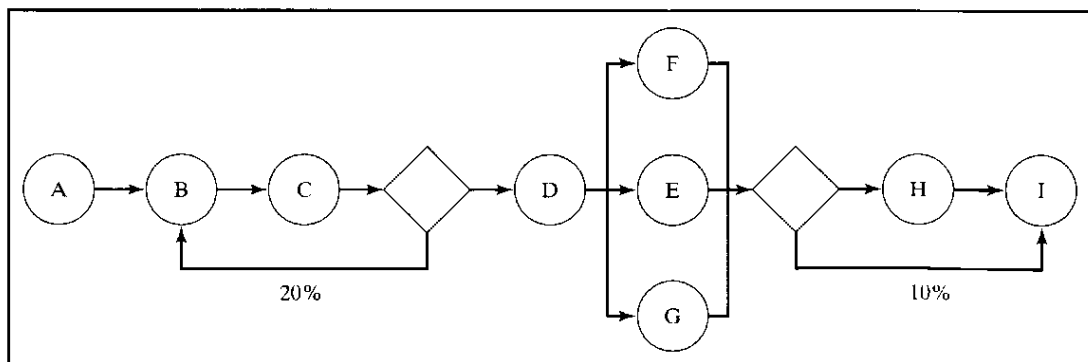


Tutorial 7 Analysing Business Processes

Objectives:

- Describe the relationship between these operational variables using Little's Law
- Analyse cycle time and capacity
- Apply the Theory of Constraints

1. Describe the terms work-in-process, throughput and cycle time. Using Little's law to define the general relationship between them.
2. A fast-food restaurant processes on average 1,200 customers per day (over the course of 15 hours). At any given time, 60 customers are in the store. Customers may be waiting to place order, placing an order, waiting for the order to be ready, eating, and so on. What is the average time that a customer spends in the store?
3. Consider the process flowchart in figure below.

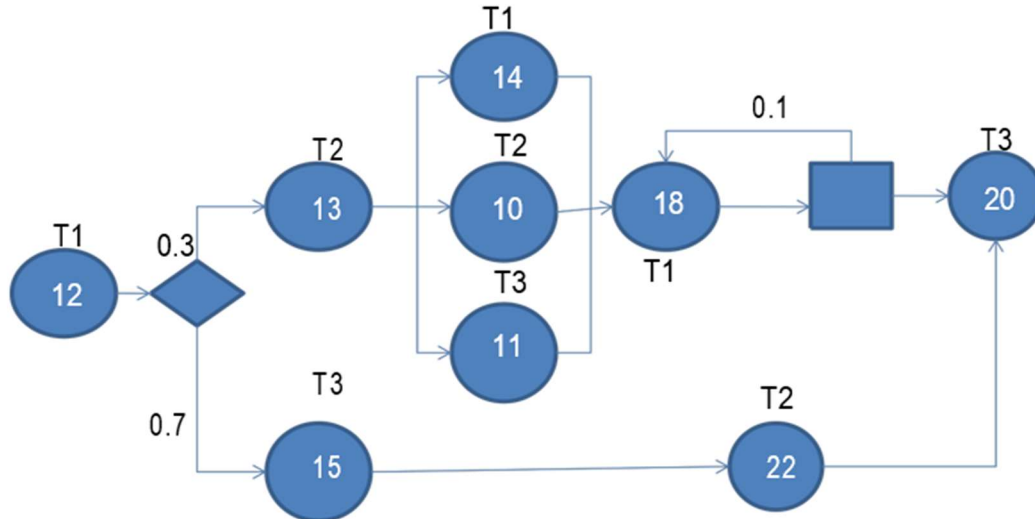


The estimated waiting time and processing time for each activity in the process are shown in table below. All times are given in minutes.

Activity	Waiting Time (in min.)	Processing Time (in min.)
A	7	3
B	5	8
C	4	2
D	10	5
E	7	2
F	0	3
G	2	5
H	8	9
I	2	8

- a) Calculate the average cycle time for this process.
- b) Calculate the cycle time efficiency.

4. 3 teams T1, T2 and T3 work in the process depicted in the figure below, where the numbers in each activity indicate processing times in minutes. Calculate the capacity utilization of the process assuming that the throughput is one job per hour.



5. ^{1*} Use the theory of constraints and data in the following tables to determine how many units of each job type should be completed per week in order to maximize profits. Consider that the availability is 5,500 minutes for Resource 1 (R1), 3,000 minutes for R2 and 8,000 minutes for R3.

Job	Activity routing	Demand (units per week)	Profit Margin
A	1,4,7	80	\$10
B	2,3,5,6	100	\$15
C	1,3,5,6,7	120	\$20

Activity	Time (min)	Resource
1	20	R1
2	12	R2
3	7	R2
4	18	R1
5	9	R3
6	29	R3
7	8	R3

^{1*} This question to be continued in next tutorial.

Use the remaining time to discuss with your tutors about your topic for Task 2 of Assignment 2.