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OBS Logistics

Vision Overview

Calidus *Vision*

9th May 2011 - 1.0
Reference: 236343

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1 Introduction

1.1 Introduction

The purpose of the *CALIDUS* Vision product is to allow visibility of productivity, system and business information through the use of graphs, charts and data lists.

There is a business need to extract and see information regarding the operation and its performance within the warehouse.

Therefore the Calidus Vision product will be used to display this information.

As *CALIDUS* Mobile (the WCS) is highly used and must remain responsive at the highest level at all times, the data for *CALIDUS* Vision is mined (extracted) into a new database, where productivity analysis begins.

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2 System Overview

2.1 Introduction

The purpose of the ***CALIDUS*** Vision product is to allow visibility of productivity, system and business information through the use of graphs, charts and data lists.

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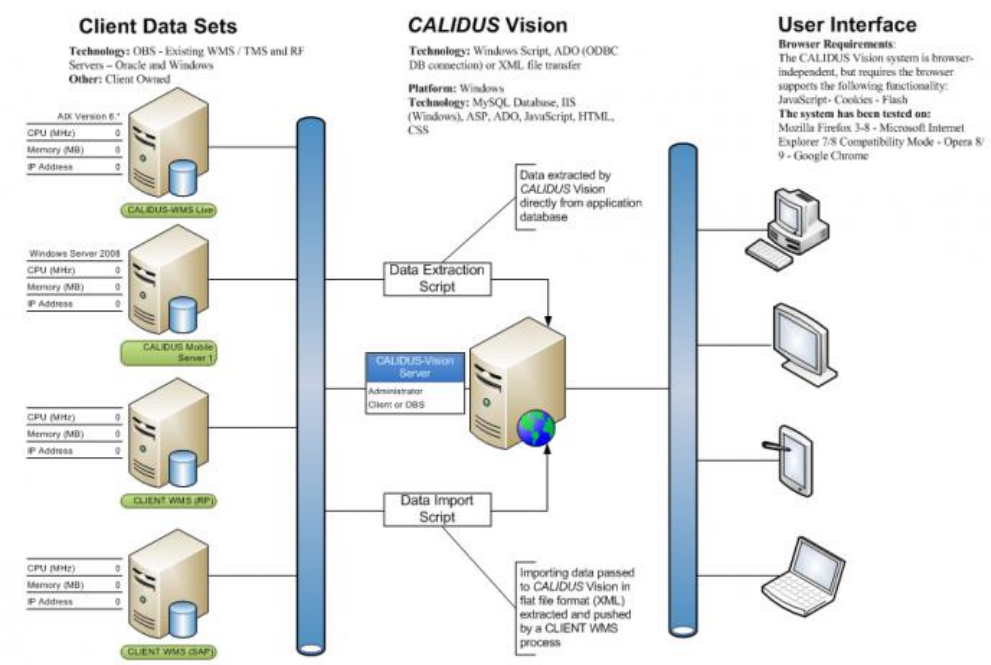
2.2 Network Diagram



In this instance, ***CALIDUS*** Mobile exists on one server and the Data Mining process and ***CALIDUS*** Vision are on a separate server, for simplicity. As all of the processes are Windows-based, all could co-exist on the same server or be distributed to separate servers as required. Additionally, although the Data Mining Process and Application Server databases are separate in the diagram, they are normally combined.

This diagram shows a standard LAN configuration, with the Vision server separate from any ***CALIDUS*** Mobile server. Additionally, this shows data being mined from systems accessible only from the WAN.

Although the systems can co-exist in one server, in this more complex set-up, it is assumed that the central configuration will require more processing power and time, and therefore will require its own server.

CALIDUS Mobile Server 2 is being mined over a WAN so, rather that link to the database directly, link database(s) are in place to protect the **CALIDUS** Mobile databases from file corruption due to network disconnection events.

The other server shows data being mined from other systems, or through file imports. It should be noted that file imports may be from systems external to any client network, with the file being transferred via FTP to a network-accessible location.

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2.3 Data Mining

OBS have created data mining processes for the extraction of system, activity and productivity data from the ***CALIDUS*** Mobile database. This includes (but is not limited to):
System Data:

- Receipts in Progress
- Total Cases SKUs on Receipts
- Total number of SKUs on Receipts
- Number of Putaways and total quantity.
- Number of Moves and total quantity
- Number of Replens and total quantity
- Number of Full-pallet Picks and total quantity
- Number of Part-pallet picks and total quantity
- Number of Stock Take tasks
- Number and Status of loading tasks (Pending, Held, In Progress, Ready for Despatch)

Activity Data:

- All Activities performed by RF users

Productivity Data (Calculated from the Activity Data):

- Summary of number of tasks completed per day
- Detail of number of tasks completed per session
- Productivity figures derived from tasks per hour, per day.

Monitor Data:

- Various (depending on system.

Platform: Windows Technology: Windows Script, ADO, MySQL Database

2.4 Parameters

The data mining database has been created to allow the entry of parameters to show Minimum and Desired Productivity rates for each functional area.

As the data mining tools are further developed, this will also include:

- Historical analysis of productivity in functional areas, to learn productivity rates and predictions.

For more details, please consult the product road map.

2.5 *CALIDUS* Vision Front-End

The ***CALIDUS*** Vision web front end displays the data on timed changing display, optionally displaying the data in forms, graphs and tables.

This supports:

- System Choice (through system popup menu) and multiple system access.
- Productivity views (per task, per Warehouse/Owner/Employee, in days, weeks, months and quarters).
- System views, showing the current state of the system mined in terms of tasks outstanding.
- Enquiries on the data in tabular form.
- Filtering (enter values in Search box provided), paging (use buttons below table), sorting (click or shift-click on column headers) and CSV or Formatted File extract (using the button provided) through Enquiries.
- Graphs (including drill-down to data, through clicking graph points).
- RAG Colour-highlighting (through Productivity Enquiry and Order Status screens).
- Quick Menu (contents can be modified through the User Settings screen).
- Definable menu structure.
- Dashboard (through Timed Display), including configurable dashboard display (through Run Settings).
- Assist help.
- Multi-owner/warehouse access (through User Settings).
- Client look & feel styling and display configuration (through Web Settings).
- Configurable productivity targets (through Productivity Settings) at each level (company/Warehouse, owner).
- Multiple information streams displayed on one form (2 horizontally, 2 vertically, 4 corners).
- Task Completion prediction.

Platform: Windows/Linux **Technology:** IIS (Windows), ASP, ADO, JavaScript, HTML, CSS

Browser Requirements:
The ***CALIDUS*** Vision system is browser-independent, but requires that the browser support the following functionality:

- Frames
- JavaScript
- Cookies
- Flash

The latest version of the system is validated to HTML 4.01 Strict standards and tested on:

- Mozilla Firefox 8
- Microsoft Internet Explorer 8/Compatibility Mode
- Opera 11
- Google Chrome 15

Note: OBS Logistics continue to test against the most common platforms and the latest version of each browser available on those platforms.

2.6 Productivity Measurement Method

One of the main functions within Vision is to collate and display productivity rates for various tasks within the mined systems. This is dependent on the data mined. The current productivity figures displayed within ***CALIDUS*** Vision come from the data stored within ***CALIDUS*** Mobile, the OBS Logistics RF solution.

The detailed activity data is mined from ***CALIDUS*** Mobile, which includes the following information:

- The type of activity, for example:
    - Task information (receipt, pick, putaway, etc).
    - Log-on/off information.
- The start date/time of the activity
- The end date/time of the activity
- Who performed the activity.
- For task-based information, this also includes:
    - Pallet information
    - Company/Warehouse/Owner information
    - Location information

This is mined and loaded into ***CALIDUS*** Vision's database, then analysed to produce productivity figures for the company, warehouse, owner and employee for the following intervals:

- Daily
- Weekly
- Monthly
- Quarterly

The Productivity data is calculated in tasks/hour (and quantity of stock/hour) by storing the total quantity of tasks completed, the quantity of stock moved and the total time taken for these tasks in summary form for each of the time intervals.

A task in Vision is defined as as single movement to or from a location, for that defined type.

So:

- A movement of a single pallet from goods in to a putaway location is one task.
- A movement of a single pallet from goods in, through a P&D to a putaway location is two tasks.
- A single order pick from a pick face is one task.
- A consolidated pick of several orders from one pallet in a pick face is one task (although Vision can be configured to count these as individual picks)

An exception to this would be the movement of many part pick tasks to their eventual marshalling location. The pick tasks have already been counted as part picks, so this is not a task, although the time taken to do this is added to the part pick time.

The productivity of a user on a task type is calculated as:
The total time taken on the task (in seconds)
divided by
the number of seconds in an hour, multiplied by the number of tasks completed

The case productivity of a user on a task type is calculated as:
The total time taken on the task (in seconds)
divided by
the number of seconds in an hour, multiplied by the number of cases in the tasks completed.

There are two methods of calculating the time taken for a task, configurable within the system.

2.6.1 By Core System

In this method, Vision calculates the time taken to complete each task by using the core system's start and end time stamps for each individual task and producing a number of seconds taken for each task. These are stored against the summary values.

2.6.2 To Next Task

In this method, Vision calculates the time taken to complete each task as the elapsed time from the start of this task to the start of the following task, in seconds, if the next task is the same type as the current task, or a log off activity.

So, for example:

Task #	Start Time	End Time	Type	Current Time Elapsed	New Time Elapsed
1	0	5	Putaway	5	10
2	10	15	Putaway	5	10
3	20	-	Log Off	0	0
4	30	-	Log On	0	0
5	40	45	Putaway	5	10
6	50	55	Putaway	5	5
7	60	65	Pick	5	10
8	70	75	Pick	5	10
9	80		Log Off	0	0

This method then accounts for time when the user may have finished one task but not yet started the next. Only time changing tasks is seen as inactive time.

2.7 Extended Productivity Measurement

Vision currently breaks tasks down by a general task type field, which identifies each task with an action, for example, for ***CALIDUS*** Mobile, the list is as follows:

- Receipt
- Putaway
- Pallet Move
- Replen
- Part Pick
- Full-pallet Pick
- Pre-Deconsolidation
- Deconsolidation
- Loading

CALIDUS Vision has the capability of breaking down these tasks by a selection of criteria. So, for example, where part picks would normally come from a pick face, it is not unusual for an operation to pick cases or units from a pallet that is high in the racking. In this case, the productivity rates for these tasks may need to be measured separately from the normal task counts. The extended productivity measurement functionality allows for this.

The process extracts both the current system tasks and the productivity information that matches the criteria provided, from the following:

- Task Type
- Source Location
- Destination Location
- Company
- Warehouse
- Owner
- Priority (for system data only)

Each activity that matches the criteria specified is collated and stored separately to the generic data and can be viewed within Vision.
Example:

Certain of owner ABC's orders for export are always taken to a specific marshalling location "MAREXP", as they are packaged differently. Additionally, all picks taken from locations not in level 1 need to be recorded separately, resulting in two extended data extracts:

- Export Low
- Export High

The criteria matched is:

To match orders as Export:

- Company = "X"
- Warehouse = "Y"
- Owner = "ABC"
- Task Type = "Part Picks"
- Destination Location = "MAREXP"

In this criteria, if the task details match explicitly, the task is marked as "Export", otherwise it is not marked for extended data extract.

To match orders as from High or Low (pick face) locations:

- Company = "X"
- Warehouse = "Y"
- Owner = "ABC"
- Task Type = "Part Picks"
- Source Location's right-most character = "1" = "Low", else "High"

In this criteria, if the Task's source location's right-most character is "1", the task is marked as "Low", otherwise it is marked as "High".

The criteria specified are cumulative, in that each set of criteria is matched against all tasks, and those that match are marked with the specified text from the criteria matched. In this example, the following tasks will be marked as follows:

Task #	Task	Source Loc	Dest Loc	Extended Type
1	Putaway	RECBAY	AA0011	-
2	Part Pick	AA0011	MAREXP	Export Low
3	Part Pick	AA0014	MAREXP	Export High
4	Part Pick	AA0011	MAR001	Low
5	Part Pick	AA0014	MAR001	High

It can be seen in this example that it is possible to have one group of criteria matching while the other does not, resulting in single rather than cumulative matches (see tasks 4 and 5 above). This allows for extremely flexible rules to be set and allows the data mining process to be efficient.

Note: This assumes that all the tasks are for Company "X", warehouse "Y" owner "ABC".

2.8 Product Architecture

Product Architecture

2.9 Building Installer Process

Build Installer Process

2.10 Initial Installation

Initial Installation

2.11 Release Process

Release Process

2.12 Development Process

Development Process

2.13 Vision Support

Vision Support

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3 Product Architecture

Vision is generally installed on E:\Vision.

The file structure is:

Vision\

- Admin\ - Sys Admin ASP forms
- MTS\ - MTS ASP forms
- Releases\ - Folder to do upgrades in - see Release Process for details.
- Scripts\ - Data Mining scripts
    - ♦ Vision_Mining.vbs - scheduled script that runs the datamines
        - ◊ GetSysDetails_MySQL.asp - the WCS datamine script
        - ◊ GetSysDetails_WMS.asp - the WMS datamine script
        - ◊ Vision_Cleardown.vbs - scheduled script to clear down data
- Settings\ - User Settings ASP forms
- TMS\ - TMS ASP forms
- WCS\ - WCS ASP forms
- WMS\ - WMS ASP forms
- Charts\ - Flash objects for Graphs and Charts
- Database\ - for releases and initial installation - the database structure.
- Files\ - GIFs, CSS, etc
- Includes\ - common ASP/JS files
- jQuery\ - JavaScript extension and plugins used in some screens

The database is installed on the machine, under port 5306. This is accessible through MySQL Workbench remotely. Install workbench through MySQL website (latest mysql-workbench-gpl-5.2.26-win32.msi).

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4 Vision Roadmap

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5 Appendix A: Document History

A.1 References

Ref No	Document Title & ID	Version	Date
1			
2			
3			

A.2 Glossary

Term or Acronym	Meaning
WCS	Warehouse Control System. The OBS RF system Calidus 3pl-Mobile.
WMS	Warehouse Management System. The OBS WMS is Calidus 3pl
RDT	Radio Data Terminal. The RF hand held terminals.
RF	Radio Frequency.

A.3 Document History

Version	Date	Status	Reason	Initials
0.1	09/05/2011	Draft	Initial draft	ANW
1.0	09/05/2011	Issue	Issued	ANW
1.1	09/05/2011	Draft	Added new Network diagram	PJH
1.1	09/05/2011	Draft	Issued after review	ANW

A.4 Authorised By

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