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Product Recommendation Engine

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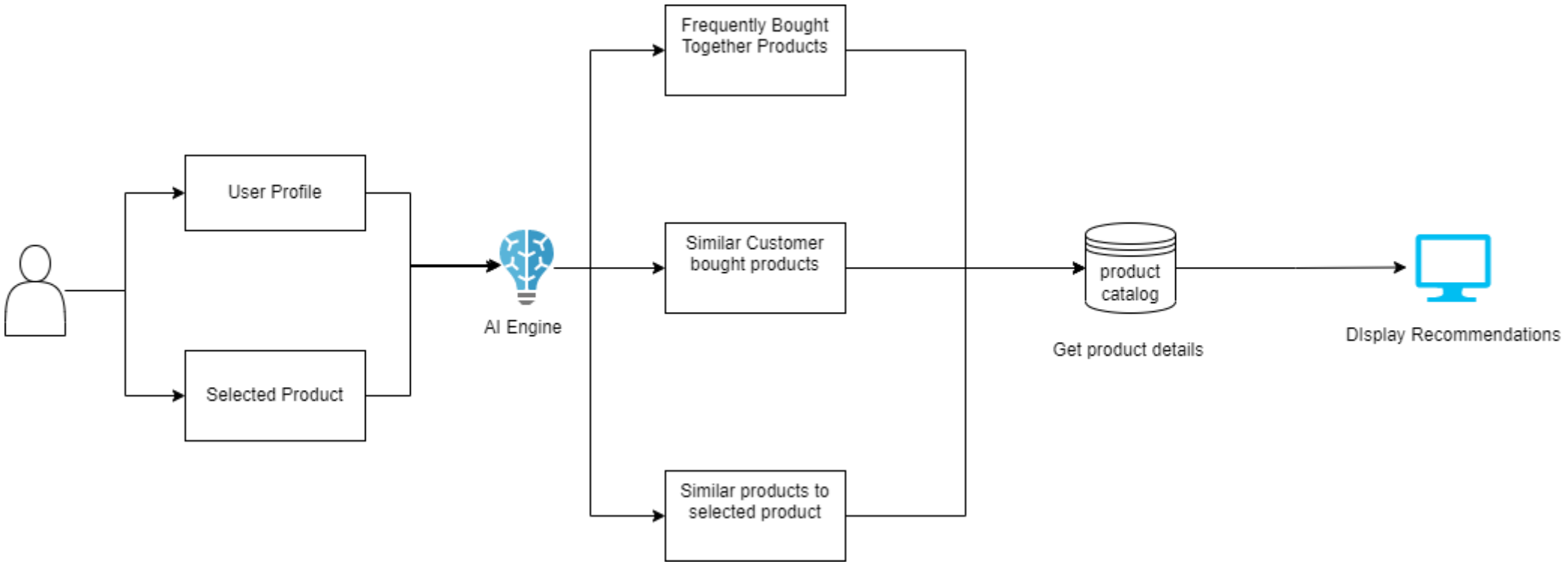
Problem Statement

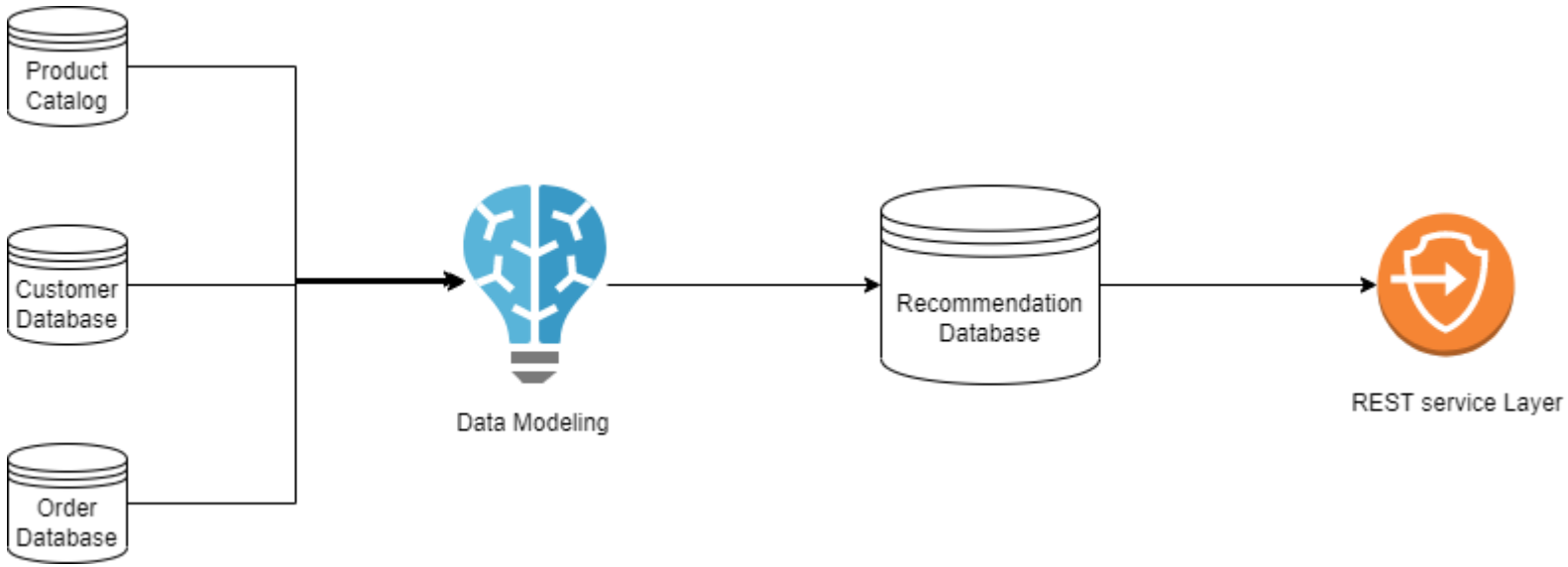
Product Recommendation engine is required for the below scenario to ensure the increase in visibility of the products for increased sales

- Product recommendation using AI engine to automatically provide the correct recommendations without human intervention
- Recommendations based on Other user’s purchase history with similar profiling
- Recommendation based on the selected product
- Recommendations for frequently brought together for

Architectural pattern for Product Recommendations Engine



Architectural Pattern For AI Engine for Recommendations



Architecture Description

The mentioned Architectural pattern shall help others understand the working flow of the AI Product Recommendation system. This pattern clearly shows how the Products shall be recommended to the user based on the user profiling, selected product and upselling.

The products recommended to the user shall be calculated by the AI engine based on the user profiling. User personas shall be created based on the user's age, location, gender etc. in and AI engine shall have data models for different personas.

AI engine shall read the product catalog data, customer data and order data to create the data models.

This is the brief understanding will get from the architectural pattern given above.

How Product Recommendation Engine Works

- AI Engine reads the product catalog data to create the “Similar Products” data-model based on product features/attributes
- AI Engine reads the customer data for creating personas for the customers and create data model for the products purchased
- AI Engine reads the customer data and creates data-model for the purchased product of similar products by similar personas
- REST service layer gets the customer profile, selected product/sku id and returns the recommended products along with the priority of recommendation for proper sorting

Quality Attributes

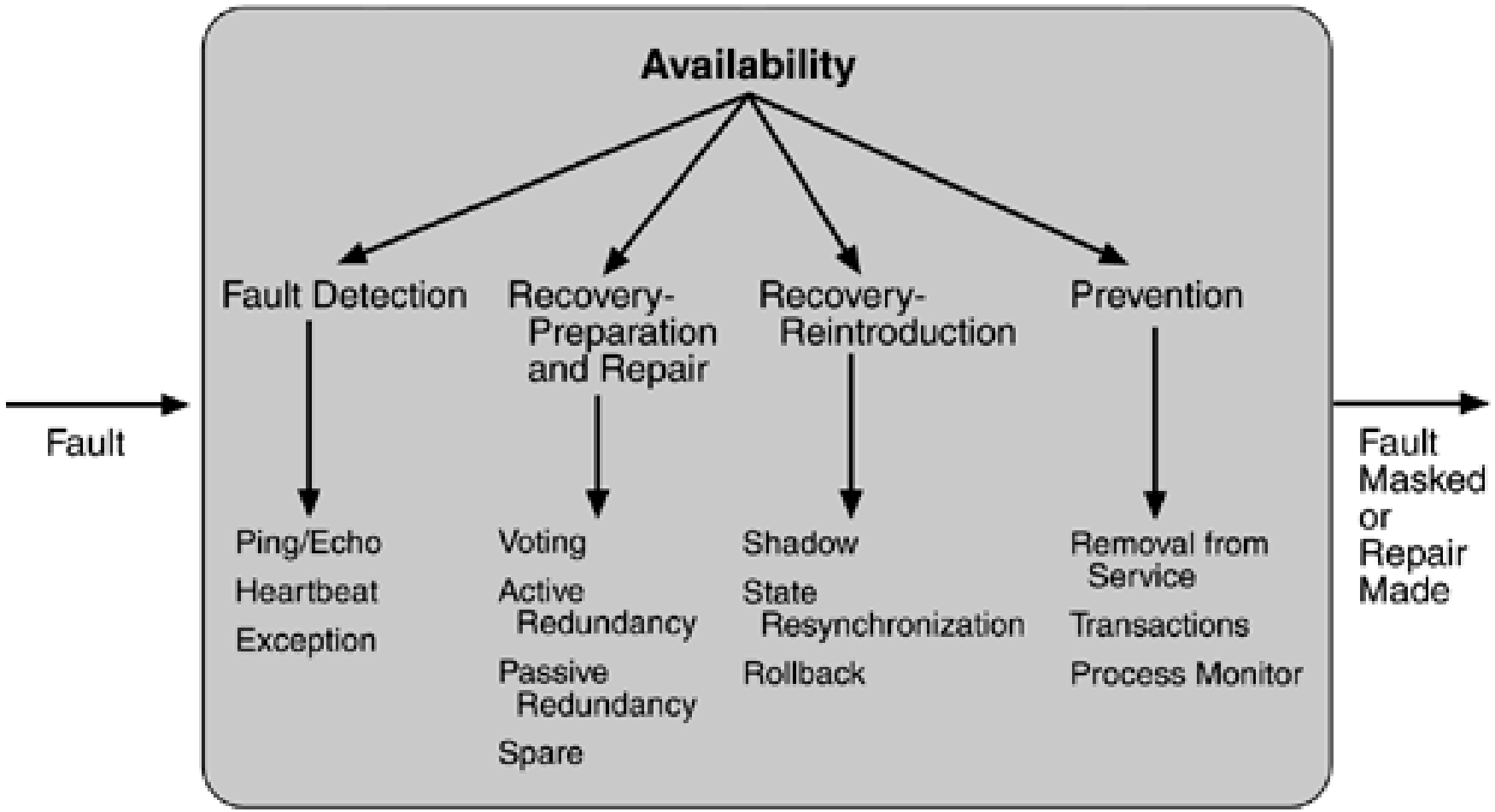
The main quality attribute in Product Recommendation Engine are:

- Availability
- Modifiability
- Performance

Availability

- A failure occurs when the system no longer delivers a service that is consistent with its specification; this failure is observable by the system's users. A fault (or combination of faults) has the potential to cause a failure. Fundamentally, availability is about minimizing service outage time by mitigating faults.
- In Product Recommendation Engine, the availability required are AI Engine, REST Layer, Product Catalog. If these are not available, system can lead to a fault/failure

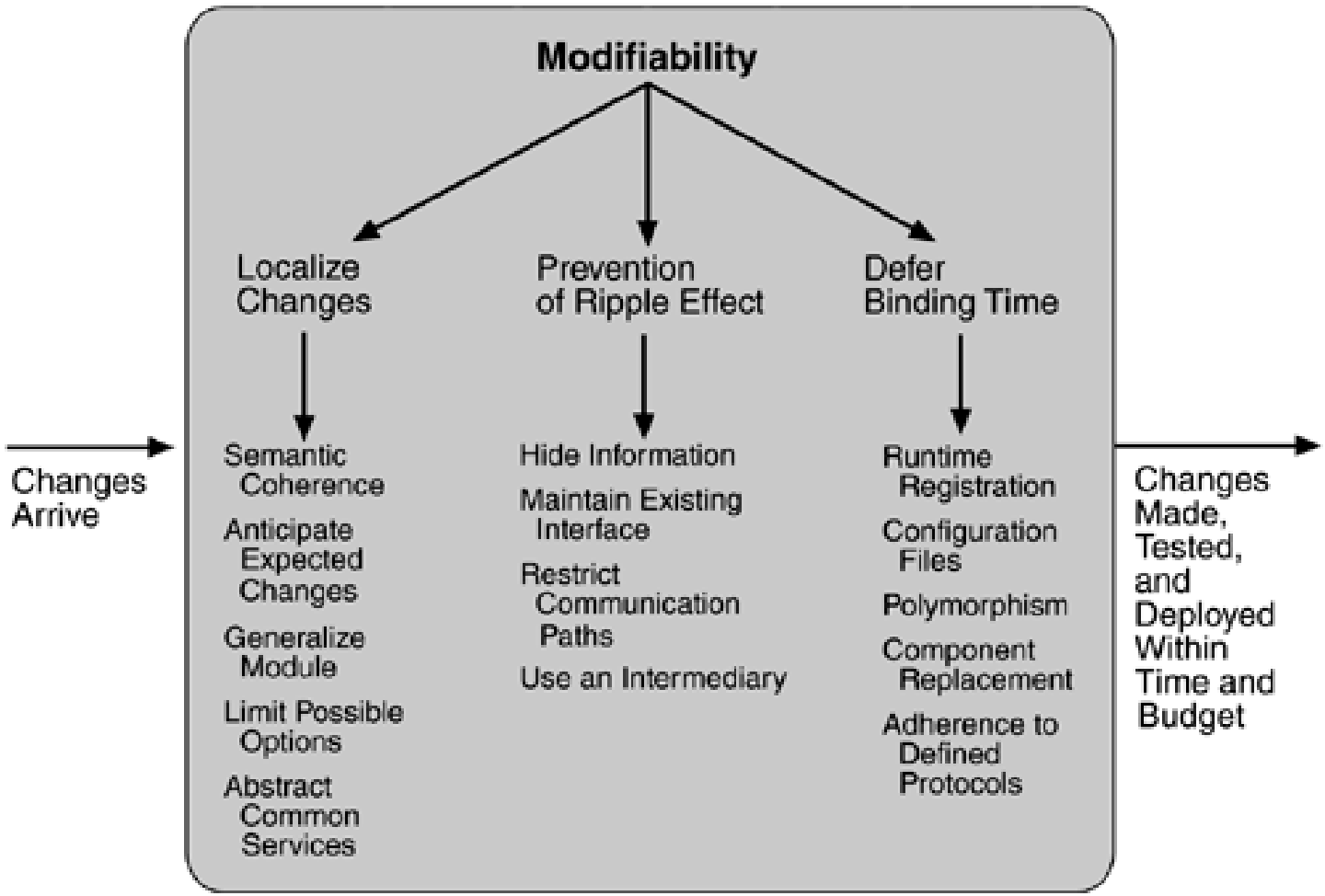
Tactics for Availability



Modifiability

- Modifiability is the degree of ease at which changes can be made to a system, and the flexibility with which the system adapts to such changes. It supports the communication between software architects and software engineers
since it captures the earliest and most important design decisions. Modification will happen as per the requirement change and deployments.
- In Product Recommendation System, the modifiability required are Application developers, testers and admins. If the requirements changed and the code changes affects the existing functionality, and the testers couldn’t find it.

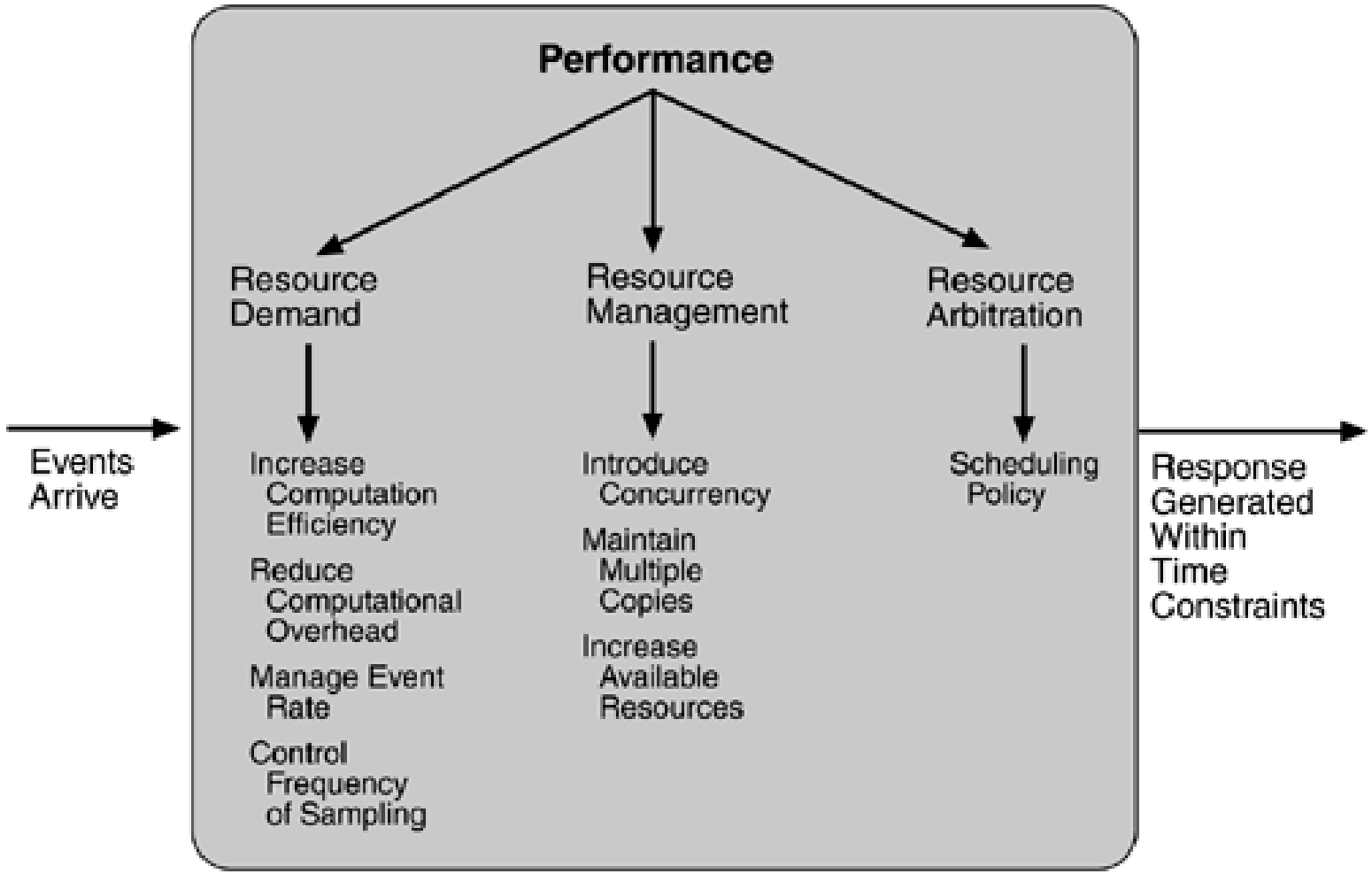
Tactics for Modifiability



Performance

- Performance is about time and the software system’s ability to meet timing requirements.
- When events occur interrupts, messages, requests from users or other systems, or clock events marking the passage of time the system, or some element of the system, must respond to them in time.
- The goal of performance tactics is to generate a response to an event arriving at the system within some time constraint. The event can be single or a stream and is the trigger for a request to perform computation.
- In Product Recommendation Engine, the modifiability required are Customers details, product catalog and other external systems. When the Customer/Product data is available and try to get the recommendation, if the network is not available at that time, it can be failure.

Tactics For Performance



Key Learnings

- System availability and performance is most important concern and must be handled properly
- As system is quite big module decomposition should be planned seriously
- Component connections can not be easily modifiable so must be planned before hand in architecture
- Recommending products increase the visibility of the products most relevant to the scenario and hence increase sales
- Helped to understand more on software architecture and its various quality attributes and related tactics on it

Thank You!