Effects of Service Orientation on Enterprise Business (A Case study in Education Department)

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Abstract- Service Oriented Architecture is a style of Information System Architecture which is constituted from a collection of services based on business and supports Loosely Coupled (independence of coding and service location) for flexibility and intersystem interactions. In this article, firstly Service Oriented Architecture and its related concepts will be elaborated on then a real enterprise, before and after making service orientation, will be studied in order to see the effects of service orientation on the business of that enterprise.

Index Terms- Achievements of Service Orientation in business, Service Oriented Architecture (SOA), Service Oriented Elements, Web Service

I. INTRODUCTION

Service Oriented Architecture (SOA) is an approach to software design ("architecture") in which applications are assembled from reusable components (called services). A service is a software building block that performs a distinct function for example, retrieving customer information from a database, producing an invoice, performing a credit check, etc. through a well-defined interface (basically, a description of how to call the service from other programs) . According to proponents, SOA is emerging as the premier integration and architecture framework in today's complex and heterogeneous computing environment. It can help organizations streamline processes so that they can do business more efficiently and adapt to changing needs, thus enabling the software-as-a service concept. It should be clear that a SOA must be able to relate the business processes of an organization to the technical processes of that organization and map the workflow relationships between the two.

SOA describes an IT systems architecture based on the principle of delivering reusable business services that are assembled from software subcomponents in such a way that the providers and The consumers of the business services are loosely coupled. Specifically, with SOA the providers and consumers do not need to have in-depth knowledge of the technology, platform, location, or environment choices of each other. SOA promotes loose coupling between software components so that they can be reused.

In other words, Service Oriented architecture enables different organizations to independently implement services that meet their immediate needs, yet can also be combined into higher-level business processes and enterprise solutions.

II. OBJECTIVES OF THE PAPER

1) Introducing the Service Oriented Elements.

2) Solutions for the integration of Information Systems

3) A case study in an Enterprise before and after being service oriented

4) Comparison of a service oriented enterprise and non-service oriented one

III. BASICS OF SERVICE ORIENTATION AND CASE STUDY

3-1 Service Oriented Architecture Elements

All of the elements of service-oriented architecture (SOA) are arranged to connect through business processes to deliver a precise level of service. SOA develops a basic arrangement of components that can collectively administer an intricate business service. To understand the layout of SOA, take a look at this flowchart of service-oriented architecture components (Figure 1):

Enterprise Service Bus: The enterprise service bus is the communications nerve center for services in a service oriented architecture. It tends to be a jack-of all-trades, connecting to various types of middleware, repositories of metadata definitions (such as how you define a customer number), registries (how to locate information), and interfaces of every kind (for just about any application).
Adapter: A software module added to an application or system that allows access to its capabilities via a standards-compliant services interface.
Business Process Modeling: A procedure for mapping out what the business process does both in terms of what various applications are expected to do and what the human participants in the business process are expected to do.
Service Broker: Software in a SOA framework that brings components together using the rules associated with each component.
SOA Governance: SOA governance is an element of overall IT governance and as such lays down the law when it comes to policy, process, and metadata management. (Metadata here simply means data that defines the source of the data, the owner of the data, and who can change the data.)
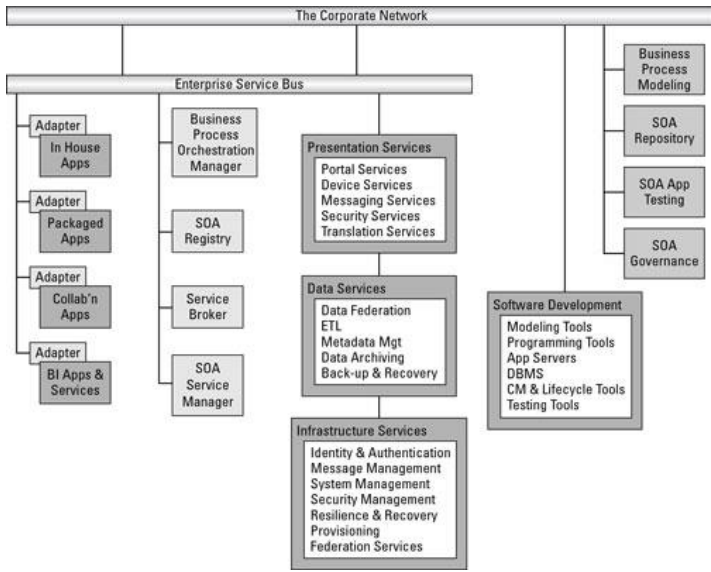
Figure 1 - layout of SOA

Figure 2 - Peer to Peer connection

SOA Repository: A database for all SOA software and components, with an emphasis on revision control and configuration management, where they keep the good stuff, in other words.

SOA Service Manager: Software that orchestrates the SOA infrastructure, so that the business services can be supported and managed according to well-defined Service Level Agreements.

SOA Registry: A single source for all the metadata needed to utilize the Web service of a software component in a SOA environment.

3-2 Solutions for the integration of Information Systems:
Presenting solutions for integrating Information Systems: for integrating different Information Systems various solutions are offered among which the most well-known ones are

1- Peer to Peer connection
2- Central Translator
3- Web Service

3-2-1   Peer to Peer connection

In the Peer to Peer Connection, in order to make interaction between two Information Systems in an enterprise, it is necessary to define and provide the communication path. Naturally, such a procedure and approach was too expensive and cumbersome (Figure 2).
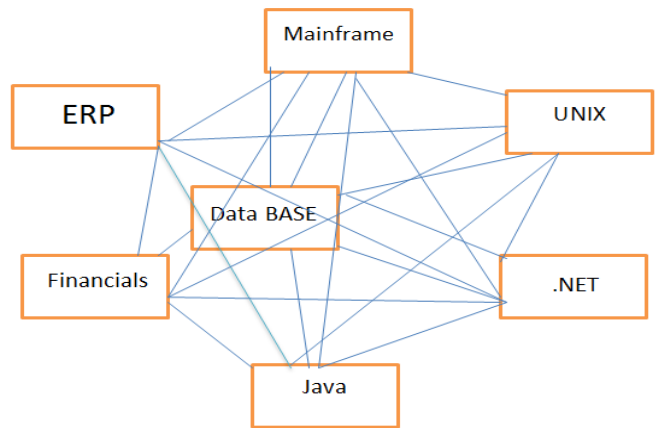
3-2-2   Central Translator

In the case of Central Translator, middleware operates between all the Information Systems in a way that like a central hob all the sent messages are referred to this mediator and after translation, they are sent to the protocol of the targeted system. This option also has had its own problems that the most salient ones were heterogeneous protocols and its limits of generalizability (Figure 3).
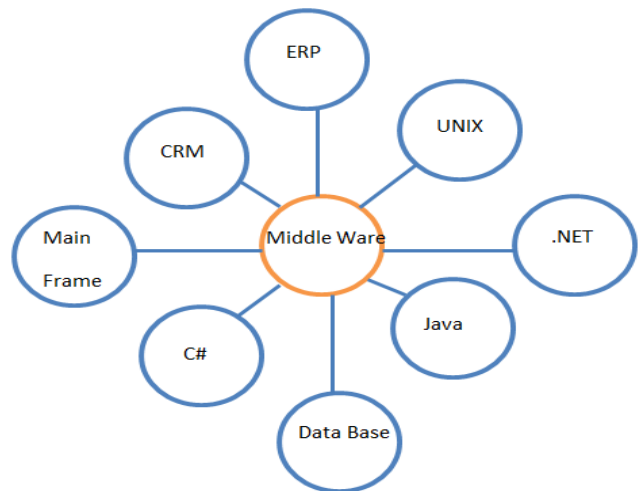

Figure 3 - Central Translator

3-2-3   WEB SERVICE

The most up-dated generation of Unified Communication is Web Service which is based on Service Orientation. In this model, all the Information Systems must interact with a standard and internationally permissible mediator called WEB SERVICE which is based on XML, possesses universal standard, and is acceptable by all Platforms, technologies, and producers.

3-3 A CASE STUDY IN EDUCATION DEPARTMENT:

Transfer is a process in which an administrative or teaching staff requests to change his/her place of employment from the source to the target office. Agreement of both offices is mandatory.

3-3-1 Education before being Service Oriented:

For transferring personnel in the past, the following steps should be followed: 1- first, the applicant entered the office and referred to the Personnel Unit. 2- The Personnel authority reviewed the records of each applicant to assure that they have the initial conditions of transferring. 3- Personnel authority gave each applicant a scoring form for filling out and determining his/her rank (transferring is done based on the final scores recorded in the form) 4- in some steps for the lack of some documents (one of the effective factors of ranking), the applicant was forced to leave the office and after preparing the documents come back. 5- Applicant, after completing all the requirements, should refer to the Secretariat Unit, register the request, and again deliver the request form to the Personnel Unit. 6- In each step, if one of the mentioned units was closed the applicant had no choice except patient. 7- Because of abundance of requests, the process was handled slowly. 8- It was at the expose of mistake or losing the documents. 9- Direct presence of the applicant in the process increased the plausibility of giving bribe and nepotism. 10- All the applicants' documents were organized based on their scores (points). 11- Documents were transferred from the original office to the State Office. 12- Documents of those whose office agreed with their transfer were sent to the target office for reviewing and commenting. 13- The target office, based on the conditions, commented on the requests. 14- Since the Offices were too far from each other, the comments were not delivered on time. All in all, to gain service, both source and target offices were busily involved, because transferring is just one of the duties that each office should do.

3-3-2 Education after being Service Oriented:

In recent years, the Transferring Unit of Education is service oriented and applicant only once refer to the Personnel Unit, receive 'transferring code' and enter their scores in the transferring system. The source and target offices make appropriate decisions based on the scores and the results are declared on time, easy as a pie! Features of Service Oriented Enterprise are completely clear: 1- Related offices can simply connect to this system by any technology or programming language since, as discussed above, integrating and unifying Information Systems based on 'Web Service' is independent of technology, platform, and operating system. 2- Instead of transferring bundles of files and documents between different offices, workflow is done by the management system. 3- The applicant just delivers the documents once and the results (transfer or not transfer) are announced on a specific time in the system. 4- Features and conditions of the service are clearly mentioned. 5- Overcrowding is avoided in offices.

IV. ACHIEVEMENTS OF SERVICE ORIENTATION IN BUSINESS:

Results and achievements of service orientation in the Personnel Transfer Unit of Education in a comparative form is depicted in Table 1.

Table 1: Comparison of transferring condition before and after service orientation

Comparison	Before SOA	After SOA
Following the steps and procedures of doing works	By applicant	Mechanized
All the procedures and steps of the works have the capability of being done by internet	Never	Somewhat
The time of being present in office	Excessive and unnecessary	Time-effective
Possibility of corruption and bribery	High	Low
Hiding the complexity and internal rules from the customer	Impossible	Possible
Document delivery	Frequently	Once
Possibility of mistake and missing the documents	High	Low
Customers' satisfaction from the Enterprise	Low	High
Enterprise condition	Weak and inflexible	Agile and service oriented
Recording the applicant's information for future use	Hard	Simple
Interaction between Departments	Excessive and unnecessary	Balanced and When required
Reliability	Low	High
Enterprise costs	High	Low

V. CONCLUSION

In an actual case study we showed that service orientation resulted in the flexibility, cost reduction, agility of enterprise, and satisfaction of applicants .

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