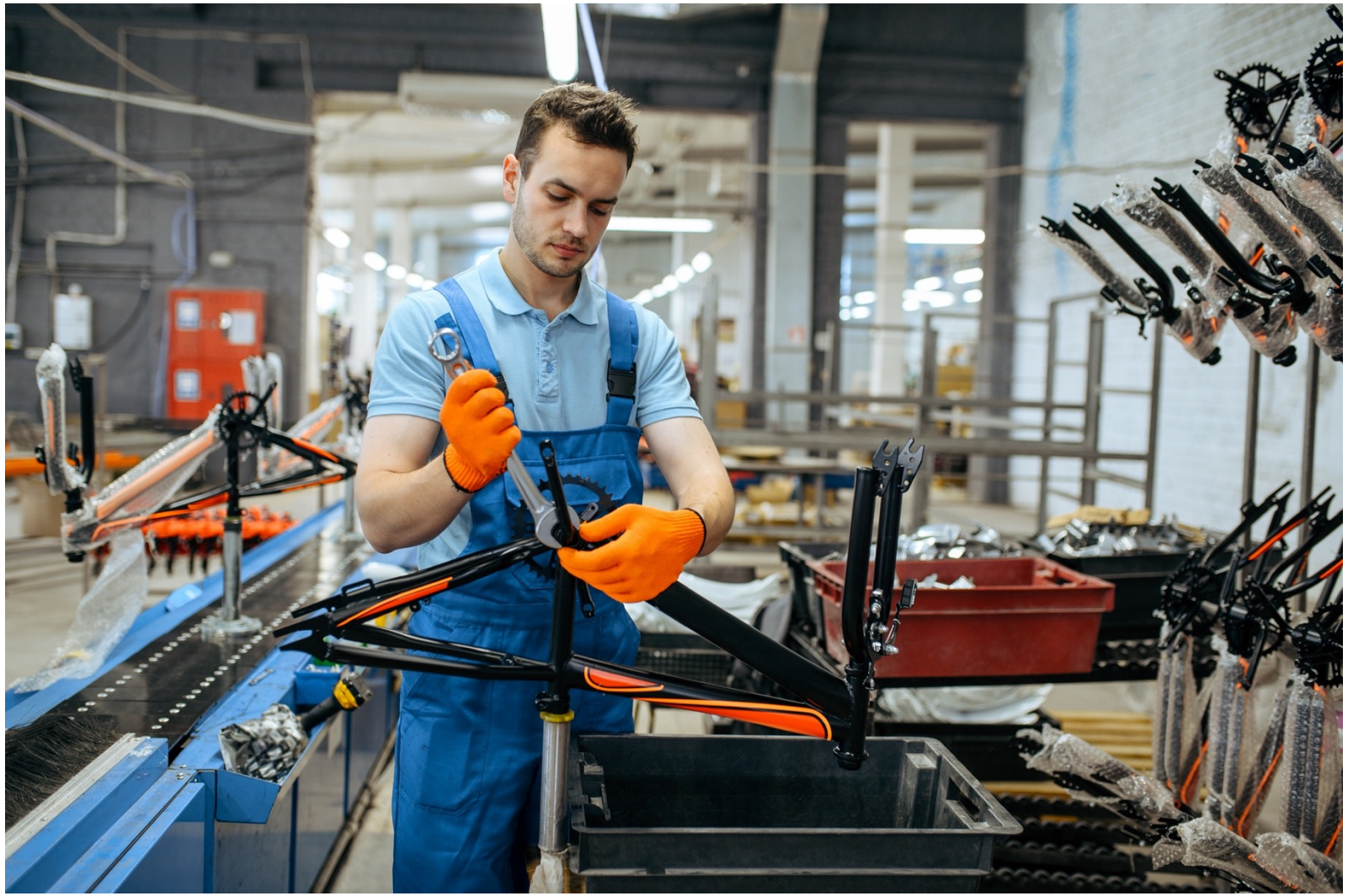
Into the Weeds on the Product Job-Cost Approach



An e-Bike Job Cost Analysis*

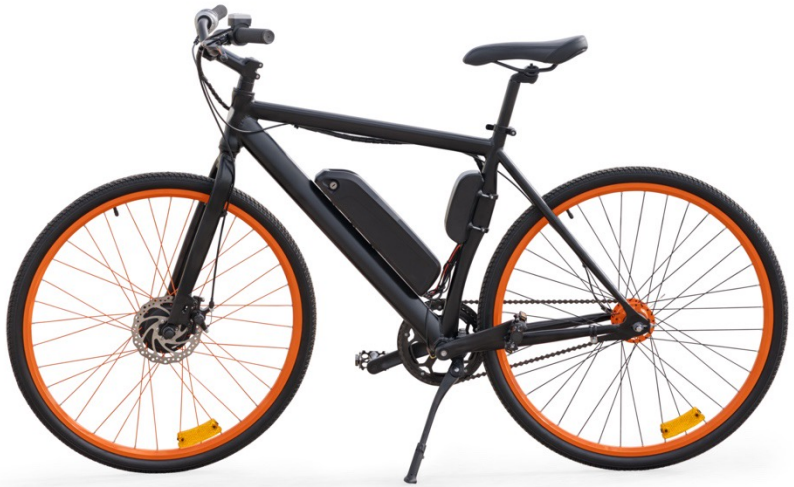
Ex. Finding the cost of an e–bike!

You're the production manager for an e-bike company.

Your company just shipped an order of their best-selling Model XT5 Commuter e-bike to Cycle World, one of your important customers.

You evaluate what you has on hand (in stock as finished goods inventory) and determine that you need to build a few more XT5's to keep stock inventory at the right level.

You first define the Production Schedule…



Model XT5 Commuter e-Bike
One of your best sellers!

** adapted from Braun & Tietz (2015).*

The Production Schedule

The Production Schedule: What you need and when…

Production Schedule For the Month of March					
Job #	**Model #**	**Stock or Customer**	**Quantity (units)**	**Scheduled Start Date**	**Scheduled End Date**
403	XT5 Commuter e-Bike	For Stock	50	3/2	3/6
404	XZ10 Gravel e-Bike	For Stock	60	3/7	3/17
405	Custom RX15 Road e-Bike	CU Buffaloes	15	3/18	3/25
406	Custom MT20 Mountain e-Bike	CU Buffaloes	12	3/25	3/31

- Each production run is assigned a Job #.
- All the jobs then determine the required raw materials and the # of people necessary to build them – defining the plant's production capacity!

The Production Schedule

The Production Schedule: What you need and when…

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406	Custom MT20 Mountain e-Bike	CU Buffaloes	12	3/25	3/31

Based on a demand analysis, you determine you need to manufacture 50 XT5 Commuter e-bikes.

You create Job # 403 to get this done, starting March 2, and completing production on March 6.

All 50 XT5 bikes are going to Stock (FG) inventory.

The Bill of Materials

What parts do you need and how many?

The production team makes sure there are enough raw materials available for the production run.

They begin by creating the Bill of Materials – the BoM...all the pieces-parts necessary to build the 50 units.

This BoM is similar to that created by the Product Design Team – now for the total number of units in the production run.

This answers the question:
"What do we need for the order?"

Bill of Materials

Job: 403

Model: XT5 Commuter e-Bike **Quantity:** 50 Units

Part #	Description	Quantity Required (units)
C12-475	Carbon Frame	50
M50KW	Hub Motor	50
W700-MX	Front and Rear Wheels	100
B3500	Brake System	100
BP1750	Battery Pack	50
	Etc.	

Raw Materials Inventory

What is in inventory?

The warehouse uses the BOM to check the Raw Materials Record to see what it is in stock for each part number, and what must to be ordered from suppliers.

The Record shows what is in stock, when it was received, and what was paid for it.

Raw Materials Record

Part #: M50KW **Description**: Hub Motor

	Received			Used				Balance in Stock		
Date	**Units**	**Unit Cost**	**Total**	**Requisition #**	**Units**	**Unit Cost**	**Total**	**Units**	**Unit Cost**	**Total**
2/25	100	$100	$10,000					100	$100	$10,000
2/28				#524	70	$100	$7,000	30	$100	$3,000

This answers the question: "What do we have on hand?"

Only 30 hub motors are in stock, and you need 50.

Purchasing will need to buy at least 20 more to make the production run.

The Job Cost Record

…keeps track of all costs for this specific job…

At the beginning of the production run for Job 403, a "Job Cost Record" is created to keep track of all costs incurred:

- Direct Materials Costs
- Direct Labor Costs
- Manufacturing Overhead

A Job Cost Record is created for each job.

Of course, all these "forms" are electronic these days…

Job Cost Record

Job Number: 403

Customer: For Stock

Job Description: 50 units of Model XT5 Commuter e-Bike

Date Started: March 2 **Date Completed:** _____

Manufacturing Cost Information	**Cost Summary**
Direct Materials	
Direct Labor	
Manufacturing Overhead	
Total Job Cost	
Number of Units	50
Cost per Unit	

Shipping Information			
Date	Quantity Shipped	Units Remaining	Cost Balance

The Materials Requisition

Ordering all the parts from the warehouse…

Production establishes what it needs for the job, and when it needs them.

It then creates a Materials Requisition to effectively "order" these from the storeroom.

"Pickers" go around the storeroom and collect all the materials itemized on the Materials Requisition and deliver it to the production floor.

Materials Requisition

Date Needed: 3/2 **Requisition #:** 528

Job: 403

Part #	Description	Quantity	Unit Cost	Amount
C12-475	Frame	50	$400	$20,000
M50KW	Hub Motor	50	$100	$ 5,000
W700-MX	Front and Rear Wheels	100	$ 75	$ 7,500
B3500	Brake System	100	$ 95	$ 9,500
BP1750	Battery Pack	50	$125	$6,250
	…everything else	50	$300	$15,000
			Total	**$63,250**

The Direct Materials associated with Materials Requisition #528 = $63,250

Updated Raw Materials Inventory Record

What is in inventory now…

The Raw Materials Record is then updated based on the purchased orders ("POs") placed by Purchasing, and the materials sent to Production.

Raw Materials Record

Part #: M50KW **Description**: Hub Motor

	Received			Used				Balance in Stock		
Date	**Units**	**Unit Cost**	**Total**	**Requisition #**	**Units**	**Unit Cost**	**Total**	**Units**	**Unit Cost**	**Total**
2/25	100	$100	$10,000					100	$100	$10,000
2/28				#524	70	$100	$7,000	30	$100	$3,000
3/1	60	$100	$6,000					90	$100	$9,000
3/2				#528	50	$100	$5,000	40	$100	$4,000

60 Hub Motors were received on 3/1 from the supplier, at $100 a piece.

At the end of 3/1, 90 Hub Motors were in inventory.

50 were pulled for Req. #528 (which is tied to Job 403) and delivered to production.

Leaving 40 remaining in RM inventory.

Updating the Job Cost Record

Now including Direct Materials

The Job Cost Record is updated with all the costs associated with each Materials Requisition.

Requisition #528 was for all the necessary parts.

Requisition #529 was for paint.

Requisition #530 was for decals and other brand materials.

We see that the total for all Direct Materials associated with the 50 units is $68,750

Job Cost Record

Job Number: 403

Customer: For Stock

Job Description: 50 units of Model XT5 Commuter e-Bike

Date Started: March 2 **Date Completed:** _____

Manufacturing Cost Information	Cost Summary
Direct Materials Req. #528: $63,250 Req. #529: $ 4,000 Req. #530: $ 1,500	$68,750
Direct Labor	
Manufacturing Overhead	
Total Job Cost	
Number of Units	50
Cost per Unit	

The Labor Time Record

Labor Costs…

Of course these 50 e-bikes are assembled by real people: which from an accounting perspective represents Direct Labor costs.

Each shop floor person completes their own time record for how many hours they worked on each job.

All this is recorded on their "Labor Time Record", which shows all the work they did, which job it was for, and their labor rate.

Labor Time Record

Employee: Miguel Arturo **Week:** 3/2 – 3/8

Employee #: 177 **Hourly Rate:** $30

Date	Job #	Start Time	End Time	Hours	Cost
3/2	402	8:00	11:00	3	$90
3/2	403	12:00	5:00	5	$150
3/3	403	8:00	4:00	8	$240
3/4	403	8:00	4:00	8	$240
Etc.					
3/8	404	8:00	4:00	8	$240

Note: sometimes the labor rate will include other costs such as benefits – and sometimes this is built into the manufacturing overhead.

The Updated Job Cost Record

Now capturing all the Direct Labor Cost!

Now the Job Cost Record is updated once again with all the costs associated with the time and costs for each person working on it.

We see that it took 500 Direct Labor hours to build the 50 units, with a total Direct Labor Cost of $15,750.

Job Cost Record

Job Number: 403

Customer: For Stock

Job Description: 50 units of Model XT5 Commuter e-Bike

Date Started: March 2 **Date Completed:** _____

Manufacturing Cost Information	Cost Summary
Direct Materials Req. #528: $63,250 Req. #529: $ 4,000 Req. #530: $ 1,500	$68,750
Direct Labor Employee 177: 21 DL Hours ($630) Employee 192: 13 DL Hours ($325) Employee 233: 12 DL Hours ($360) … (a total of 500 hours)	$15,750
Manufacturing Overhead	
Total Job Cost	
Number of Units	50
Cost per Unit	

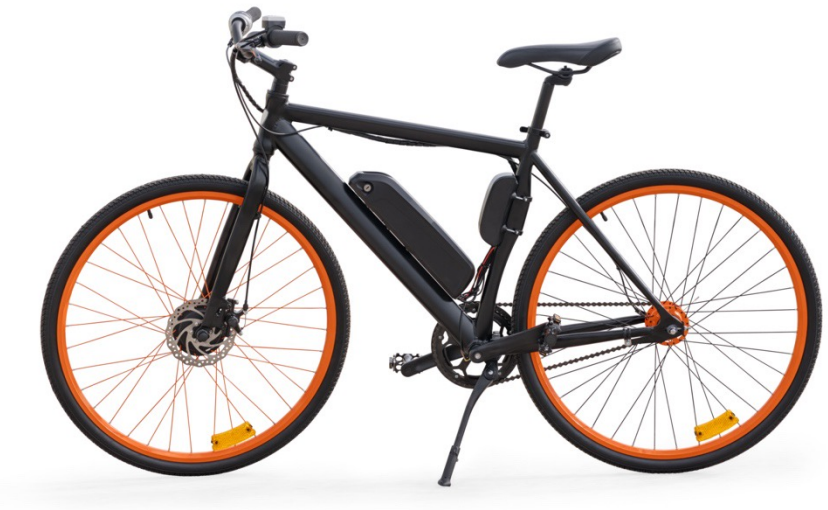
Product Costs

Direct Material Costs ✓ + Direct Labor Costs ✓ + Manufacturing Overhead Costs ? → Product Cost

We now understand how direct material costs are established…

And we see how direct labor is determined.

The last step is to see how manufacturing overhead is allocated across all the different jobs!



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One of your best sellers!

Next Time…

All about Manufacturing Overhead!

Credits & References

Slide 1: Bicycle factory, worker holds teen bike frame by Nomad_Soul, Adobe Stock (389654739

Slide 2: Black electric bike isolated with clipping path by eshma, Adobe Stock (222853589.jpeg). Note this example was adapted from “Managerial Accounting” by Braun and Tietz, Pearson (2015).

Slide 13: Black electric bike isolated with clipping path by eshma, Adobe Stock (222853589.jpeg).

Slide 14: Bicycle factory, worker packs teen bike in box by Nomad_Soul, Adobe Stock (389658850.jpeg).