E2024

Swiggy -->|has_event| E2025

%% Event -> affected entities (queryable, audit-friendly)

E2014 -->|launched| Food

E2020 -->|launched| Instamart

E2020 -->|launched| Genie

E2021 -->|launched| Membership

E2022 -->|acquired| Dineout

E2022 -->|launched| Minis

E2023 -->|launched| CreditCard

E2023 -->|acquired| Lynk

E2023 -->|launched| Mall

E2024 -->|launched| Bolt

E2024 -->|launched| Scenes

E2025 -->|launched| SNACC

E2025 -->|launched| Pyng

Test Chunks

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Swiggy is a new-age, consumer-first technology company offering users an easy-to-use unified platform, structured as a consumer convenience platform. This platform encompasses four primary service categories: Food delivery, Dining out and Events, Grocery and Household items delivery, and Other hyperlocal services. Supporting these services are four partner categories: Restaurant partners, Merchant partners, Brand partners, and Delivery partners. Underpinning the entire ecosystem are four foundational capabilities: Technology, Analytics, Fulfilment, and Membership, with the Membership component branded as “Swiggy one.” The source of this information is the Swiggy Limited IPO Prospectus.

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Swiggy positions itself as a pioneer in high-frequency hyperlocal commerce categories, driven by an innovation-led culture that is described as an integral part of its DNA, encouraging constant ideation, experimentation, and iteration. The company emphasizes a convenience-first approach, faster delivery times, product quality, assortments, and personalized recommendations. Its primary app and underlying reusable tech stack enable quick and low-cost innovations. Swiggy was a pioneer in Food Delivery in 2014 and in Quick Commerce in 2020. It has a successful track record of scaling up businesses, exemplified by Instamart, which scaled to 124 cities as of 31 March 2025 from 2 cities in less than 5 years of launch. Strategic acquisitions, such as Dineout, have expanded its platform capabilities. The company offers a membership programme providing benefits across its offerings, including 10-minute food delivery, food delivery from restaurants, quick delivery of groceries and household items, restaurant reservations and payments, events and experiences, a co-branded credit card, and Quick Bites.

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The urban convenience platform was built by adding adjacent services over a decade, beginning with the incorporation of the company in 2013 under the name Bengaluru, followed by the launch of the Food Delivery business in 2014. In 2015, the company completed its first major fundraise. The platform expanded in 2019 with the expansion of the food delivery business to cover over 500 cities. In 2020, Swiggy Instamart and Swiggy Genie were launched. The year 2021 saw the launch of the membership program, Swiggy One. In 2022, the company acquired and integrated Dineout, expanded Swiggy Instamart to cover 25 cities with over 400 dark stores and over 8,400

SKUs, and launched Swiggy Minis. In 2023, the company launched the Swiggy-HDFC Bank co-branded credit card, acquired a 100% stake in Lynk, and launched Swiggy Mall, now integrated with Instamart. In 2024, the Swiggy One membership base crossed 5.7 million members, the company completed its public listing, launched Bolt for 10-minute food delivery, and launched Swiggy Scenes for events and experiences. In 2025, the platform surpassed 120 million transacted users and launched SNACC and Pyng. The source of this information is the Swiggy Limited IPO Prospectus, Annual Report FY 2024-25.