Mother Theresa Group of Hospitals – HealthCare System SOA Project Plan

Approach for SOA-based Patient Care Information System

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Creation Date: 11/13/08
Last Revised: 11/16/08
Version: 1.1

CPET 545 SOA and Enterprise Applications
Fall 2008
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EXECUTIVE SUMMARY

• The EJM Service Oriented Architecture (SOA) design team will address the problems of Mother Theresa Hospitals by designing a SOA-based patient care automation system offering efficiency and interoperability across multiple departments and locations. This new platform will:
  – Establish unity among processes and allow easy extendibility to meet unpredictable business demands.
  – Improve response time, security and flexibility of the patient care system.
  – Facilitate coordination and information sharing, both internal and external, to the participating Hospitals.
  – Enhance the ability and effectiveness of communication between applications on various platforms.
  – Provide a reliable technology base for the future.
  – Facilitate the electronic capture of data at its source.
  – Built for ease of use.
  – Eliminate redundant data entry throughout the Hospitals

• The EJM SOA team will produce several deliverables resulting from this project:
  – Purpose of the project
  – Scope of the project
  – Project cost estimation
  – Project Schedule
  – SOA implementation risks management
  – Prototype of the new system and schedule

INTRODUCTION

• The EJM SOA team plans to implement the concept of Service Oriented Architecture (SOA) as the base of the new patient care information system to meet these challenges. SOA will allow the patient care information system platform to:
  – Provide interoperability, loose coupling, dynamic discovery, reusability, compositionality, and federation among its components.
  – Organize and utilize distributed capabilities that may be under the control of different ownership domains [1].
  – Provide a uniform means to offer, discover, interact with and use capabilities to produce desired effects consistent with measurable preconditions and expectations.
  – Allow different applications to exchange data with one another as they participate in business processes.
Benefits of SOA

- The benefits offered from SOA can only be achieved if Mother Theresa Hospitals embrace solutions to ensure operational effectiveness and secure loosely coupled applications [2].
- The federated architecture that SOA introduces, with its agnostic solution logic and loosely coupled applications, enhances the return of investment (ROI) by supporting reusable logic that decreases maintenance requirement efforts.
- These characteristics will increase the value of Mother Theresa Hospitals by reducing the financial overhead required and allowing expansion of long term assets.
- Furthermore, a SOA-based patient care information system will allow business goals and objectives to be accomplished within the defined budget and time parameters thereby minimizing the impact to business operations within the affected units.

Outline of Project Sections

- This project plan relies on previous analysis and experience with products offered by Microsoft Corporation to achieve efficient and interoperable SOA-based healthcare systems.
- The previous experience of the EJM SOA design team will be first be outlined followed by the project scope, estimated cost, project schedule, and risk assessment and management.
- The planned implementation will involve process design using business process modeling notation (BPMN) and use case scenarios based on the patient care process at Mother Theresa Hospitals.
- A prototype implementation will be described with necessary services and components in order to generate a manageable and well-designed system.
- The Appendix may include minimum system requirements, software inventory and vendors, and terms and keywords as deemed necessary.
SOA PROJECT EXPERIENCE

• Enterprise Process Automation

• Service-Oriented Architecture and SOA
SOA PROJECT EXPERIENCE

• The Pilot Project

Improved Cutitt Lab Project Business Process

SOA PROJECT EXPERIENCE

• Conclusions
  – The EJM team used the Business Process Execution Language
    (BPEL) environment to design the lab project process by
    incorporating XSD and WSDL files as follows:
  – Section of imported documents for namespace, location, and
    importType.
  – Section of partner links includes: name, partnerLinkType, and
    partnerRole
  – Section of variables defined in the BPEL process includes:
    name, Type, and messageType
  – Section describes elements used in the BPEL process includes:
    name, createInstance, partnerLink, operation, portType, variable,
    inputVariable, outputVariable, and variable.
SCOPE

• The Project will introduce a SOA-based patient care information system with the following deliverables:
  – Flexible system to communicate among Mother Theresa Hospitals
  – Microsoft BizTalk software
  – Allow communication with existing SAP systems for data processing
  – Security around the modules based on roles and constraints
  – Automated reporting module
  – Communication between Insurance carrier and hospital management system
  – Integration with Active Directory

• The Platform for Applications include:
  – .NET Framework as the infrastructure for Health Information Networks
    • Service Oriented Architecture
    • Web Services and XML
  – BizTalk Server as the key integration technology via:
    • Accelerators for HL7, SOAP, UDDI, WSDL, and healthcare-specific standards such as HIPAA (Health Insurance Portability and Accountability Act)
    • Native support for XML standards and Web Services
  – SQL Server for the clinical repository Information integration enables new opportunities
    • Clinical portals
    • KPI (Key Performance Indicators) and business intelligence

Scope

• Constraints and Limitations
  – The project does not include the following:
  – Track Patient and details with RFID software.
  – DSS (Decision Support System) for doctors
PROJECT COST ESTIMATION

• Technology and Standards
  – There are multiple standards of Windows Server, each of which is defined to meet the need of a certain market segment. However, this project utilizes Windows Server enterprise edition. The characteristics of this server are:
    • Designed to enable large enterprises to deliver highly available applications and web services
    • Available in both 32-bit and 64-bit versions
    • Server can be a member server, domain controller, or standalone server
    • Supports load balancing
    • Clustering and Metadirectory Services are supported
    • Capable of 64-bit processing
    • Support for hot add memory
    • Non-Uniform Memory Access is supported (NUMA)
  – The following components are required to architect and automate the patient care system
    – Microsoft BizTalk Accelerator for SWIFT
    – BizTalk Server 2006
    – Microsoft Office InfoPath® 2007
    – Microsoft SQL Server™ 2005
    – Microsoft Windows Server® 2003
    – Microsoft Office SharePoint® Server 2007
    – Exchanger server

• Hardware Platform
  – The hardware requirements for the proposed windows enterprise server are: minimum CPU speed is 133 MHz, recommended CPU speed is 733 MHz, recommended RAM is 128 MB, minimum Ram 128 MB, disk space for set up 1.5 GB, Maximum RAM 32 GB, Maximum processor are 8 processor. Each server machine should have 4 Hard Drive of 500 GB total, 10/100 Fast Ethernet Switch, Zonet 4-port KVM Switch, 8 Monitors, 8 Keyboard, and 8 scroll

• Software Tools
  – Service Enablers
    • .NET Framework
    • IIS
    • Silverlight
    • Active Directory
    • Stateless
    • Virtualization
Risk Management

• The information contained within the Project Plan will likely change as the project progresses. While change is both certain and required, it is important to note that any changes to the Project Plan will impact at least one of three critical success factors: Available Time, Available Resources (Financial, Personnel), or Project Quality. In order to reduce the affects of these risks the EJM team will adhere to the following guidelines:
  – The Project Manager will ensure that team members are available as needed to complete project tasks and objectives
  – The Project Plan will be executed in a timely manner (i.e., timely approval cycles and meeting when required)
  – Changes to draft deliverables will be communicated effectively with respect to the project timeline to avoid delays
  – Mother Theresa Hospitals will foster support and "buy-in" of project goals and objectives
  – Management will support the existence of a technological infrastructure that can support the new SOA implementation project for patient care information system

IMPLEMNTATION PHASES

• Architecture
IMPLEMENTATION PHASES

- Service Inventory

REFERENCES