Warehouse Management System for Telecom Inventory

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Abstract:
All the large telecommunication service providers need the ability to track, manage and report on all their assets including fixed and mobile telecom assets. A recent case study revealed that 40% of IT managers believe that telecom asset management is an area that needs improvement to have a better network implementation processes and speed up the process.

The Warehouse Management System (will call as WMS) is a solution developed on top of GIS System i.e. ESRI ArcGIS Desktop and Ericsson Network Engineer application (ENE), to support day to day operations in inventory warehousing activities required for telecommunications service providers. The main objective of this solution is to have the close monitoring and control on the inventory requirements, Consumption, order management and tracking etc.,. As WMS is aligned with Physical network inventory system (ENE), the activities that are performing on ENE and that can have the influence on inventory will be directly reflected in WMS. So, the live and accurate information will be available for all the users.

WMS will also be integrated with Physical Network Inventory system Job/work order life cycle to have the accurate and real time data.

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Introduction

Cyient has a considerable implementation experience on number of inventory management system software applications. For a communications service provider, it is important to have warehouse management system integrated with inventory management system. Cyient has developed Warehouse Management System (WMS) solution to address this requirement.

WMS is a solution developed on top of GIS System i.e. ESRI ArcGIS Desktop and Ericsson Network Engineer application (ENE) with backend database as Oracle. This will support day to day operations in inventory warehousing activities required for communications service providers. The main objective of this solution is to have the close monitoring and control on the inventory requirements, consumption, order management and tracking etc., As WMS is aligned with Ericsson Network Engineer (ENE), the activities that are performing on ENE and that can have the influence on inventory will be directly reflected in WMS. This enables live and accurate information for all the users. This solution can be customized and configured to suit existing work flow (work order life cycle) of telecommunication operator. This solution addresses the end to end requirements of warehouse management. It is not only tightly integrating with existing work flow system but also controls the work flow based on the availability of consumable items. Role based functionality, Bill of Material (BOM) report management, BOM variance compare report and purchase order life cycle integration are few of the key features of this solution.

Business Challenge

A recent case study revealed that 40% of IT managers believe telecom asset management is an area that needs improvement to have a better network implementation processes and speed up the process. Today, majority of Communications Service Providers’ (CSP) procurement, planning and implementation teams are functioning in silos with their own operational activities. Each department maintains their own database and follows different methodologies to track their own departmental activities and their day to day operations.

Usually CSPs planning and implementation activities will be done in Physical Network Inventory systems (PNI). Planners do not have clear visibility of the available inventory and shipment progress. It will result in delays in work order construction due to unavailability of required inventory, lengthy procurement process, difficulty for re-plan, etc.

Therefore, it is recommended for communications service providers to have an improved PNI system that can track, manage and report on all their assets and operations including warehouse system.

Solution

In general Communications service providers will have separate database systems to store procurement related data and GIS inventory data. WMS solution provides the facility to integrate the procurement data
with GIS inventory database. It tightly controls the work order flow in PNI with respect to availability in WMS and updates the WMS database based on the inventory consumption. Therefore, WMS data will be in line with Enterprise database. In order to integrate the WMS with enterprise database securely, purchase indent life cycle is also added in WMS solution.

![Enterprise Database](image)

**Figure 1-Integration Workflow**

Usually all PNI systems will have an in-built work order life cycle that is flexible enough to configure to the CSPs implementation life cycle requirements like planning, approval, release for construction and construction complete etc.,

As part of planning process, the planner will analyze the requirements and plan the site location, structure, cable and equipment etc., inventories required in PNI system. This planning is done in planning phase of work order. In this stage, WMS supports the planner to know the available inventory in warehouse system and provides the facility to reserve the required inventory in WMS and ensures the inventory availability during construction phase. During the planning stage, planner can change the plan with alternative inventory if the required inventory is not available.

During the transition from Planning to Construction, WMS will check the final list of planned inventories and automatically reserve or release required inventory. WMS provides a facility to raise a purchase request for the inventories which are not available in the WMS. The WMS will not allow the planner to transition the job from planning to construction until the inventory is made available or indented. This way, WMS provides full control on planning till it gets roll out.
In addition to this, WMS has the facilities to configure the inventory threshold values. By using the threshold values WMS will check the availability of the inventories with respect to threshold values on a periodic basis and automatically will raise an alert / indent to the responsible authorities if any of the inventories falls below the threshold value.

WMS also has the feature to raise an automatic indent in case the required inventory for the current job is available but on reservation it will fall below the threshold.

WMS also provides the facility to configure the minimum re-order quantity.

![Figure 2- WMS Features](image-url)

**Features**

(i) Role based functionality (User, Manager and Administrator). These roles differentiate the planner, approval authority and warehouse administrator.

a. **User:** This role fulfills the requirement of planner role. i.e. reserve the required inventory, raise the indent etc.,

b. **Manager:** This role facilitates the allocation of inventory to any specific work orders, change the reserved inventory to release and make use in priority work orders, Generate the bill of materials report, minimum re-order quantity configuration for auto alert generation etc.,

c. **Administrator:** Administrator is responsible for the purchasing and management of warehouse stock. He will be able to update the information in WMS system by either adding an additional record to increase the available quantity or to decrease the available quantity (in terms of loss of inventory or error correction or inventory audit). Inventory will also be returned from the construction crew if it is unused and able to be restocked.

(ii) Providing real-time, accurate and detailed inventory tracking information to the right people at the right time to make informed decisions and prioritize the jobs / work order.
(iii) Directed and automated communication of inventory requirements with in the internal departments or outside suppliers based on planning and actual consumption. So the components/inventories made available on time.

(iv) Has the facility to configure the bundling of components as one inventory and thereby manages the interoperable communication between the inventory system and warehouse system. This ensures the provision of component level monitoring and controlling.

(v) Has the facility to configure special consumption rules for linear features to address the special consumption requirements for linear items i.e. in warehouse system, one Cable means one reel. However, in PNI a particular work order, the entire reel may not be required. In that case, WMS will consider % of reel used in that work order only considered as reserved/consumed. It prioritizes the remaining part, whenever the suitable new requirement comes. Further, if the majority of the linear feature is consumed, that can be considered as complete consumption of one reel based on the configuration.

(vi) Has the facility to create and store the historical information in terms of different BOM versions of a work order and store the information beyond the life of the work order. It also has the ability to generate the BOM variance reports.

(vii) Complete purchase order management integration with PNI

(viii) Warehouse reports management

(ix) Automatic Update of consumption details using GIS data created as part of planning

(x) Facility to configure the alert generation on minimum quantity available

(xi) Provides consumption reports with different options like user based, time based, work order based etc.,

(xii) Controls the work flow based on inventory availability

(xiii) Can be configured to any PNI work flow life cycle

(xiv) Periodical short fall notice mails

Benefits

(i) Optimized processes

(ii) Improved supplier and customer relationships

(iii) Reduced operational expenses

(iv) Reduce plan to roll out time

(v) Better demand planning

(vi) Transparency and visibility

(vii) Monitor and control the consumption of inventory

(viii) Alerting on short fall

(ix) Controls work flow based on availability

(x) Facility to raise and track the Inventory Indents
Conclusion

WMS (Ware House Management) is the solution that enhances the existing Physical Network Inventory system functionality and enables the planner to choose the required inventory based on the availability in store during the planning or provides the facility to raise the indent for planning inventory. On the other hand, it provides the facility to allocate the available inventories on priority requirements and controls the work order implementation life cycle to avoid the delays during the implementation. It uses availability of inventory in store, demand of new requirements, real time updates on purchase order updates and shows the holistic view of the system data and provides the full monitoring and controlling facility to CSPs.