



DEPARTMENT OF COMPUTER SCIENCE & ENGINEERING

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Experiment-02

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Semester: 6th

Date of Performance:14/01/2026

Subject Name: System Design

Subject Code:23CSH-314

Aim: To design an online E-commerce platform similar to Amazon/Flipkart for browsing and purchasing products like mobiles, laptops, cameras, and clothes. To implement Kafka, Elasticsearch, and a CDC pipeline for real-time data processing, fast search, and scalability.

Objectives:

1. To develop a scalable online shopping system for product listing, search and management.
2. To use Kafka for real-time event streaming and inter-service Communication.
3. To implement Elastic Search for fast and efficient product search.
4. To integrate a CDC pipeline for real-time synchronization between database and service.

API End Points Creation-

1. Get API Call: product_Search

```
Https://Local_Host/products/search_item = {Search_keywords}  
HTTP Req  
{  
GET: <iPhone 16>  
}  
HTTP Res  
{  
<ProductID:iPhone>  
}
```

2. GET API Call: View Product Details:

```
Https://Local_Host/products/{product_id}  
HTTP Req  
{  
GET: <Product_id=17>  
}
```



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```
HTTP Res
{
Product_id:17,
Name: iPhone 17,
Color: Navy Blue,
Price: $1099,
Image Thumbnail: URL_Image
}
```

3. PUT API CALL : To update any order in the cart.
4. DELETE API CALL: To remove any item from the cart.
5. POST API CALL: for Check out and Payment.

Https://Local_Host/checkout -> {post body}

HTTP REQ

```
{
All products ID's,
Total Quantity,
Total Price
}
```

HTTP RES

```
{
Order_ID
}
```

Functional Requirements -

- User Should be able to search and find the product based on product title or names.
- User should be able to view the details of the product like description, image, available quantity, review, accessed.
- User should be able to select the quantity and move the product/item into the cart.
- User should be able to make the payment and should be able to perform the check out.

Non-functional Requirements

- Target Scale: 100Million DAU with 10 orders processed per second.
- Availability – System should be available 24/7 .
- Consistency & Availability: Here for this system we need both as per the Target Scale.
Now we should specify that, which part of our system needs what?
- Latency : Required: ~ 200 ms.
- Scaling : Horizontal / Vertical Consistency.



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Core-Entities of the System:

1. User/Client.
 2. Product.
 3. Cart.
 4. Orders.
 5. Checkout Followed by Payment.

REQUIRED SYSTEM DESIGN –

