REQUIREMENT ANALYSIS FOR LOGISTIC MANAGEMENT SYSTEM OF EGAT

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Abstract

EGAT(Electronic Generating Authority of Thailand) presently builds, owns and operates several types and sizes of power plants across the country with a combined installed capacity of 13,617.10 MW, accounting for about 47.8 percent of country's 28,479.00 MW generating capacity. EGAT also purchases electric power from private power companies and neighboring countries (Electricity Generating Authority of Thailand et al. 2012). In current process to manage transportation and internal documentation to import both equipment and electric power is done by manually. Logistic Management System that development team will develop for EGAT emphasizes on three sub system. First is Shipping Management System. Second is Transportation and Machinery and Approval System and the final is Workflow and Contract Management System. We are in final phase of requirement analysis. From analysis with user development all of systems will help to reduce resource and make them to be standard process. Moreover information kept by manual process could not be traceability and analyze.

Keywords: Logistic Management System, EGAT, Transportations

Introduction

EGAT 's logistic system in module Shipping Management, Transportation and Machinery and Workflow Management process currently done by manual in paper form that is inconvenient and muddle. Distribution and Logistic Department of EGAT provide problem domain and requirement to MFU student development team to design solution and develop Logistic Management System in all three modules. Systems also provide reporting and attach contractor file module for review contract after fill in information for approver. All part control by File No. to relate all document in four parts make them consistency and easy to inquiry document for operate.

Research Implementation Method

Requirement analysis phase of SDLC process methodology apply to all modules. Studying existing process and analyze domain problem found lack of collaborative and consume a lot of

resource both human and material (Matthew Barth, Michael Todd et al. 2000). Web service technology was selected to use in design and develop solution to match the requirement.

System Architecture

From study As-Is process, researcher found bottle neck process of collaborative to entry document in four parts and process of review and approve was delayed. Researcher team chooses web-service technology to solve the problem support online transaction for all users from all division and all location. System also designs to support security level for limit permission to manipulate or inquiry application data. Architecture of designed security level is shown in figure 1.

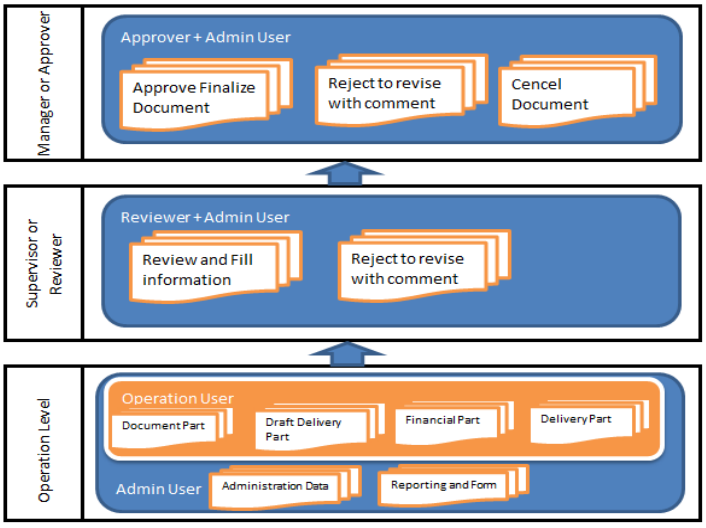

Figure 1 Architecture of designed security level.

N-Tier architecture is an industry-proved software architecture model, suitable to support enterprise-level web applications by resolving issues like scalability, security, fault tolerance and etc. .

Applied to web applications and distributed programming, the three logical tiers usually correspond to the physical separation between three types of devices or hosts.

1. Browser or GUI Application
2. Web Server or Application Server
3. Database Server (often an RDBMS or Relational Database)

However, inside of the application server, there is a further division of program code into three logical tiers. This is kind of fractal: the part (app server object design) resembles the whole (physical system architecture). In a classic JSP/Servlet system, these objects are usually implemented as:

1. JSPs or Servlets responsible for creating HTML or WML user interface pages
2. Servlets or JavaBeans responsible for business logic

3. Servlets, JavaBeans, or Java classes responsible for data access. These objects usually use JDBC to query the database (Apiwich Jetsadapornpan, Somjit Ajin et al. 2009). Architecture of development system is shown in figure 2.

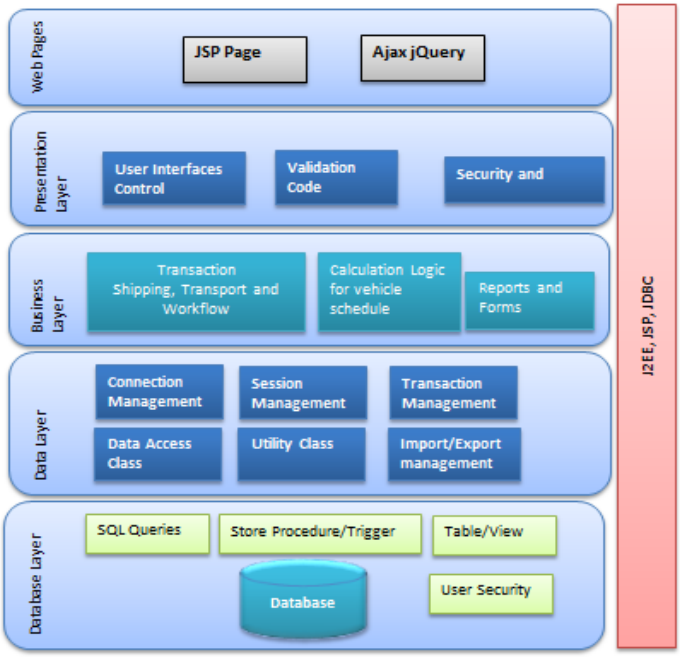

Figure 2 Architecture of development system.

Data Migration for administration part

For this research, data migration has to be done for migrate data in administration part such as currency, incoterm, destination, source, Cost Center etc. from existing system to new development system. From source data export from SAP program into text file format then import to new system database to use in To-Be system. All migrations follow the basic methodology illustrated in Figure 3.

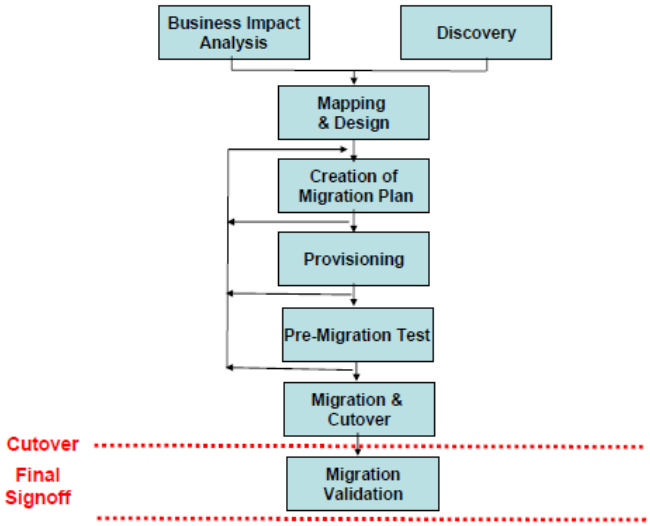

Figure 3 Migrations follow the basic methodology.

Business Impact Analysis

The objective of the business impact analysis is to identify the business and operational requirements that impact the migration process. Various stakeholders within the company need to be consulted to ensure that their requirements are factored into the migration planning.

• Database and system administrators define application and database requirements

• Business owners define the importance of, and requirements for, specific applications and types of data

Discovery

Accurate and complete discovery is critical to the success of the migration, so although discovery can be manual (via command line) or automated (via a discovery tool), using an automated discovery process is the preferable option. Not only does automated discovery reduce discovery time, but also it minimizes the chance of error. Unfortunately, no one discovery tool provides all the required data, so often multiple tools must be used.

Mapping and Design

During discovery, the migration source—what data is moved—is identified. During mapping and design, the second half of the equation, the migration destination—where is the data moved—is identified. There are two basic mapping layouts: one-to-one, where the source and destination layout are the same, and re-layout, where the source and destination layouts are different. Although a one-to-one mapping enables a much simpler migration, migration is often seen as an optimal opportunity to consolidate and/or optimize performance and/or capacity utilization, so re-layout is a very common scenario. A combination of the migration goals and best practices drives the layout of the new (destination) storage environment.

Creation of Migration Plan

The migration plan, which is the end deliverable of the planning phase, functions as the blueprint for the migration implementation, specifying customer expectations, defining project deliverables, and identifying migration methodologies to be used. There are four major inputs into the migration plan:

- Business and operational requirements, which provide the constraints
- Data to be migrated, with all associated attributes
- Available migration tools
- Verification procedures
- Risks and contingency plans
- Change control procedures
- Project schedule
- Post-implementation activities/responsibilities
- Migration completion criteria

Although the migration plan is the end deliverable of the planning phase, it is really a living, rather than static, document. Variables in the environment can change, or execution can lead to unexpected results, impacting the migration plan as documented.

Provisioning

During provisioning, the destination storage environment is prepared for the data move. Volumes, directories, and so on are allocated, security attributes are set, and shares/exports are created. Provisioning for a one-to-one mapping is simple; for a re-layout, it is a more complex task.

Pre-migration Test

Before any data is moved, it is important that some portion of the migration plan—with the scope depending on the specific situation and the agreement with the customer—be tested and validated. Results of the migration test determine whether modification of the migration plan—for example, timeline, migration tools used, amount of data migrated per session, and so on—is required. For example, if testing shows that allowable downtime would probably be exceeded, the migration methodology needs to be revisited.

Migration and Cutover

This is the point within the migration process when the source data can be moved to the destination devices.Basically, there's no one right way; it's all about making trade-offs based on knowledge of the environment, business and operational requirements, and migration experience, which provides a proven set of best practices. In fact, the entire planning phase focuses on developing the best-in-class migration plan for the specific migration project at hand. By migration and cutover, all the upfront planning, analysis, and trade-offs have been made; the migration plan serves as the implementation guide.

Migration Validation

Before the migration can be considered a success, one critical step remains: to validate the post-migration environment and confirm that all expectations have been met prior to committing. At a minimum, network access, file permissions, directory structure, and database/applications need to be validated, which is often done via nonproduction testing.

Shipping and Contract Management System

For the purpose of development system, Shipping and Contract Management System. It is a part of manage consistency of preparation importing both equipment and electric power document. The activity diagram of system is shown in Fig.4. The Shipping and Contract Management System composed of four parts of transaction data management, one part of administration data and one part of report. Web application technology was applied for develop this project. There are given the following benefit to Logistic and Distribution department of EGAT (Sunthorn Mikuntod, Prapa Thongmeesit et al. 2011):

Reduce unmanageable transactions in paper form control by "File No." 5 digits of document number.

Support integrity of data entry by prepared administration data.

Support collaboration between four parts of operation. They can entry data by operation user and review by supervisor cross functions.

All user can view status of document in each part make them can trace the status of workflow.

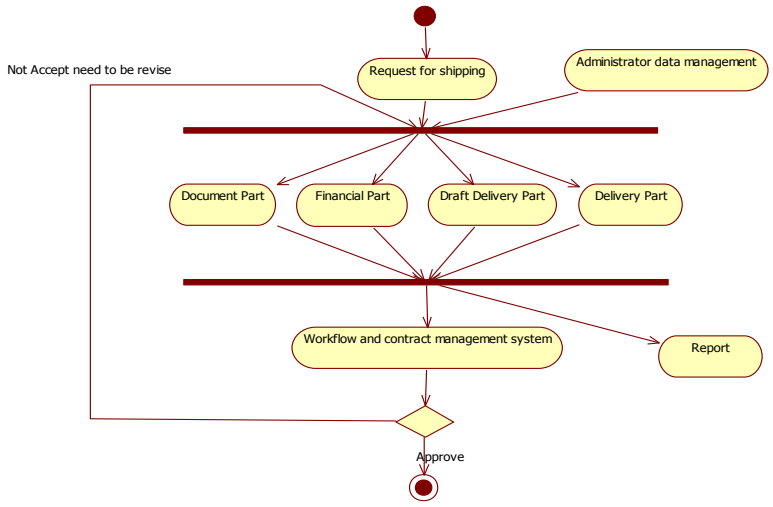

Figure 4 Activity diagram of Shipping and Contract Management system.

Transportation and Machinery Allocation Approval System

According to EGAT has too many vehicles and machineries for support transportation and logistics activity. To allocate all assets has to manage by complexity process. Develop team design solution by use web application compose of three parts to serve transaction and module to calculate for reserve schedule of vehicle and machinery. Systems also provide transaction form

for daily transaction and summary report to analyze history data by period weekly, monthly or yearly (Sunthorn Mikuntod, Prapa Thongmeesit et al. 2011). The workflow of system is shown in figure 5. Daily transaction document to store data that request for transportation. All request transactions have to submit into workflow from operation user then send to supervisor to review and approve transaction. System generates running number separate by series of requested department to control and categorize transactions.Calculate logic for reserved vehicles and machineries schedule support user to planning and select available assets for operates their task. Vehicle and Machinery that status not ready to use can maintenance and trace maintenance status by identify PM Order of fix task.Daily form to operate daily transaction and summary report by monthly or yearly in any dimension. Management can considerate all report to improve their operation process and also trace transaction in history to investigate and audit problem of transaction. Moreover, in this module can distribute expense from transportation to each cost center in SAP system.

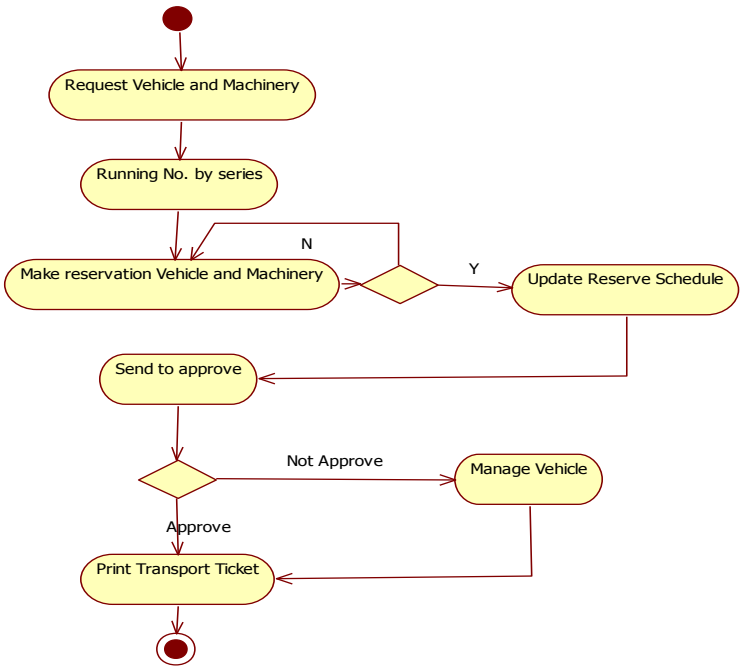

Figure 5 Workflow of Transportation and Machinery Allocation Approval System.

Workflow and Contract Management System

In workflow and Contract Management System has function to review and fill in more required data that already fill in four parts in Shipping and Contract Management System. Users have to fill information contract order quantity, shipped quantity and remaining quantity. It also provides function to approve the shipping document by approver from review transaction data and attach document from contractors. Workflow designs for retrieve data that already fill in all

four parts from Shipping and Contract Management System. If document is not correct or need to be revises approver can change status of document and send back to operator team to revise document with attach comments. Workflow of document is shown in figure 6. The information of Workflow and Contract is detail about product, quantity, remain quantity and shipped quantity.

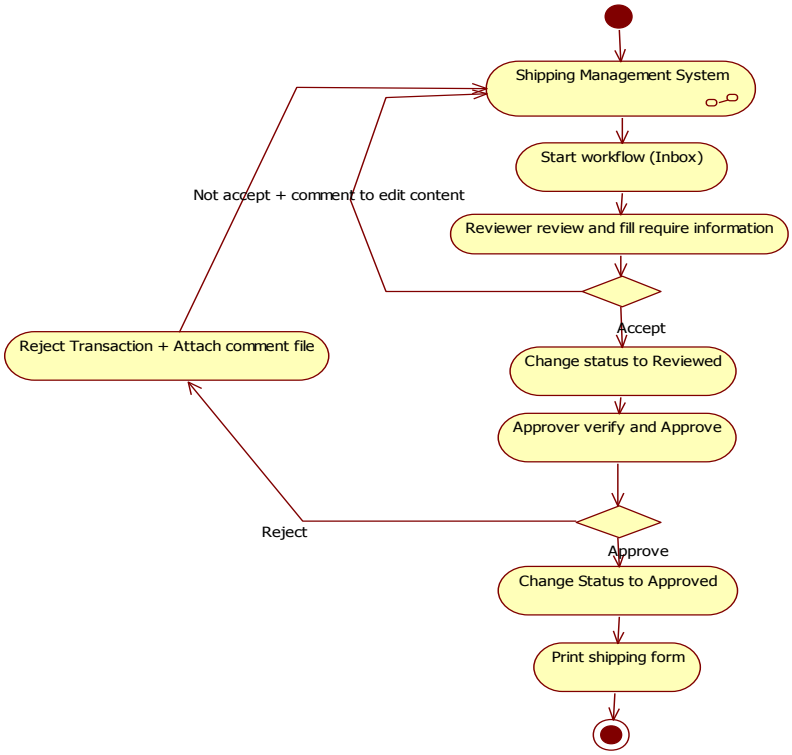

Figure 6 Activity diagram of Workflow and Contract Management System.

In this project combine both Shipping Management System and Workflow and Contract Management into same workflow to support integrity ofr information and collaboration among operation, supervisor and management team. The design of sequence is shown in figure 7. All users who have to responsible to the document will receipt email notification to process their task. For automatic send email function support user to perform task on time (Sunthorn Mikuntod, Prapa Thongmeesit et al. 2011).

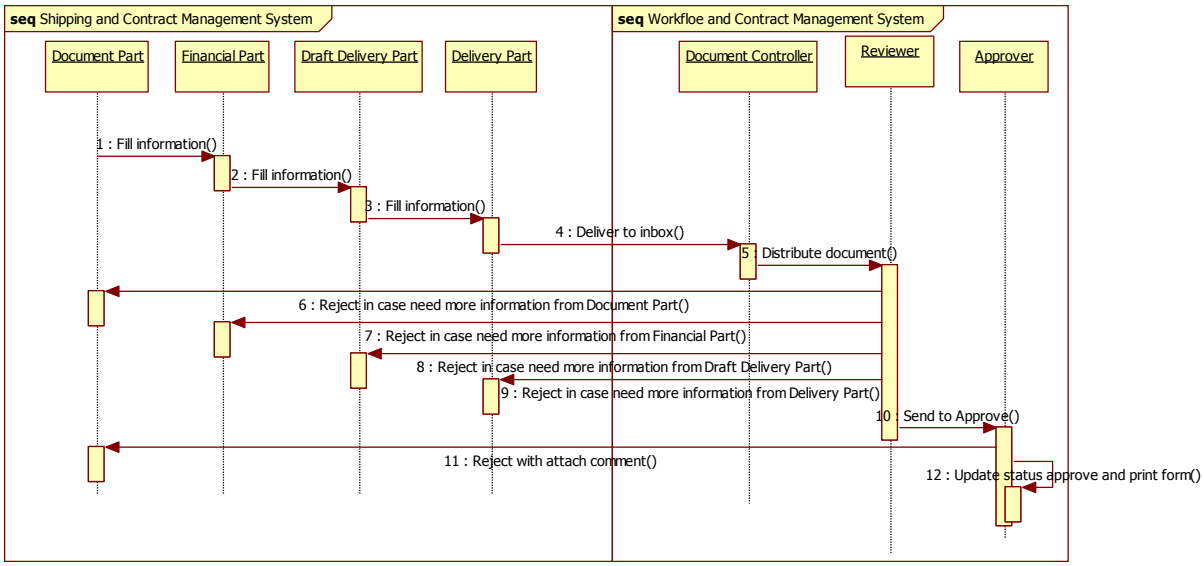

Figure 7 Sequence diagram of integrate system.

Designation of Deployment Approach

Parallel adoption can be considered the middle road between big bang and phased adoption. For example, the pace of the changeover is slower than big bang, but the faster than phase adoption. Similarly, user adaption is easier than big bang, but more difficult than phase adoption.The major trade-offs cost. Parallel adoption is the most expensive implement method. Additional, having employee enter data in both systems is not efficient. However, if the extra cost are less than costs incurred after a backfired big bang adoption, then it‘s a reasonable plan Still, organizations cannot predict cost overruns of big bang, so parallel adoption has become decreasingly popular because of perceived high costs (Ralph L. Vinciguerra et al. 2011). Deployment diagram is shown in figure 8.

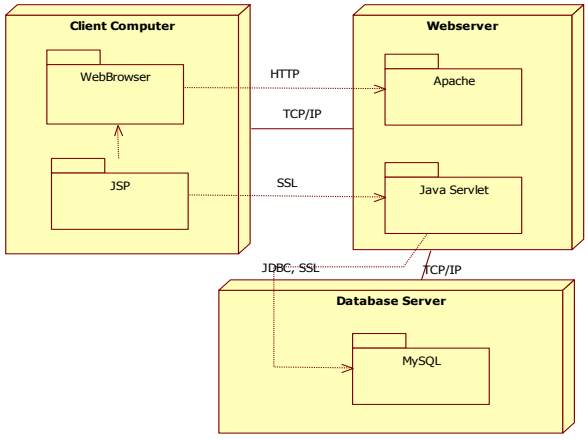

Figure 8 Deployment approach diagram of EGAT Logistic system.

Conclusions

To sum up, the existing logistic systems manually has been used for longtime in EGAT organization, and has had so many problems in term of managing or tracing the work. The result of implemented internal logistic solution in requirement phase will help user to discover of weak point of each document process and find the way to optimize resource and integrate collaborative all internal logistic document process with MFU student consultant team. However, the implementation of the new internal logistic system has made a lot of change in the organization; especially in the improvement of processing and the way employee operate support more collaborative and tractability of their tasks. Moreover, in the future when information growth enough to analyze. System can extend to analysis module such as indicate the efficiency of vehicle or machinery; predict the available of vehicle or machinery.

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