Allocation of Support-Department Costs, Common Costs, and Revenues

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Lecture 9 – Week 9
4 April 2020

Allocate Multiple Support department costs using:

- Direct Method,
- Step-down Method
- Reciprocal Method

3) Reciprocal Method

The **reciprocal method** allocates support-department costs to operating departments by fully recognizing the **mutual** services provided among all support departments.

For example,

the **Engineering** and Production Control Department provides engineering services to the Materials Management Department.

Similarly, the Materials Management Department handles materials for the **Engineering** and Production Control Department.

The **reciprocal** method **fully** incorporates **interdepartmental relationships** into the support-department cost **allocations**.

Reciprocal method is an **extension** of the **step-down** method.

Under reciprocal cost allocation method

First : we will allocate the budgeted costs ***Materials*** Management Department to ***all*** **other** ***departments***, including:

- **Engineering** and Production Control, *10* %;
- **Machining**, *20%;* and
- **Assembly**, *70%*

Second : we will allocate the budgeted costs of ***engineering*** and Production Control Department to ***all* other departments**, including:

- **Materials** Management, **30**%;
- **Machining**, 50%;
- **Assembly**, 20%

Implementing the Reciprocal Method

- In order to implement the reciprocal method it is necessary to **formulate** and **solve linear equations**.

This implementation requires three steps.

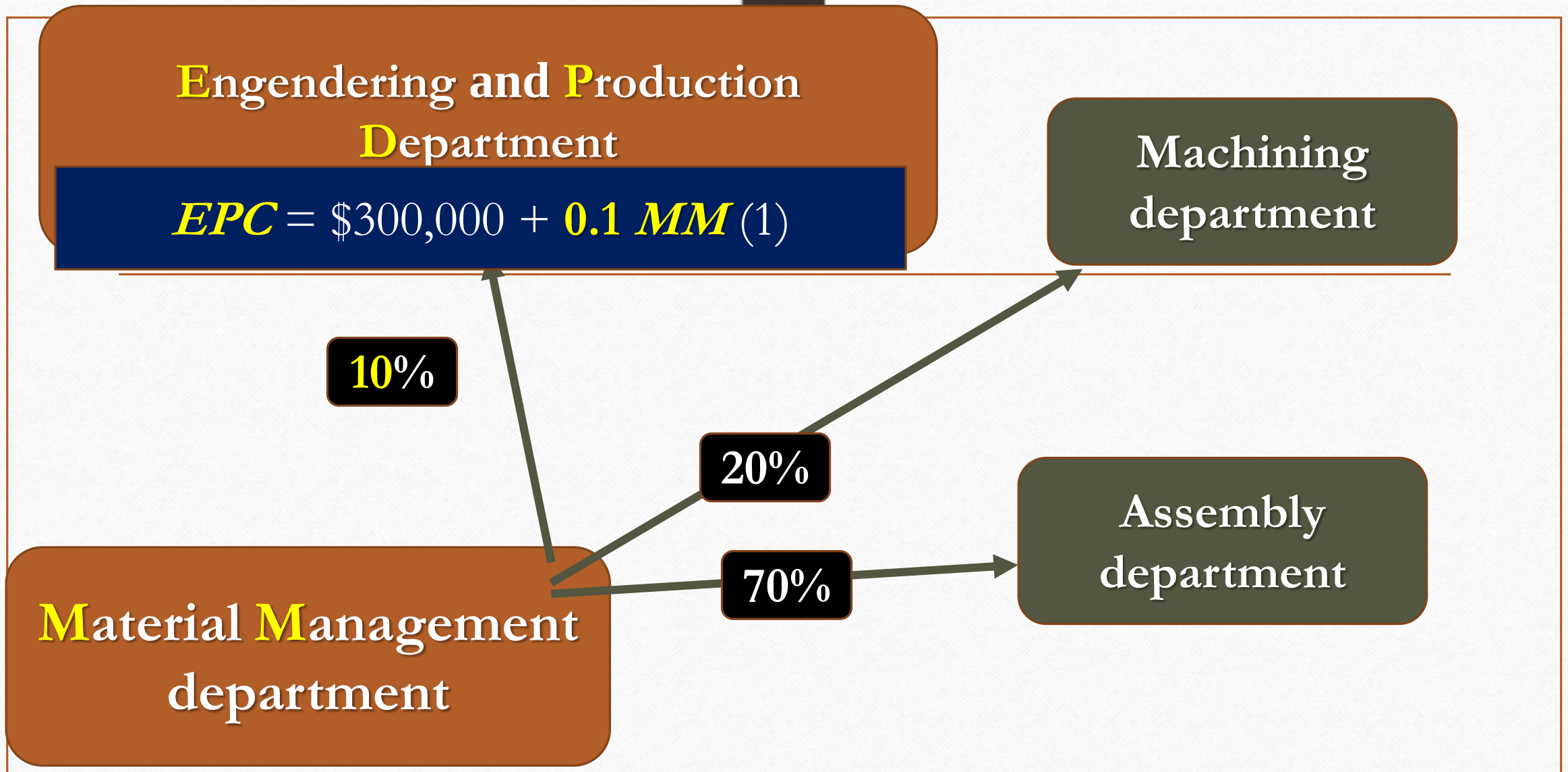
Step (1): Express Support-Department Budgeted **Costs** and Reciprocal **Relationships** in the Form of **Linear Equations**.

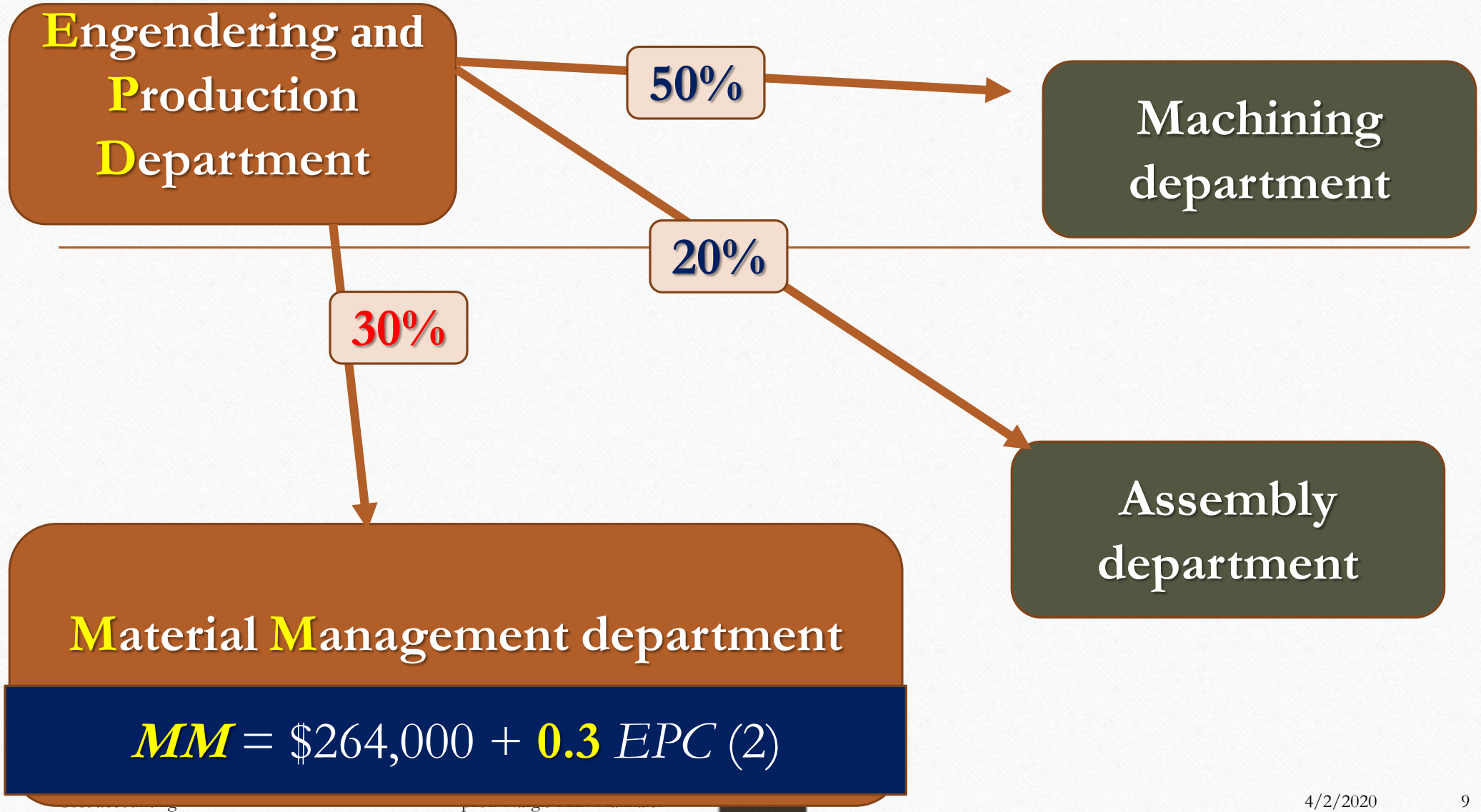
Let ***EPC*** be the *complete* **reciprocated costs** of the ***E***ngineering and ***P***roduction ~~***C***ontrol Department~~.

MM be the *complete* **reciprocated costs** of the ***M***aterials ***M***anagement Department.

By sating **complete reciprocated costs**, we mean the support department's own costs **plus** any **interdepartmental** cost **allocations**.

- $EPC = \$300{,}000 + 0.1\ MM$ (1)
- $MM = \$264{,}000 + 0.3\ EPC$ (2)


Engendering and Production Department
EPC = $300,000 + 0.1 MM (1)
Machining department
10%
20%
70%
Assembly department
Material Management department


Engendering and Production Department
50%
Machining department
20%
30%
Assembly department
Material Management department
MM = $264,000 + 0.3 EPC (2)

Step (2)

Solve the Set of Linear **Equations** to Obtain the **Complete** Reciprocated Budgeted **Costs** of Each **Support Department**.

- ***EPC*** = **$300,000 + 0.1 *MM*** (1)
- ***MM*** = **$264,000 + 0.3 ($300,000 + 0.1 *MM*)** (2)

Substituting equation (1) into (2):

MM = $264,000 + $90,000 + 0.03 ***MM***

MM - ***0.03 MM*** = $264,000 + $90,000

0.97 ***MM*** = $354,000

$$MM = \$364,949$$

$$MM = \$364,949$$

- Substituting the value of ***MM*** which $**364,949]** into equation (1):
- ***EPC*** = $300,000 + 0.1 **$364,949** (1)

$$EPC = \$300,000 + \$36,495 = \$336,495$$

$$EPC = \$336,495$$

The complete reciprocated costs or artificial costs are budgeted to be:

- $**364,949** for the **Materials Management** Department and
- $**336,495** for the **Engineering** and **Production** Control Department.

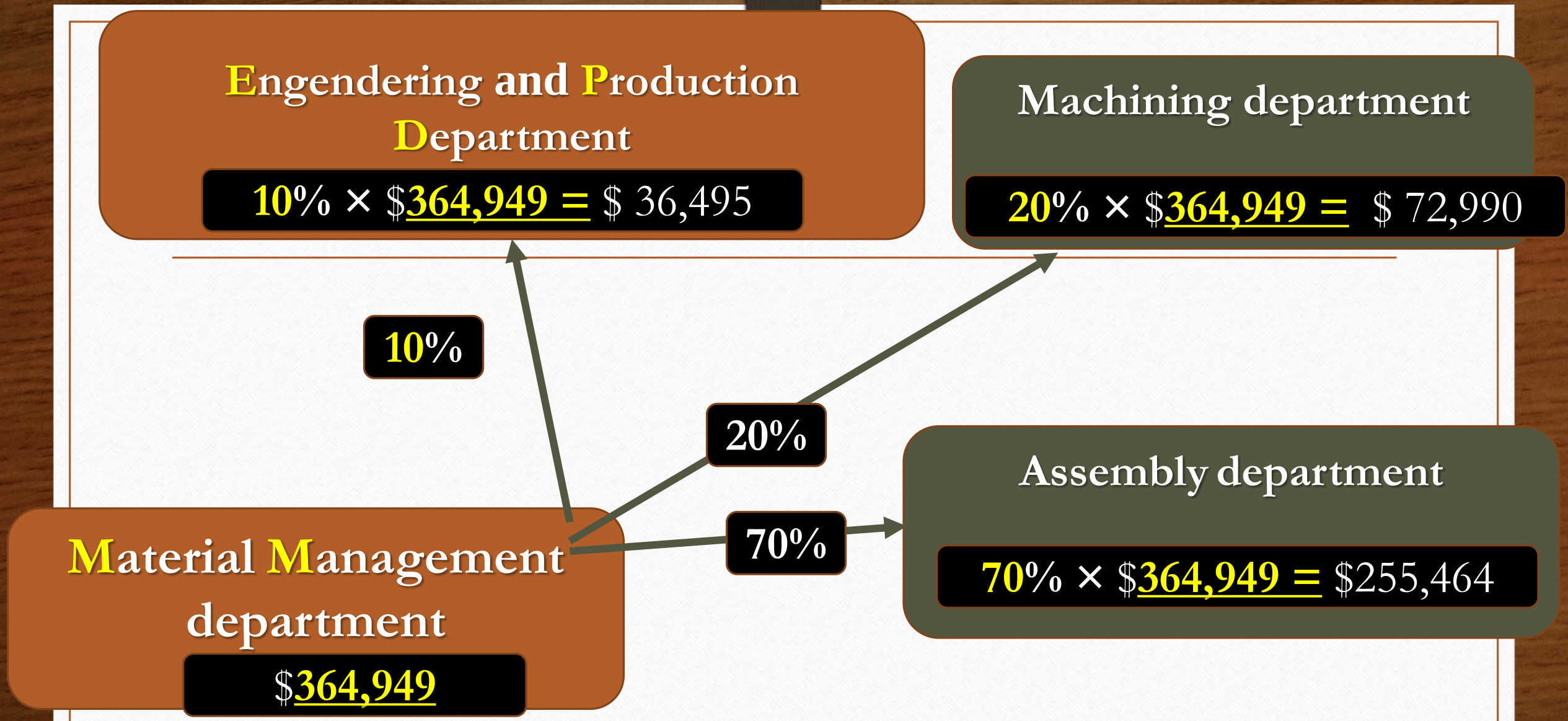
Step (3)

Allocate the Complete Reciprocated **Budgeted Costs** of **Each Support** Department: **Material** management department and **Engineering** and production control Department) to **All** Other **Departments** both:

- Support Departments and
- Operating Departments

on the Basis of the **Budgeted** Usage **Percentages** which are Based on Total Units of Service Provided to All Departments.

Allocating the costs of **Material Management** department (**First** support Department)

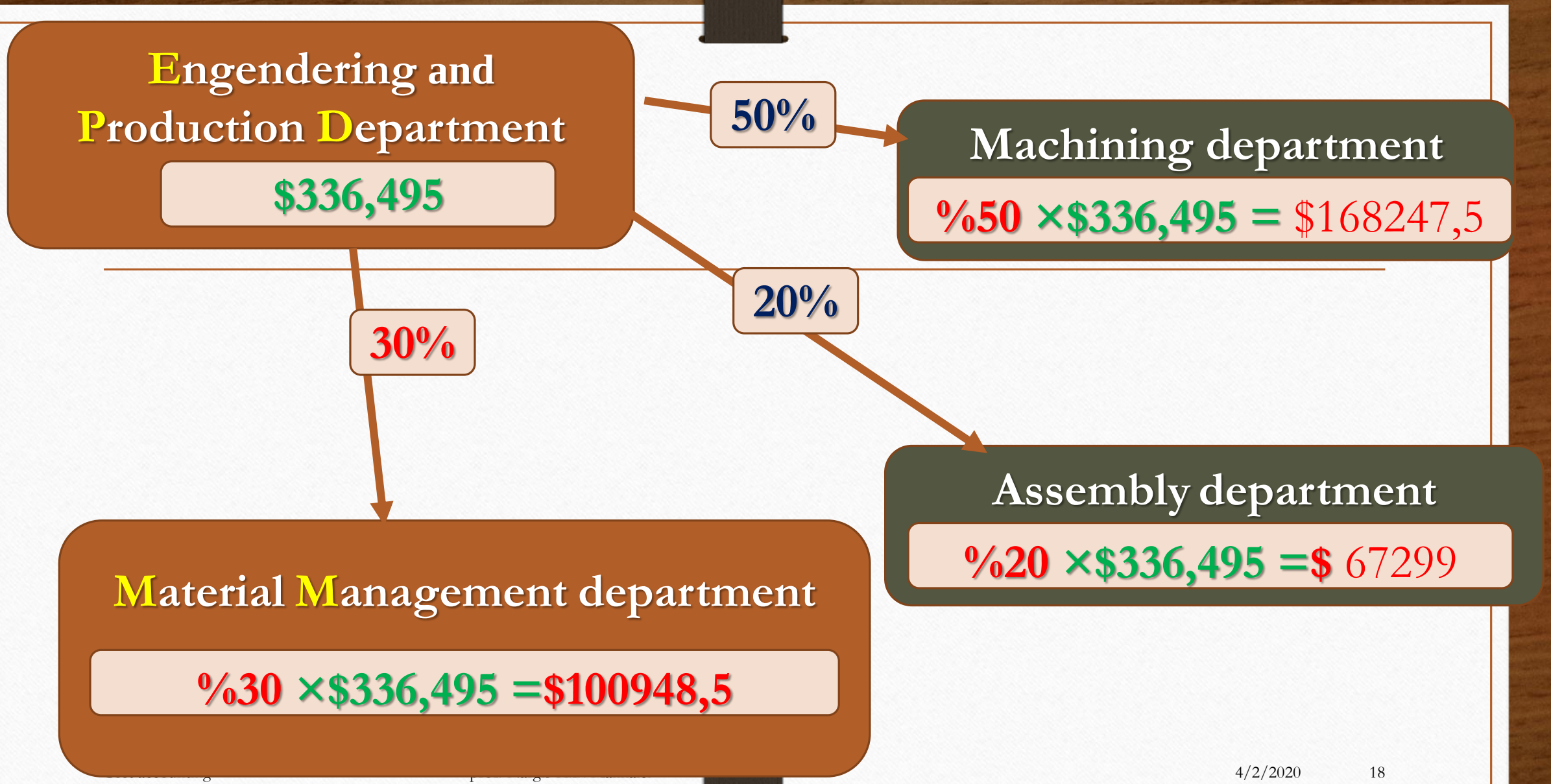

Engendering and Production Department
10% × $364,949 = $ 36,495
Machining department
20% × $364,949 = $ 72,990
10%
20%
70%
Material Management department
$364,949
Assembly department
70% × $364,949 = $255,464

Materials Management Department.

The complete reciprocated budgeted costs of $364,949 are allocated as follows:

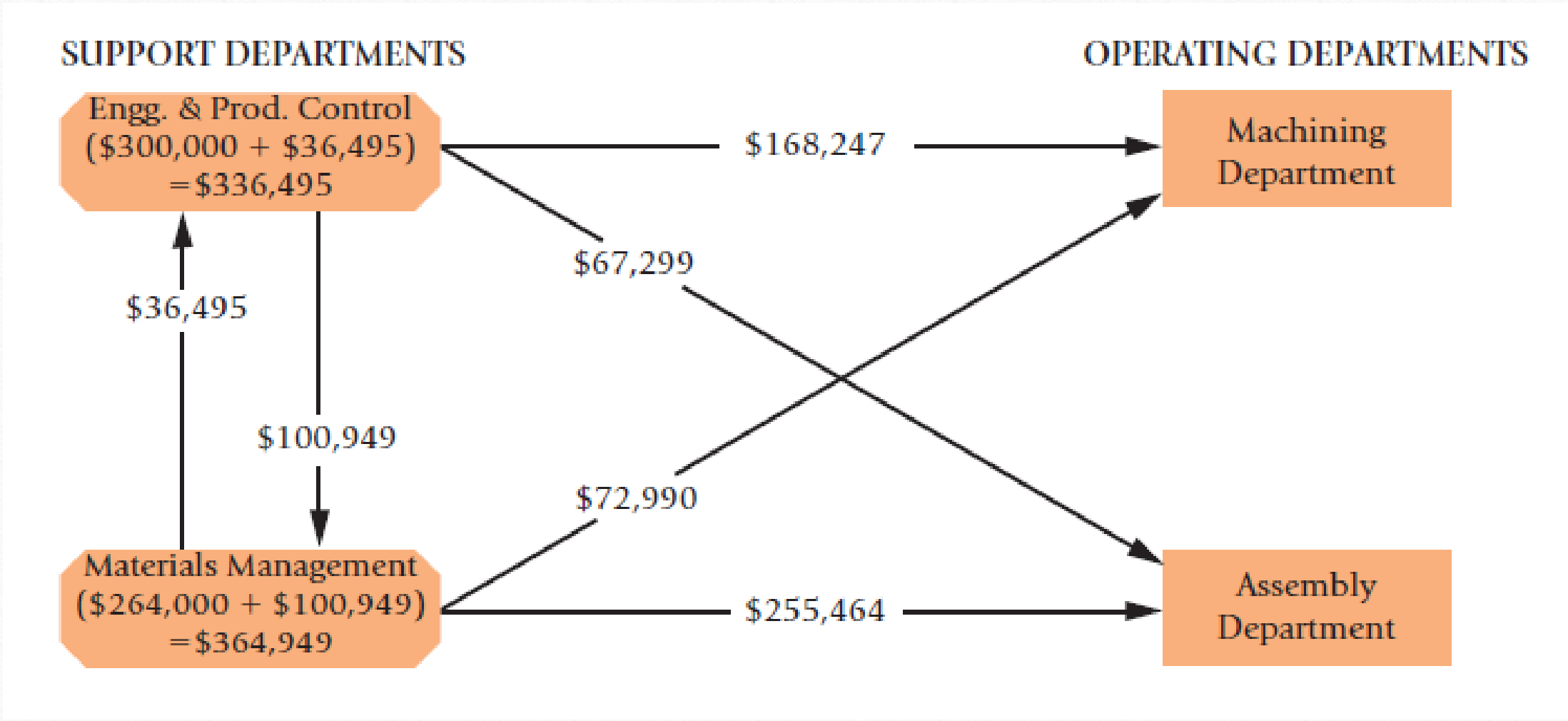
- **To Engineering and Production Control Department %10 × $364,949 = $ 36,495**
- **To Machining Department %20× $364,949 = $ 72,990**
- **To Assembly Department %70 × $364,949 = $255,464 Total $364,949**

Allocating the costs of **Engineering** and Production Control (**Second** support Department)


Engendering and Production Department
$336,495
50%
Machining department
%50 ×$336,495 = $168247,5
20%
30%
Assembly department
%20 ×$336,495 =$ 67299
Material Management department
%30 ×$336,495 =$100948,5

The $**336,495** in reciprocated budgeted costs of the **Engineering** and Production Control Department are allocated to:

- the **Materials** Management Department %**10** × **336,495** = $100948,5
- Machining Department %**50**× **336,495** =168247,5
- Assembly Department %**2** 0× **336,495** =67299


SUPPORT DEPARTMENTS
OPERATING DEPARTMENTS
Engg. & Prod. Control
($300,000 + $36,495)
=$336,495
Materials Management
($264,000 + $100,949)
=$364,949
Machining Department
Assembly Department
$168,247
$67,299
$36,495
$100,949
$72,990
$255,464

	SUPPORT DEPARTMENTS		OPERATING DEPARTMENTS		
	Engineering and Production Control	Materials Management	Machining	Assembly	Total
Budgeted overhead costs before any interdepartment cost allocations	$300,000	$264,000	$329,000	$227,000	$1,120,000
Allocation of Engg. & Prod. Control (3/10, 5/10, 2/10)[a]	(336,495)	100,949	168,247	67,299	
Allocation of Materials Management (1/10, 2/10, 7/10)[b]	36,495	(364,949)	72,990	255,464	
Total budgeted overhead of operating departments	$ 0	$ 0	$570,237	$549,763	$1,120,000

[a] Base is ($36,000 + $60,000 + $24,000), or $120,000 ; $36,000 ÷ $120,000 = 3/10; $60,000 ÷ $120,000 = 5/10; $24,000 ÷ $120,000 = 2/10.

[b] Base is (400 + 800 + 2,800), or 4,000 hours; 400 ÷ 4,000 = 1/10; 800 ÷ 4,000 = 2/10; 2,800 ÷ 4,000 = 7/10.


the end