Efficient Web Application for Improved Productivity

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Abstract— Nowadays use of computer applications has increased tremendously in many businesses ranging from small scale businesses to large industries. The proposed approach in paper presents a web based efficient application as a service for data manipulation, extraction, analysis of data in any manufacturing industry by using some advanced web technologies and services for better business process management.Most applications are not that much efficient in data organization, data backup, data retrieval, user interface and performance. These drawbacks are due to less use of advanced web technologies and services. To address above mentioned problems, an efficient application which is provided as a service from cloud is proposed here. As the current applications in small industries are installed on the machine, they need periodic maintenance which leads to money expenditure. To solve this issue a web application which can be used at any time using just a browser is proposed here. This causes less attention towards maintenance and more focus will be given on process. Another important factor is security. Security is maintained in the proposed system using OAuth2.0.In order to increase the performance of the system a single page application technique is used in the proposed system.

Keywords— Web services, Token based authentication, SPA(single page application), REST API

I. INTRODUCTION

In present days, use of software applications is being done on a large scale for every purpose from obtaining information to entertainment. Use of software is not limited to large industries but also for small industries. Small industries are making progress day by day due to use of computer applications. But the growth is not very fast due to many reasons. Use of software is not only thing that is to be focused for efficient output. Use of software that limits things as user interactivity, data security, data storage and various such aspects can indeed result in overall development retardation. In this paper we aim to develop a pattern for application development, more reliable and efficient than existing system.

We propose a more well organized, secure and methodical application system with use of limited resources and colossal functionalities. This paper is organized into many sections. Section II describes the existing system. This includes the overview of traditional computer applications. Section III describes the proposed system. This section briefly focuses the architecture of new system. Section IV describes the advanced technologies and tools used for the development of proposed system. And finally the advantages and future scope is described in short in section V.

II. EXISTING SYSTEM

The existing computer applications mostly used in small industries have following features:

A. Nature of application:
Most of the applications are installed on single machine using compact disk.(CD).These applications use all the resources from the single machine and performs activity. Due to lack of network connectivity data cannot be shared between different systems as well as data accessibility from remote location is not possible in such system.

B. Maintenance and Cost issues:
As these applications are installed on the system they need periodic maintenance of system, system update, antivirus update etc. These things cause an additional attention besides improving productivity of businesses. Also cost of the overall activity becomes huge.

C. User Interactivity:
User interaction plays a vital role in every system. These computer applications lack proper interactivity with user. They are complex in nature and lack of proper organization of modules in the system. This causes the time expenditure in searching desired things.

D. Security:
Every system needs security to avoid the data loss. Traditional systems are poor in security. Their login system can be easily break. Stack smashing attack can be done on login system.

E. Architecture:

Architecture of traditional application is single tier architecture. All the application code and data resides on the single machine. This architecture leads to poor performance.

III. PROPOSED SOLUTION

To overcome the above problems in traditional system, the proposed solution includes the following things:

A. Use of web:

To overcome the losses due to maintenance in traditional computer applications, the proposed solution suggests the use of web and cloud computing. This causes no maintenance on end customer side. Users can simply use the application at any time using the web browser only. The proposed system can easily deployed on cloud and can be provided to users as a service on subscription basis. Typical architecture of cloud is shown here. Software as a Service is the topmost layer of cloud where applications reside.
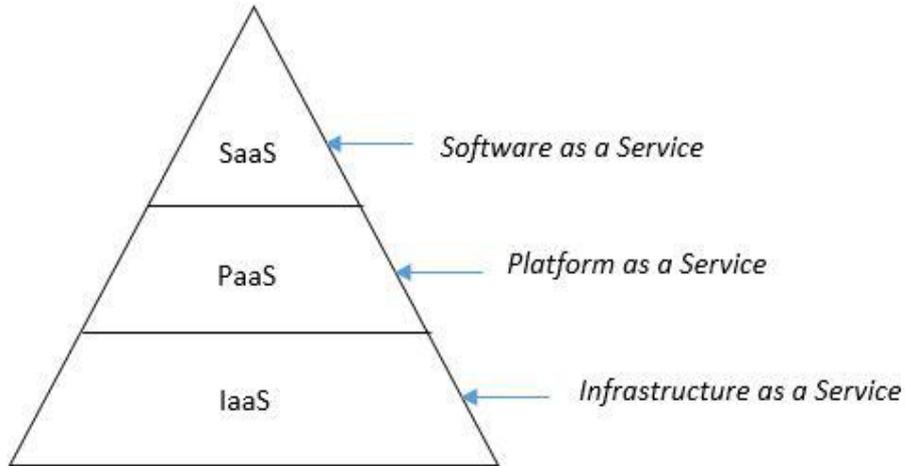

Fig. 1. Cloud architecture

B. Multi-tier architecture:

Multi-tier architecture implies the separation of application from database. This causes entire application runs on different server than database. Web server is used to communicate between the application and database.
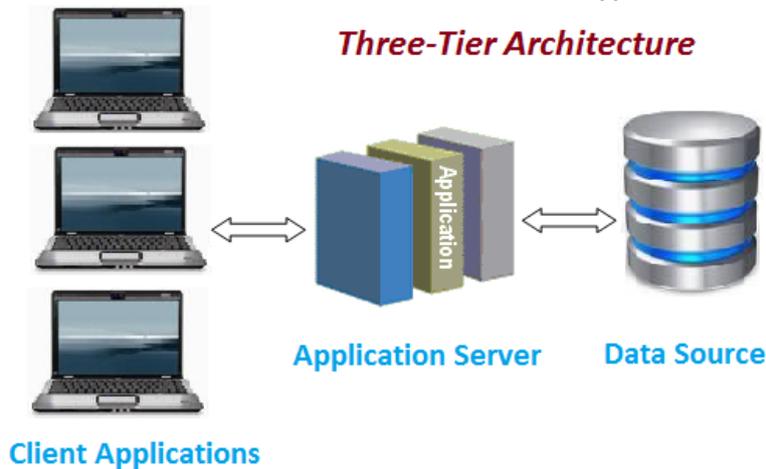

Fig. 2. Multi-tier architecture of proposed system

In three tier architecture, there are three tiers client, application, database. Client tier sends requests to application tier and performs database CRUD operations like create, delete, update etc. Entire application code resides on the application server. This causes easy debugging when some problem occurs in the system. Multi-tier architecture is also a type of client server architecture.

C. Security:

Proposed system suggests login module of system using JWT authentication scheme. This improves the security of the application.

JWT login authentication scheme includes a token generator which generates a json web token after validating the credentials of the user. If the user is a valid user then it grants a service token to the user. Then using the granted service token the user requests to the server for a particular service. After authenticating, the server sends the particular service to the user.
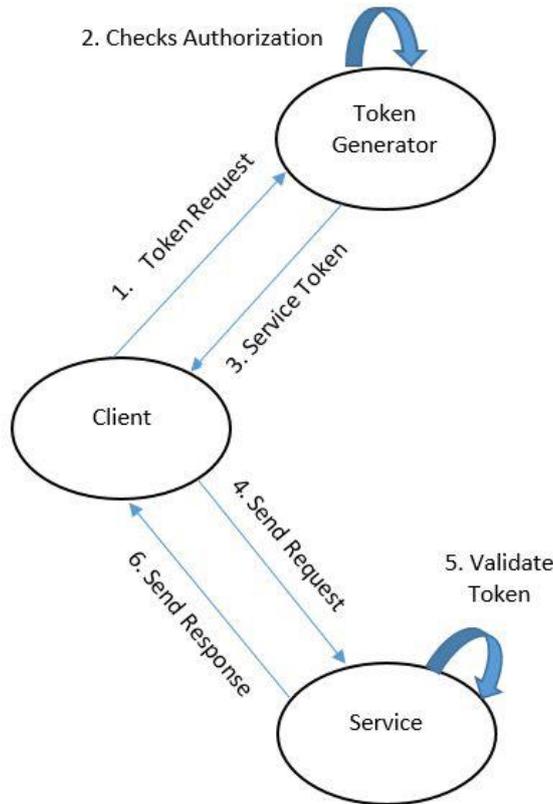
Fig. 3. JWT login authentication

D. Interactivity:

Interactivity issues in traditional systems can be managed using advanced web technologies at client side. This includes HTML, Angular JS, Bootstrap, etc. using which the navigation and simplicity of the overall application can be improved.

E. Performance:

Performance of the proposed system lies at both client as well as server side. Due to Single page application technique (SPA) the routing in overall application becomes very efficient. Minimum requests need to be send to server for fetching the resources. Use of elastic search service on database side improves the searching and performance. The REST API's of the entire system is written in GO language in order to implement concurrency on server side. This increases the overall performance of the system with less utilization of resources as compared to traditional system.
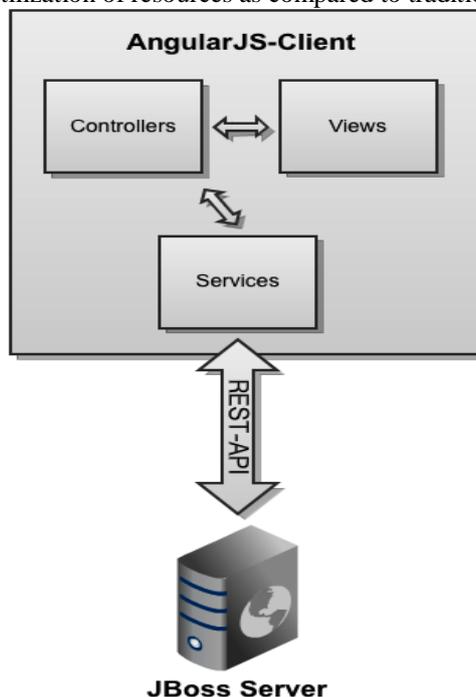

Fig. 4. Single page application using angular JS

IV.   CONCLUSION

This paper proposes a good solution to handle the problems existing in traditional computer applications. By making the new system web oriented, better management of activities can be possible and thereby increasing the productivity by minimizing the cost.

REFERENCES

[1]   Antonio Fernández-García, Ingenieros Alborada, Luis Iribarne, Javier Criado, Jesús Vallecillos, "An Approach to   a Pattern for Business Process Management and Deployment of Software Engineering for Small Companies in a Cross platform Era. " , 2012

[2]   Jeff Meyerson, "The Go Programming Language", published by the IEEE computer society, 2014 IEEE

[3]   Xiang-Wen Huang, Chin-Yun Hsieh, Cheng Hao Wu and Yu Chin Cheng, "A token-based user authentication mechanism for data exchange in RESTful API", 2015 18th International Conference on Network-Based Information Systems.