Shop Floor Data Collection

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November 2012
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Shop Floor Data Collection
With the addition of Routers from Mascidon, labor and component usage on the shop floor can be collected. In Figure 1.1 the flow of data for shop floor data collection is outlined.

The basics of the shop floor data collection system are simple:

- Create a Production Order with routing steps
- Print a production order form that includes the PDO – sequence as a single bar code for each sequence on the PDO
• Release the PDO to the floor
• When the operator starts work on this PDO – Sequence, they scan their badge and the PDO – Sequence to ‘Clock-On’
• When the operator completes the work on this PDO – Sequence, they scan their badge and the PDO – Sequence, and then enter the quantity produced to ‘Clock-Off’
• Clocking off a sequence on a PDO creates issues to production of components to be relieved at that operation sequence
• Clocking off a sequence on a PDO creates issues to production of the labor hours to be relieved at that operation sequence (difference in time between clock-on and clock-off)
• Clocking off a sequence on a PDO creates receipts to production if this is the last sequence in the router for the item being produced

When this is in place, you have visibility to all transactions on the floor in real time. For instance, if a customer calls in and asks for the status of their order, you can view the in stock information using standard SAP item master views, AND you can view the current status of the PDO associated with the customer’s order. This will enable you to provide the best possible estimate of when the product will be shipped.

In addition, the labor reported against the PDOs enables you to the total costs of the production.

There is setup and maintenance involved in shop floor data collection. The following functions / processes need to be in place:

• Routers need to be set up for every manufactured item
• Operation codes and cost information associated with operations need to be defined
• Machine codes and tools need to be defined as part of the router (optional)
• Production shifts need to be defined
• Employees need badge number assignments and a default production shift
• Exceptions to the assignment of an employee to a production shift need to be maintained
• A PDO form that includes bar coding of the routing steps needs to be implemented
• A process for handling mistakes needs to be in place
  o People forget to clock on
  o People forget to clock off
  o People enter wrong quantities

In addition to the processes outlined in Figure 1.1, the Mascidon shop floor data collection system also uses hand held devices to move material to the employees’ work sites within the plant. This has been implemented in conjunction with bin control of inventory (LBSI add-on). The hand held devices have Bin from and Bin to transactions to move material to the bin locations for a department.

Also, an option in the shop floor data collection is to relieve inventory of the PDO components at a specific routing step. The advantage of this is apparent if we consider a PDO that takes 4 weeks to complete and has 10 routing steps and 50 components.
• One method of relieving component inventory would be to have all the components back flushed when the item has been completed. This means that components used on day one of the production and day 28 of the production are all relieved on day 28. If the components are common to many PDOs, this means that the inventory on average is accurate to only 14 days. Not very good for managing a plant.

• Another method of relieving inventory would be to have all of the components issued to the PDO at the start of the work. This creates complications from a processing view because you may need to start the production before all of the components are in stock. It also relieves the in hand of components that may not be actually used for 20 – 28 more days.

• The third method is to embed in the BOM the routing sequence at which each of the 50 components needs to be relieved. In this manner, the components associated with sequence 10 would be relieved well in advance of components associated with sequence 210.

**Shop Floor Maintenance**

Shop transactions can be viewed and edited in the shop floor maintenance screen. The shop floor maintenance screen is shown in Figure 1.2 – as it comes up initially. The user then selects the date of transactions to review and the shift and clicks the ‘Refresh Data’ button. The result is shown in Figure 1.3.

![Shop Floor For Employees](image)

**Figure 1.2 Shop Floor Maintenance Screen**

The data shown is every transaction for this date and shift. In this case, since the radial button ‘All’ is shown, this includes all transactions. The result could simply be the unprocessed transactions by selecting the ‘Open’ transactions for the date. In a typical scenario – assuming the shop floor
transactions are updated manually on a periodic basis – the ‘Open’ transactions option would show the transactions that have not been updated at this point in time.

![Figure 1.3 Shop Floor Maintenance Screen with Data Displayed](image)

The data can be sorted by time, employee or PDO by clicking on the appropriate radial button. Figure 1.3 shows the data sorted by time. Figure 1.4 shows the data sorted by PDO. During the day, if a supervisor wants to see the progress for a specific PDO, they could access the shop maintenance screen, select the sort by PDO, and select ‘All’ transactions. They would see the progress of transactions against each PDO in time sequence.

![Figure 1.4 Shop Floor Maintenance – Sorted by PDO](image)
If there is a need to review transactions by employee, Figure 1.5 shows the data sorted by Employee badge. This could be used to assess the progress an employee is making on specific work assigned. It is also the most useful screen to utilize when there is a Clock On – Clock Off error since the data is arranged by Employee and time.

**Figure 1.5 Shop Floor Maintenance – Sorted by Employee**

If there are problems with the recording of shop transactions, the ability to add new transactions or delete information that has not been updated is provided. The ‘Add’ function is shown in Figure 1.6.

**Figure 1.6 Adding a Shop Transaction Manually**
When the ‘Add Row’ button is clicked, a new data entry row is displayed at the bottom of the screen. The operator can then enter this transaction, starting with the transaction time. There are only two ‘Types’ that can be created – either the Clock on or the Clock Off transaction. There are edits on the PDO (must exist and have a ‘Released’ status), the PDO sequence (must exist), the Employee (must be a valid badge), and the quantity and scrap quantity (must be 0 or greater). The setup / run flag defaults to ‘R’ = Run. The comment should be entered since this is a manual transaction and this would be the audit trail information.

Case 1: a person forgets to log off a PDO.

To correct this error the operator would access this screen, select ‘Open’ documents, the date, and the shift and sort the information by employee. A list of data by employee would be shown (Figure 1.4 except only ‘Open’ transactions’). This will be a short list of information since most data will have been posted. The operator would then click the ‘Add Row’ button and add the information for the offending Employee.

Case 2: a person logs on to a PDO in error.

In this instance, the person logged on to one PDO and then another PDO in succession. They really only meant to log into the second PDO. To correct this error, select ‘Open’ documents, the data and the shift and sort the information by employee. Since the employee never logged off the first PDO, this is an ‘Open’ transaction and it will be displayed. For the transaction in error, click on the ‘Mode’ column – row and select ‘Delete’. This will flag the record to be deleted.

Case 3: a person entered the wrong quantity.

Assuming the transaction is still ‘Open’, select the appropriate date and shift and for the ‘Mode’ for the transaction in question select ‘Update’. Then change the quantity to be processed.

In all cases, the data is not changed in the file until the ‘Process’ button is clicked. When it is clicked, it will validate all of the information on the screen (remember – if you have selected ‘All’ as the radial button selection this means there is more data to validate). Assuming the data is verified, the transaction is created. Click the Refresh button to show the revised data. This data is then posted when the next Posting process is run.