1. Functional Requirements:

Functional Requirements:
1) Video Onboarding/Uploading

Functional Requirements:

1) Video Onboarding/Uploading
2) Search Video

Functional Requirements:

1) Video Onboarding/Uploading
2) Search Video
3) View Videos

Functional Requirements:
1) Video Onboarding/Uploading
2) Search Video
3) View Videos
4) Generate Recommendations

Functional Requirements:
1) Video Onboarding/Uploading
2) Search Video
3) View Videos
4) Generate Recommendations

Non-Functional Requirements:

Functional Requirements:
1) Video Onboarding/Uploading
2) Search Video
3) View Videos
4) Generate Recommendations

Non-Functional Requirements:
1) Low Latency

Functional Requirements:

1) Video Onboarding/Uploading
2) Search Video
3) View Videos
4) Generate Recommendations

Non-Functional Requirements:

1) Low Latency
2) High Availability

Design Video Streaming Platform:

Functional Requirements:
1) Video Onboarding/Uploading
2) Search Video
3) View Videos
4) Generate Recommendations

Non-Functional Requirements:
1) Low Latency
2) High Availability

Capactiy Estimations:

10"3 = 1KB = Thousand
10"6 = 1MB = Million
10"9 = 1GB = Billion
10"12 = 1TB = Trillion
10"15 = 1PB = Quadrillion

Day to Seconds:
24 hours * 60 mins *60 seconds
=24 * 3600
=25 * 4000
100,000
=10"5

Functional Requirements:
1) Video Onboarding/Uploading
2) Search Video
3) View Videos
4) Generate Recommendations

Non-Functional Requirements:
1) Low Latency
2) High Availability

Capacity Estimation:
1) DAU: 1OOM Users * 2 times/day
QPS= 1OOM *2 times /(24 hours * 60 mins * 60 seconds) = 100 * 10"6 * 2 / 10/\6
=2000 QPS

Functional Requirements:
1) Video Onboarding/Uploading
2) Search Video
3) View Videos
4) Generate Recommendations

Non-Functional Requirements:
1) Low Latency
2) High Availability

Capacity Estimation:
1) DAU: 100M Users * 2 times/day
QPS= 100M *2 times /(24 hours * 60 mins * 60 seconds)
= 100 * 10^6 * 2 / 10^5
=2000 QPS

Storage:
10:1 viewers : Creators
100M viewers -> 10M Creators
Two times a week
Each video 5GB

Storage capacity =
10 M Crators * 2 times / week * 5GB video
= 10 * 10^6 * 2 times a week * 4 weeks * 12 monts * 5GB
= 10 * 10^6 * 100 * 5 * 10^9
= 10^15 * 5000
= 5000 PB/year

Database Design:

Database Design:

Videos -> BLOB storage

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Videos -> BLOB storage

Video Metadata DB: SQL
Video ID(PK) UserID (FK) DTTM : DateTime Visibility: Public/Private Short Description: String Long Description: String Category : String

VideoURL Table:
Video ID (FK) PartID: Numeric Format: String(Mp3,MP4 etc) ---------- Unique Key

VideoURL Table:

Video ID (FK)
PartID: Numeric
Format: String(Mp3,MP4 etc)
---------- Unique Key

User Table :

UserID(PK)
UserName: String
FirstName : String
Last Name : String
CreatedDTTM: DTTM
LastLogin : DTTM

Video ID (FK)
PartID: Numeric
Format: String(Mp3,MP4 etc)
---------- Unique Key

User Table :

UserID(PK)
UserName: String
FirstName : String
Last Name : String
CreatedDTTM: DTTM
LastLogin : DTTM

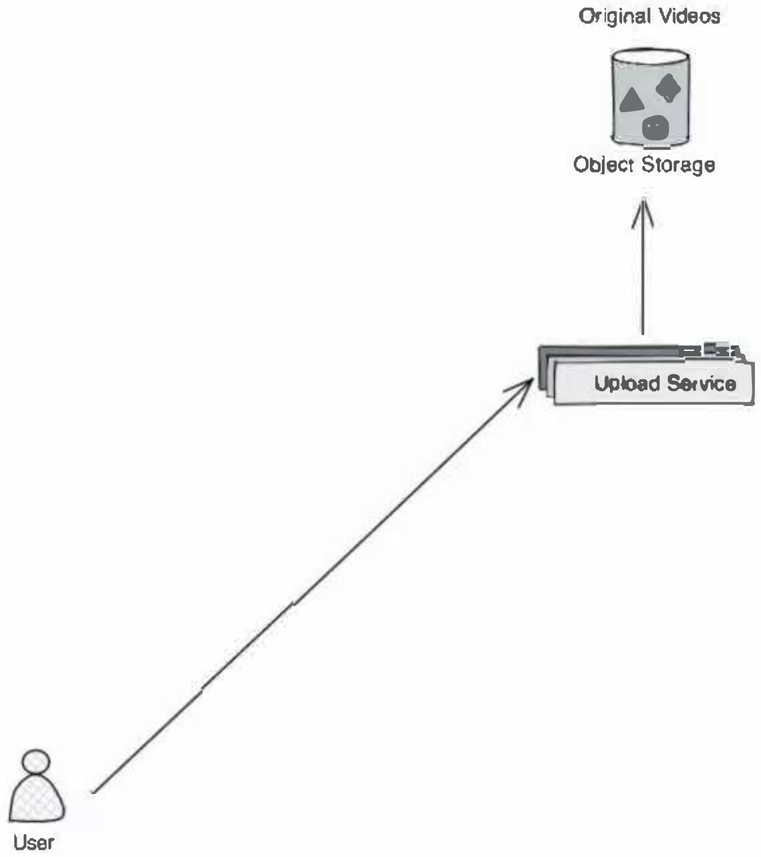
History Table:

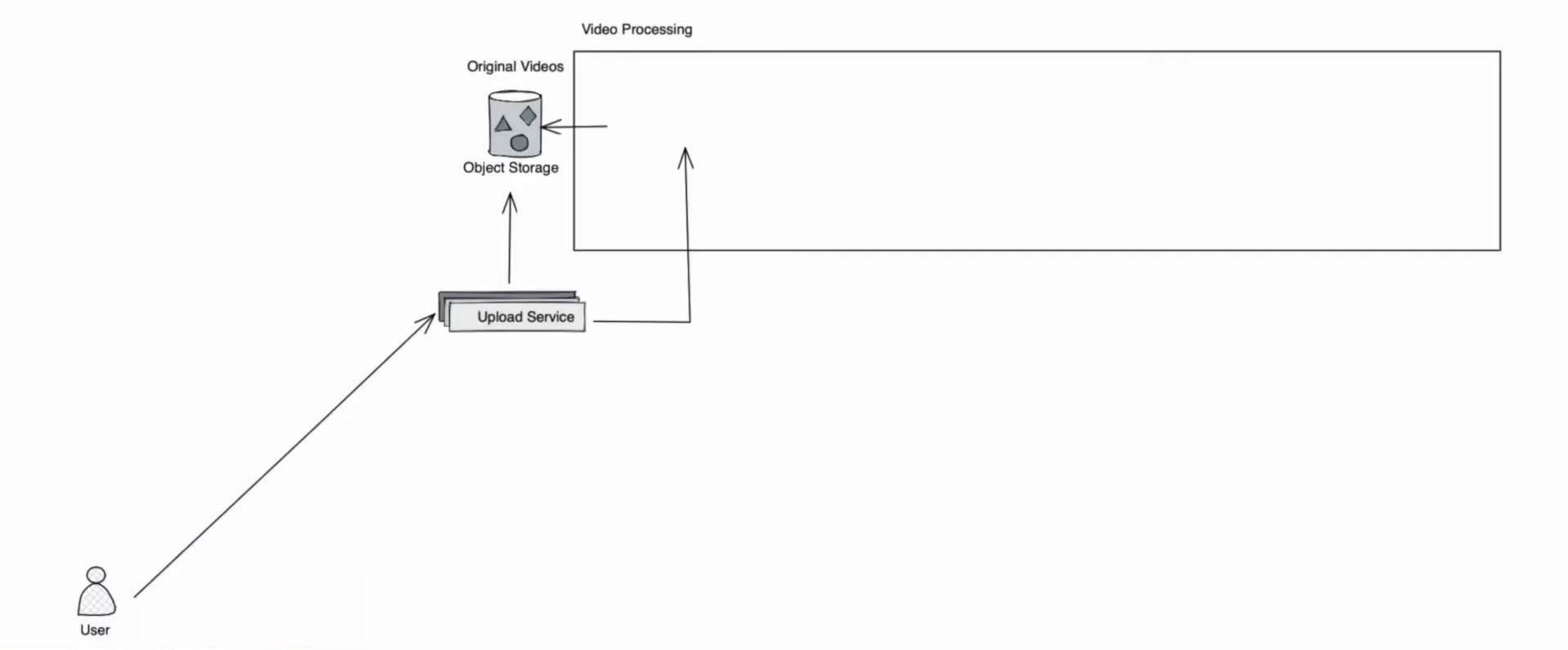
UserID (FK)
Video ID (FK)
DTTM: Date Time
WatchTime : Float

= 10^15 * 5000
= 5000 PB/year

Bandwidth Server side:
2000 QPS * 5GB
= 2 * 10 ^3 * 5 * 10 ^9
=10 * 10^12
=10TB/Second

API:
1) View Service(VideoID) - GET method - return video URL parts
2) Upload Service(Video File) - POST Method - return a message of successful upload or an error
3) Recommendation service(UserID) - GET - return 20 recommended videos
4) Update History Service (UserID, VideoID,Start DTTM, End DTTM) POST Method


Original Videos
Object Storage
Upload Service
User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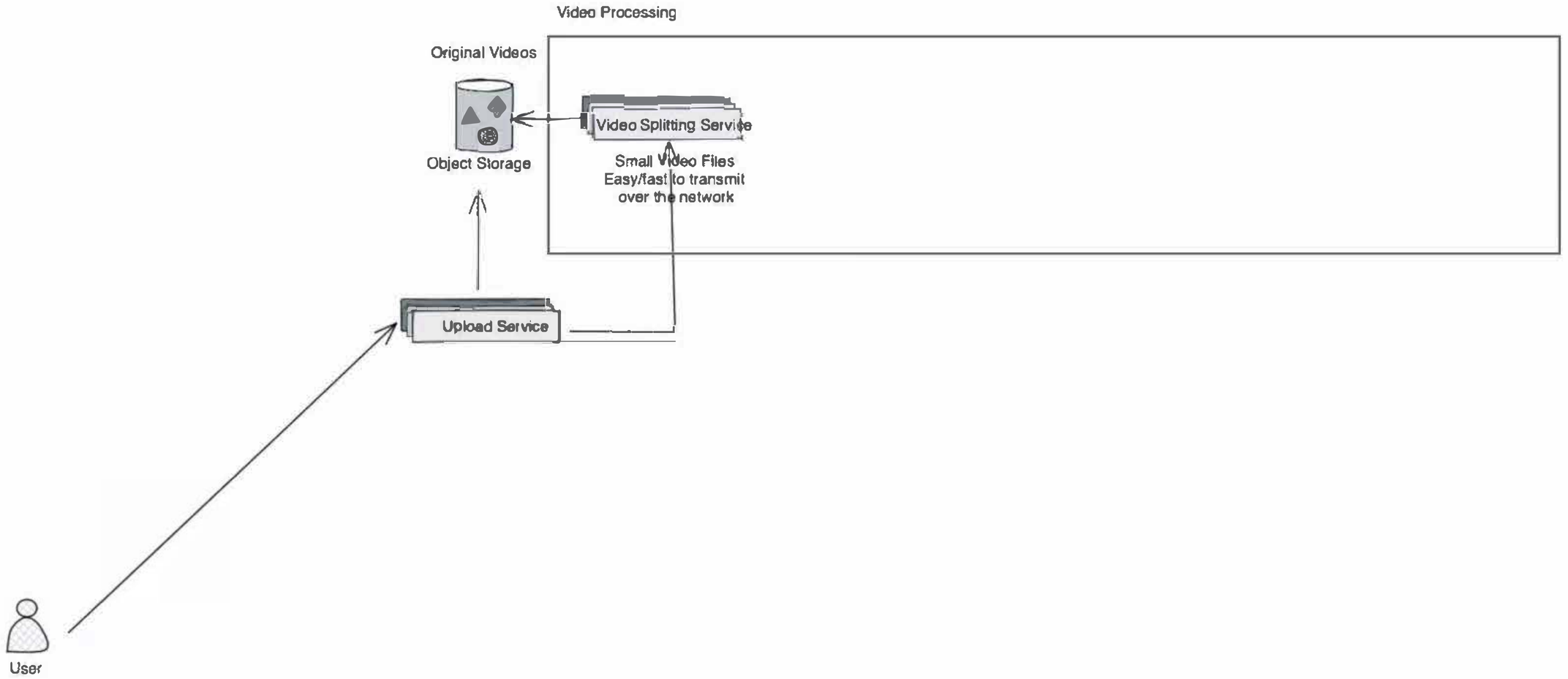
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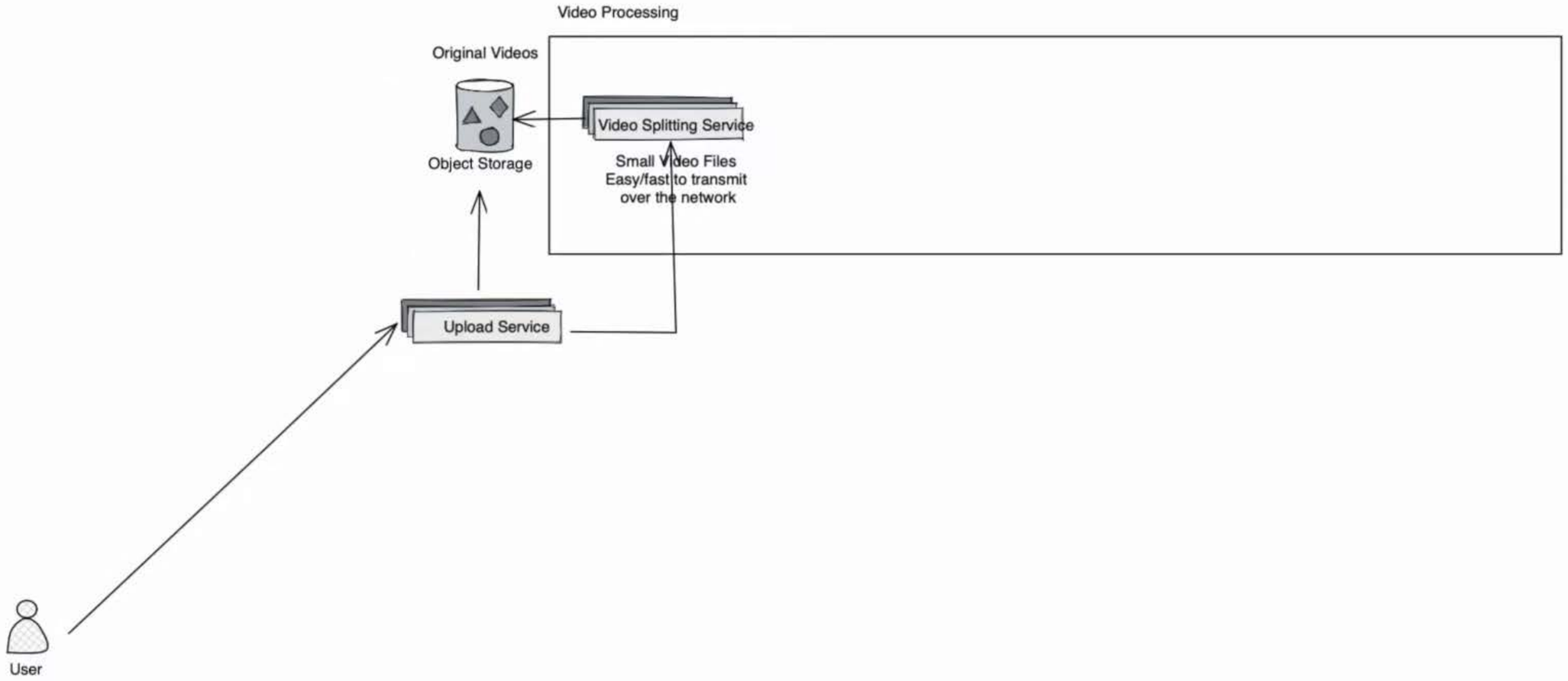
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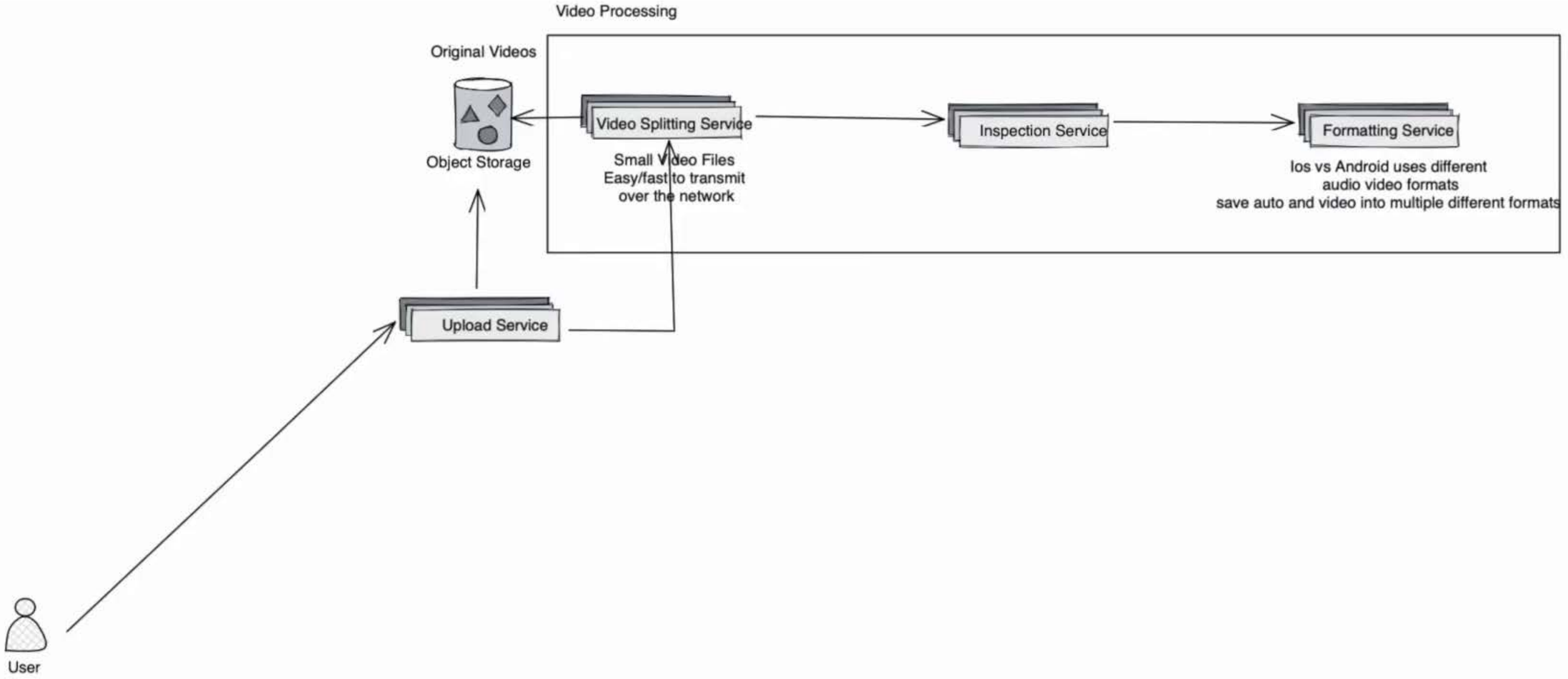
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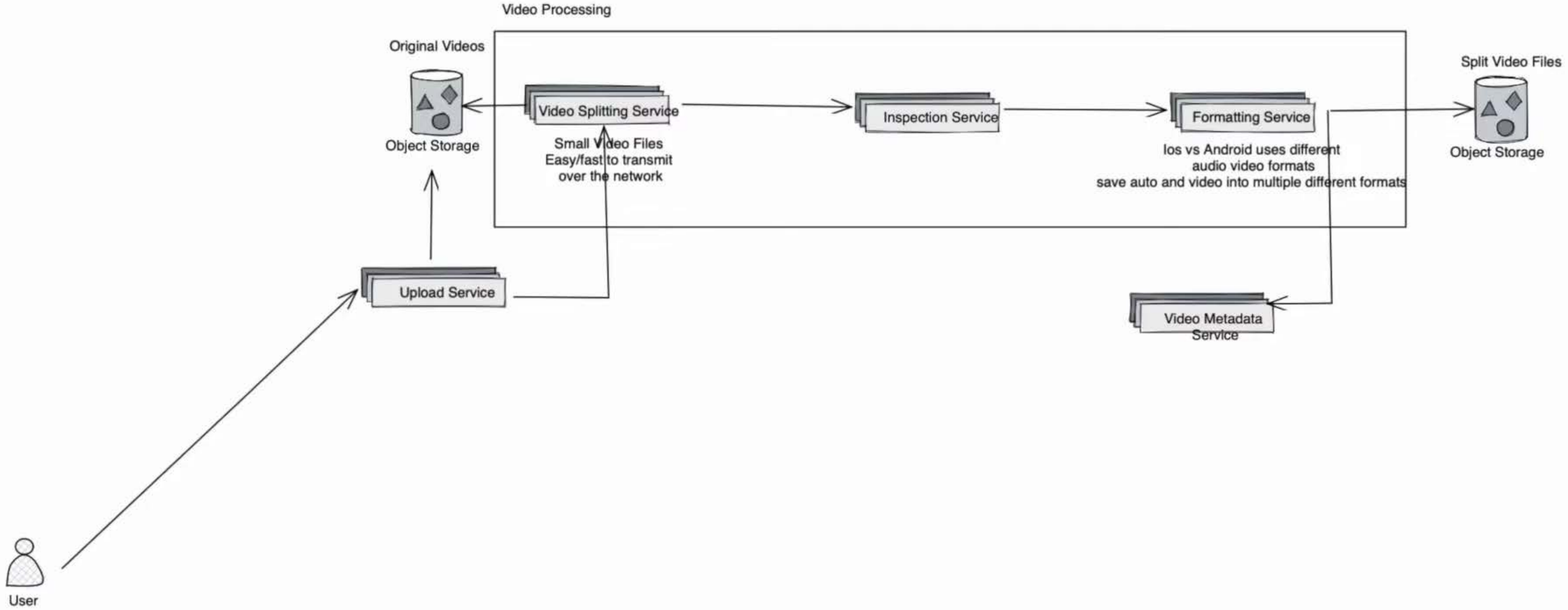
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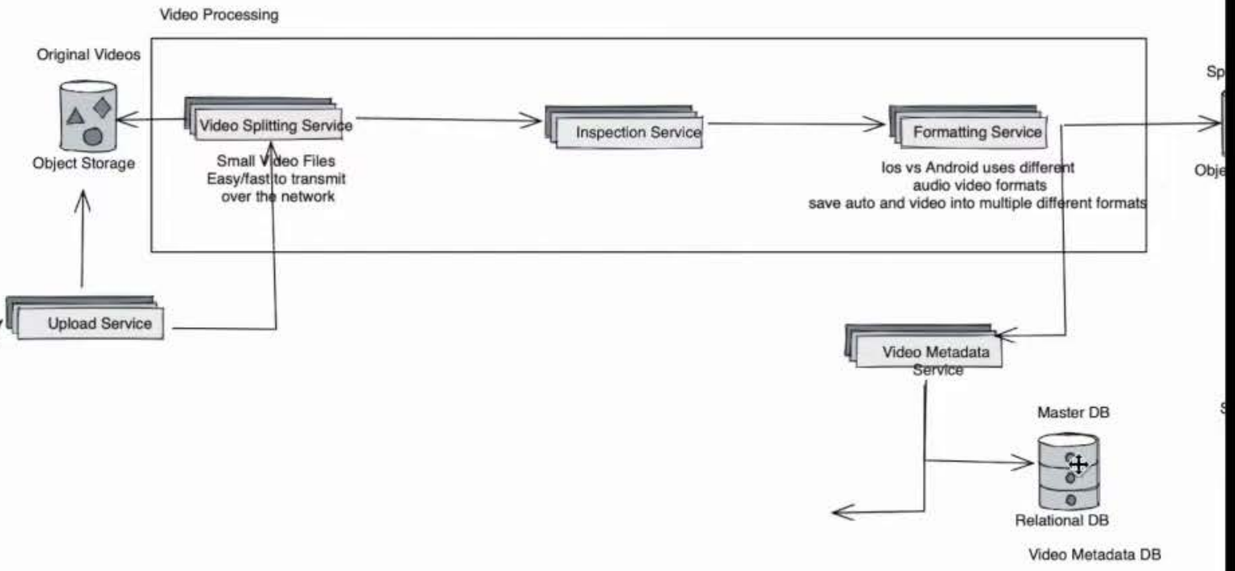

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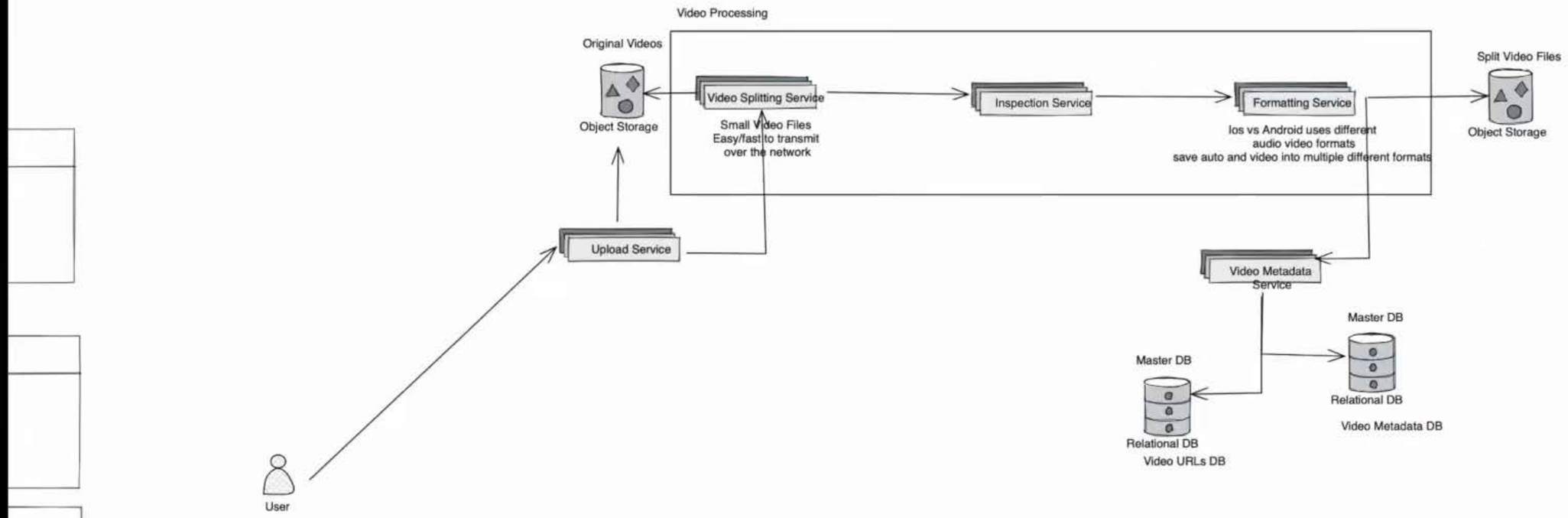
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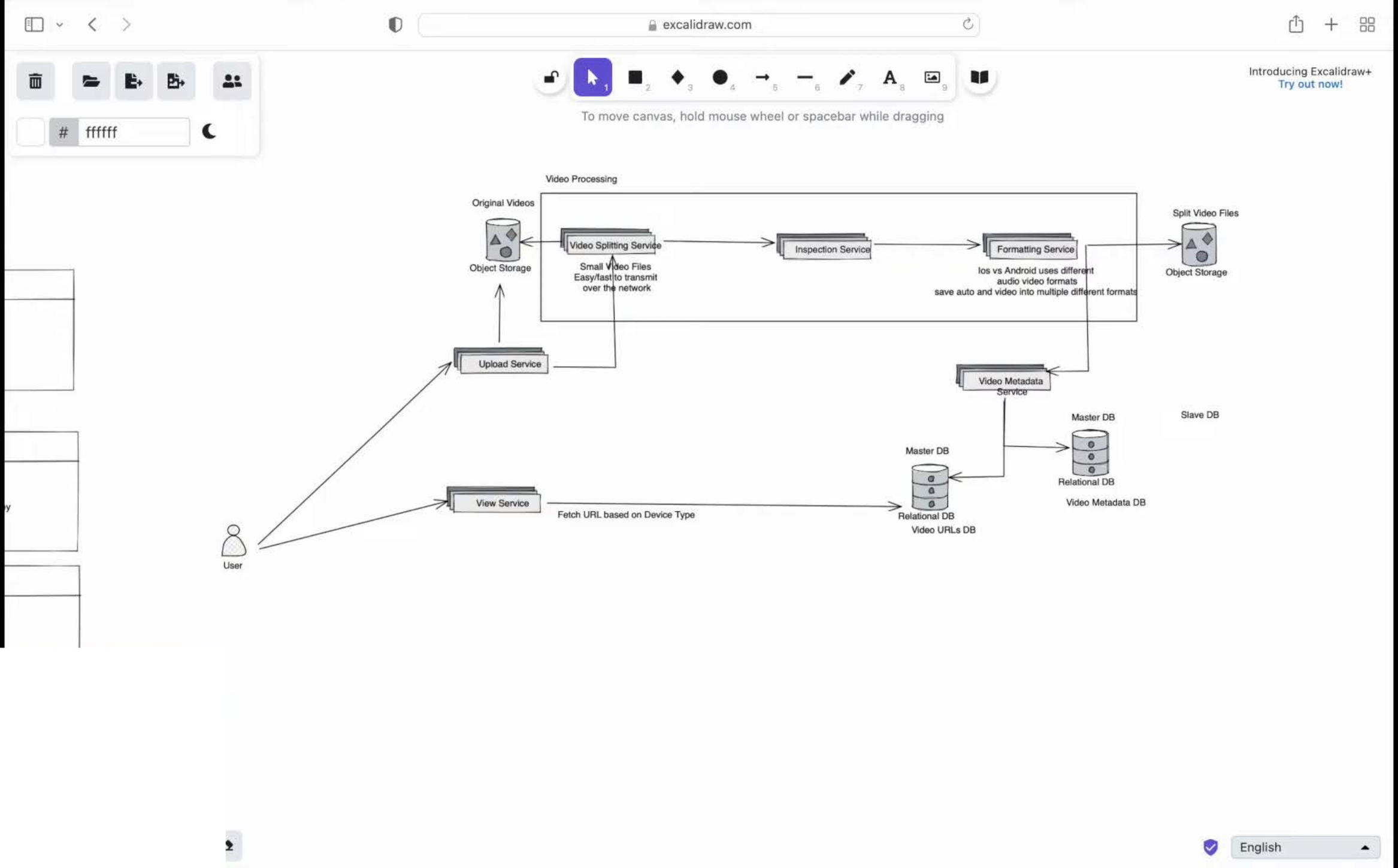
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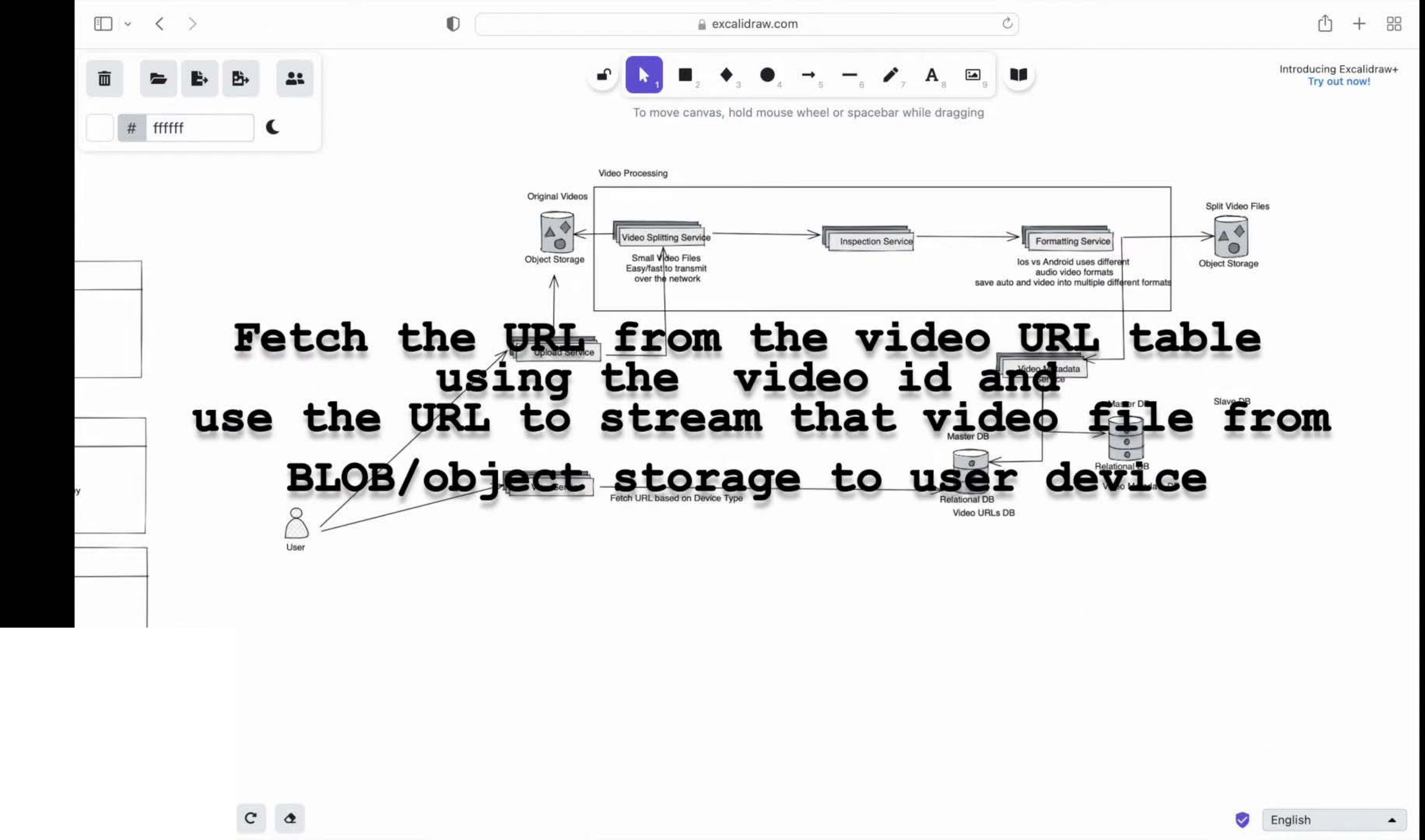
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using the video id and
use the URL to stream that video file from
BLOB/object storage to user device
Upload Service
Master DB
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Fetch URL based on Device Type
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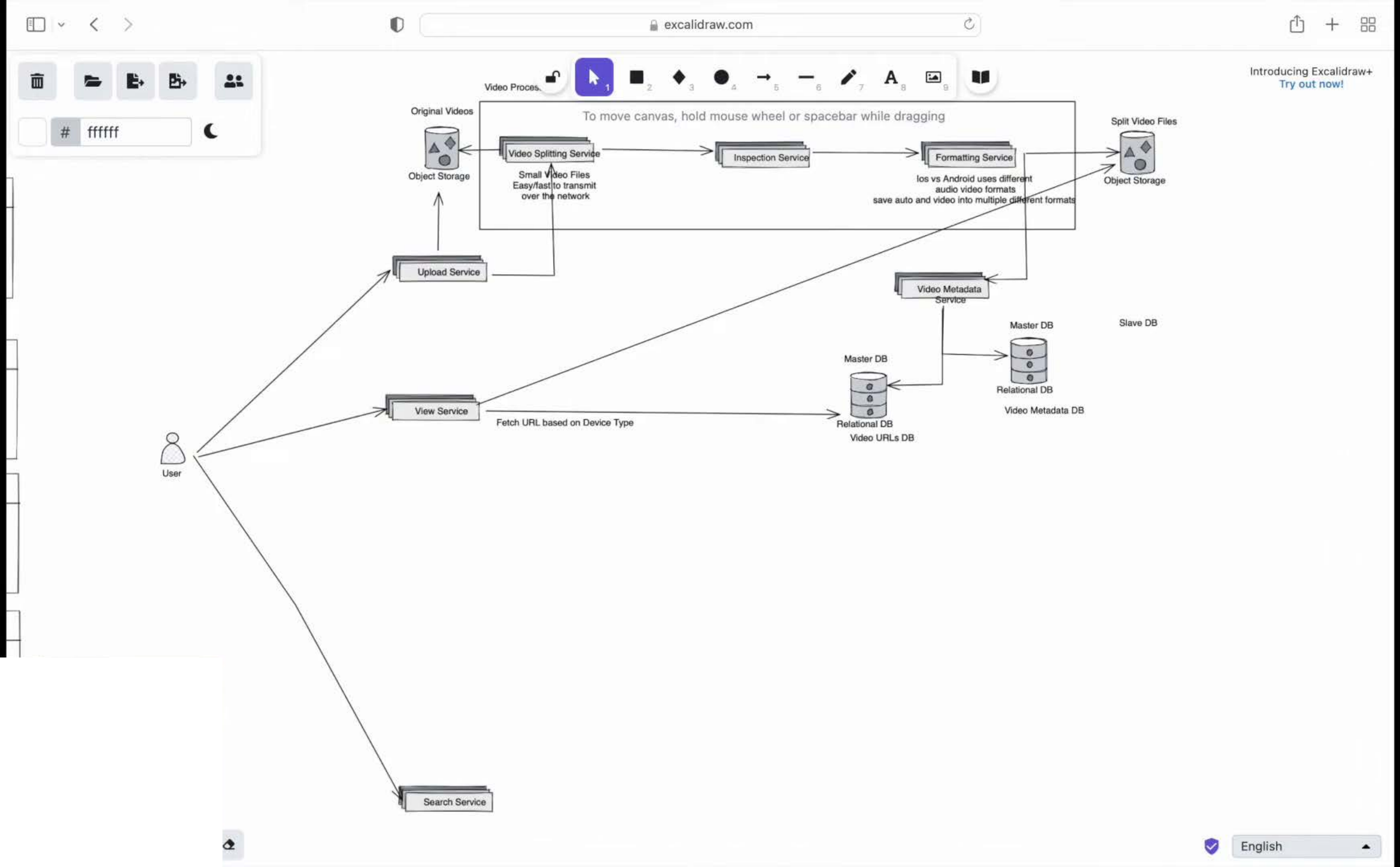
English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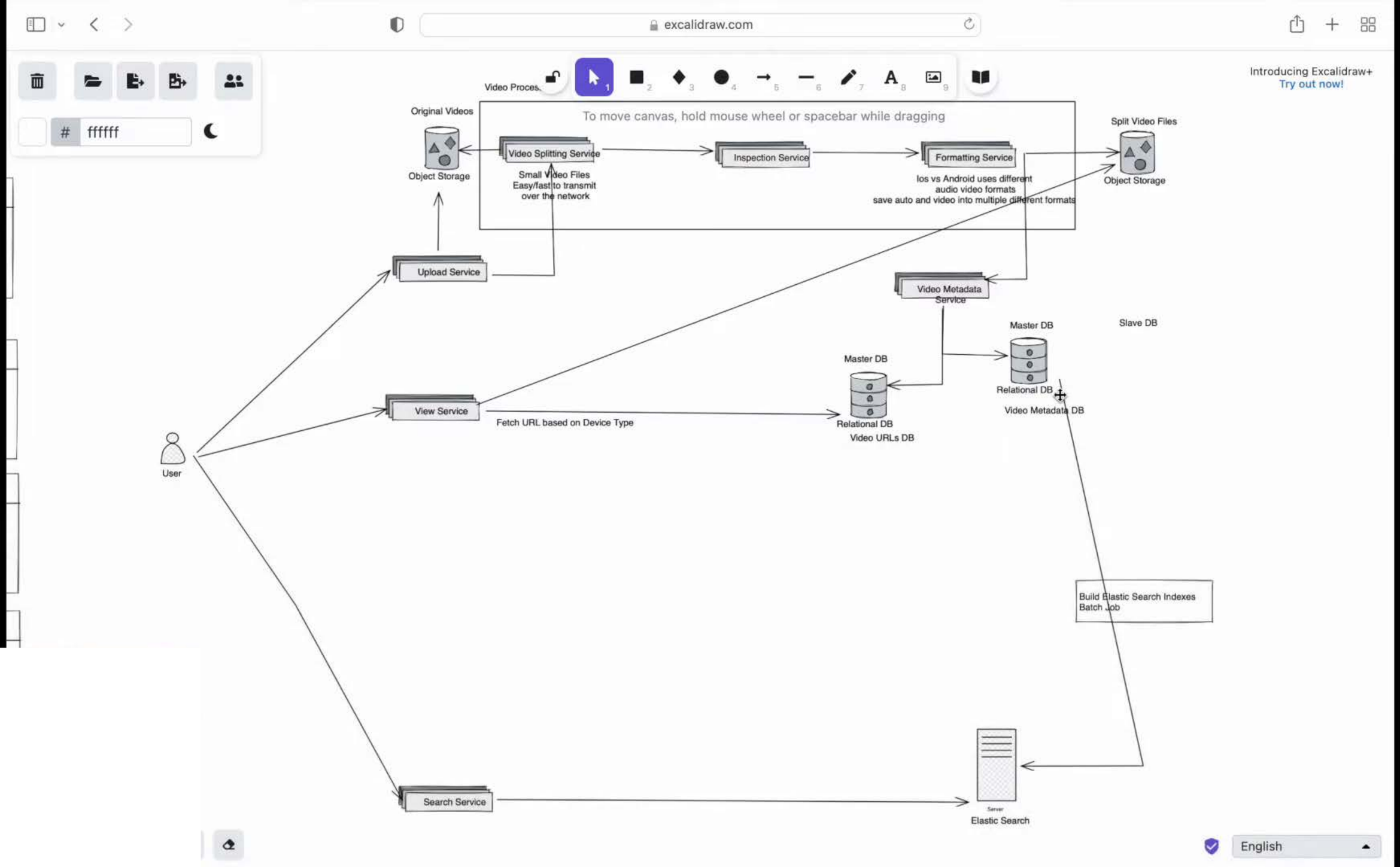
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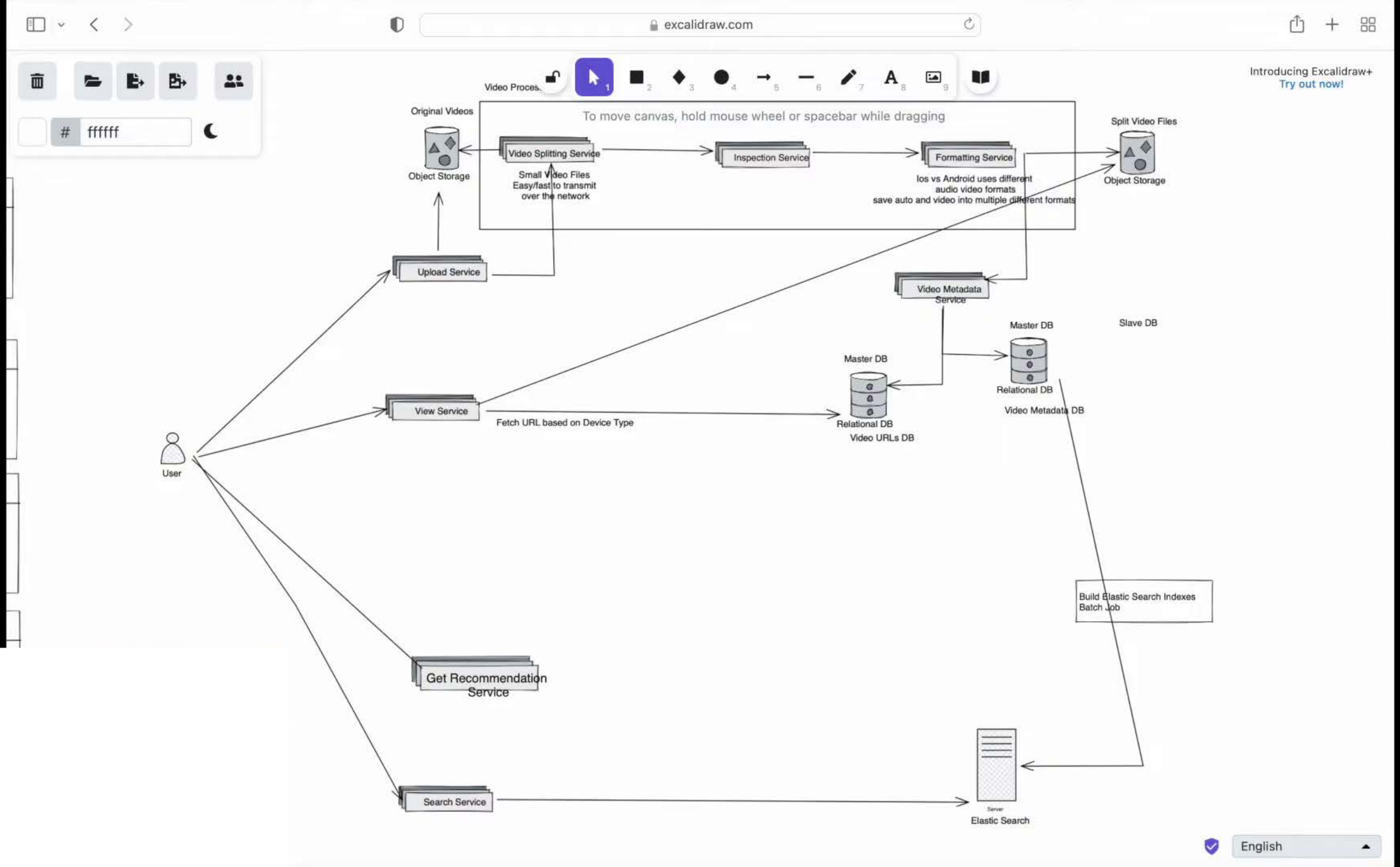
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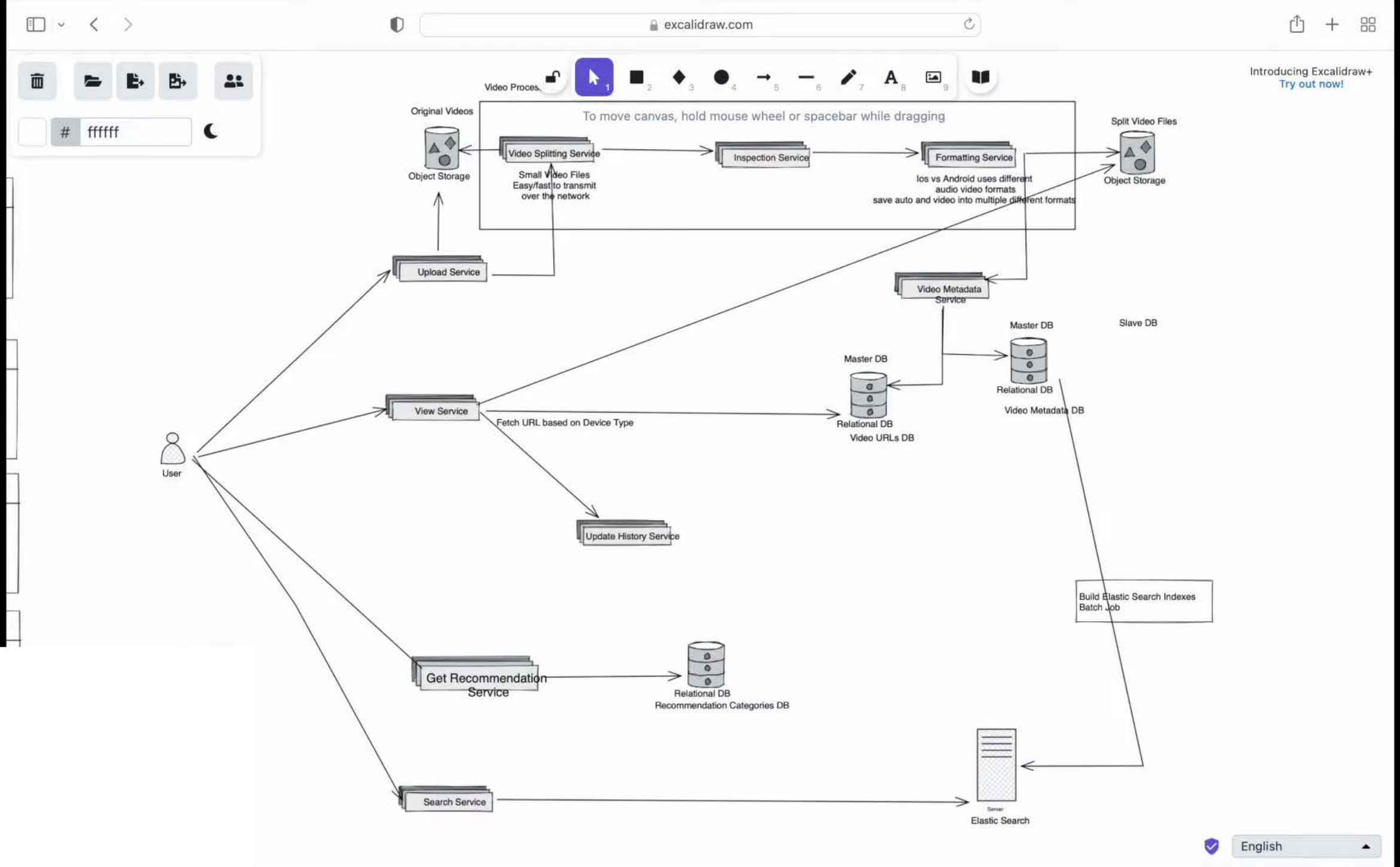
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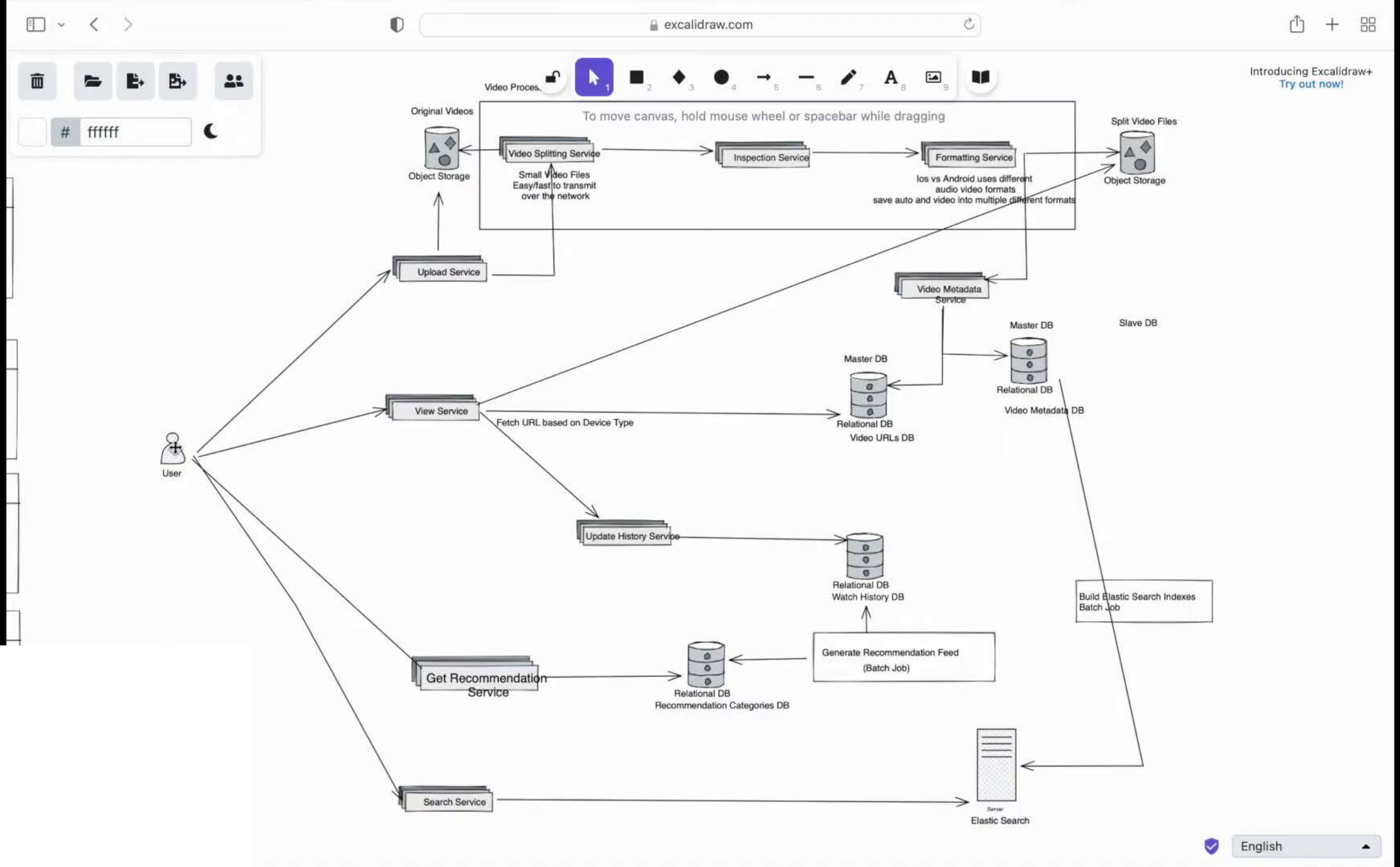
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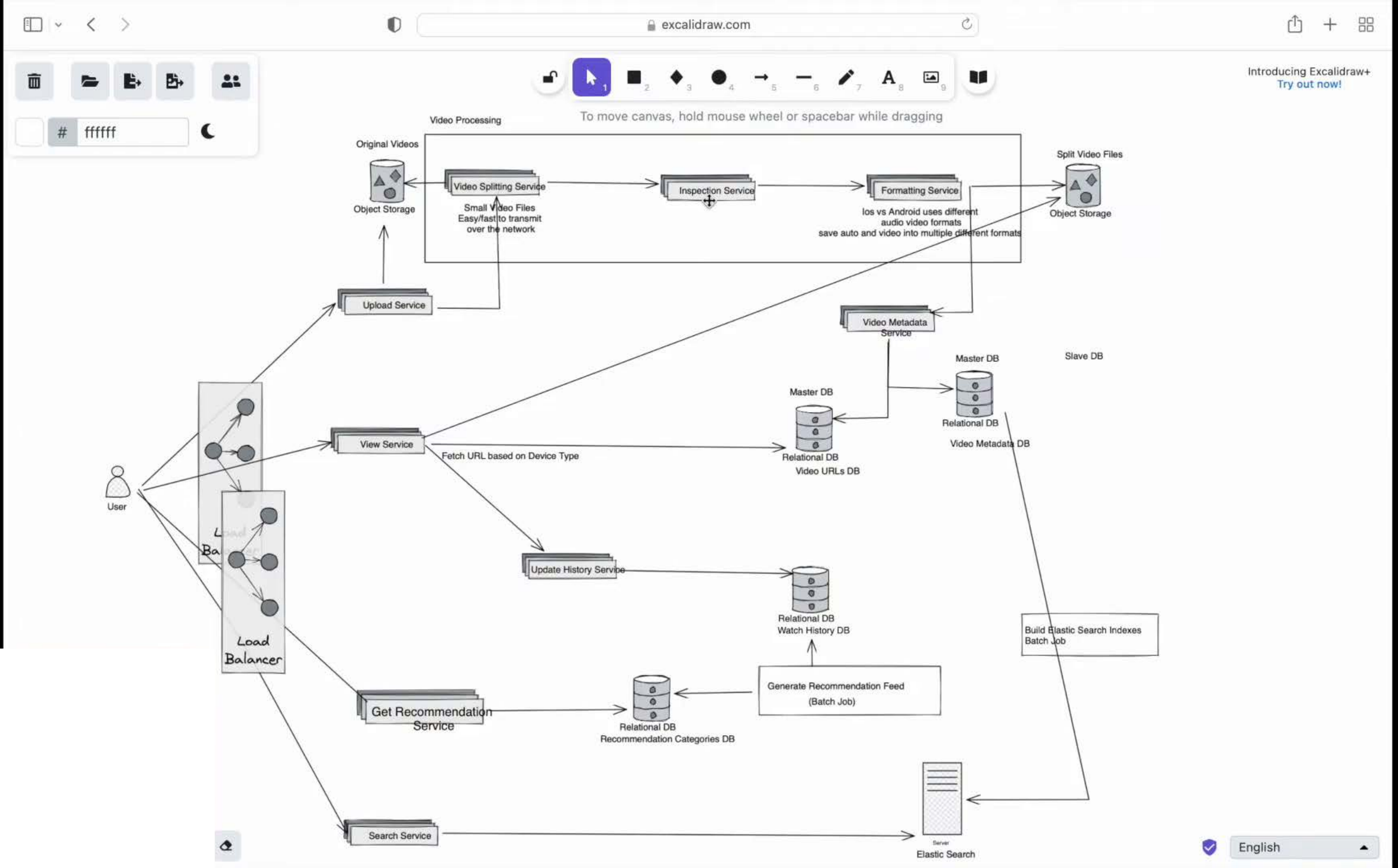
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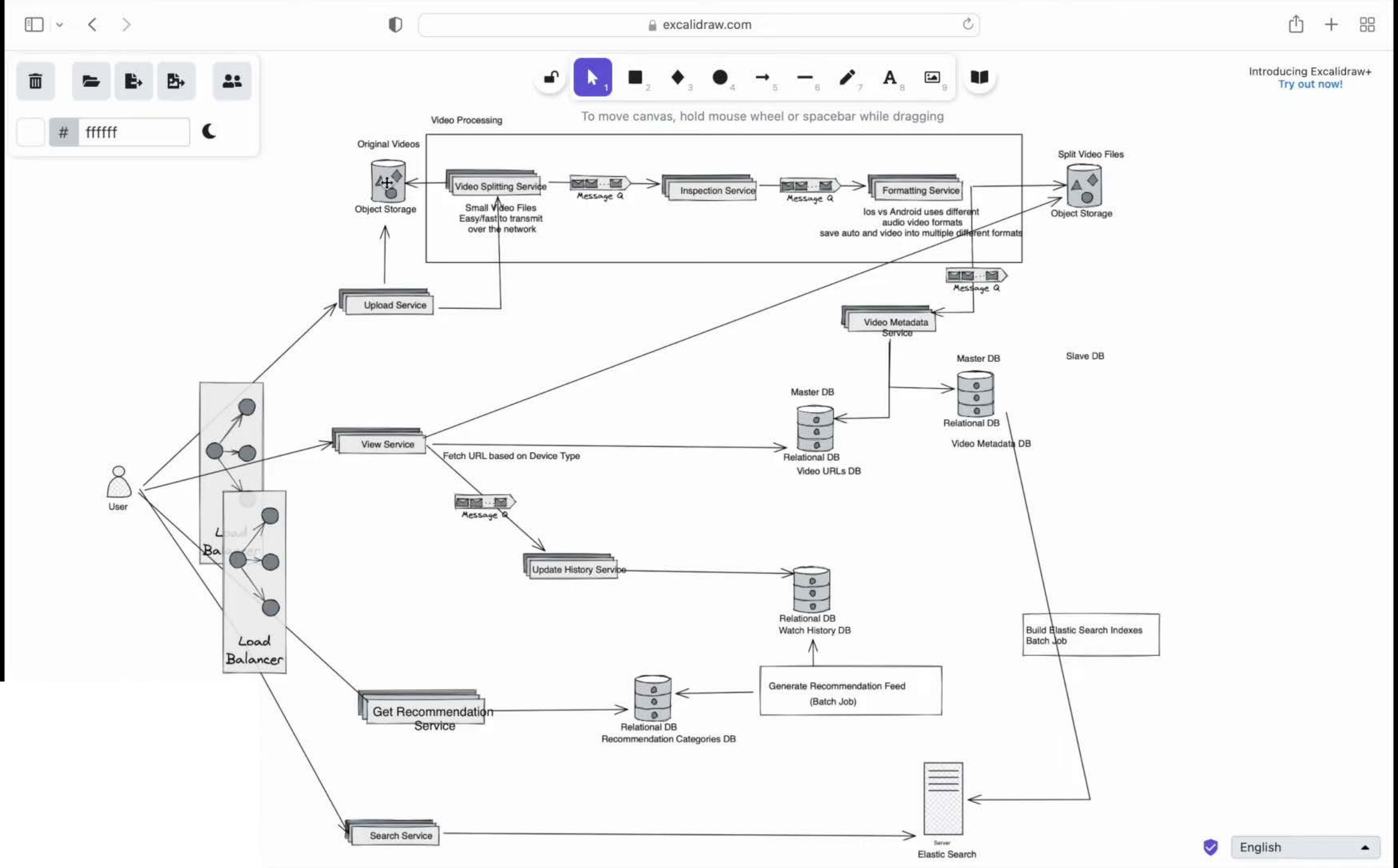
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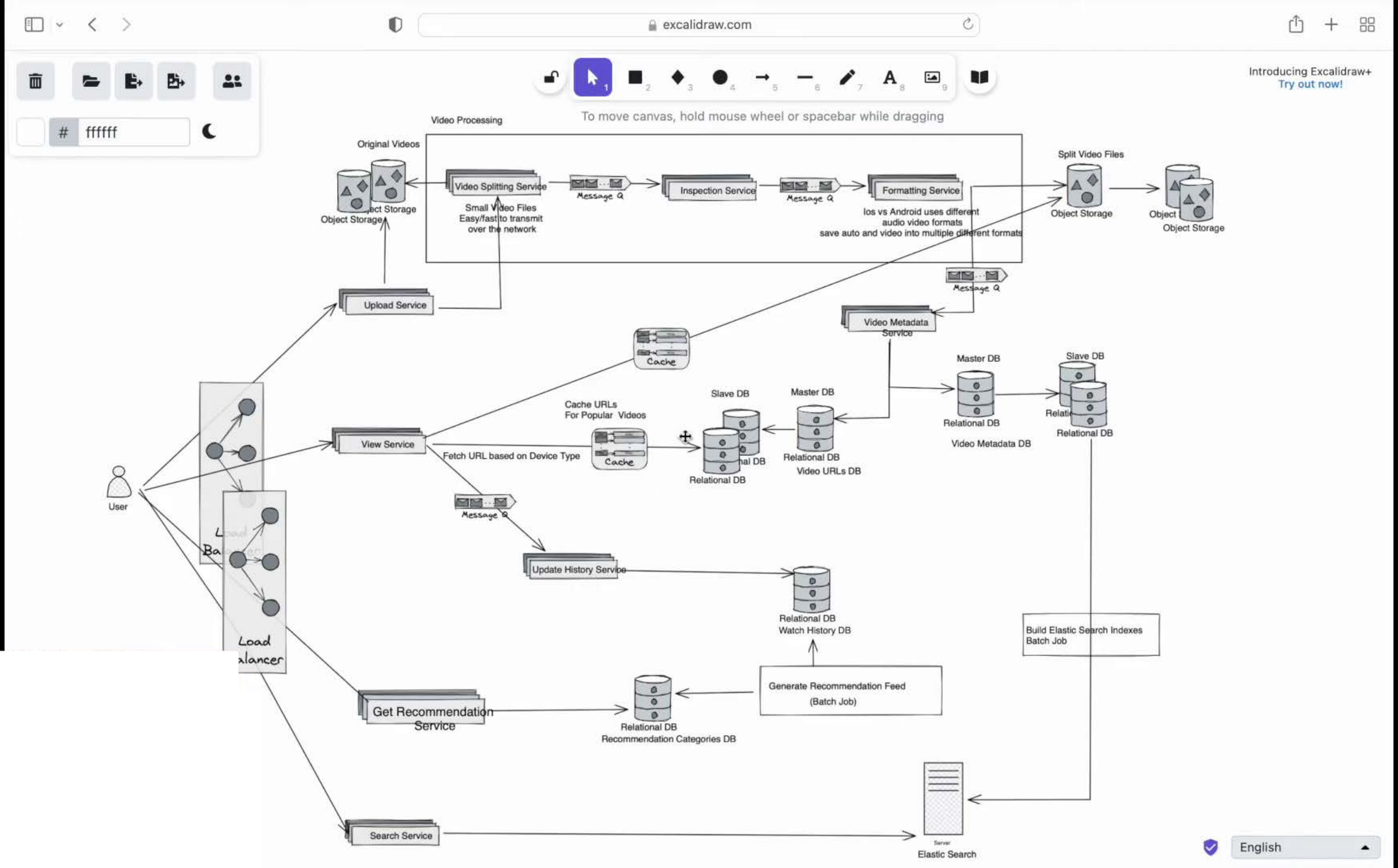
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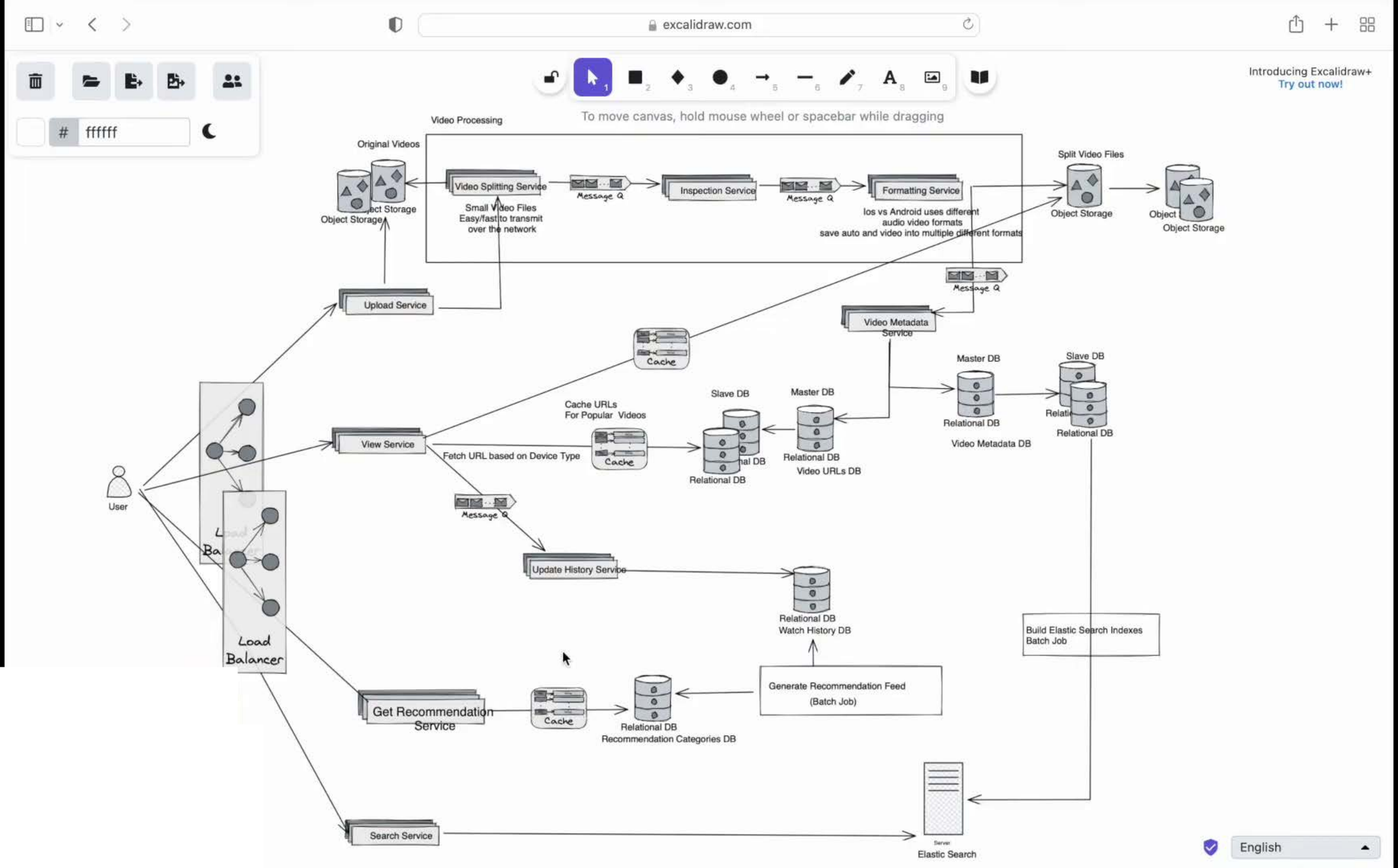
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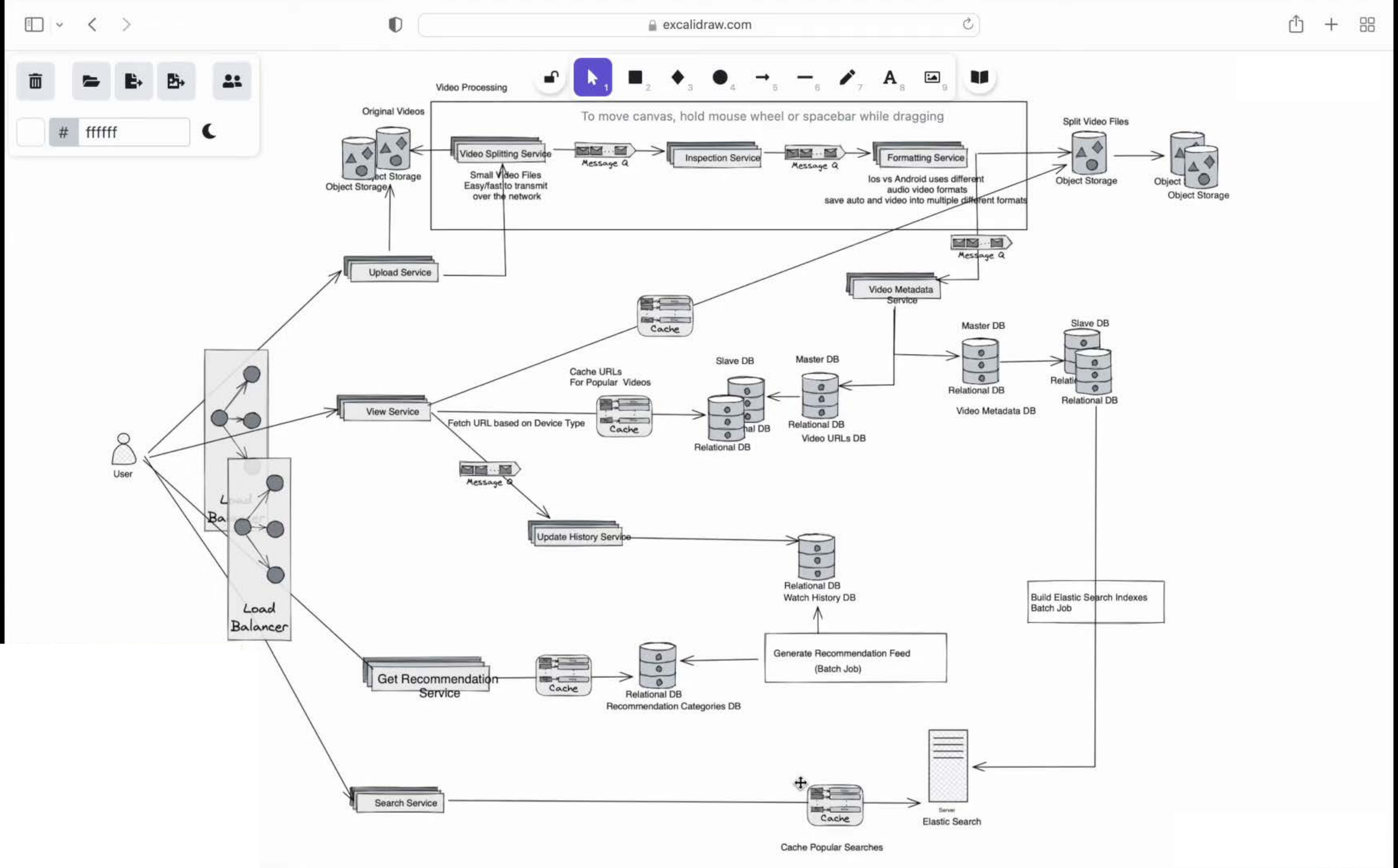
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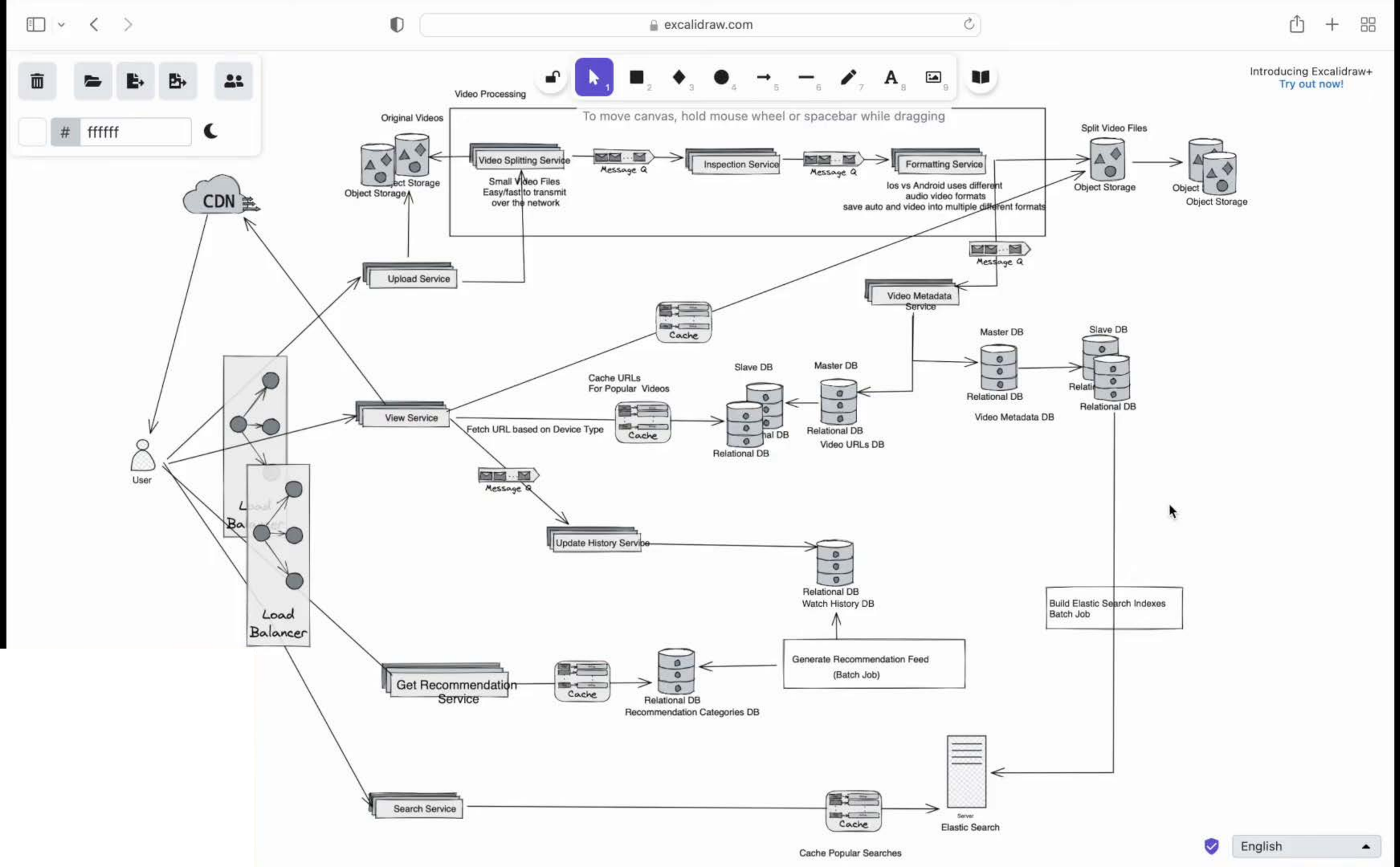
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