

Job Cost Reporting

Introduction (Seminar 11)

One of the principle functions of the ManuDyn system is to provide a tool for Job Cost control. The “Shop Floor Data Collection” systems are extremely efficient and result in a huge amount of data being collected. The task of analyzing all of this data however can be daunting, and this is exacerbated by the tendency for users to attempt the task, initially that is, in “too much” detail.

The end result can be that the user finds it all “too hard” and as a result the task is “put off” to another day and often never done. The Job Costing task however is critical to the success of the manufacturing operation and manufacturers, particularly in a jobbing environment; Management needs to know which jobs are failing and which are succeeding.

I am sure it is also obvious to everyone, that there is no point putting time and effort into collecting shop floor data unless it is going to be used.

The first point therefore that needs to be made is that the Manager must be determined to undertake the task of Job Costing and to avoid the pit falls there must be a structured approach, or plan, of attack.

Fortunately you don’t need to analyze every single manufactured job or part in order to obtain productivity improvements with ManuDyn. In fact it is quite common to obtain productivity improvements without analyzing any jobs at all, that is, by simply adhering to the “Rules” discussed in earlier seminars.

For example, if jobs are released to production in accordance with material and labour availability (Rule 1), Work-In-Progress is likely to fall and Through-Put will increase (lead time will be reduced). If operators are required to account for all of their time (Rule 2) and work always on the top priority jobs (Rule 3), and at the same time limits are set governing how plans can change (Rule 4), the manufacturing operation will become more stable and amenable to planning.

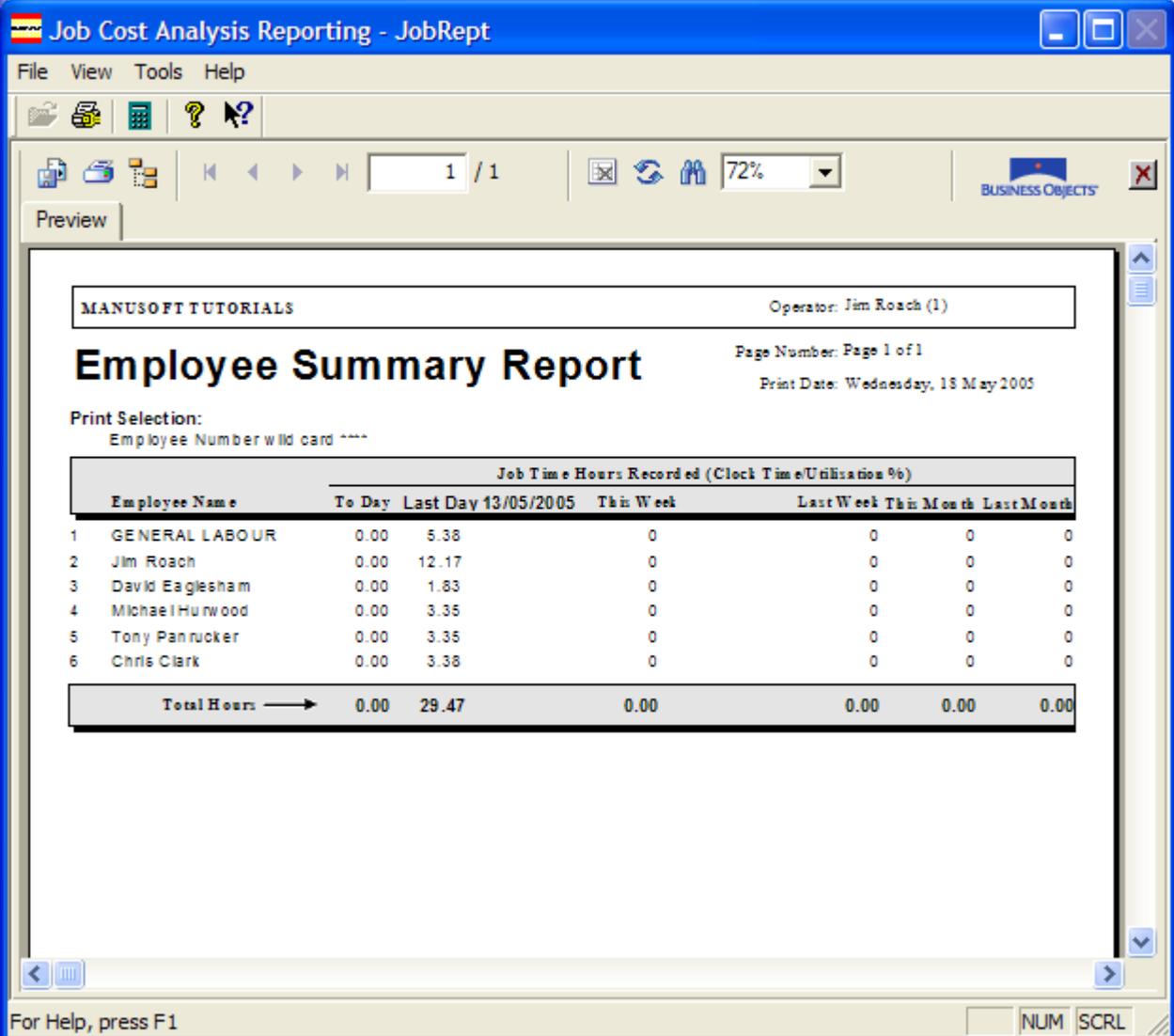
Without Job Cost analysis however, jobs may continue to go wrong and mistakes will no doubt be repeated. The efficacy of the Quoting and Estimating system will not be known and although the business may be profitable, the profitability of individual jobs will be uncertain. The likely out come is that some jobs will end up subsidizing others and profits will not be maximized.

During this stage we are not concerned with the nature of the job against which the employee time is recorded. The only thing that is of importance is that all employee time is accountable. To do this a number of “Down Time” activity jobs will need to be established so that the operators can account for time which is not spent on manufacturing jobs. “Down Time” jobs are for activities such as “Cleaning” and “Training”, “Maintenance” and “Breakdown”. The specific detail concerning their setup is covered in Seminar 8 and will not be dealt with here.

Basically the situation can be summarized as follows:

The Job Cost analysis can not begin until all of the production operators’ account for all of their time.

ManuDyn provides two (2) reports that can be used to monitor progress against this stage. The first report we are going to examine is the **Labour Time Summary** report, which is accessed via the (4/7/3). The Time Sheet provides an employee analysis for either an individual employee, which can be obtained by entering the Employee Number or selecting the Lookat Icon (), or a report for all employees, accessed via the Selection Icon (). The latter is shown below:



Job Cost Analysis Reporting - JobRept

MANUSOFT TUTORIALS Operator: Jim Roach (1)

Employee Summary Report

Page Number: Page 1 of 1
Print Date: Wednesday, 18 May 2005

Print Selection:
Employee Number wild card ****

Employee Name	Job Time Hours Recorded (Clock Time Utilisation %)					
	To Day	Last Day 13/05/2005	This Week	Last Week	This Month	Last Month
1 GENERAL LABOUR	0.00	5.38	0	0	0	0
2 Jim Roach	0.00	12.17	0	0	0	0
3 David Eaglesham	0.00	1.83	0	0	0	0
4 Michael Hurwood	0.00	3.35	0	0	0	0
5 Tony Panrucker	0.00	3.35	0	0	0	0
6 Chris Clark	0.00	3.38	0	0	0	0
Total Hours	0.00	29.47	0.00	0.00	0.00	0.00

For Help, press F1

This report shows the hours recorded against jobs for the current day, the previous production day, the current week and previous week etc. The figures in brackets in the “Last Day” and “This

Week” columns are the key items concerned with interpreting this report. These figures detail the time recorded on the Time Card and the resulting percentage utilization for each employee. That is the following ratio:

Hours on Jobs / Time Card Hours

A utilization of 100% represents a situation where all of the employee’s time is accountable. A utilization of say 50% means that you do not know what the employee was doing for half of the hours for which wages were paid.

Success in this stage can be demonstrated when all employees achieve a 90% plus utilization. That is, when most of their time is accountable.

The second report is the **Employee Time Sheet** which is accessed via menu item 4/7/1. This report is designed to provide a detailed analysis of the jobs the employee actually worked on, during a nominated period as shown below:

The screenshot shows a software window titled "Job Cost Analysis Reporting - JobRept". The interface includes a menu bar (File, View, Tools, Help), a toolbar with various icons, and a status bar at the bottom. The main content area displays the following report:

MANUSOFT TUTORIALS Operator: Jim Roach (1)
 Page Number: Page 1 of 1
 Print Date: Wednesday, 18 May 2005

Print Selection:
 Employee Number wild card ****

Employee Name	Chris Clark	Time (Hours)	Employee Based Cost (\$)	
Job Number:	20001.3	Reference: F00-B300X250X400	1.78	0.00
Job Number:	20010	Reference: F00-A SSEMBLY	1.52	0.00
Job Number:	20010.1	Reference: F00-FP300X250	0.08	0.00
Total Time (Hours) :			3.38	Total Cost : \$0.00

For Help, press F1

In this report the Selection Icon () provides a Time Sheet for each employee (for the nominated period). There are also options available through the Setup Icon () which permit

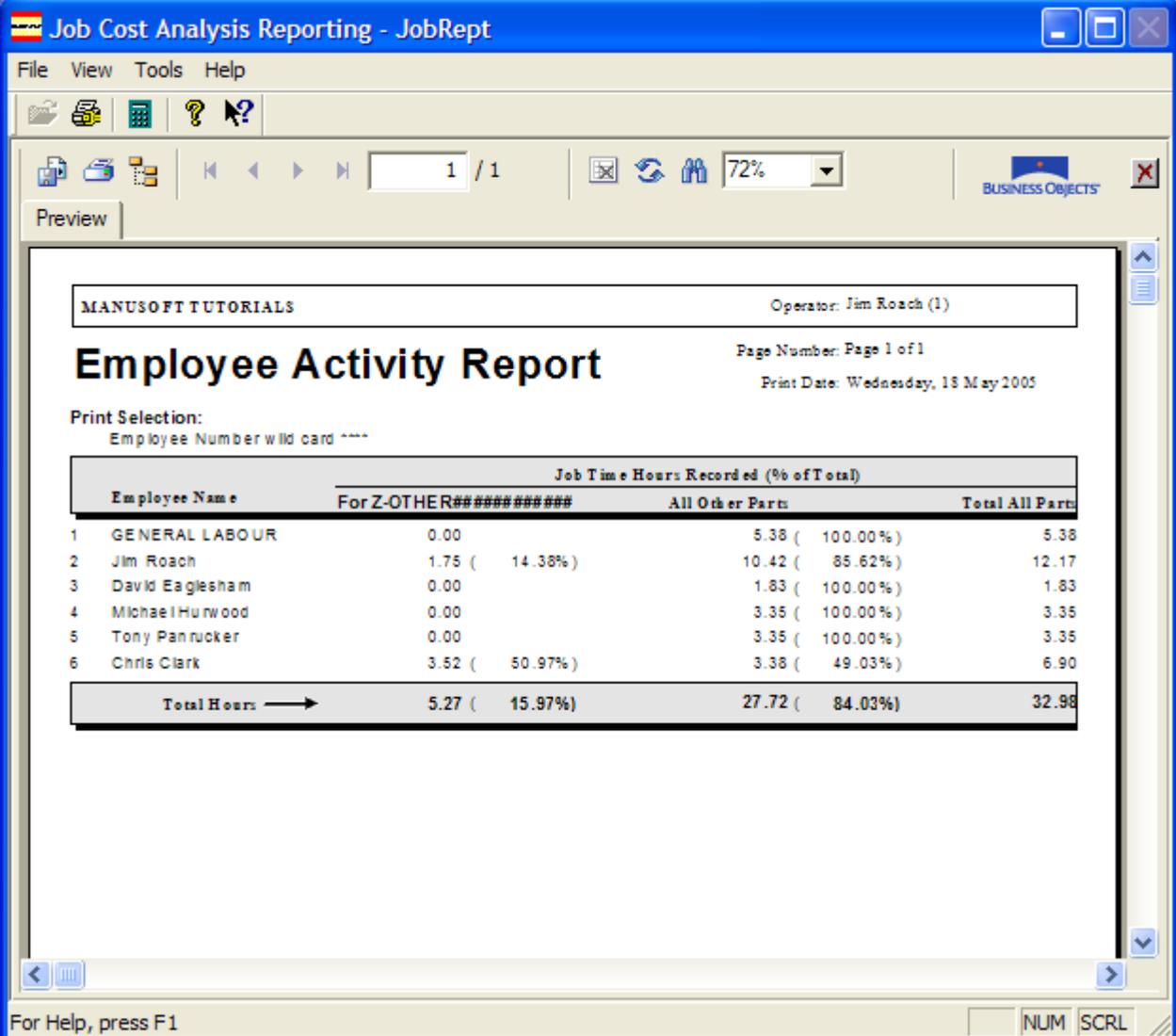
either a Detailed, Summary or Total Only report to be generated. The example above represents the Detailed report.

UP TO HERE*****

Minimize the “Down Time”

In Stage 1 above the emphases was to get the operators to account for their time. By achieving success in this stage you effectively placed our foot on the first run of the ladder leading to Job Cost control. The next step is to simply reduce the extent of “Down Time” that occurs. This stage is therefore all about reducing the level of “Non-Productive” activity within the organisation.

First, the level of “Down Time” needs to be measured and reported. In ManuDyn this is also obtained via the Labour Time Summary report in 4/7/3. This time the Print All Icon () is accessed. The report was primarily designed to provide an easy and convenient means whereby productive and non-productive activity (recorded against the “Down Time” Part), could be measured. An example is shown below:



MANUSOFT TUTORIALS Operator: Jim Roach (1)
Employee Activity Report Page Number: Page 1 of 1
 Print Date: Wednesday, 18 May 2005

Print Selection:
 Employee Number wild card ****

Employee Name	Job Time Hours Recorded (% of Total)		
	For Z-OTHER#####	All Other Parts	Total All Parts
1 GENERAL LABOUR	0.00	5.38 (100.00%)	5.38
2 Jim Roach	1.75 (14.38%)	10.42 (85.62%)	12.17
3 David Eaglesham	0.00	1.83 (100.00%)	1.83
4 Michael Hurwood	0.00	3.35 (100.00%)	3.35
5 Tony Panrucker	0.00	3.35 (100.00%)	3.35
6 Chris Clark	3.52 (50.97%)	3.38 (49.03%)	6.90
Total Hours →	5.27 (15.97%)	27.72 (84.03%)	32.98

For Help, press F1 NUM SCRL

The initial screen display upon selecting the Print All Icon in the 4/7/3 routine is as follows:

The operator is required to indicate the specific Part Reference which is to be examined in detail. For an analysis of employee “Down Time” the “Non-Productive” Part reference will need to be entered here.

- Note i.** The Part Reference may need to be “padded out” using the “wild card” character (“*”) where the selection requirement is for a group of “Non-Productive” Parts. Usually however, you only need to setup one part to cover all “Down Time” activities.
- ii.** A print selection criteria based on either Start Date or Finish Date will give the most appropriate result.

The Activity Report details the time (hours) recorded, by employee, against both the “Down Time” part and “All Other Parts”. The latter basically represents productive activities. The report also shows the percentage of time spend on productive and non-productive activities.

The real question concerning this stage is how you go about reducing non-productive activity and how you maintain any gains that may be achieved?

One approach is to examine the report activity by activity and employee by employee. A detailed breakdown of “Down Time” activity can be obtained by running the report for selected “operations”. These selection criteria are available via the print selection options. This approach will work but it is time consuming and requires considerable effort on the part of the Manager.

Another approach is to introduce some form of incentive scheme. Pay a bonus when the Employee Utilization is maintained above a certain level (stage 1) and when the “Down Time” activity is minimized (stage 2).

It should be noted that the first two stages only provide a measure for productivity improvement and a means of monitoring ongoing performance. You will still have to divine a plan to achieve the end result.

However you do this the key is to regularly monitor performance to ensure that any gains are permanent.

Job Cost Analysis (trouble shooting)

The next step on the ladder is to actually embark on the Job Cost analysis of specific jobs. At this stage we should have the employees accounting for their time and by skill and good management you have reduced the level of “Down Time” activities. The employee time is now being recorded against production jobs.

It is at this point that the real question concerning Job Costing can be asked, namely:

Was the time spent working on the job in accordance with the standards that have been set?

Another way of saying this is *Did I make any profit on the Job?*

This question raised a number of other questions, namely:

- Which Jobs should be examined?
- When and how should the analysis take place?
- What is the basis for the analysis and who sets the standards?
- What do you do when you find a discrepancy?

We will come back to these questions shortly, first however I would like to examine the Job Cost reports that are available in the ManuDyn system.

There are two principle Job Cost reporting routine within ManuDyn, namely, the **Job Cost Report** option in 4/7/2 and the **Job Cost Variance** reports in 4/7/5. There are a number of different presentation options available and in the case of the latter report there are two completely different formats to examine.

For the Job Cost Report (4/7/2) there are 3 primary reporting options. The first is for one (1) selected job, and is accessed by either entering the job number directly or selecting it from the Lookup Icon (). An example of this report is shown below:

Job Cost Report

MANUSOFT TUTORIALS Operator: Jim Roach (1)

Page Number: Page 1 of 1
Print Date: Wednesday, 18 May 2005

Print Selection:

Job Number : 20001	Part Number : F00-A SSEMBLY
Customer : CUSTOM	Order Number :
Due Date : 15/04/2001	Quantity : 100.00

Employee : GENERAL LABOUR

Labour Cost → \$ 0.00	(2.00 Hours)	Estimate → \$ 735.00	Variance → -100 %
Material Cost → \$ 2,515.50		Estimate → \$ 2,800.00	Variance → -10 %
Total Cost → \$ 2,515.50		Total Estimate → \$ 3,535.00	Variance → -29 %

For Help, press F1

A similar presentation is provided from the Selection Icon () option which can be used to obtain a report for all sub-assemblies associated with a specific job. If for example the Itemised Job Numbering option is activated (in 10/5/2), then a “Job Number”/”Included”/”NNNN” Print Selection criteria can be used to obtain a report for each associated job.

There are Detailed, Summary and Total Only options available, which are defined from the Setup Icon () , and which effect the presentation and length of the report. The Total Only report can be used for example to initially determine which Jobs have problems and then the Detailed report can be used to identify the precise nature of the problem.

The report setup also defines how time is to be turned into dollars. The Employee Based job costing option multiplies the time by the Employee Recovery Rate which is defined through 1/4/1. The Process based option uses the same criteria as the Quoting and Estimating System (QES) and turns time into dollars based on the Work Centre recovery rate (as defined from the Work Group Icon in 10/5/3).

The Labour variance, shown in the Detail report, is calculated according to the following formula:

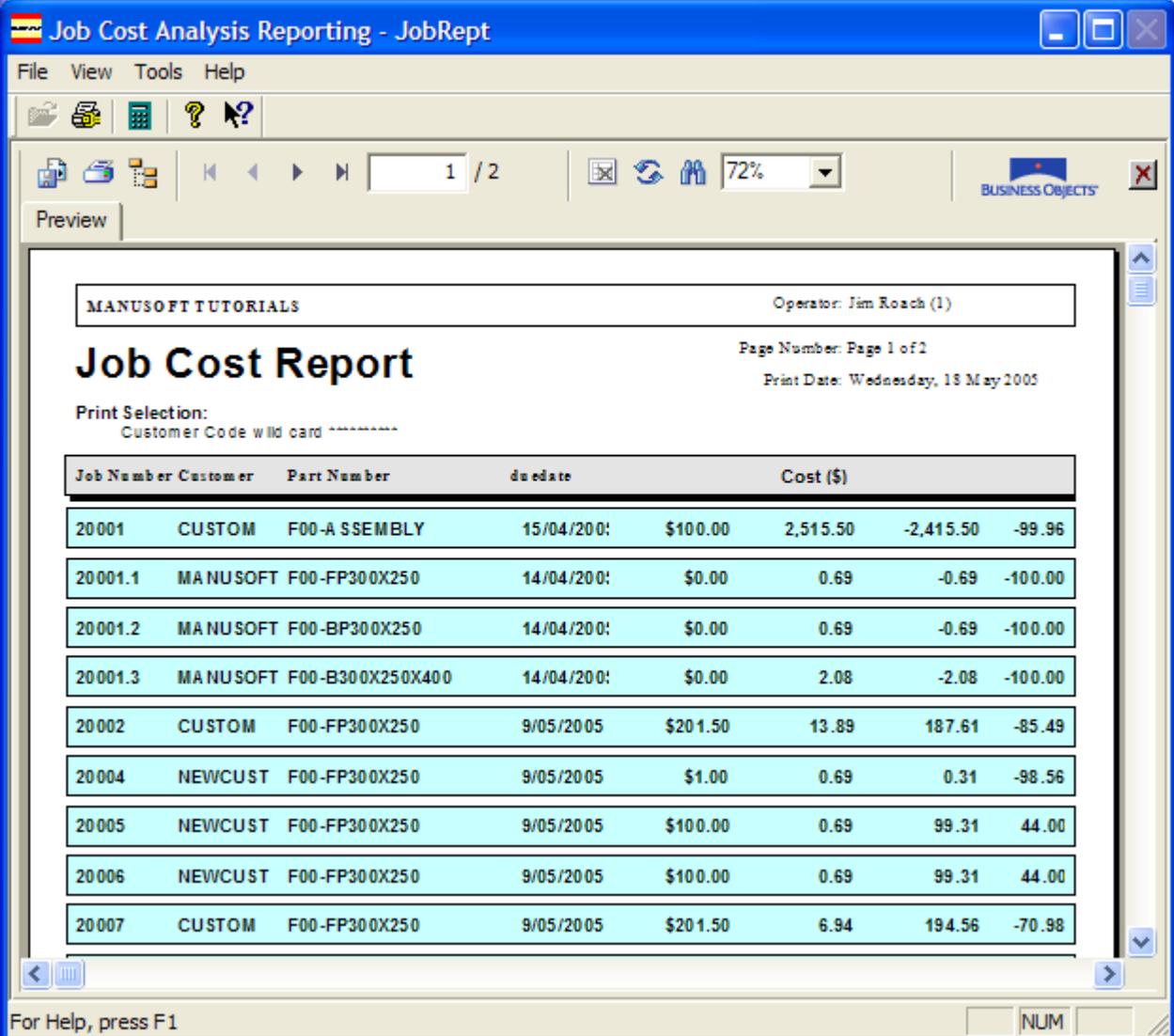
$$(Actual\ Time - Estimated\ Time) / Estimated\ Time$$

That is, negative variances are in your favor as it takes less time to do the job than was estimated.

Note i. Variance calculations are only displayed when they can be made. That is, there must be an estimate for the setup or process time and for the latter there must also be a quantity done (or recorded as being done).

The information at the bottom of the report show the total Labour and Material costs together with a Job Cost and a Gross Margin (and variance). That is, the job value as calculated by quantity and price (stored on the MOB file), less the total Job Cost.

The Print All Icon () can be used to collate Job Cost information for a collection of jobs and when used in conjunction with the Summarized Print option produces a single page report similar to that shown below:



Job Cost Analysis Reporting - JobRept

File View Tools Help

1 / 2 72%

Preview

MANUSOFT TUTORIALS Operator: Jim Roach (1)

Job Cost Report

Page Number: Page 1 of 2
Print Date: Wednesday, 18 May 2005

Print Selection:
Customer Code wild card *****

Job Number	Customer	Part Number	date	Cost (\$)			
20001	CUSTOM	F00-A SSEMBLY	15/04/200:	\$100.00	2,515.50	-2,415.50	-99.96
20001.1	MANUSOFT	F00-FP300X250	14/04/200:	\$0.00	0.69	-0.69	-100.00
20001.2	MANUSOFT	F00-BP300X250	14/04/200:	\$0.00	0.69	-0.69	-100.00
20001.3	MANUSOFT	F00-B300X250X400	14/04/200:	\$0.00	2.08	-2.08	-100.00
20002	CUSTOM	F00-FP300X250	9/05/2005	\$201.50	13.89	187.61	-85.49
20004	NEWCUST	F00-FP300X250	9/05/2005	\$1.00	0.69	0.31	-98.56
20005	NEWCUST	F00-FP300X250	9/05/2005	\$100.00	0.69	99.31	44.00
20006	NEWCUST	F00-FP300X250	9/05/2005	\$100.00	0.69	99.31	44.00
20007	CUSTOM	F00-FP300X250	9/05/2005	\$201.50	6.94	194.56	-70.98

For Help, press F1 NUM

This report identifies a Job with all its sub-assemblies and collates the total Labour and Material costs. The detail at the base of the report provides an Order Value calculation based on job quantity and price and also an estimated Gross Margin.

The Gross Margin calculation is not a variance and is determined as follows:

$$\text{Total Order Value} - \text{Total Job Cost}$$

In this case a negative amount represents a loss on the job.

The reports generated from the Job Cost variance reporting area (4/7/5) exhibit a similar set of options. Once again there are 3 primary reporting options however in this case two (2) different formats are presented. The first is for one (1) selected job, and is accessed by either entering the job number directly or selecting it from the Lookup Icon (). An example of this report is shown below:

Job Variance Report

MANUSOFT TUTORIALS Operator: Jim Roach (1)
 Page Number: Page 1 of 1
 Print Date: Wednesday, 18 May 2005

Print Selection:

Job Number : 20001	Ordered : 15/04/2005	Quantity : 100.00
Customer : CUSTOM	Start : 9/05/2005	Quantity : 180.00
Part Number : F00-A SSEMBLY	Finish : 30/12/1899	Quantity : 0.00

Labour Items :

Work Centre	Actual Hours		Estimated Hours		Variance Time		Actual (\$)	Estimate (\$)	Variance	
	Setup	Process	Setup	Process	Hours	(%)			(\$)	(%)
DESPATCH	0.00	0.00	0.00	3.33	-3.3	(-100%)	0.00	150.00	-150.00	(-100%)
S/CONTRACT	0.00	0.00	3.00	0.00	-3.0	(-100%)	0.00	0.00	0.00	(0%)
ASSEMBLY	0.00	2.00	0.00	8.33	-6.3	(-76%)	0.00	375.00	-375.00	(-100%)
Total	3	3	3	3	-12.7	(-86%)	3	3	-525.00	(0%)

Material Items :

Material Item	Actual		Estimate		Variance		Actual (\$)	Estimate (\$)	Variance	
	Quantity	Quantity	Quantity	Quantity	Quantity	(%)			(\$)	(%)
R00-24001200120	0.00	100.00	-100.0	(-100%)	0.00	2,500.00	-2,500.00	(-100%)		
F00-B300X250X400	90.00	100.00	-10.0	(-10%)	0.00	0.00	0.00	(0%)		

For Help, press F1

This report shown the actual and estimated labour hours, itemized by process, together with the itemized material costs. The variance calculation is provided both as quantity and as an amount breakdown. The Order, Start and Finish quantity is also shown on this report.

Once again a similar presentation is provided from the Selection Icon () option which can be used to obtain a report for all assemblies associated with a specific job. As a general rule the details for each job will be shown on a single page of printout.

The Print All Icon () associated with the Job Cost Variance report is totally different. It can be used to collate Job Cost information for a collection of jobs. The presentation below shows a variance (\$) based on estimated minus actual costs:

Job Cost Analysis Reporting - JobRept

MANUSOFT TUTORIALS Operator: Jim Routh (1)

Job Cost Variance Report Page Number: Page 1 of 2
Print Date: Wednesday, 18 May 2005

Print Selection:
Customer Code wild card *****

Job Number Reference	Quantity	Material (\$)			Labour (\$)			Total Cost (\$/Unit)	Std. Cost (\$/Unit)	Variance	
		Actual	Estimate	Variance	Actual	Estimate	Variance			(Total \$)	(%)
20001 F00-ASSEMBLY	1800	2,515.50	9,612.00	-7,096.50	0.00	945.00	-945.00	13.98	100.00	-8,041.50	(-76%)
20001.1 F00-FP300X250	1.0	0.69	0.69	0.00	0.00	12.75	-12.75	0.69	20.00	-12.75	(-63%)
20001.2 F00-BP300X250	1.0	0.69	0.69	0.00	0.00	15.75	-15.75	0.69	6.00	-15.75	(-96%)
20001.3 F00-B300X250X400	1.0	2.08	2.08	0.00	0.00	16.50	-16.50	2.08	0.00	-16.50	(-89%)
20002 F00-FP300X250	20.0	13.89	13.89	0.00	0.00	112.50	-112.50	0.69	20.00	-112.50	(-89%)
20004 F00-FP300X250	1.0	0.69	0.69	0.00	0.00	12.75	-12.75	0.69	20.00	-12.75	(-64%)
20005 F00-FP300X250	1.0	0.69	0.69	0.00	0.00	12.75	-12.75	0.69	20.00	-12.75	(-64%)
20006 F00-FP300X250	1.0	0.69	0.69	0.00	0.00	12.75	-12.75	0.69	20.00	-12.75	(-64%)
20007 F00-FP300X250	10.0	6.94	6.94	0.00	0.00	60.00	-60.00	0.69	20.00	-60.00	(-90%)
20009 F00-B300X250X400	2.0	4.17	4.17	0.00	0.00	18.00	-18.00	2.08	0.00	-18.00	(-87%)
20010 F00-ASSEMBLY	100.0	2,800.00	5,300.00	-2,500.00	0.00	525.00	-525.00	28.00	100.00	-3,025.00	(-52%)
20010.1 F00-FP300X250	100.0	69.44	69.44	0.00	0.00	532.50	-532.50	0.69	20.00	-532.50	(-86%)
20010.2 F00-BP300X250	100.0	69.44	69.44	0.00	0.00	832.50	-832.50	0.69	6.00	-832.50	(-92%)
20010.3 F00-B300X250X400	100.0	208.33	208.33	0.00	0.00	165.00	-165.00	2.08	0.00	-165.00	(-44%)
20011 F00-BP300X250	100.0	69.44	69.44	0.00	0.00	832.50	-832.50	0.69	6.00	-832.50	(-92%)
20012 F00-BP300X250	200.0	138.89	138.89	0.00	0.00	1,657.50	-1,657.50	0.69	6.00	-1,657.51	(-92%)
20013 F00-B300X250X400	200.0	416.67	416.67	-0.01	0.00	315.00	-315.00	2.08	0.00	-315.01	(-43%)
20014 F00-B300X250X400	200.0	416.67	416.67	-0.01	0.00	315.00	-315.00	2.08	0.00	-315.01	(-43%)
20015 F00-B300X250X400	200.0	416.67	416.67	-0.01	0.00	315.00	-315.00	2.08	0.00	-315.01	(-43%)
20016 F00-B300X250X400	200.0	416.67	416.67	-0.01	0.00	315.00	-315.00	2.08	0.00	-315.01	(-43%)
20017 F00-B300X250X400	200.0	416.67	416.67	-0.01	0.00	315.00	-315.00	2.08	0.00	-315.01	(-43%)
20018 F00-ASSEMBLY	100.0	2,800.00	5,300.00	-2,500.00	0.00	525.00	-525.00	28.00	100.00	-3,025.00	(-52%)

For Help, press F1

Once again negative variances are in your favor. This report also has a Gross Margin option as shown below:

MANUSOFT TUTORIALS Operator: Jim Roads (1)
 Page Number: Page 1 of 2
 Print Date: Wednesday, 18 May 2005

Print Selection:
 Customer Code wild card *****

Job Number Reference	Quantity	Material (\$)			Labour (\$)			Total Cost (\$/Unit)	Price (\$/Unit)	Margin (Total \$)	
		Actual	Estimate	Variance	Actual	Estimate	Variance				
Customer Code : ANOCUS											
20011	F00-BP300X250	100.0	69.44	69.44	0.00	0.00	832.50	-832.50	0.69	1.00	30.56
20013	F00-B300X250X400	200.0	416.67	416.67	-0.01	0.00	315.00	-315.00	2.08	1.00	-216.67
20014	F00-B300X250X400	200.0	416.67	416.67	-0.01	0.00	315.00	-315.00	2.08	1.00	-216.67
20015	F00-B300X250X400	200.0	416.67	416.67	-0.01	0.00	315.00	-315.00	2.08	1.00	-216.67
20016	F00-B300X250X400	200.0	416.67	416.67	-0.01	0.00	315.00	-315.00	2.08	1.00	-216.67
20017	F00-B300X250X400	200.0	416.67	416.67	-0.01	0.00	315.00	-315.00	2.08	1.00	-216.67
Customer Code : CUSTOM											
20001	F00-ASSEMBLY	180.0	2,515.50	9,612.00	-7,096.50	0.00	945.00	-945.00	13.98	1.00	-2,335.50
20001.1	F00-PP300X250	1.0	0.69	0.69	0.00	0.00	12.75	-12.75	0.69	0.00	-0.69
20001.2	F00-BP300X250	1.0	0.69	0.69	0.00	0.00	15.75	-15.75	0.69	0.00	-0.69
20001.3	F00-B300X250X400	1.0	2.08	2.08	0.00	0.00	16.50	-16.50	2.08	0.00	-2.08
20002	F00-PP300X250	20.0	13.89	13.89	0.00	0.00	112.50	-112.50	0.69	20.15	389.11
20007	F00-PP300X250	10.0	6.94	6.94	0.00	0.00	60.00	-60.00	0.69	20.15	194.56
20009	F00-B300X250X400	2.0	4.17	4.17	0.00	0.00	18.00	-18.00	2.08	2.00	-0.17
20018	F00-ASSEMBLY	100.0	2,800.00	5,300.00	-2,500.00	0.00	525.00	-525.00	28.00	11.00	-1,700.00
20018.1	F00-PP300X250	100.0	69.44	69.44	0.00	0.00	532.50	-532.50	0.69	0.00	-69.44
20018.2	F00-BP300X250	100.0	69.44	69.44	0.00	0.00	832.50	-832.50	0.69	0.00	-69.44
20018.3	F00-B300X250X400	100.0	208.33	208.33	0.00	0.00	165.00	-165.00	2.08	0.00	-208.33
20020	F00-MAKEIT	100.0	0.00	4,520.00	-4,520.00	0.00	82.50	-82.50	0.00	20.00	2,000.00
20021	F00-MAKEIT	100.0	2,500.00	4,520.00	-2,020.00	0.00	82.50	-82.50	25.00	1.00	-2,400.00

For Help, press F1

As in the previous case a negative Gross Margin represents a loss on the job.

We are now basically in a position to answer some of the questions raised earlier. The first point to note is that you don't need to examine every job, in detail, in order to achieve a result, which is just as well because the work load would be prohibitive.

If a structured job selection plan is followed then all problems will eventually come to light and the opportunity to address them will be presented. What is needed is a procedure for selecting the jobs which are to be examined.

The Job Cost Analysis reports shown above (in either the Gross Margin or Variance Cost forms), should be used to identify which jobs require examination. The detailed reports can then be obtained via 4/7/2 or 4/7/5 to help identify the nature of the problem.

I have mentioned "problems" however it should be noted however that it is important to look at the successes as well as the failures. We need to reward and recognize the successful jobs as well as those that have failed.

To answer the question concerning when the analysis should take place, it is worth noting that the more immediate the analysis, the better. We need to be questioning today what happened yesterday, while the information is still fresh and current in everyone memory. Attempting to question what happened last week or last month is likely to produce the, "I can't recall", comment and the analysis stalls.

Once the analysis has been done, and the problem (and successful) jobs identified, the Job Costing task becomes one of finding the cause for that success or failure. This is actually the most important part of Job Costing and is where the productivity improvements will come from.

It is important to ask the question “Why did that happen?”

It should be noted that quality is important here not quantity. A specific job needs to be examined in detail, in a timely fashion, and all people involved in its manufacture may need to be questioned.

This is not a task that is just done once but needs to be done daily and is ongoing indefinitely.

The reward from this effort will be improving productivity and profitability, as manufacturing problems (and successes) are identified and corrective action taken where necessary.

Manufacturing Cost Analysis (Strategic Analysis)

In the previous stage the Job Costing task was one where individual jobs were examined detail. In this next stage the examination is more macroscopic in nature and is concerned with gathering information over a large number of jobs in order to determine trends.

The **Labour Variance Reports** (menu item 4/6), as the name suggests concentrates on a labour analysis, and contain a useful group of reports such as the **Job Number Analysis** (4/6/1), **Part Number Analysis** (4/6/2) and **History File Analysis** (4/6/3). The first 2 generally provide an itemized job-by-job display as shown below:

MANUSOFT TUTORIALS Operator: Jim Roach (1)

Labour Variance (Mob) Report Page Number: Page 1 of 1
Print Date: Wednesday, 18 May 2005

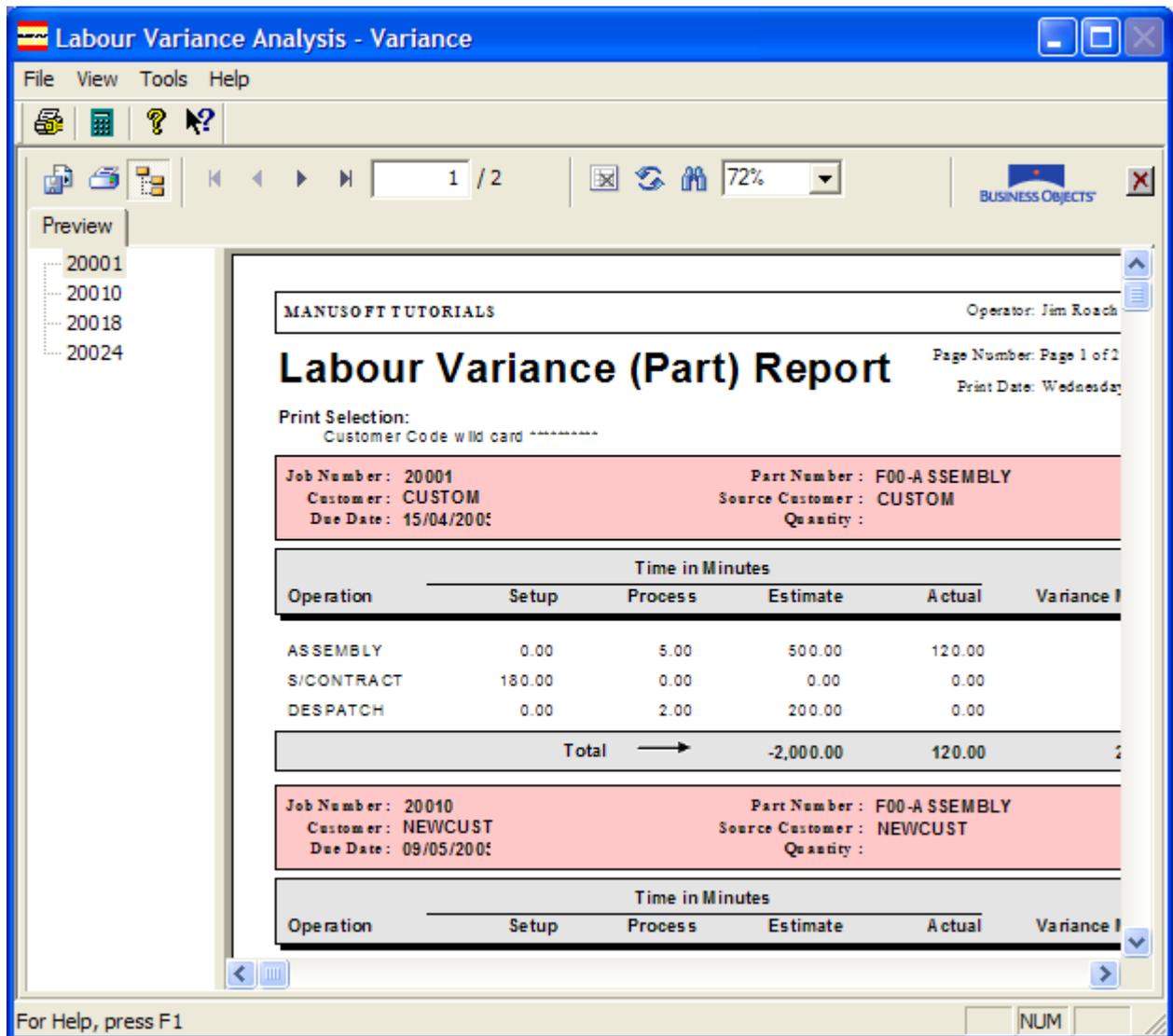
Print Selection:

Job Number : 20001 Part Number : F00-A SSEMBLY
Customer : CUSTOM Source Customer : CUSTOM
Due Date : 15/04/2005 Quantity : 100.00

Operation	Estimated Time (minutes)	Actual Time (minutes)	Variance Minutes (%)
ASSEMBLY	500.00	120.00	-380.00 (-76.00)
S/CONTRACT	0.00	0.00	0.00 (0.00)
DESPATCH	200.00	0.00	-200.00 (-100.00)
Total →	-2,000.00	120.00	2,120.00

For Help, press F1

The following Job Number report was generated via the Selection Icon () option and provides a series of reports for each of the selected jobs. A similar display is obtained with the Part Number report however in this case an average, over a number of different jobs, is obtained as shown below:



These reports are limited however in that they do not collate a massive amount of information, and they do not present the analysis in the summarized form that we are looking for in this stage. The third report however does exactly this.

The History File Analysis report can be used to examine all jobs on the History file (or selected jobs by period), to provide a breakdown of cumulative Actual and Estimated time, by Work Centre. An example of this report is shown below.

Information obtained from this report can be used to adjust the Quoting and Estimation time standards. This is usually done by altering the Efficiency Factors, which defined against each Work Centre in the system setup (10/5/3), according to the variance results shown in the report.

The alternative is to alter the Quoting and Estimating régime directly however this is likely to involve considerably more effort and may not be easily reversed.

MANUSOFT TUTORIALS Operator: Jim Roach (1)

Labour Variance (Hist) Report Page Number: Page 1 of 1
Print Date: Wednesday, 18 May 2005

Print Selection:
Customer Code wild card *****

Work Centre	Total for ALL jobs on File				Total for Selected Jobs			
	Number of Jobs	Estimate (Hours)	Actual (Hours)	Variance (%)	Number of Jobs	Estimate (Hours)	Actual (Hours)	Variance (%)
CUTTING	21.00	40.28	3.38	-91.6	21.00	40.28	3.38	-91.6
BEND	0.00	0.00	0.00	0.0	0.00	0.00	0.00	0.0
DRILL	0.00	0.00	0.00	0.0	0.00	0.00	0.00	0.0
WELD	21.00	24.62	3.33	-86.5	21.00	24.62	3.33	-86.5
ASSEMBLY	30.00	118.55	14.22	-88.0	30.00	118.55	14.22	-88.0
S/CONTRACT	4.00	348.00	3.28	-99.1	4.00	348.00	3.28	-99.1
STORES	0.00	0.00	0.00	0.0	0.00	0.00	0.00	0.0
DESPATCH	18.00	50.77	1.53	-97.0	18.00	50.77	1.53	-97.0

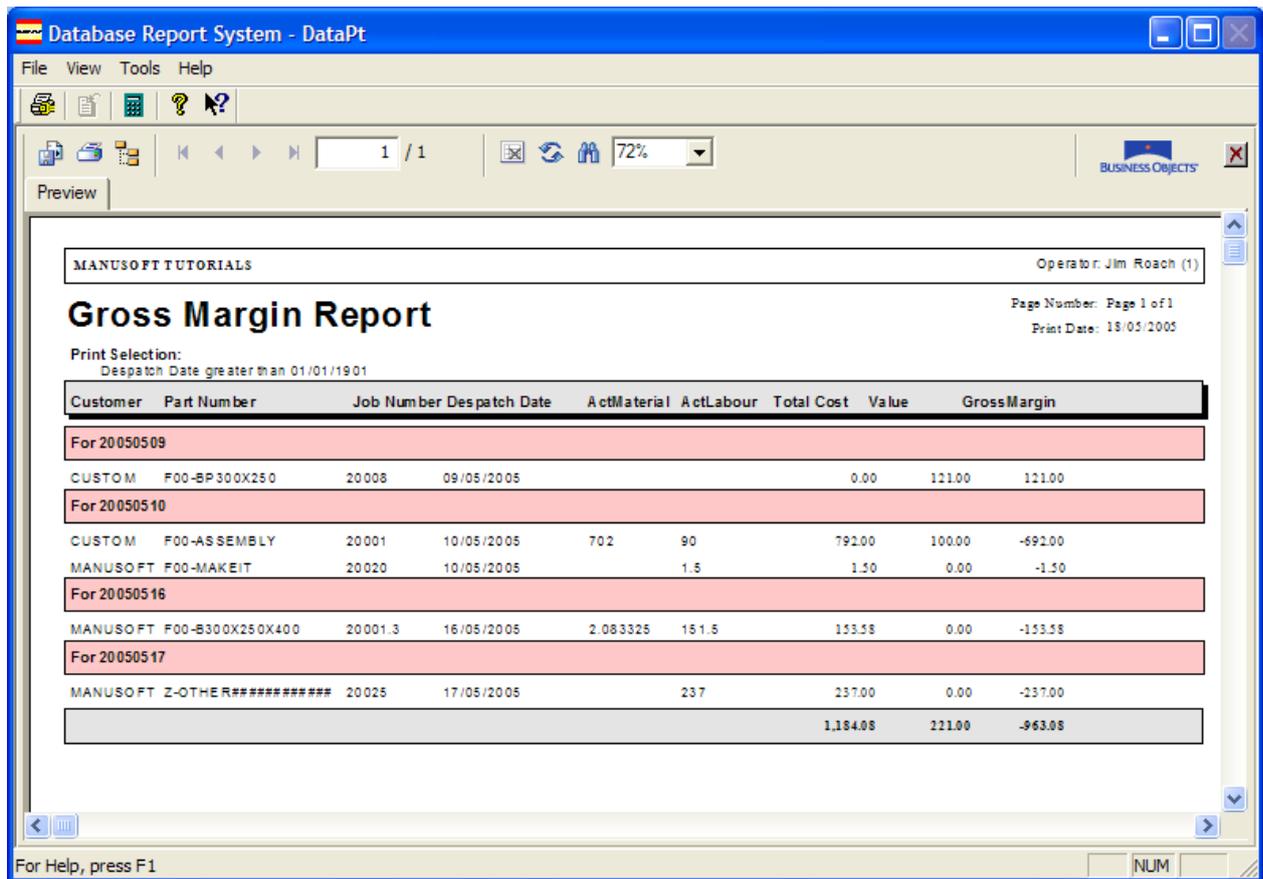
For Help, press F1

The next report to examine is the **Sales Cost Analysis** report accessed from 4/7/5. This report provides a Gross Margin analysis based on the Invoice Value for the job and the estimated Labour and Material costs. The Invoice File print selection criteria are used so an analysis can be obtained for period and/or product type where such is applicable. An example of this report is shown below:

Unfortunately neither this report nor the Job Cost Variance report discussed above provides the ideal report which is to compare actual costs with invoice value. In version 6-5 however actual Labour and Material cost totals are stored directly on the job file so user reports may now be created through the Report Generator.

The first user-defined report we will examine comes from the Job History file in 9/4. We can call up the actual labour and material costs from the MOB file via a [REGION] and then use a column [FORMULA] to obtain a total cost (actual). The sales value can be obtained also from a use a [FORMULA] using the Total Despatch Quantity and the job unit price (and extras).

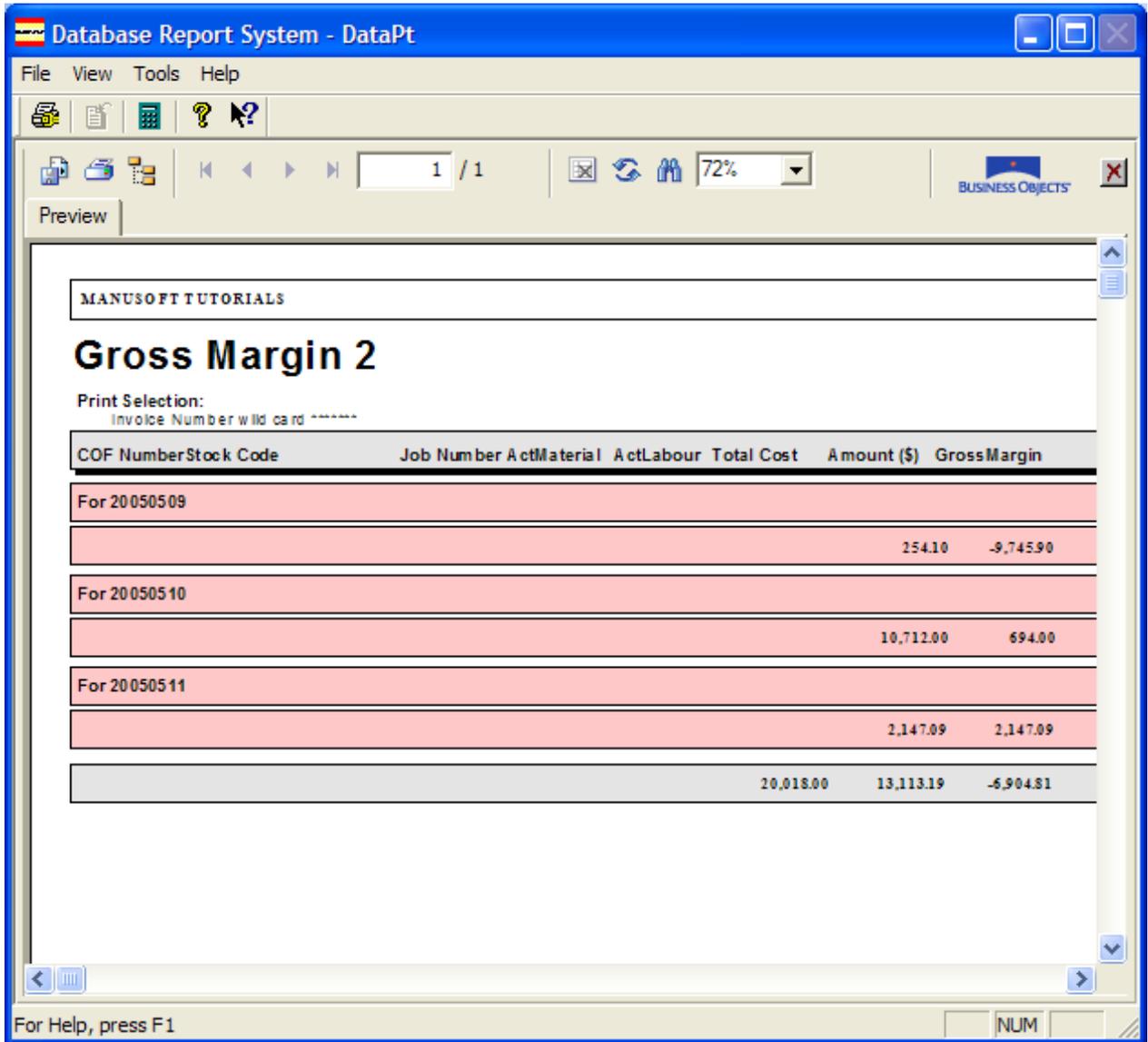
In such History file reports in 9/4, the Despatch and Invoice information (date) may be used as the Print Selection criteria. An example of this report is shown below:



The specific instructions for defining the report are as follow:

Select	Required Item	Width	Decimal	Heading	Totals
New Item	CUSTOMER CODE	10		CUSTOMER	
New Item	PART NUMBER	Default	Default		
New Item	JOB NUMBER	Default	Default		
New Item	DESPATCH DATE	13		Default	
New Item	[REGION]	11		ActMaterial	
	Start Position 905				
New Item	[REGION]	11		ActLabour	
	Start Position 883				
New Item	[FORMULA]	11	2	Total Cost	Y
	([5]+[6])				
New Item	[FORMULA]	11	2	Value	Y
	(((E*B)+C)+D)				
New Item	[FORMULA]	11	2	GrossMargin	Y
	([8]-[7])				

A similar report can be generated from the Invoice file in 9/7. This next report is a little more complex as it involves using the Secondary Transaction data as well as the Primary Invoice file information. The example below is for a Total Only report:



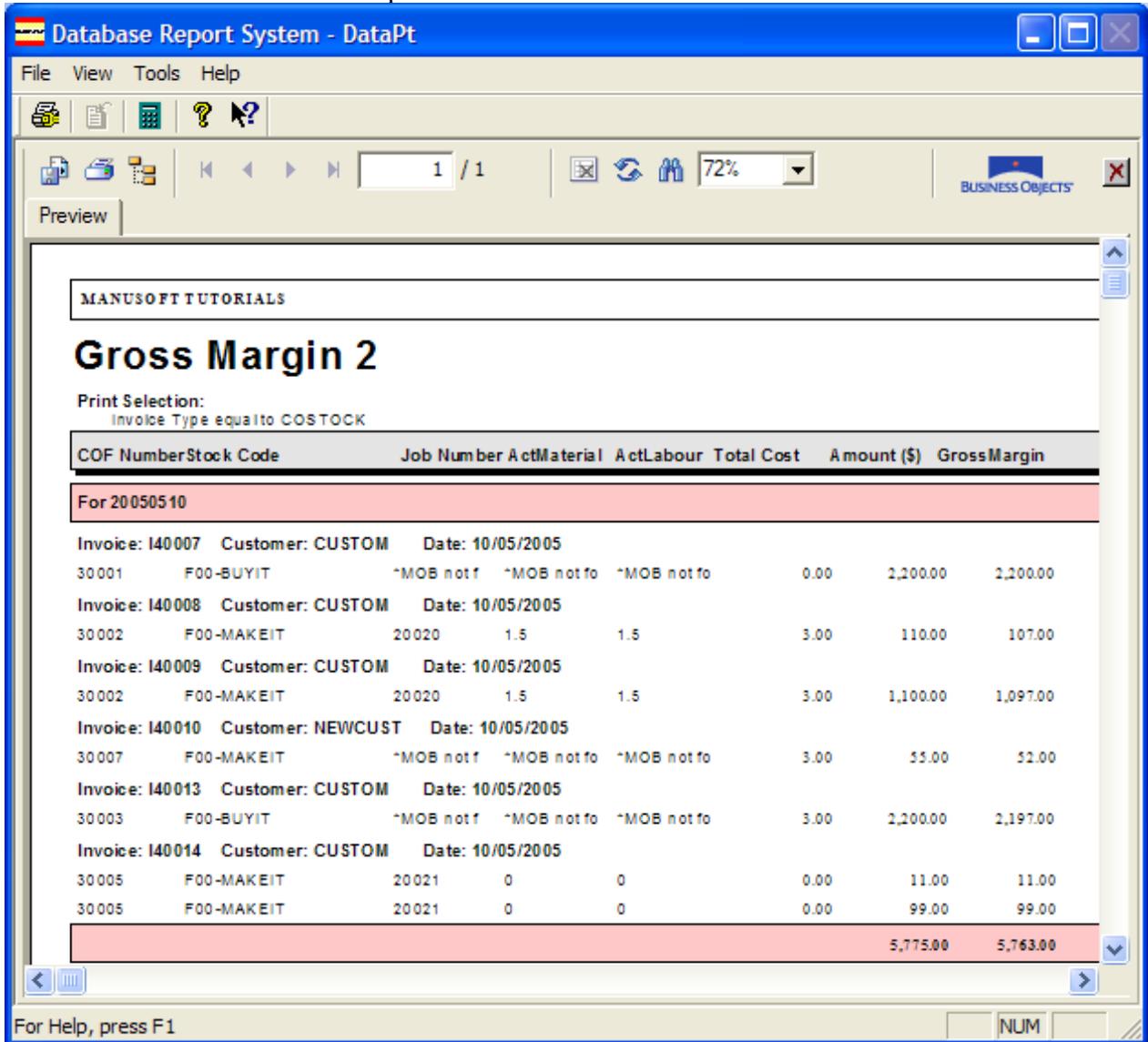
The specific instructions for defining the report are as follow:

Select	Required Item	Width	Decimal	Heading	Totals
<u>From the Primary Invoice File:</u>					
New Item	INVOICE NUMBER	7		INVOICE	
New Item	CUSTOMER CODE	10		CUSTOMER	
New Item	INVOICE DATE	10		DATE	
<u>From the Invoice Items Only Secondary File:</u>					
For the DRC2 System Only:					
New Item	JOB NUMBER	Default		COF NUMBER	
For all systems:					
New Item	STOCK CODE	Default	Default		
New Item	X->COF->MOB:JOB NUMBER	Default	Default		
New Item	X->COF->MOB:[REGION]	11		ActMaterial	
	Start Position 905				
New Item	X->COF->MOB:[REGION]	11		ActLabour	
	Start Position 883				
New Item	[FORMULA]	11	2	Total Cost	Y

	([28]+[29])					
New Item	AMOUNT (\$)	11	2	Default		Y
New Item	[FORMULA]	11	2	GrossMargin		Y
	([31]-[30])					

Select the “Total Only” option from the Other Criteria tab

The “Detailed” version of this report is as follows:



Although this report incorporates the Invoice value directly the limitation here is its ability to identify a specific job relating to that invoice. Some invoices may not have a direct job (MOB) assignment. Stock or General invoices for example.

In DRC2 the invoice is from the COF file and there will only be a MOB assignment when the order has been processed through 6/2.

Even where there is a direct assignment the relationship will only apply to the top level of the build. That is if there are sub assemblies their labour and material costs will not be reflected in the final invoiced job. Basically this report will work best with DRC1 and where there is a single level build in the Bill-Of-Materials.

Considering all of this the best reporting option with respect to the Report Generator is that obtained from the History file report shown above. The sub-assembly jobs may be selected so that a total labour and material cost can be obtained (by using the included or wild card Job Number search, in the case of the Itemized Job Number option report, or via the Order Number or Comment fields where the Sequential Job Number assignment is used).

Strategic Analysis can be a complex task, particularly as shown above where there may be no direct link between the cost of the job that is manufactured and final invoiced sale. Even where such links exist they may be incomplete, particularly when inventory processing considerations are concerned.

In such cases two(2) or more reports may need to be collate and analyzed in order to achieve the desired result. The ODBC reporting capability of the ManuDyn system may assist in this regard allowing the user to create your own reports in Excel or Crystal Reports for example.

Concluding Remarks

The task of Job Cost is one of the most important that can be undertaken concerning the ManuDyn system. Job Costing is what all of the effort of shop floor data collection is leading toward. As noted earlier, there is no point collecting the data if no use is to be made of it.

I have identified a number of stages associated with Job Costing. The initial stages are relatively easy to achieve and the gains that can be made here are significant. They are also about bringing a level of discipline to the manufacturing environment from which future gains can be made.

We recommend that a structured approach be followed concerning the Job Costing task and that a “plan of attack” be devised and put into action. Monitoring progress against the plan is also important and in this regard the reporting system within ManuDyn can be of great assistance.