Designing Timber Tracking Application by Using ASP.Net and Web Service as Instrument of Timber Legality Assurance System

Ririn Widyastuti[*,1)]**, Didiek Sri Wiyono**[2)] **and Wahyudi Sutopo**[3)]

[1)] Student of Dept. of Computer Science, Sebelas Maret University
[2)] Department of Informatics Engineering, Sebelas Maret University
[3)] Department of Industrial Engineering, Sebelas Maret University
Jl. Ir. Sutami 36A, Surakarta 57126, Indonesia

Aabstract

Timber Legality Assurance System (TLAS) is a regulation which provided to prevent illegal logging. The system insists the furniture manufacturers have certification of timber used for their production. They must ensure that the raw materials (log) that used are legal and traceable. Timber Tracking's services are designed by using ASP.NET Web Service Technology which uses SOAP protocol and WSDL interface so it can be used for multi platform system to system communication which using HTTP protocol. The database of Timber Tracking is designed by using Microsoft SQL Server DBMS which has fully compatibility with other applications that made by ASP.NET framework. Object oriented C# is needed to make the application for client side. The Web Service services has been integrated with Timber Tracking Application which based on desktop application, so it would be accessed easily, and it can be used to help maintain and manage the Timber Legality Verification System variables.

Keywords: Timber Tracking, ASP .NET Web Service, Microsoft SQL, TLAS.

1. Introduction

Timber Legality Assurance System (TLAS) or SVLK (in Indonesia, Sistem Verifikasi Legalitas Kayu) is a regulation which provided to prevent illegal logging. The regulation insists the furniture industries have certification of timber that used for production. International markets (European and USA) request the Indonesian furniture has to use the legal log and certified. They must ensure that the raw materials (log) that used are legal and traceable. If the TLAS/SVLK couldn't completed by manufacturers, they can't export their production to global market (Brown, 2006; Sudarsono, 2009.

Attenborough (1997) explained that the wood is one of the most important materials to mankind. It used for making houses and furniture and multitude of other things. One advantaged it has over other materials is that is renewable, in that new trees can grow in the place of one's chopped down and they can produce more wood. Illegal logging is widespread accounting for more than 50 percent of all timber in some countries and causes great damage. Once cut, illegal logs feed the great demand for exotic hardwoods in developed and developing countries. The result has been an enormous loss of both revenue and forest resources. Paradoxically, despite the negative impact, illegal logging also benefits many stakeholders, including some marginalized communities. Recognizing that resolving the illegal international trade problem is first and foremost in the hands of national governments, who are responsible for monitoring forest management, tracking forest products trade and enforcing national laws and in the hands of forest products corporations and professional trade organizations, who are responsible for internal trade monitoring mechanisms and codes of conduct (Glastra, 1999).

Future timber supplies are threatened by unsustainable harvesting. However, this situation could change if a critical mass of companies started to implement forest management

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[*] *Correspondance* : ririnsfabrie@gmail.com

practices by both (Dennis, 2002). In the context of development plans and programs, participation can be defined as "the process through which stakeholders influence and take part in decision-making in the planning, implementation, monitoring and evaluation of Programs and projects" (Hidayat, 2011). Therefore, proactive furniture companies should start to design their product for end-of-life recovery, thereby minimizing wood waste in the future (Bromhead, 2003).

Department of Forestry has a new policy to trace the origins for each timber furniture throughout Indonesia Company. To prevent the illegal use of wood furniture, the company needs to build a credible legality verification tools and efficient as an effort to prepare for the regulations on the performance assessment of sustainable production of forest management and timber legality verification (Regulation of Director General of Forestry Production Number: P.02/VI-BPPHH/2010).

According to Dennis (2002), the TLAS or SVLK can be applied to industrial concessions, production forest concessions, and community forests. This system can help convince consumers that they are not buying stolen wood. This system will provide a competitive advantage for manufacturers of furniture and it is certain that the supply of raw materials can be traced to origins - his proposal so as to create export-oriented furniture industry. Formulation of the problem of this research is how to design an application that can facilitate the tracking and reporting of origin - wood proposal for export-oriented furniture company efficiently. The purpose of this study was to design a system which is a prototype application to make the system of verification easier to be accessed by manufacrurers.

2. The Methodology for Designing Application

Timber Tracking Application is designed by using the Unified Modeling Language (UML). This method is used to define the requirement, making analysis and design than describing the architecture of TLAS. Stages of system design are (Fig. 1):
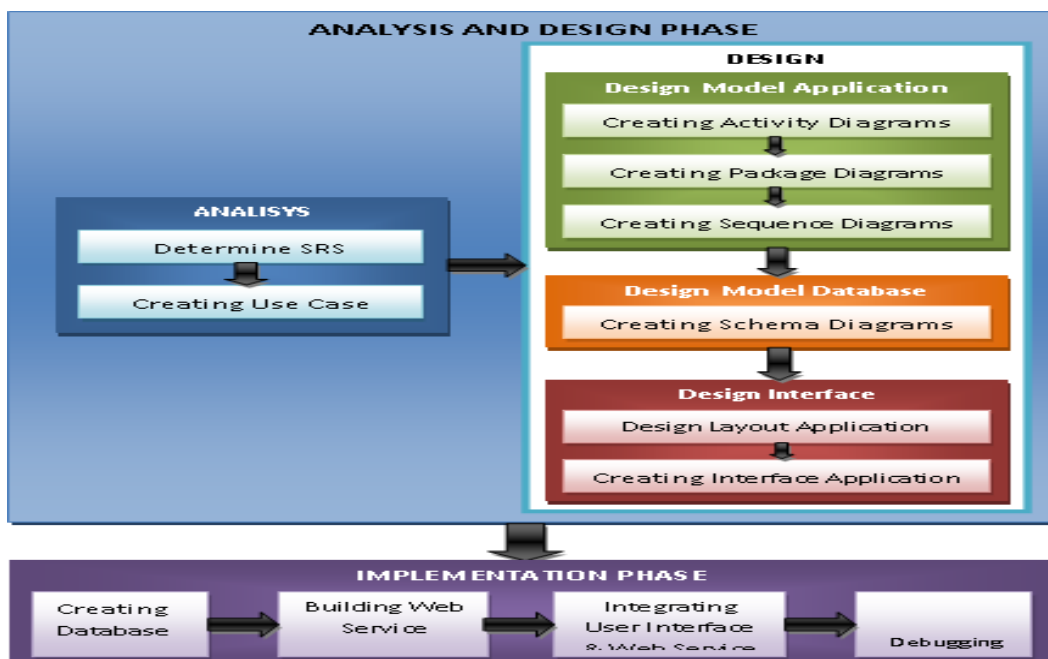

Figure 1. The Methodology for Designing Application

The purpose of this analysis is to understand the implementation of the Timber Legality Verification System. The analyzes were performed by determining the System Requirement Specification (SRS) and the portrayal of Use Case Tracking Timber in design applications.

The design stage is to map the specification or the system needs to be built with object-oriented concepts into the design of modeling to be more easily implemented in the design of

Timber Tracking application. Modeling applications is done by making Activity Diagram, Package Diagram and Sequence Diagram. While the modeling done by creating a database schema diagram. To design the user interface layout designed by the manufacture and application interfaces.

The process of implementation of the designed system begins with the development of a database, build and integrate web service user interface and web service. This process ends with debugging. The results of implementation produces a certificate stating that the wood is tracked from the processing of raw materials to finished goods Timber Tracking application is eligible to be marketed.

3. The Designing Timber Tracking Application

A Web service is a software system designed to support interoperable machine-to-machine interaction over a network. It has an interface described in a machine - process able format (specifically WSDL). Other systems interact with the Web service in a manner prescribed by its description using SOAP messages, typically conveyed using HTTP with an XML serialization in conjunction with other Web-related standards (Roger, 2006).

Timber Tracking application can't only be used by the user, but can also be used by other systems which the utilizing services that are owned by the application, namely the retrieval of the WSDL service needs. According to Ryan (2011) decision to use the WSDL SOAP or HTTP POST protocol. As for the user can access the Timber Tracking application using the interface that is built in C #.

3.1 Database Design

In database management designing there was production line which process performed by the each user, they are demand for raw materials, inventory management, and production processes. Characteristics of this system took place between suppliers, firms, consumers and customs. Here is a database design that is built :
a.   User: userID, name, username, password
b.   Request : userID, requestID, GF, Ind, date
c.   Stock : requestID, logAIIGFID, logAIIIGFID, logAIIindID, logAIIIindID
d.   Accessories : AccID, type, descriptions
e.   LogAIIGF : LogAIIGFID, volume, date, total, age, place, converse
f.   LogAIIIGF : LogAIIIGFID, volume, date, total, age, place, converse
g.   LogAIIindoor : LogAIIindID, volume, date, total, age, place, converse
h.   LogAIIIindoor : LogAIIIindID, volume, date, total, age, place, converse
i.   BoardAIIGF : BoardAIIGFID, LogAIIGFID, volume, date, total, converse
j.   BoardAIIIGF : BoardAIIIGFID, LogAIIIGFID, volume, date, total, converse
k.   BoardAIIindoor : BoardAIIindID, LogAIIindID, volume, date, total, converse
l.   BoardAIIIindoor : BoardAIIIindID, LogAIIIindID, volume, date, total, converse
m.   RSTAIIGF : RSTAIIGFID, BoardAIIGFID, LogAIIGFID, volume, date, total, converse
n.   RSTAIIIGF : RSTAIIIGFID, BoardAIIIGFID, LogAIIIGFID, volume, date, total, converse
o.   RSTAIIindoor : RSTAIIindID, BoardAIIindID, LogAIIindID, volume, date, total, converse
p.   RSTAIIIindoor : RSTAIIIindID, BoardAIIIindID, LogAIIIindID, volume, date, total, converse
q.   Product : ProdID, AccID, RSTAIIGFID, RSTAIIIGFID, RSTAIIindID, RSTAIIIindID

3.2 Application Interface Design

User interface design is intended to facilitate users in accessing the application (user friendly). In this application there are four parts of a user interface consisting of the application

demand of finished goods, raw materials inventory applications, manufacturing applications, and monitoring the application of wood. For each application has a different interface designs and tailored to the needs of application users.

a. Request for Finished Goods

Data demand of finished products (Figure 2) can be divided into garden furniture products (GF) and indoor (IND). Garden Furniture is a furniture products are usually placed outside the room or can be referred to as outdoor furniture. This product uses the raw material quality is better. While Indoor furniture is a product commonly placed in the room and usually use quality raw materials are cheaper and lower. The Figure 2 describes the process of entering data for finished goods.
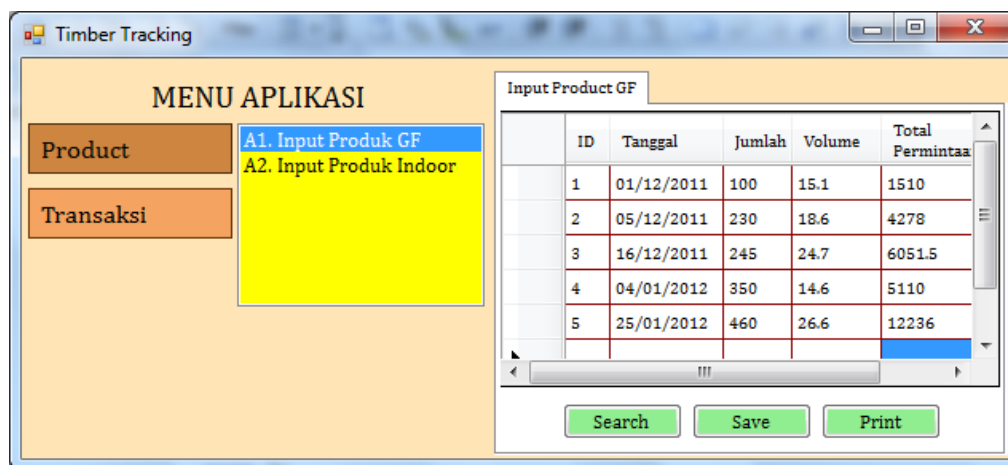

Figure 2. The Process of Entering Data for Finished Goods

b. Raw Materials Inventory

The data includes the remaining inventory of raw materials in the previous period. These raw materials are the basic ingredients to make finished products. Logs are logs that have not been cut or processed into other forms. While the board is the raw material base material to create a finished product that has undergone processing and is the result of logs cut by considering the size of its thickness. In developing this model, the inventory logs and boards are divided into logs and boards for your Garden Furniture (GF) and Indoor. To be able to meet the supply needs of the board, it is based on the number of existing log inventory. So the number of boards produced volume should not exceed the existing log inventory. The process of entering data for raw materials is described in Fig. 3.
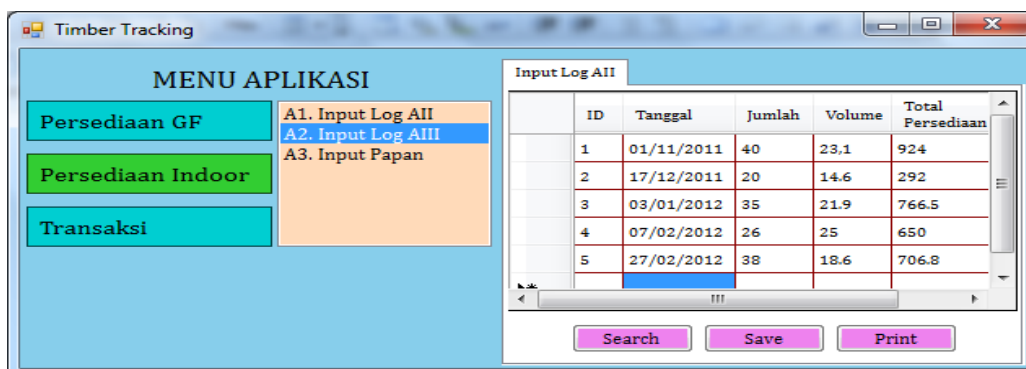

Figure 3. The Process Of Entering Data for Raw Materials

c. Raw Material Processing

The company ordered the raw materials in accordance with the data on the number of consumer demand. The company determines the volume and type of raw material that must be provided so that the production process can proceed smoothly and demand can be met in a timely manner. The raw material obtained from Forestry of teak logs grade AII and AIII. Teak logs obtained from suppliers and then stored before being used in the production process. Production process that takes place in this system consists of four stages, namely the log into planks, boards become Rough Sawn Timber (RST), a component of the RST construction and assembly of finished products. Log and board is the raw material that can be stored as inventory for the next production while the RST including semi-finished products that are tailored to the size component of finished goods.

In the furniture industry, is often found any scrap or waste wood that is unusable as a raw material production. The remainder of this wood usually appear during the process of cutting logs, processes and RST board formation, and the construction process in which the components of the product cut to the desired pattern. Facilitate the conversion value of the plan to determine the amount of raw material used is equivalent to the amount of the desired output. The transaction processing for indoor is described in Fig. 4.

Figure 4. The Transaction Processing for Indoor

d. Monitoring the Wood Tracking

To be able to do the tracking system needed some data about the product being marketed. Data - the data is displayed in the form of report. Parties Customs will provide an assessment of the processing of wood raw materials into finished products. And will provide a statement of whether the timber is worth to be sold. The Figure 5 describes the display of application.
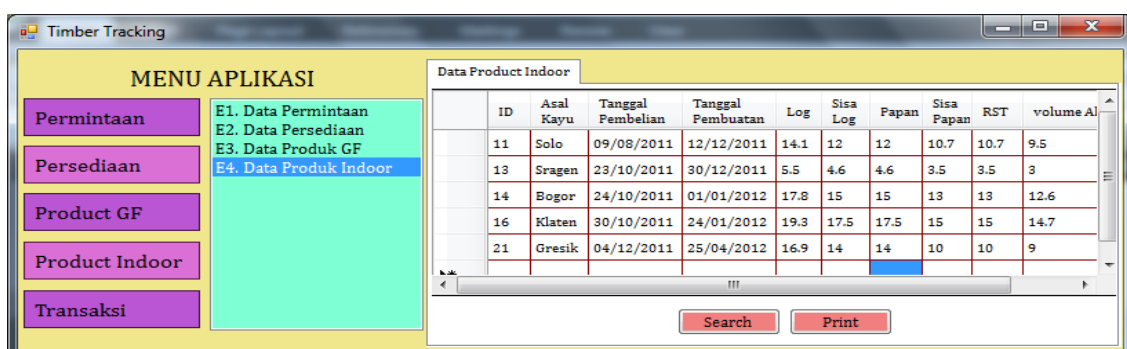

Figure 5. The Display of Application

3.3 Output Applications

Through the application of Timber Tracking the outcomes obtained a certificate stating that the wood is processed and produced the known origin - his proposal so that the wood used as raw material is appropriate for the market. The Figure 6 describes the certificate of wood.

Figure 6. Certificate of wood

4. Conclusions and Recommendations

Design of Timber Tracking application is a web-based service using ASP.Net technology. This application is designed to produce a certificate stating that the proper timber marketed for sale. To improve mobility and update data in the automation of these applications should be integrated with RFID technology. A security on the web service is enhanced with encryption on XML that is transported.

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