BASIC MA TOOLS

ACCOUNTING

- **Cost allocation – fixed and variable cost, relevant costs**
- **Absorption costing**
- **Job order costing**
- **Process costing / Throughput accounting**
- **Activity based costing (“ABC”)**
- **Time driven ABC (“TDABC”)**

BASIC COSTING

- Cost can be classified various ways but total should be the same
- Why costing important?
- How to classify?
  - Direct versus indirect
  - Product versus period
  - Prime versus conversion
  - Fixed versus variable
- Garrison chapter 2

ABSORPTION COSTING

- Garrison Chapter 5
- Must be used for financial accounting reporting and tax filing
- Cost of goods sold include all product related variable and fixed cost (allocated)
- Use of predetermined usage rate to cost items during year, then year end will have variance to adjust for
- While not optimal for decision making (vs variable costing), it is required and more theoretically correct (accrual basis of accounting)

JOB ORDER COSTING

- Garrison Chapter 8
- Many different products
- Made to order
- Trace costs order to order basis
- Suits higher priced / costs / value unique products

PROCESS COSTING

- Garrison Chapter 9
- Single homogeneous product produced continuing basis with uniformly applied process on all units of production
- Record input material and process lost along the way
- Calculate cost of equivalent units of production for unfinished products at period end
- Back out cost of production

ACTIVITY BASED COSTING

- **An approach to the costing and monitoring of activities which involves tracing resources consumption and costing final outputs. Resources are assigned to activities and activities to cost objects based on consumption estimates. The latter utilize cost drivers to attach activity costs to outputs.**
- **Garrison Chapter 7**
- **Direct materials, direct labor, and other direct cost same treatment**
- **Uses various cost pools based on activities to allocate non-direct costs**

ACTIVITY BASED COSTING

- **Frequently used?**
- **Activities can be defined clearly and distinctly?**
- **Benefits > costs?**
- **High costs to set up, if process change very quickly then much lower benefits compared to costs required**
- **Do not separate into variable, fixed, or relevant, had to back track to normal costing system for other analysis**
- **Required multiple costing systems**
- **If ABC info not updated, provides even worse results**
- **Slacks and down time not fully accounted for**

ACTIVITY BASED COSTING

- **Modern manufacturing environment**
- **Short production runs and lots of variations (phones)**
- **Production changes specs frequently**
- **Production process changes frequently**
- **Multi-task of activities**
- **Some activities involves more than one cost and some cost involves more than one activity pool**

The following information is available for Dresden plc, which produces three products:

	A	*B*	*C*
Output (units)	20 000	25 000	2 000
	$/unit	$/unit	$/unit
Sales price	20	20	20
Direct material cost	5	10	10
Labour hours/unit	2	1	1
Wages paid at $5/hr			

Other information is as follows:

Total production overheads are $190 000

	$
Machining	55 000
Quality control and set-up costs	90 000
Receiving	30 000
Packing	15 000
	190 000

Cost driver data	*A*	*B*	*C*
Labour hours/unit	2	1	1
Machine hours/unit	2	2	2
No. of production runs	10	13	2
No. of component receipts	10	10	2
No. of customer orders	20	20	20

Required

Using ABC, show the cost and gross profit per unit for each product during the period.

Workings: recovery rates

1 *Machine cost* $\frac{\$55\,000}{40\,000 + 50\,000 + 4\,000} = \$0.5851$ per machine hour

2 *QC and set-up* $\frac{\$90\,000}{10 + 13 + 2} = \$3\,600$ per production run

3 *Receiving* $\frac{\$30\,000}{10 + 10 + 2} = \$1\,363.64$ per component receipt

4 *Packing* $\frac{\$15\,000}{20 + 20 + 20} = \$250$ per customer order

	A	*B*	*C*	*Total*
	$	$	$	$
Machining costs	23 404	29 255	2 341	55 000
Quality control & set-up	36 000	46 800	7 200	90 000
Receiving	13 636	13 636	2 728	30 000
Packing	5 000	5 000	5 000	15 000
Total overhead costs	78 040	94 691	17 269	190 000
Units produced	20 000	25 000	2 000	
Overhead cost/unit	$3.90	$3.79	$8.63	

	A	*B*	*C*
	$/unit	*$/unit*	*$/unit*
Direct materials cost	5.00	10.00	10.00
Direct labour cost	10.00	5.00	5.00
Production overhead cost	3.90	3.79	8.63
	18.90	18.79	23.63
Sales price	20.00	20.00	20.00
Gross profit/unit	1.10	1.21	(3.63)

TIME DRIVEN ACTIVITY BASED COSTING

- **See reading pack**

Concepts in Action

Hospitals Use Time-Driven Activity-Based Costing to Reduce Costs and Improve Care

In the United States, health care costs in 2012 exceeded 17% of gross domestic product and are expected to rise to 19.6% by 2021. Several medical centers, such as the M.D. Anderson Cancer Center in Houston and Children's Hospital in Boston, are using time-driven activity-based costing (TDABC) to help bring accurate cost and value measurement practices into the health care delivery system.

TDABC assigns all of the organization's resource costs to cost objects using a framework that requires two sets of estimates. TDABC first calculates the cost of supplying resource capacity, such as a doctor's time. The total cost of resources—including personnel, supervision, insurance, space occupancy, technology, and supplies—is divided by the available capacity—the time available for doctors to do their work—to obtain the capacity cost rate. Next, TDABC uses the capacity cost rate to drive resource costs to cost objects, such as the number of patients seen, by estimating the demand for resource capacity (time) that the cost object requires.

Medical centers implementing TDABC have succeeded in reducing costs. For head and neck procedures at the M.D. Anderson Cancer Center, the TDABC-modified process resulted in a 16% reduction in process time, a 12% decrease in costs for technical staff, and a 36% reduction in total cost per patient. Prior to implementing TDABC, managers did not have the necessary information to make decisions to reduce costs.

More broadly, health care providers implementing TDABC have found that better outcomes for patients often go hand in hand with lower total costs. For example, spending more on early detection and better diagnosis of disease reduces patient suffering and often leads to less-complex and less-expensive care. With the insights from TDABC, health care providers can utilize medical staff, equipment, facilities, and administrative resources far more efficiently; streamline the path of patients through the system; and select treatment approaches that improve outcomes while eliminating services that do not.

Sources: Based on R. S. Kaplan and S. R. Anderson, "The Innovation of Time-Driven Activity-Based Costing," *Cost Management* (March-April 2007); R. S. Kaplan and S. R. Anderson, "Time-Drive Activity-Based Costing" (Boston, MA: Harvard Business School Press, 2007); and R. S. Kaplan and M. E. Porter, "How to Solve the Cost Crisis in Health Care," *Harvard Business Review* (September 2011); and Louise Radnofsky, "Steep Rise in Health Costs Projected," *The Wall Street Journal* (June 12, 2012).

Dresden plc's receiving overheads for its production facility are $30 000, of this, $5 000 relates to non-receiving costs such as staff training and meetings. Each standard delivery takes 1 hour of receiving time, and each complex delivery takes 2 hours. Total receiving time available in the period is 200 hours. Product A entails 4 standard receipts and 6 complex receipts. Production is 20 000 unit of Product A.

Calculate:

(a) The capacity cost rate for receiving.
(b) The cost of each standard and complex delivery.
(c) The receiving cost to be allocated to Product A.

(a) $$\text{CCR} = \frac{\text{Total resource cost}}{\text{Total available capacity}}$$

$$= \frac{\$30\,000 - \$5\,000}{200 \text{ hours}}$$

$$= \$125$$

(b) Standard delivery cost= $125

Complex delivery cost = $125 × 2

= $250

(c)

Product A receiving cost	$
4 standard receipts @ $125	500
6 complex receipts @ $250	1 500
	2 000
Receiving cost per unit of Product A	$\frac{\$2\,000}{20\,000} = \$0.10$