

HUMAN RESOURCES MANAGEMENT SYSTEM: SOA REFERENCE MODEL

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Abstract: In the fast-paced global economy, a corporation must be flexible and agile to meet the shifting needs of operating in an on-demand environment. Taking in consideration that cotemporary organizations are ever-increasing, the paper presents a single place for all Human Resource (HR) processes, which will automate many manual, paper-based processes and transactions, such as tax, payroll and benefits. Also, is risen the need of redesigning the existing organizational models, by proposing the Human Resource System (HRS), as a new organizational structure that optimizes the workforce and streamlines cross-unit processes to leverage the new IT systems using Service-Oriented Architecture (SOA).

Key words: SOA, HR, HRIS.

1. INTRODUCTION

Initiatives for service-oriented architecture (SOA) and on demand business are being adopted at various corporations to meet the operating challenges of business in the 21st century. Currently, the primary focus is to apply SOA concepts incrementally to existing information technology (IT) systems, such as Human Resource System.

Human resources (HR) departments play a critical role in contributing to the overall productivity and strength of an organization. As HR helps to build a stronger workforce through better recruiting, training and retention, the workforce helps drive the efficiency of the business. To improve their own efficiency and contribute to the organization's bottom line, human resources organizations need to build HRS (Human Resources System) based on SOA in manner to automate tasks and streamline workflow and improve the efficiency of the workforce by providing self-service tools, training and information.

The findings of this study will redound to the benefit of society considering that Human Resources plays an important role in overall productivity and strength of an organization. And this way will help to retain and improve the workforce, so it will lead to a high-value services, such as self-service capabilities, training and education, but at a low cost to the enterprise. In this paper we will have a case study to a particular University's existing HR, which is not based on SOA and elaborate on how it will be better if this system is based on SOA, which will increase productivity and profitability for both the human resources department and all employees.

2. PROBLEM DEFINITION

Aligning information technology (IT) systems using service-oriented architecture (SOA) to provide end-to-end enterprise integration and virtualized IT services is a critical step to be truly effective. However, the SOA paradigm also needs to be extended to transmute organizational structures and behavioral practices. We raise the need to redesign the existing organizational models, and we propose the Human Resource System (HRS), a new organizational structure that optimizes the workforce and streamlines cross-unit processes to leverage the new IT systems.

The goal of intelligent HR software is to replace the traditional approach to decision making with an approach that makes a better decision in the most efficient manner. SOA may be a solution, as it converts monolithic and static systems into modular and flexible components. According to Roberts [1], "The big change in enterprise software that will impact everything from financials to HR is standards-based, service-oriented software (SOA)". The transition from the traditional vertically integrated business and IT structures towards SOA presents several important challenges.

These challenges range from purely technical issues as performance of the Simple Object Access Protocol (SOAP) protocol and the maturity Web Services standards to business issues that include considerations of skills availability and SOA infrastructure costs. While the core Web Services standards (i.e. XML, SOAP, WSDL, and UDDI) are relatively mature and stable, many of the additional standards that address important issues such security and reliability (e.g. WS-Coordination, WS-Atomic Transaction, WSDM, WS-reliability, etc.) are still under development. The ever-increasing number of Web Services standards and the complexities and politics of the standardization process make it difficult for vendors to maintain conformance and at the same time to deliver stable technology platforms.

The contribution of technology to Strategic HRM has been limited, and some research indicates that HR professionals view ERP (Enterprise Resource Planning) vendors as "over promising and under delivering" in this area.

It is important to remember that technology is only an enabling tool and not a solution or panacea for HR-related problems. Instead, the successful implementation of an HRIS depends on many different factors, such as the organizational culture, leadership and managerial competence, and the fit of the technology with organizational processes. In addition, many organizations fail to implement technology successfully because of their inherent rigidity, disinterest, and resistance to change. Sometimes, there can also be certain “unintended negative consequences” within the process of realizing the potential of an HRIS problems “related to the various ways in which different organizational stakeholders and groups engage with, enact, subvert, or avoid the technology or its planned objectives, can undermine its anticipated value to the HR function and organization more generally”.

So, this paper will help us into:

- Creating an organizational culture where trust, open communications and fairness are emphasized and demonstrated by leaders;
- Having jobs designed to provide employees with meaningful work that has a clear purpose in meeting organizational objectives;
- Demonstrating a commitment to employee development;
- Offering a higher total rewards package (i.e., total compensation and benefits package) than organizations that compete for the same talent.

3. STATE OF THE ART

According to the several authors [2] a SOA is about creating, discovering, and using (remote) capabilities. SOA makes alignment easier because the large-grained capabilities are more comparable to the grains of business processes. The agility gained by a SOA’s loose coupling serves as a basis for achieving architectural adaptability for realignment. SOA facilitates aligning existing IT infrastructure and systems to achieve end-to-end enterprise connectivity by removing redundancies and streamlining IT processes. Flexible value configuration and service re-composition supports both stakeholder and financial perspectives and the interoperability that a SOA promotes simplifies IT service operations. In a SOA environment, a change to a vendor-supplied application programming interface means that an upgrade needs to be applied in one place only. Providing a central location for offering and discovering services makes their management easier and more consistent.

The advantages that SOA brings to end users [3] in manner to change the business process, since SOA is a solution to many systems base on it and with flexibility it accomplish successfully the functions that need to be performed by HRIS, such as: job description and specification, job analysis information might be placed on it, tracking minority hiring, recruitment, and advancement, forecast supply and demand of labor from both the internal and external labor markets, scanning resumes submitted online (web based or e-mail) or in person (or mail), matching

qualifications with open positions (finding the best fit), help with registration, tracking training, monitor training costs, and schedule training, provides reports for Occupational Safety and Health

Administration (OSHA), tracking accidents and costs of accidents, tracking disciplinary actions and grievances, labor contract data etc. In manner to achieve a solution to all abovementioned processes the system of HRIS has to be based on SOA to function at one place and in autonomous way. Therefore, this will lead to a big change in software system that will impact everything from financials to HR is standard-based service-oriented software (SOA).

However, mostly agreed that system build on an SOA, offers optimization when it comes to the connection of people and processes needed for HR [4]. Therefore, this type of software solution brings: a more agile and competitive corporate culture (able to quickly adapt to change), enhanced efficiency through single sign-on to existing HR systems, lower costs by increasing efficiency with automated processes for managing the many types of transactions found in human resources, increased revenues from the competitive advantages brought by a human resources department focused on supporting business strategy employee self-service using electronic forms; and streamlined processes for managing benefits, training and compliance programs.

Some conclusions refer that if the system of human resources is based on SOA has the following benefits [5]: Human Resource Management in the service oriented companies in the service industry can gain an insight into the importance of Human Resource Management, gain insight about the future trends and then design their strategies according to these trends, which will benefit these organizations. The future of Human Resource in service-oriented companies is more like a strategic partnership then an administrative one and because of technological advancements in this global era Human Resource Management based on SOA has become a major challenge for different companies and organizations nowadays.

4. PLATFORM DESIGN AND DEVELOPMENT

Building an efficient and productive e-HR solution requires a service-oriented architecture SOA, which is the ideal foundation for e-HR portals and collaborative workflow, because it is based on services. Services for an SOA are defined conceptually, rather than technically, as business functions and processes that have been broken down into individual, reusable components. Therefore, to build HR system based on SOA we will have to create: database, authentication, services, entities, controllers and the frontend part. Regarding to the technologies to create these parts we will discuss in the next section of this paper.

Database – in this part we will create all the tables we need to store the data and their relationship. We have to store data such as:

- Employee information;
- Leaves of employees, it is approved or not;
- Payroll, it will include the salary structure which will depend on attendance detail and leave detail;
- Attendance's data, from which we can generate monthly or daily reports;
- Recruitment detail;
- Loan, employee loan with the rate;
- Training events or for employees;
- Announcements which simultaneously will appear the tables of system's database.

From all the above-mentioned data stored in database the users will have the possibility from the system to generate different reports, such as reports for: HR, recruitment, employee etc.

Services – since SOA is based in services, this is one of the most important steps for creating our system. Therefore, here is defined the entire logic of manipulating and managing the data of the system. Services will help to obtain the data we need from the database, the way we want to return the data on the system, and last but not least here it will be included the security of the system.

Entity – this part will contain all the tables with its particular fields and the relationships among them. Apart from entities the system will has “dtos” for determining the fields of our table that we will share through API (make it reusable for other companies).

Controllers – the REST API will be designed here, which will make it possible the communication to the frontend and discoverable for other user that want to use a similar system.

Also, the methods used in this process are as follows:

- GET, if the HR employee need to see the information of different department's employee within the organization or company;
- POST, if any of the employee has published new academic research
- PUT, if the HR employee needs to insert the information needed for a newly employed or modify information for existing employee
- DELETE, to delete any kind of information from the database.

Authorization – each user that wants to login in the system must be authorized and has a particular role. For example the director of HR will has a complete access to the system, the admin role will be granted with fully access on the database's system and the system itself, the one which is responsible for the contract between the organization and the employee will have access to that part of the system, the one which is responsible for the payroll it will have access to that part, employees

can have access to their personal information, edit them, view their salary, attendance, leaves etc. So, everyone must have a role and regarding of that is authorized to the access of the system. The below pictures illustrates how users are provided with information based on their roles and according to their responsibilities in a process (Fig. 1).

Frontend – also known as client-side development, is the place where the user interacts with backend in easiest way. The user can login here and the information will be displayed in a format that is easy to read and relevant. The below picture shows how the system will gather the necessary information from back-end systems or other staff and creates customized front-end views (Fig. 2).

All those processes are displayed in below use case diagrams. The first use case diagram in Fig. 3 shows how the user (in our case the director of HR system) request for access of information about all employees within the organization/company.

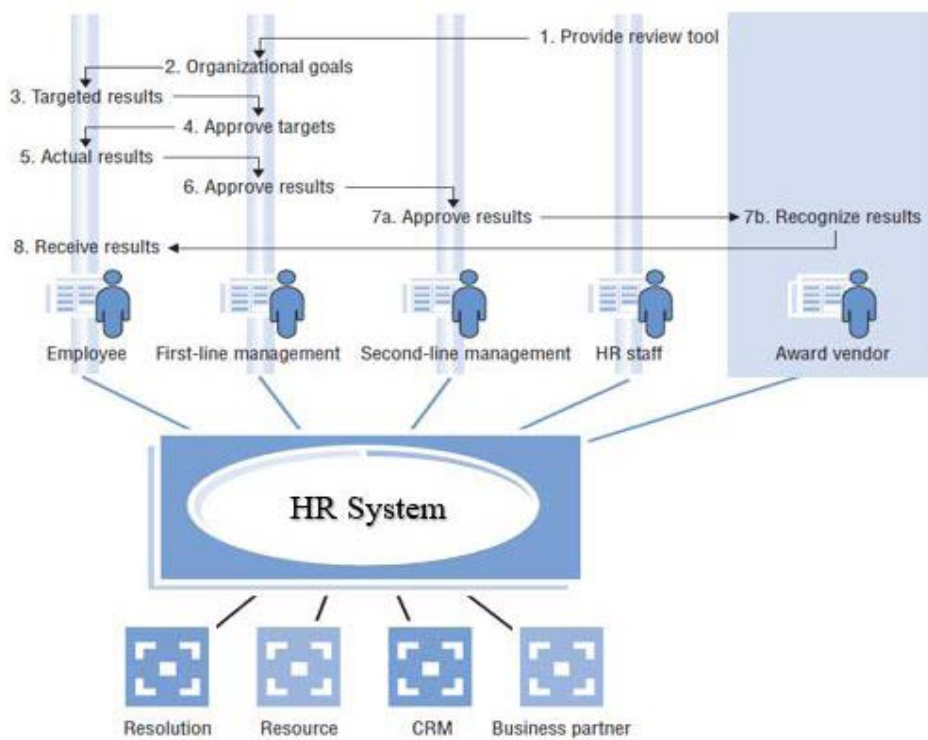


Fig. 1. User roles and responsibilities

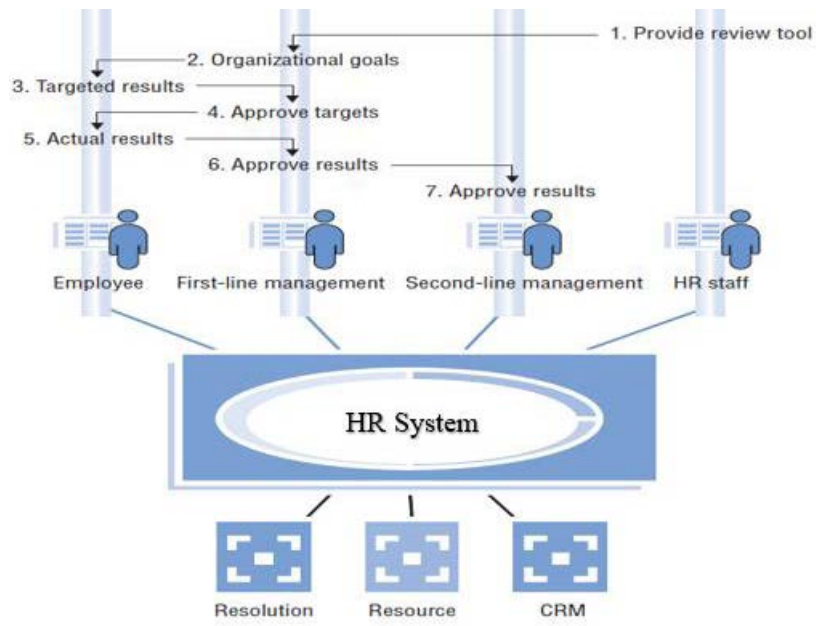


Fig. 2. Front-end views

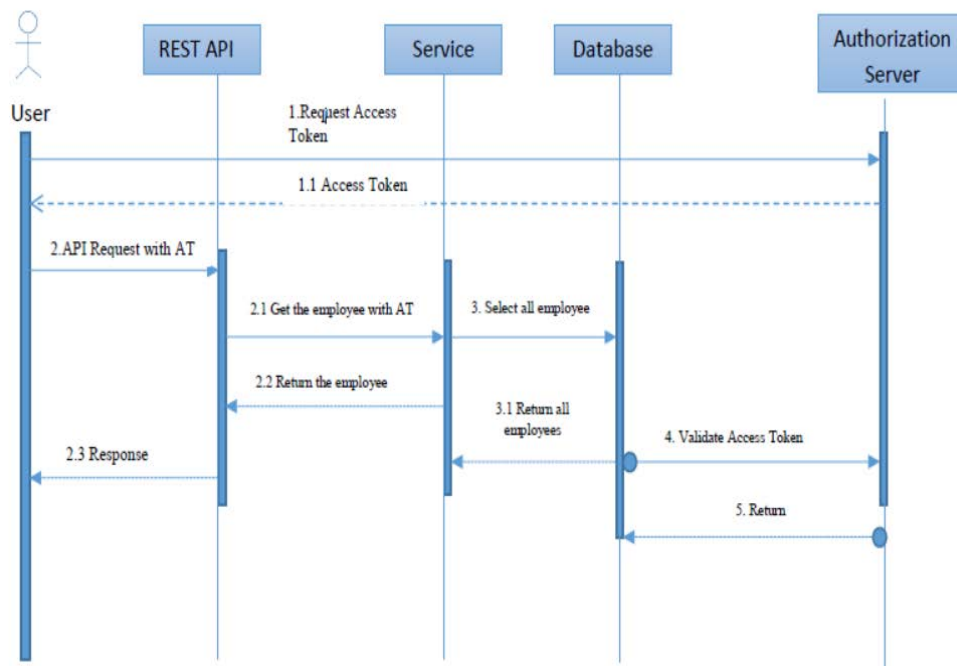


Fig. 3. "Request All Information" Use Case Diagram

The use case diagram below shows how the user (in our case the director of HR system) request for access of information about a specific employee within the organization/company (Fig. 4).

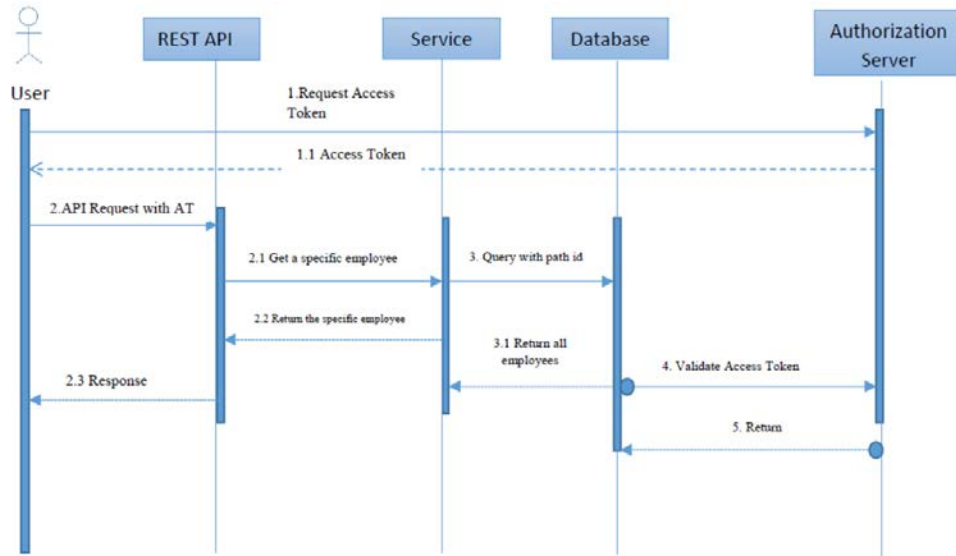


Fig. 4. “Request Specific Information” Use Case Diagram

How the administrator adds new employee within the organization/company to database is displayed in the following case diagram (Fig. 5).

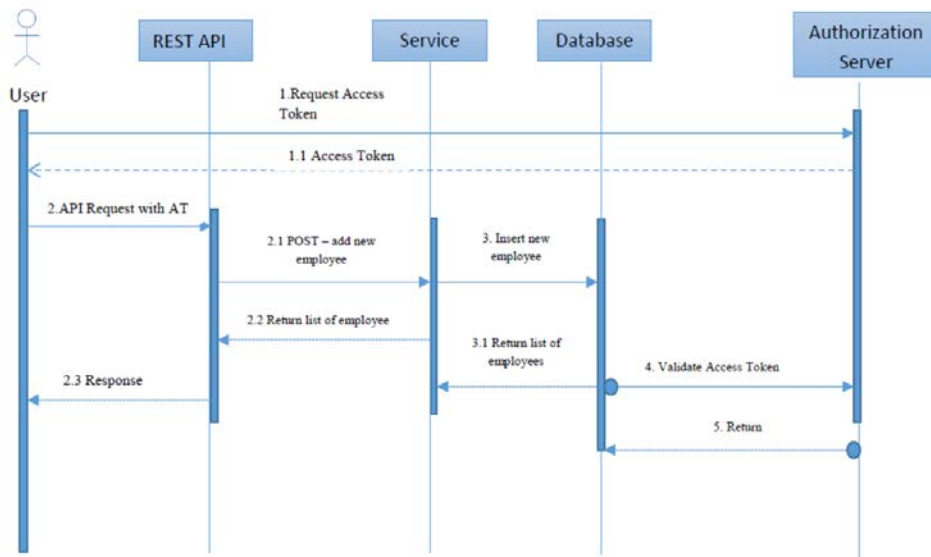


Fig. 5. “Add New Employee” Use Case Diagram

The following use case diagram shows how the user (in our case the person who is responsible for payroll's employee in HR system) to make the payroll of a salary for a specific employee within the organization/company (Fig. 6).

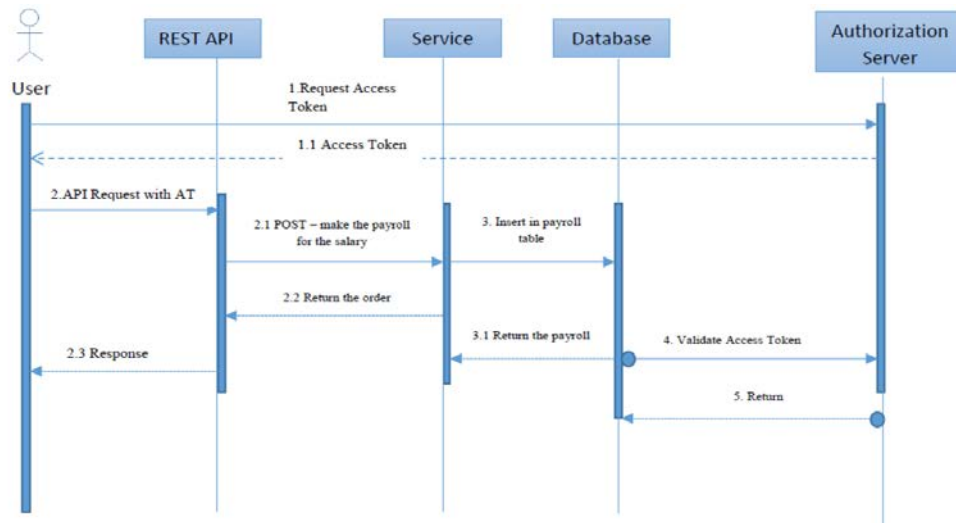


Fig. 6. "Payroll Activities" Use Case Diagram

The use case diagram in Fig. 7 displays how the user (in our case the employee in HR system) to get notification about any process that needs to be done (ex. This month transaction salary is done, of any signature needed from the employee, and all these processes to be done within the system).

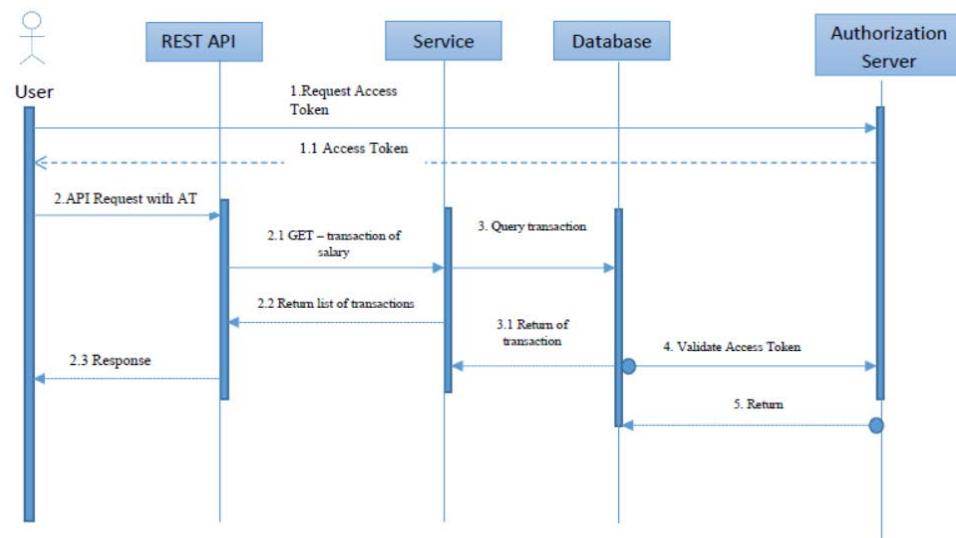


Fig. 7. "Get Notification" Use Case Diagram

CONCLUSION

In this paper, we showed how SOA can be leveraged beyond IT transformation to meet a corporation's on demand needs in the 21st century. For realizing the true value of SOA, organizational and cultural transformation is essential. While change is always accompanied by uncertainty, the potential benefits that can be realized outweigh those risks.

The Human Resource Management function is considered a source of competitive advantage by the management of organizations/companies, as it provides the source of distinction between the services provided by the particular company and other companies. Moreover, the effectiveness of the services-oriented companies rests heavily on the knowledge, skills, and drive of their human Resource. This study also reveals some major trends which compel Human Resource to change, and these trends include globalization, technology and outsourcing, consistent with the findings. The main idea of future work regarding to the Human Resource System is the best atomization and optimization of all processes mentioned in this research paper.

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