INTRODUCTION

1.1 Middleware Technology in Banking and Payment Sector

Current generation is very dynamic and majorly focused in the area of Information and communication technology as a result of technological innovation, increased awareness and demands from customers. Today when we go through the news paper, refer to term "new economy" or the "Information society". ICT are also introduced in Banking, Railway, Aviation, Health, Transportation, Food Industry, Manufacturing or any business bodies.

Earlier it was very difficult to wait for branch opening hours or stand in a queue, now a day’s hole banking process are going through the e-way and providing the customer to e-facilities including 24*7 customer supports. [1][2]

My research is focus on the effects of ICT on the banking sector and the payments system. My aim is to identify and understand the changes after ICT introduced on the banking and payment systems and how the technology is changing day by day. There are various methods to studying the effects of ICT on banks and payments systems. In this regard my research work is totally described about the Middleware technology in banking and payment system. Middle tier technology designed in such a way, developers provides the graphical user interface (GUI) through any programming language and user’s computer contain that GUI and application-specific entry forms or interactive windows. [2]

All business logic written by developers is located on LAN (Local area network) server or may be deployed in application server like weblogic, websphere etc. The business logic reacts as the server for client request from their computer or workstation. After that

The Middleware technology is introduced in banking and payment system over the last few years. By using this technology banking and payment sector are very competitive in market and providing personalized or user friendly services to their users or their customers. Middleware technology basically used at second tier or middle tier in three tier technologies or in between the client or database tier, here below figure shows this architecture.[4][3]
There is lot of Middle product available in market; all are J2EE application server like Oracle weblogic server, IBM websphere application server, Jboss and Oracle application server etc. As all are J2EE application servers. So there is not much difference in functionality. [5][8]

This technology is adopted in banking and payment system because it provides the Scalability, High-Availability, Load Balancing and Security.

1.2 Scalability

Scalability means, how much we expand the capacity of an application installed on the middle tier without disturbing or degrading of the quality of services to increasing the number of users or we can say how much we expand the environment dynamically or at run time without affecting the other users.

As per banking environment application server must be available for 24*7 to take the request for client.

Suppose banking application running on 2 servers, suddenly application getting slow due to number of request is getting increased, in that case we expand one more server that can share the load. [9][7]

1.3 High-Availability

High Availability means, application that we installed on weblogic server, consistently accessible and operational to their client because in banking and payment system applications are always available for 24*7. For High availability we used cluster environment that I will cover latter in thesis.

For today's high-speed, high-density communication systems, downtime can cost companies millions of dollars and, in some cases, can even endanger lives. While in the telecom industry, nearly zero downtime is taken for granted, this type of system robustness is a very tall order to fill, but absolutely essential, for today's carrier-grade applications.[10]

The term high availability (HA) describes a system/application that provides a level of service availability that can be measured in terms of downtime per year.
1.4 Load balancing

Load balancing means load should be equal on each application server in which we have installed application we can do the load balancing in many ways, like below.

Through hardware load balancer

Through Webserver, and we can also do the load balancing after creating an application server as proxy server.[12][13]

Load balancing middleware is used extensively to improve scalability and overall system throughput in distributed systems. Many load balancing middleware services are simplistic, however, since they are geared only for specific use cases and environments. These limitations make it hard to use the same load balancing service for anything other than the distributed application it was designed for originally.

1.5 Security

Nowadays we are doing everything though the internet, like shopping, booking of e ticket for railways, airline etc, means if we are doing anything that involved an electronic transaction then almost certainly middleware will have played a part in it. Suppose we are checking the balance in our bank account, looked the availability of railway ticket, booked a movie ticket or bought a burger in a supermarket in the background messages would have moved between computer systems through the middleware. Some of the most important uses of middleware occur within the financial sector where it handles everything from money transfers to share transactions.

Here I want to focus on efficiency and security because all business that is belongs to financial sector need information to be transferred between different systems and applications.

Middleware is a layer of software which exists between the core banking system and the banking delivery channels (e.g., ATMs, phone banking, Internet banking, mobile banking etc.). This software provides services such as communication, identification, authentication, authorization, administration, and security. By promoting standardization and interoperability, middleware makes advanced network applications much easier to use.[5][8][15]

1.6 Security Architecture

Below is the security architecture in which there are three sections Application layer, Middleware layer and underlying technology layer.
The application layer integrated in the communication path, Preserves abstraction, portability, automation. Middleware layer is the main layer which shows the Access control and audit policies, Preserves flexibility, interoperability. Underlying technology layer shows Cryptography (authentication protocols across the network) and Preserves flexibility, and interoperability.[3][9]