

RESEARCH ARTICLE



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HUMAN RESOURCE MANAGEMENT SYSTEM USING SPRING 'REST'FUL WEB SERVICE

S.PRIYA, R.SUMATHY, CH.SWATHI, Mrs.D.ANURADHA., M.E.,(PhD)

Department of Computer Science and Engineering,
Panimalar Engineering College, Chennai.

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ABSTRACT

Security is not taken into account by default in the Human Resource Management System(HRMS) .In this paper, HRMS web service is implemented using Spring 4.0 RESTful API. It provides secure data transfer using JSON more efficiently when accessing from the web server. The web service helps the user to process CRUD techniques for easy access.A single server is connected with group of organizations for web communication. As a result, the development cost is reduced. Since the business logic is stored in the web server, this overcomes time delay.

Key words—Human Resource Management System, RESTful web service, JSON, CRUD.

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1.INTRODUCTION

1.1 HRMS

A Human Resources Management System (HRMS) or Human Resources Information System (HRIS), refers to the systems and processes at the intersection between human resource management (HRM) and information technology.It integrates HRM as a discipline and in particular its basic HR activities and processes with the IT field, whereas the compiling of data handling systems evolved into standardized routines and packages of enterprise resource planning (ERP) software.The function of human resources (HR) departments is administrative and common to all organizations. Organizations may have specified selection, appraising and payroll processes. Management of "human capital" progressed to an essential and complicated process. The HR function used to trace existing employee data which commonly includes personal histories, skills, potential, performance and salary. To reduce

the manual workload of these organizational activities, organizations began to electronically automate many of these processes by introducing specialized human resource management systems.

1.2 WEB SERVICE:A web service is a method of communication between two or more electronic devices over the World Wide Web.W3C defines web service as a "software system designed to support interoperable machine-to-machine communication over a network. It has a network described in a machine-processable format (specifically WSDL). Other systems can communicate with the Web service in a manner recommended by its description using SOAP messages, typically transferred using HTTP with an XML or JSON serialization in conjunction with other Web-related standards".

1.3 WEB API:A Web API is a development in Web services where emphasis has been moving to simpler representational state transfer (REST) based communications. RESTful APIs may not require XML-

based Web service protocols (SOAP and WSDL) to support their interfaces.

RESTful web APIs (or RESTful web service) is a web API implemented using HTTP and basis of REST. RESTful API separates user interface involved from data storage. It improves flexibility of interface over multiple platforms and simplifies server components by making them stateless. Each request from client comprises all the state information and server does not hold client context in the session.

2.EXISTING WORK

Human Resource System is managed as manual or automation system in the organization. Initially,an organization details are stored in a single server. Most of the current automation system uses web technologies and maintain the associate's information. But the business layer of the automation system is not maintained proper and there is no code reusability. Business Layer is not generalized for dynamic usage. An organization performance is reduced because there is a data loss due to security problems. For Advanced updates, an organization deals with the problems like time consuming, code complexity, inefficient security and expense. Web Services can be classified into two categories namely RESTful and SOAP-based Web Services. This classification is based on the architectural style used in the implementation technology. SOAP stands for Simple Object Access Protocol.It is used asprotocol specification for exchanging structured informationin the implementation of Web Services in computer networks using XML[3].This protocol defines aset of principles for converting platform specific data types intoXML representations

3.PROPOSED WORK

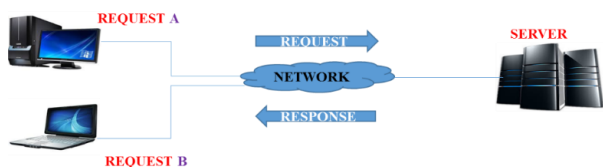


Fig.1 WEB SERVICE

In this paper,discussed about the implementation of web service in which more than one organizations connected with the single server.In this method,multiple requests are simultaneously processed by the server and then respond to the clients respectively. Requested data can be accessed

easily and can also reduce time consumption. Initially XML is used for exchanging of messages.But now JSON is preferred for better data serialization and provide easy mapping process. Comparison of JSON and XML as shown in the Table 1. [5]

Table 1 : Comparison of JSON and XML

JSON	XML
JSON is an acronym for"Java Script Object Notation".	XML is an acronym for" Extensible MarkupLanguage".
JSON has been extended from JavaScript.	XML is extended from SGML ("Standard Generalized Markup Language").
JSON is data oriented and can be mapped more easily.	XML is document oriented and needs more effort for mapping.
JSON is one type of text-based format or standard for interchanging data i.e. human readable.	XML is a Markup Language having pattern that contains set of rules for the encoding the documents which is readable for both human & machine.
JSON supports datatype including integer and strings, JSON also supports array.	XML does not provide any data type so needs to be separated into particular datatype. There is no direct support for array.
JSON syntax is lighter than XML as JSON has successive format of data having less redundancy. JSON does not contain start and end tags.	XML is not so lighter as JSON as having start and end tags and it takes more character than JSON to represent same data.

3.1 RESTful

REST(Representational State Transfer) it is aresource oriented technology[4] and as an architectural style that consists of set of criteria that states the proper way for using web standards such as HTTP and URIs. REST has become a common implementation technology for developing web services. In RESTful services,certain structure characteristics of service

documents are commonly focusing on three parts, i.e. *Endpoint*, *Input* and *Output*. *Endpoint* describes command information of the service. RESTful services use URL and HTTP calling methods [11] such that CRUD (CREATE, READ, UPDATE, DELETE) [10]. *Input* aims to explain the input Parameters. *Output* introduces the output information and explains the results and data formats returned. For RESTful services, most of the data are returned in the form of XML OR JSON [6]. The *Endpoint* part contains a URL-format text, which differentiates from ordinary text. The *Input* part gives the name, type and description of input parameters. The *Output* part also gives a table of the descriptions of respective fields, and additionally presents a piece of sample code in the JSON format. Comparison of REST and SOAP as shown in the table 2 [7].

Table 2 : Comparison between REST and SOAP

REST	SOAP
Assumes an end-to-end interaction model but not usable for distributed computing environment where message may go through one or more intermediaries	Designed to handle distributed computing environments
Minimal tooling/middleware is necessary. Only HTTP support is required	Requires significant tooling/middleware support
URL typically references the resource being accessed/deleted/updated	The content of the message typically decides the operation e.g. doc-literal services
Better suited for point-to-point or where the intermediary does not play a significant role	Well suited for intermediated services
Built-in error handling (faults)	No error handling
Tied to the HTTP Transport model	Both SMTP and HTTP are valid application layer. It is used as Transport for SOAP.

4. SYSTEM ARCHITECTURE

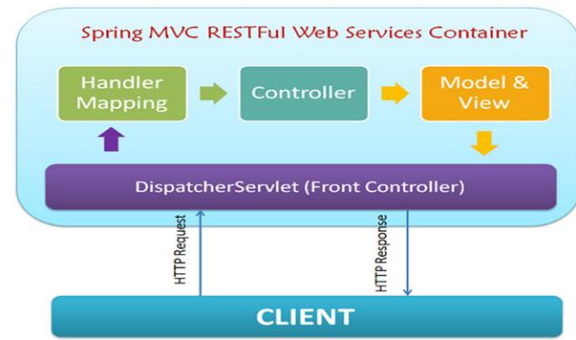


Fig.2 SYSTEM ARCHITECTURE

The above architecture diagram explains how Spring MVC RESTful web service handles requests from client. Client application issues request to web service in the form of URI's. All HTTP Requests are checked by DispatcherServlet (Front End Controller). This is defined in the web.json file. DispatcherServlet looks for Handler Mappings. Spring MVC handles three different process of mapping request URI's to controllers are annotation, name conventions and explicit mappings. Handler Mappings section characterized in the application connection file, reports DispatcherServlet which action is used to find controllers based on the incoming request. Requests are now processed by the RestController and response is returned to DispatcherServlet. This Servlet looks for View Resolver section in the application context file. For RESTful web services, where the web controller returns Model and View object, 'ContentNegotiatingResolver' is used to find the correct data representation format. There is also an alternate option to the above step. Rather than forwarding Model and View object from Controller, which directly returns data from Controller using @RestController annotation.

5. METHODOLOGY DESCRIPTION

Strategic HRM has initiated to view the relationship of HR practices with organizational performances.



Fig.3 PROCESS OF MODULES

The below list of modules are incorporated with "Human Resource Management System" such as

Module 1a: News/events

This module helps the HR Admin to share present events, training, client visits, rewarding details, etc., of the organization to all the associates.

Module 1b: Associate's profile

This module helps HR Admin to add/edit/delete/list all associates profile in HRMS. The associate related information can be modifiable only to HR Admin. Each associate can view their profile information. Profile information includes Personal Information, Education Information and Technical Information of the associates. This can be maintained by HR Admin.

Module 1c: Leave

This module helps associates to apply for leave. Leaves can be applied based on leave category (Casual Leave, Sick Leave, etc.). Each associate will be having different category of leaves and no of leaves based on their designation. Leave must be approved by the in charge of the associates.

Module 1d: Payroll

This module converts the pay process by gathering details about employee time and attendance, calculating various deductions and taxes, and generating periodic pay cheques and employee tax reports. Data is generally provided from the human resources. This module can enclose all employee-related activities.

Module 1e: Permission

This module helps associates to apply for permission for early leaving of the day from the office. Each associates allocated two hours of permission per month. Permission must be approved by the in charge of the associates.

Module 1f: On-Duty

This module helps associates to add on duty information in order to notify the management of the organization.

Module 1g: Training

This module helps to list the training events to all employees of the organization. The training events are added by the top level management.

Module 1h: Reports

This module helps HR Admin and Top management to generate various reports of the organization such as Associate Profile Report, Leave Balance Report, Training Report, iShare Report, HR Matrix, Exit

Report, Permission Report, Leave Report, On-Duty Report.

Module 1i: ishare

This module helps employees to post any kind of issues as a ticket directly to HR Desk. HR receives all the tickets, take necessary action on the tickets posted and then he closes the tickets. The information will be updated to the requested employee.

MEASUREMENT

The organizational performance and innovative performance are measured by the response of the HR manager who have perceived [9]. HRMS scale includes nine modules, i) News/Events ii) Associate's profile, iii) Leave, iv) Payroll, v) On-Duty, vi) Permission, vii) Training, viii) Reports, ix) ishare. These details are completely maintained and updated by the HR. In this calculation is done for two modules such as Leave and Payroll.

These two modules will play the major role for employee because based on the performance of the employee, HR will update the employee status and calculates the amount to be paid to the employee as their salary in a month. The calculations based on the number of leave taken by the employee and their payroll details based on deductions and taxes applied by the organization. There are three types of leave: Casual Leave (CL), Sick Leave (SL) and Paid/Personal Leave. Some organizations maintain Casual and Sick Leave while other organizations may have three types of leave.

To calculate leave.,

Available CL = Total Leave - No. of leave taken.

Available SL = Total Leave - No. of leave taken.

Available PL = Total leave - No. of leave taken.

An organization will allocate salary for the employee, based on the estimations of the organization. An organization's estimation includes Basic, HRA (House Rent Allowance), Daily Allowance (DL), LTA (Leave Travel Allowance), PF (Profit of Fund), Tax, PT (Professional Tax), LOP (Loss Of Pay).

To calculate payroll,.

Payroll = [Basic + HRA + DA] + [LTA + PF] - [LOP + TAX]

7. CONCLUSION

In this paper, Spring 4.0 is implemented for easy access and less time requirement. Spring security is

used to protect the data which is stored in the database. A single server is accessed by multiple organizations which provides simultaneous communication between the client and the provider. @RestController is used instead of @ResponseBody and @RequestMapping. This single annotation handles both request and response to the client and the provider.

In future, Spring 4.0+ environments which provides efficient secure access than Spring 4.0. It uses an annotation @JsonView manages communication between the client and the provider.

VIII. REFERENCES

- [1]. Human Resource Management System, http://en.wikipedia.org/wiki/Human_resource_management_system , 26 November 2014.
- [2]. Web Service and Web API, http://en.wikipedia.org/wiki/Web_service, 25 February 2015.
- [3]. Feda AShahwan, Klaus Moessner, "Providing SOAP Web Services and RESTful Web Services from Mobile Hosts", "The Fifth International Conference on Internet and Web Applications and Services", pp 174-179, 9-15 May 2010.
- [4]. Qingling Wang, Yan Liu, "Representation Design for RESTful Web Services", "4th International Conference on Next Generation Web Services Practices", pp 5-9, Aug 2008.
- [5]. JSON vs XML, <http://www.withoutbook.com/DifferenceBetweenSubjects.php?subId1=73&subId2=37&d=Difference%20between%20JSON%20and%20XML>.
- [6]. Yao Zhao et al, "Towards Effectively Identifying RESTful Web Services",
- [7]. "IEEE International Conference on Web Services", pp 518-525, June 2014.
- [8]. REST vs SOAP, <http://blog.manishchhabra.com/2013/04/rest-and-soap-web-services-analogy/>
- [9]. Jingjing Zhu et al, "Identifying RESTful Web Services in Service-oriented Software Product Line", "International Conference on Cloud Computing and Big Data", pp 487-492, 16-19 Dec 2013.
- [10]. Xiaobing, Zhang, "The Effect on Human Resource Management System and Organizational Performance", "International Conference on Management of e-Commerce and e-Government", 17-19 Oct. 2008.
- [11]. Hongjun Li, "RESTful Web Service Frameworks in Java", "IEEE International Conference on Signal Processing, Communications and Computing (ICSPCC)", pp 1-4, September 14-16, 2011.
- [12]. Sujit Kumar Chakrabarti, Prashant Kumar, "Test-the-REST: An Approach to Testing RESTful Web-Services", "Future Computing, Service Computation, Cognitive, Adaptive, Content, Patterns, 2009. COMPUTATIONWORLD '09. Computation World", pp 302-308, 15-20 Nov. 2009.