



Webinar On



# API Design & Testing

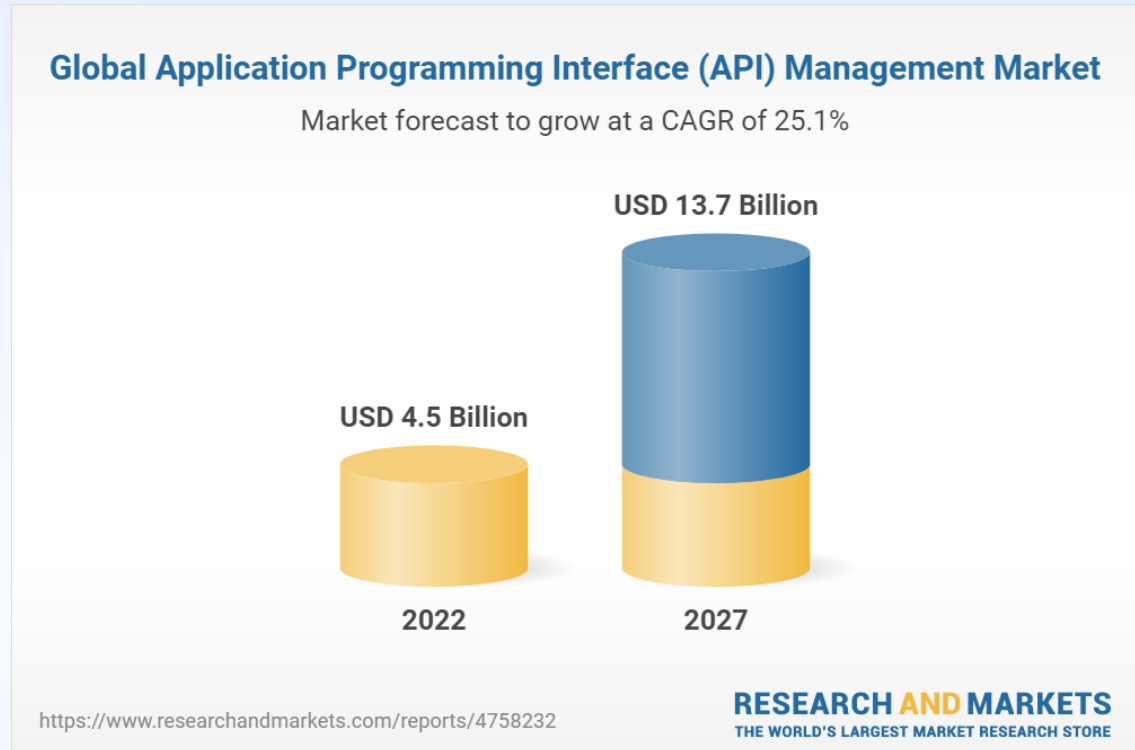


Speaker

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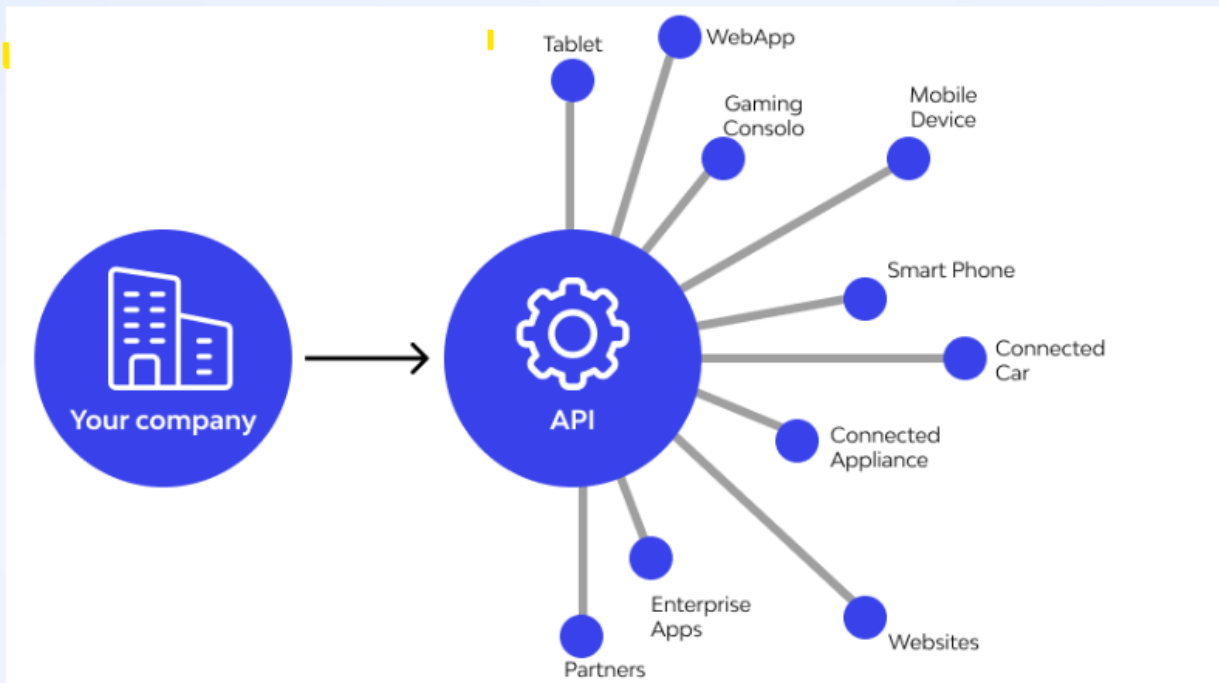


# Overview



APIs used daily are going to implode exponentially by 2027 to \$13.7 billion economy

# API Design - Requisites



1) The choice of API architecture is closely related to the application's non-functional requirements, that describes the quality criteria under which the product operates.

2) This includes design patterns to use, architectural components to employ, and how requests and responses flow between consumers and data sources.

3) A well-designed API architecture is easy to use and maintain, scalable, and handles data and interactions securely. It can also be extended as new technologies emerge.

# API Design - Principles



## Basic principles of API design

- 1 Consistency
- 2 Simplicity
- 3 Security
- 4 Scalability
- 5 Collaboration
- 6 Business benefits

# API Design - Protocols

## API Protocols

### REST

REST is an architectural style for designing networked applications, using stateless communication and standard HTTP methods



### Webhooks

A webhook is a mechanism for one system to notify another system in real-time via HTTP callbacks when a specific event occurs



### GraphQL

GraphQL is a query language for APIs that allows clients to request only the data they need



### SOAP

SOAP is a protocol for exchanging structured information using XML



### WebSockets

WebSockets provide a full-duplex communication channel over a single, long-lived connection, allowing for real-time data exchange



### EDA

Event-Driven Architecture (EDA) is a trending software architecture pattern nowadays



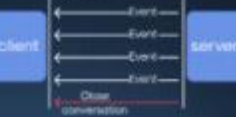
### EDI

EDI (Electronic Data Interchange) is a set of standards for exchanging structured business data between organizations electronically without human intervention.



### SSE

SSE (Server-Sent Events) is a simple and efficient standard for server-push notifications over an HTTP connection



### AMQP

AMQP is an open-standard protocol for message-oriented middleware, facilitating message routing, queuing, and delivery.



### MQTT

MQTT is a lightweight publish-subscribe messaging protocol designed for low-bandwidth, high-latency, or unreliable networks



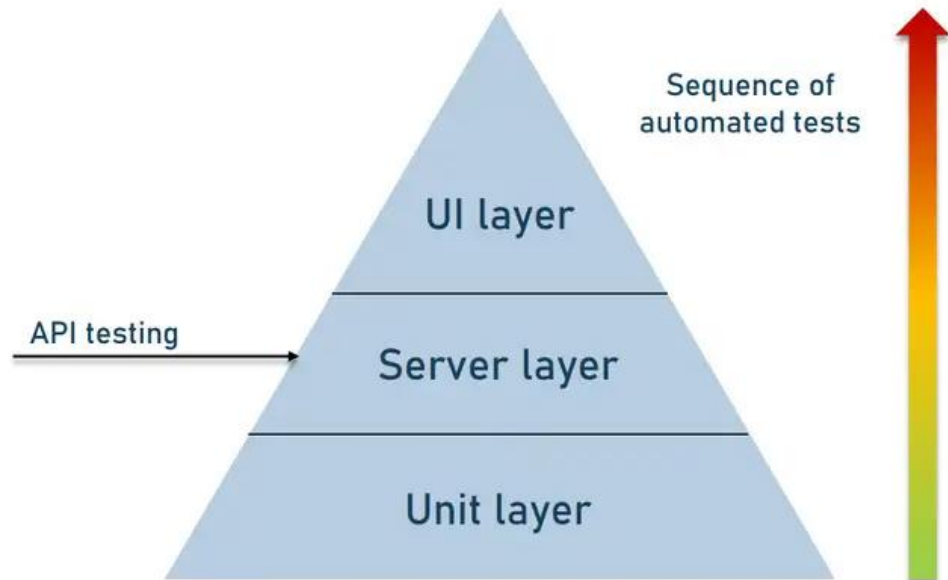
### gRPC

gRPC is a high-performance, open-source framework for RPCs using Protocol Buffers



# Importance of API Testing

TEST AUTOMATION PYRAMID



Functional Testing → Address the need for Positive/Negative testing

Performance Testing also monikered as LS<sup>4</sup> testing

Security testing classified as Security, Penetration, Fuzz (SPF)

API Integration and Reliability testing

Tests must be run for a feature, including the results and highlight blockers that halts testing.



# API Testing - Steps



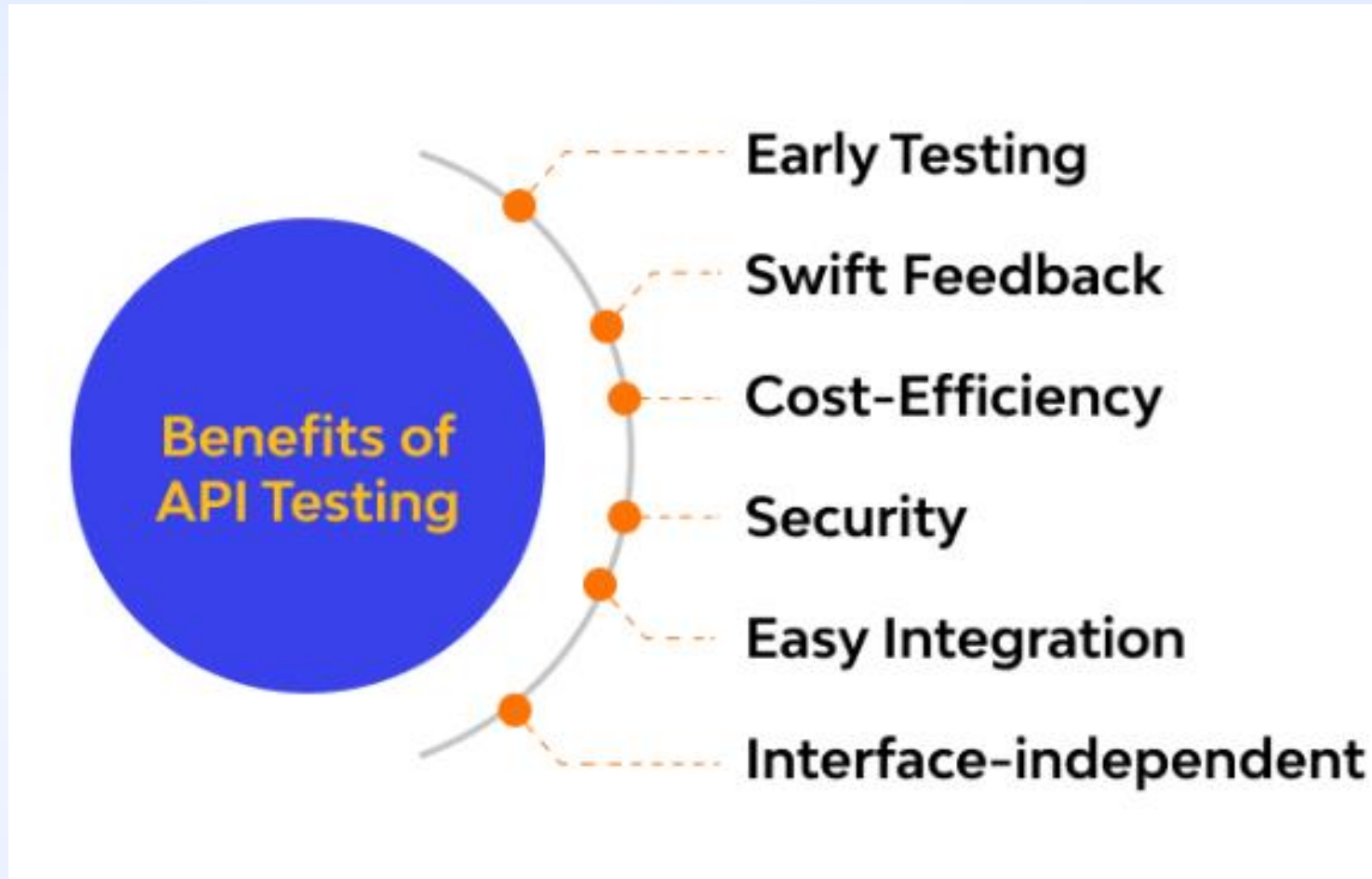
# API Testing – Stages in Development

## Types of API testing

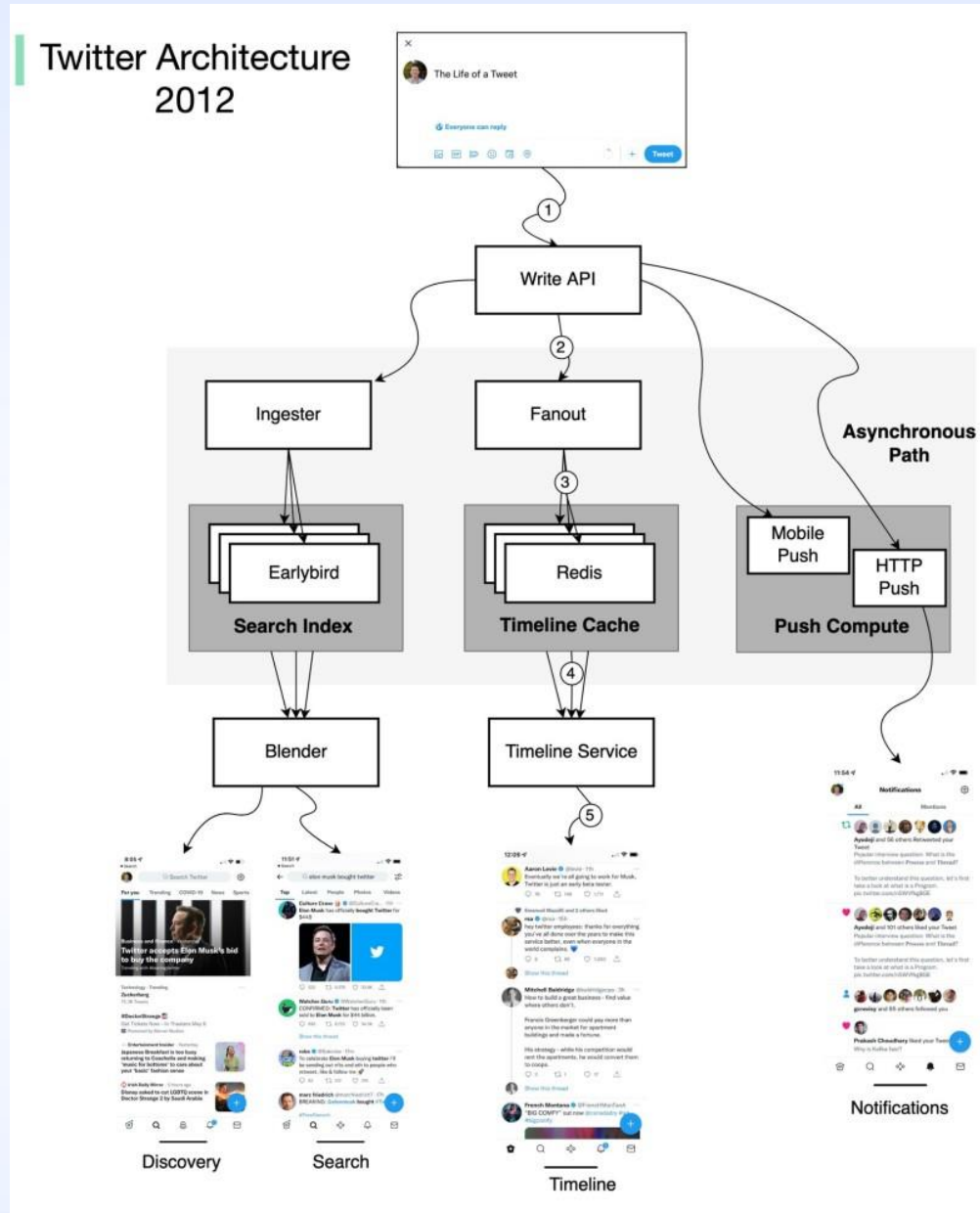
Type of testing	Stage of software
Unit testing and integration testing	Development stage
Performance and load testing	As early as possible as these tests take time
Runtime error detection and security testing	Ongoing processes
Interoperability and fuzz testing	Testing stage
Validation testing	User Acceptance testing



# API Testing - Benefits



# Twitter – 2012

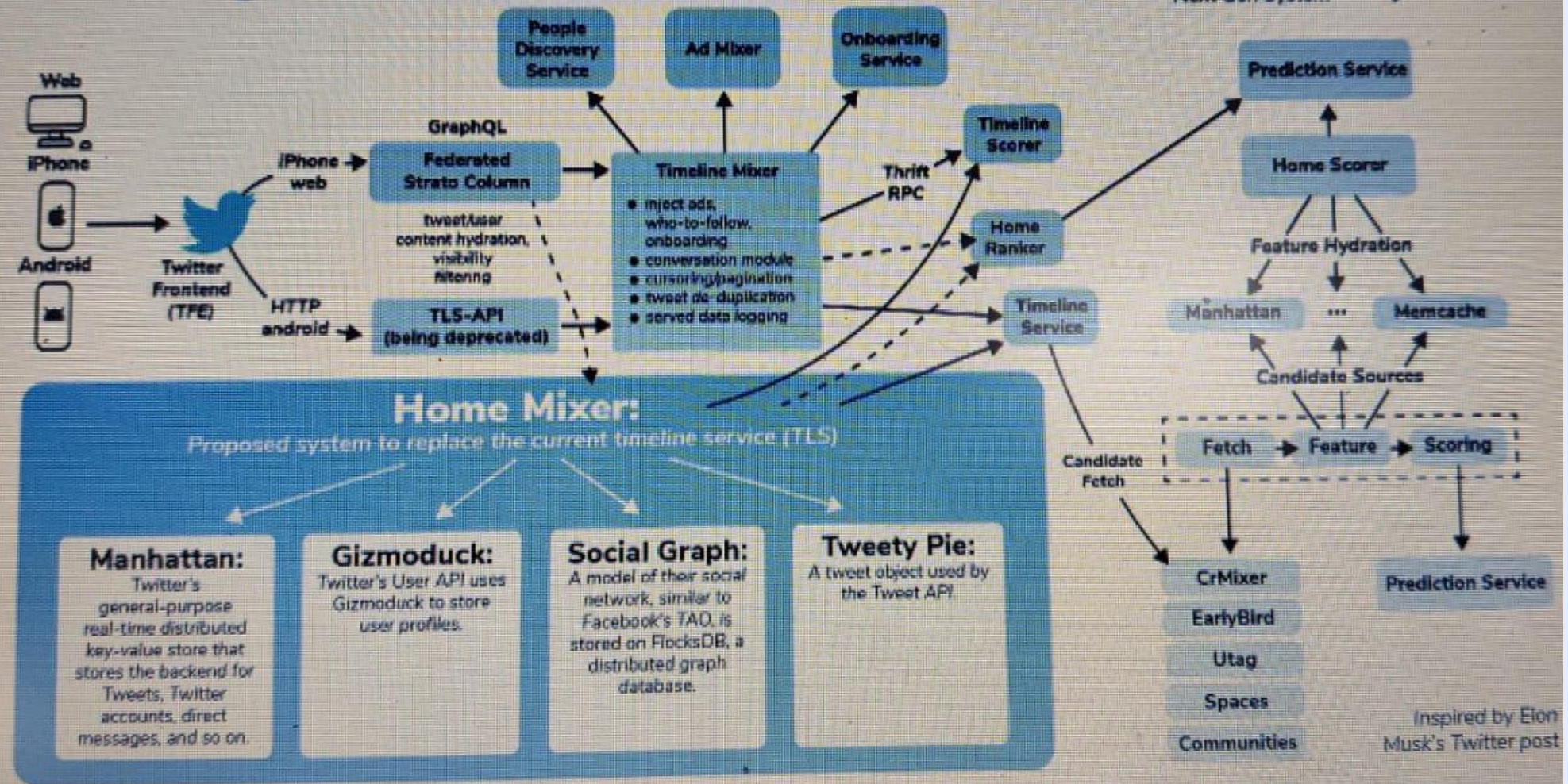




# X 2 (2022)

educative

## Generating the Twitter Timeline





# API ECONOMY BENEFICIAL STATISTICS

1. Over 90% Of Developers Use APIs
2. Developers Spend 30% of Their Time Coding APIs
3. Broken APIs Are Rare for 60% of Consumers
4. Travel Data Is a Top Integration Need
5. There Are 46 Million Postman Collections
6. API Management Market Valued at \$5.1 Billion by 2023
7. 91% of Organizations Had An API Security Incident in 2020
8. There Are 24,000+ APIs On Programmable Web
9. We Charted 8 Major API-Centric Fundraisers In 2021
10. There Are Over 2 Million API Repositories On GitHub
11. More Than 93% Of Communications Service Providers Use OpenAPI
12. Open Banking to Have 130 Million Users by 2024
13. Healthcare APIs Are Growing By 6.3% CAGR
14. Cloud Automation Will Become a \$623.3 Billion Industry By 2023
15. 83% of All Internet Traffic Belongs to API-Based Services
16. GraphQL Is Used By 22.5% of API Developers
17. 93.4% of API Developers Are Still Using REST
18. Walgreens Customers Spend 600% More Online Than In-Store
19. 65% of Companies Are Accelerating Their Digital Transformation Due To The Pandemic
20. 56% Of Developers Report APIs Help Them Develop Better Products

The future – Platform Engineering beckons

**Thank You!**

