

Distributed Transaction System Application Using Design Pattern

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Abstract: *Distributed Systems are helpful in gathering and processing information about customers or users of a particular domain by means of efficient communication techniques between Models for an effective sharing of resources. Extraction of relevant data from enormous volume of data has become a tedious task in today's world. Distributing System reduces the complexity of the task by assisting the users to obtain the relevant information from various data sources. Distributed System that fills the gap between a customer and resource provider through various Models communications in the specific domain is proposed which has a service requestor module which can access the services offered by the system by making request with Interface. Also this system is made up of a number of role based Models which provide services such as user registration, authorization, & after successful validation, user access the functions. In this paper we have discussed detail working of a distributed system application that we have developed using different design patterns.*

Keywords: SOAP, DS

I. INTRODUCTION

In this project, Distributed System provides effective and secures transaction services to user. The distributed system discussed in this work includes a number of distinct and expedient features such as ease of use, effective Communication between customers and service providers, segregation from resource specific details. The main focus of this work is on the design and implementation of a System, which offers a wholesome access to information present in the database. Moreover, this system provides additional features such as the Login Validation, Service Registration, user Identification, and User Interface for an effective interaction between customer and the system. In this system information accessed from database & all details about transaction is send on user mail id. The main contributions are the establishment of system to improve the security by using algorithm.

II. BACKGROUND

Distributed systems are groups of networked computers which have the same objective for their function. Distributed system is classified into 2 types. In homogeneous DS, all sites they have identical software & it appears to user as single system. All sites are known to each other so that they agree to cooperate with user request. In heterogeneous DS, different sites use different schemas & software and may not be aware of each other & they provide only limited facilities for cooperation in transaction processing.

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Design Pattern:-

Design patterns are recurring solutions to software design problems you find again and again in real-world application development. Patterns are about design and interaction of objects, as well as providing a communication platform concerning elegant, reusable solutions to commonly encountered programming challenges.

3. RELATED WORK

Software design patterns are best practice solutions to common software problems. The thought of building software architectures from software design patterns is not new. There are numerous eminent approaches for software architectures from design patterns and are in particular real time systems these approaches just give unique descriptions of design patterns and high level guidance on how the patterns can be used to form software architectures.[3]

The key idea of this paper is to present the ways of enhancing quality of design procedure & expanding reusability of industrial control system components by means of applying design patterns for development of system software architecture.[2]

To build distributed system & web applications the middleware methods & design methods are used. The middleware methods consist of communication, content & business process levels. At communication level, there are technologies that support tightly or loosely coupled communication styles. Electronic data interchange & internet based services are supported by communication & content levels. The workflow based system focus on interoperability at business process level. The various design methods are specifically proposed for concurrent & distributed systems. Due to their support for modularity, flexibility & reusability the object oriented methodologies have been proposed for the design of Das.[1]

IV. OUR ANALYSIS

4.1 Design

As we are creating our application using Designing patterns. We are using three types of designing patterns which are Service Oriented Designing Pattern, Technology Based Designing Pattern, and Business Process Pattern. We have Made Four Webservices For User, PO, Accountant and Manager. We will host all these Web Services on IIS.

We are adding all these webservice web references in our distributed application so that we can use functionality of all these Web Services. Each Web Service contains web method in which we will write business logic for each module.

User Module

We have included Registration, Deposit, Withdraw, Account Summary, and Transfer. User has to register to website. Then

password is generated & it is sending on his/her e-mail id. Then user deposit & withdraw money. All information is displayed on e-mail id like date, time, Location etc. We have set minimum balance up to 5000. If any user does transactions like Withdraw, Deposit he will get information about credit and debit on Internet. User can also see previous transaction details.

PO Module

In PO module PO will check whether the documents which are necessary for opening account. If documents submitted by user are enough for opening account then he will approve for that user. If submitted documents are not enough for opening account then he will send the information regarding documents on his/her email id.

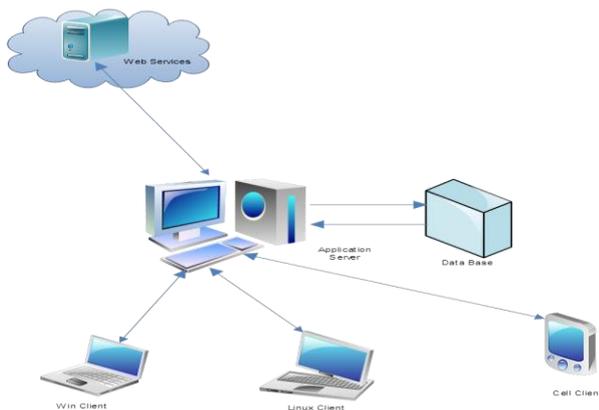
Accountant Module

In accountant module accountant will check And Validate documents and also information of users approved by PO, if all the information is valid then he will approve that user. In accountant module accountant will request the authority for PO for some period.

Manager Module

Manager will give final approval. After that only user will be able to access account. Manager can approve PO and Accountant. Manager can provide authority requested by accountant.

4.2 System Architecture



4.3 Implementation

We are hosting our application on any windows version so that we can access our application on any OS where we need to browse our application using which we can achieve OS Independence. Here we need any OS which support browser and we can access our application on Android Smart Phones also. In Our Project we have used SOAP,SMTP Protocols. We used Intel Pentium 4 processor, Mother board, 40 GB hard disk, 256 MB RAM, Modem, Monitor, Printer, CD ROM drive & cache memory are required. We used SQL server 2008, C# & Asp.net components, Internet Explorer / Mozilla / Netscape, IIS (Internet Information service) manager 6.0 are required.

4.4 Algorithm

In this application AES algorithm is used to encrypt and decrypt data. AES means Advanced Encryption Standard. In this algorithm key value is used to encrypt & decrypt the data. In this project password is stored in encrypted format. Whenever attacker, attack on password then he will get encrypted data. So he cannot understand about original message.

4.5 Effectiveness

For User, we are providing security by sending all the information like password, deposit, credit amount including date, time, location and balance on her/his email id. If any accountant will need authority of any PO for some duration then he can request for that & it's working correctly.

We have used AES algorithm for security. AES has "key lengths" of various sizes (in the case of AES, keys are 128, 192, or 256 bits long). These keys are what are used to actually encrypt the data, using the publicly-known AES algorithm. As of now, even taking into account all known attacks, 128-bit AES would still require approximately 2^{126} calculations to retrieve an unknown key, with 256-bit AES taking 2^{254} calculations. Again, without getting too technical, that number of calculations would take millions of years to complete. In this project AES algorithm provides security by encrypting password.

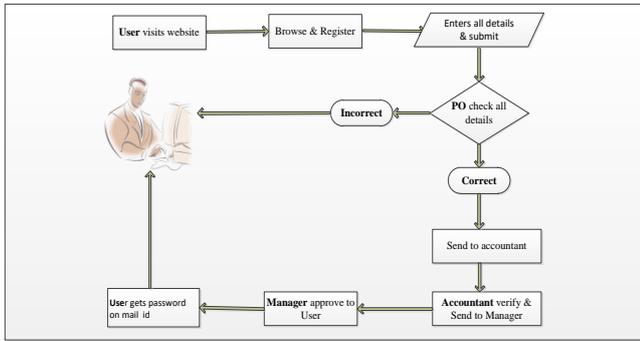
We have Used Web Services. A web service is a collection of open protocols and standards used for exchanging data between applications or systems. Software applications written in various programming languages and running on various platforms can use web services to exchange data over computer networks like the Internet in a manner similar to inter-process communication on a single computer. This interoperability is due to the use of open standards. Web Services allows different applications to talk to each other and share data and services among themselves. Other applications can also use the services of the web services. For example VB or .NET application can talk to java web services and vice versa. So, Web services are used to make the application platform and technology independent. In this project 4 web services are used which includes user, PO, accountant & manager & it share data & services among themselves.

We used SMTP (Simple mail Transfer Protocol) Protocol. SMTP provides a set of codes that simplify the communication of email messages between servers. It's a kind of shorthand that allows a server to break up different parts of a message into categories the other server can understand. Any email message has a sender, a recipient - or sometimes multiple recipients - a message body, and usually a title heading. From the perspective of users, when they write an email message, they see the slick interface of their email software, but once that message goes out on the Internet, everything is turned into strings of text. This text is separated by code words or numbers that identify the purpose of each section. Due to this protocol, user receives all information on their e-mail id.

We used SOAP (Simple Object Access Protocol) protocol. SOAP is used to communicate with web services. SOAP is the simplest mechanism yet to achieve integration and interoperability between enterprises. Due to SOAP protocol all web services communicates with each other.

4.6. Working of the System

System workflow-



1. User registers on distributed website; he enters all the necessary details required for opening account.
2. He gets password on his Email Id.
3. All information entered by user will go to PO, PO will check all details and he will approve that user.
4. Whatever users approved by PO will come to accountant. Accountant will check & validate all details of user. If he needs authority of any PO then he will send request to manager with duration of Authority.
5. All the users approved by accountant will come to the manager and after that manager will do the final approval of user. Manager will also approve authority of PO & accountant and also approve request for authority send by accountant. Manager is having rights to delete accounts of users.
6. After Final Approval of manager, User's Account will be activated after that user can be able to do deposit, withdraw and transfer. And he will also be able to see last transaction made by him. All the information i.e. Deposit Amount/Withdraw Amount, Date and Time of Deposit Amount/Withdraw Amount and Current Balance after Deposit Amount/Withdraw Amount and Also Location Will Be Send on the User's Email ID So that he will get detailed information about transactions. And also we are using AES Algorithm for encryption and decryption so even though Database will be hacked by attacker then also he will get information in Encrypted Format which is not readable.

V. LIMITATION AND FUTURE WORK

First, troubleshooting and diagnosing problems are the most important disadvantages of distributed computing system. The analysis may require connecting to remote nodes or checking communication between nodes. Second, less software support is the main disadvantage of distributed computing system. Because of more software components that comprise a system there is a chance of error occurring and if one Webservice will be dependent on another then if one webservice is not working properly then it will affect other webservices also.

VI. CONCLUSION

As the popularity of distributed system applications increasing day by day. Developers are focusing on the advancements of distributed system applications using various techniques. Design patterns are one of such technology that is used in the development of such distributed applications. In this paper we have discussed about a distributed system applications that we have developed, which is useful in the Banking domain, we have used different design patterns to develop this application which made this application truly distributed in nature.

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