

AD 715: Quantitative and Qualitative Decision-Making Class 9

AGENDA

- A** Prior to Class 9 **Individual Exercise IW9-1:** Working with the Tutorial for AD 715 “Operations Management and D-M”
- B** 5 min **Review of Weeks 5 to 8 and Plan for Week 9**
- C** 20 min **In-Class Review Session:** Preparation for submission of the managerial report Team Assignment 3 PART 1
- D** 15 min **Lecture 9, Part 1:** Operations Management and Decision Making in Organizations **1** **2**
- E** 35 min **In-Class Team Exercise TW9-1:** Applying quantitative and qualitative decision support methods for the selection of starting assumptions for a new decision cycle “Functional Area Operations Management” and for the analysis of the output parameters of the new business project Microbrewery **4**
- 15 min break**
- F** 10 min **Lecture 9, Part 2:** Operations Management and Decision Making in Organizations **3**
- G** 5 min **Bb Discussion W9:** Research in Preparation for Assignment 3 PART 2
- H** 10 min **In-Class Team Exercise TW9-2:** Preparing an Implementation Plan with the help of the Process Mapping and/or the Value-Stream Mapping (reference: Heizer Ch. 7)
- I** 40 min **In-Class Review Session:** Preparation for submission of the managerial report Team Assignment 3 PART 1 (continued)
- J** After Class 9 **Individual Exercise IW9-2:** Working with the Tutorial for AD 715 “Optimization Analysis in Solver”

Review of Weeks 5 to 8 and Plan for Week 9

AD715 A7

W's 1 & 2

W's 3 & 4

W's 5 & 6

W's 7 & 8

W's 9 & 10

W's 11 & 12

W's 13 & 14

Students, Section
A7

43

Final Present

Max Gr. Pts	Pts	2+2+5=9	2+2+5=9	2+2+5+10=19	2+2+5+10=19	2+2+5+8=17	5	12 +10	100
Progress	%	9%	18%	37%	56%	73%	78%	100%	100%
Max Pts									
Bb Discussions	20	D1: 1.77/2	D3: 1.92/2	D5: 1.9/2	D7: X.X/2	D9: X.X/2			
		D2: 1.90/2	D4: 1.88/2	D6: X.X.2	D8: X.X/2	D10: X.X/2			
Quizzes	25	Q1: 4.36/5	Q2: 4.47/5	Q3: 4.34/5	Q4: 4.31/5	Q5: X.X/5			
Assignments	50			A1: 9.2/10	A2: X.XX/10	A3-1: X.XX/8		A3-2 + FP: XX.XX	
Engagement	5						E: X.XX/5		
Average	Pts	8.06/9	16.33/18	XX.XX/37	XX.X/56	XX.XX/73	XX.XX/78	XX.XX/100	
	%	90%	90%	XX%	XX%				

Week 5, Class 9

Week Date	Modules & Topics	Readings	Discussion Topics	Individual Exercises & Assignments & Quizzes
Week 9 A1: 11/17 – 11/23 A2: 11/17 – 11/23 A7: 10/28– 11/3 A8: 11/29 – 11/4 Class #9 A1: 11/17(Tue) A2: 11/17(Tue) A7: 10/28 (Wed) A8: 10/29 (Thu)	Lecture 9 Operations Management and Decision-Making Part 1: D 1 2 Part 2: F 3	e-Reserve Heizer, Ch. 1, 7 Recommended Readings W9: → What to Expect from Agile Lecture Notes for L9	Review of Weeks 5 to 8 and Plan for Week9 B Bb Discussion Forum W9 G	Individual Exercise W9-1 (to be completed prior to Class 9): Working with the Tutorial for AD 715 “Operations Management and Decision-Making” A Individual Exercise W9-2 (to be completed after Class 9): Working with the Tutorial for AD 715 “Optimization Analysis in Solver” J In-Class Team Exercise TW9-1: Applying quantitative and qualitative decision support methods for the selection of starting assumptions for a new decision cycle “Functional Area Operations Management” and for the analysis of the output parameters of the new business project Microbrewery E In-Class Team Exercise TW9-2: Preparing an Implementation Plan with the help of the Process Mapping and/or the Value-Stream Mapping H In-Class Review Session: Preparation for submission of the managerial report Team Assignment 3 PART 1 (Tasks 3-0, 3-1, 3-2.1, 3-3.1 -- functional areas Marketing Management and Financial Management) C Section A7, Team Assignment 3, PART 1 Due Tuesday Nov-4 at 11:59pm ET I

L9: LEARNING OBJECTIVES

After you complete this lecture, you will be familiar with the following concepts:

- 1 Operations Management and Decision Making – An Introduction
- 2 Operations Management Process & Corporate Business Strategy: horizontal and vertical integration of the decision making
- 3 Operations Management: Decision Making Focus & Decision Support Tools
- 4 Corporate Management, Operations Management, and Decision Making Explained with the Help of the Business Running Case & the Business Simulation for AD715

Preparation for submission of the managerial report Team Assignment 3, PART 1

TITLE: What is the Rationale for Investing in a New BrewPub?

Conceptual Study by the Owner of an Existing Restaurant/Tavern (Based on a running case and a business simulation package)

Read the Business Running Case: The decision making process in evaluating the rational for investing in a new BrewPub (preparation for a conceptual study by the owner of an existing restaurant/tavern)

Learn how to use a business simulation package, specifically developed for this course, in combination with selected decision support tools covered in this course.

Due Date: Team Assignment 3 Part 1, Week 9, Day 7 at 11:59pm ET

Possible Points: 8

- Task 3-0 (A3/Part 1):** Structure and present your paper in the form of a Managerial Report, with a cover page, table of content, main body, appendices. Recommended length of the main body of Part 1 (without the preparatory and appended parts): 15 pages APA format. **(max 1 points)**
- Task 3-1 (A3/Part 1):** Based on the business simulation 'Strategies and Decision Support in Organizations' and the business running case, define and present the overall goals and objectives from the business owner point of view. **(max 2 points)**
- Task 3-2.1 (A3/Part 1):** Formulate your preparation for a decision making based on a research of the following areas of your study -- Marketing Management, Financial Management. **(max 2.5 points)**
- Task 3-3.1 (A3/Part 1):** For each one of the functional areas apply at least two from the introduced and discussed in this course decision support tools (e.g. Decision Tree Analysis, Sensitivity Analysis, SWOT Analysis, PESTEL Analysis, Break-Even Point Analysis, What-If-Analysis, Optimization Analysis, Risk Analysis, others). **(max 2.5 points)**

Preparation for submission of the managerial report Team Assignment 3, PART 1



Resources

- Strategic location
- Population size
- Existing customers

Marketing

- Local advertising
- Trade shows
- Social Media
- Promotional events

Innovation

- Capacity for new technology
- POS system
- Inventory control

Operations

- Efficiency of production
- Wholesale production
- Retail production

Finance

- Increase of penetrated market with new product
- Total ROI
- Financial forecast

People

- Salesmen
- Office assistant
- Consultants



Resources

- Competition in close proximity
- New to the industry
- Lack of reputation

Marketing

- Website URL
- Branding establishment
- Community outreach

Innovation

- Website URL
- Lack of network security
- New systems for efficiency

Operations

- Wholesale distribution strategy
- Franchise

Finance

- Loan/debt
- Limited financial base
- Hidden/unknown costs

People

- Brew master
- Marketing personnel



Political

- Federal brewing permit
- Brewers bond
- Operating permit

Economic

- Expand customer base
- Improve costs
- Expand company personnel

Social

- Increase marketing strategy
- Social media ads
- Create website
- Community outreach

Technology

- Internet and software
- Network security
- Accounting software

Legal

- Training on regulations
- Wholesalers license
- Food & Safety compliance

Environmental

- Wastewater treatment
- Recycling
- Decrease energy consumption



Political

- Policy changes
- Taxation
- Interest rates
- Labor cost
- Health & Safety laws

Economic

- Economic downturn
- Downsizing
- Increased taxes

Social

- Customer retention
- Lack of community participation
- Social lifestyle

Technology

- System Failures
- Security breaches
- Lack of understanding new technology

Legal

- Food & safety laws
- Operating laws
- Alcohol consumption laws

Environmental

- Workplace efficiency
- Environment regulations
- Availability of non-renewable goods
- Pollution

P

- Federal and State Taxes on ingredients, alcohol, and marketing
- Mandated campaigns on consequences of drinking
- Advertising is heavily monitored and needs approval from government

E

- Competition is heavy in the industry in general
- There are other niche brewpubs or pubs in the city
- Retail shelf space could be difficult in the future
- Economical shifts can impact consumer buying power for commodity items like beer

S

- Religious people who oppose drinking in Madison will likely not visit Ruka Loui's
- Trouble from customers who drink too much
- Light beer lovers may not choose Ruka Loui's as their first choice
- Wine and liquor trends - becoming more popular

T

- Purchasing tech for efficient distribution
- Learning new processes for efficient distribution
- Machinery fails that cause delays, closings, and give customers to competition

E

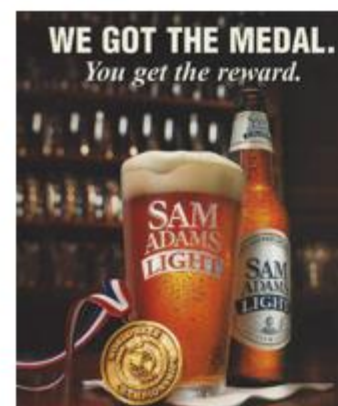
- Waste water treatment facility
- Recycling materials
- Weather-related decreases in customer traffic
- Clean energy alternative like solar panels
- Seasonal promotions based on changes in climate during the year

L

- Enforcing drinking age
- Alcohol consumption laws
- Licensing of products
- Acquisition and maintenance of alcohol license

Preparation for submission of the managerial report Team Assignment 3, PART 1

Strengths	Weaknesses	Opportunities	Threats
Established brand Reputable quality Local to Boston Seasonal beers	Getting fixed costs to decrease Marketing budget Training	Trade shows Advertisements Growth in demand Loyalty program Non-alcoholic beer	New and existing competitors Negative reviews Rising costs of ingredients Uncertain economic environment Gluten-free trend



Preparation for submission of the managerial report Team Assignment 3, PART 1

Political	Economic	Social	Technological	Environmental	Legal
Rules against overconsumption Taxes on beer sales (taxation policy) Highly regulated: • Production • Distribution • Advertisement	Cost reduction Rise of packaging prices Interest rate Unemployment/wage cost	Popularity of beer Health concerns Preference of alcohol Population demographics	Brewing process No R&D budget Increase in efficiency Innovation in beer production	Green/eco-friendly companies Using recycled bottles Acquisitions and mergers	Drunk driving Restrictions in advertising Age restrictions

**TAX
INCREASE**



Strengths

Weaknesses

Opportunities

Threats

Strengths

- Locally owned and produced
- Having a continuous innovation to reduce costs
- High flow of people around the area

Weaknesses

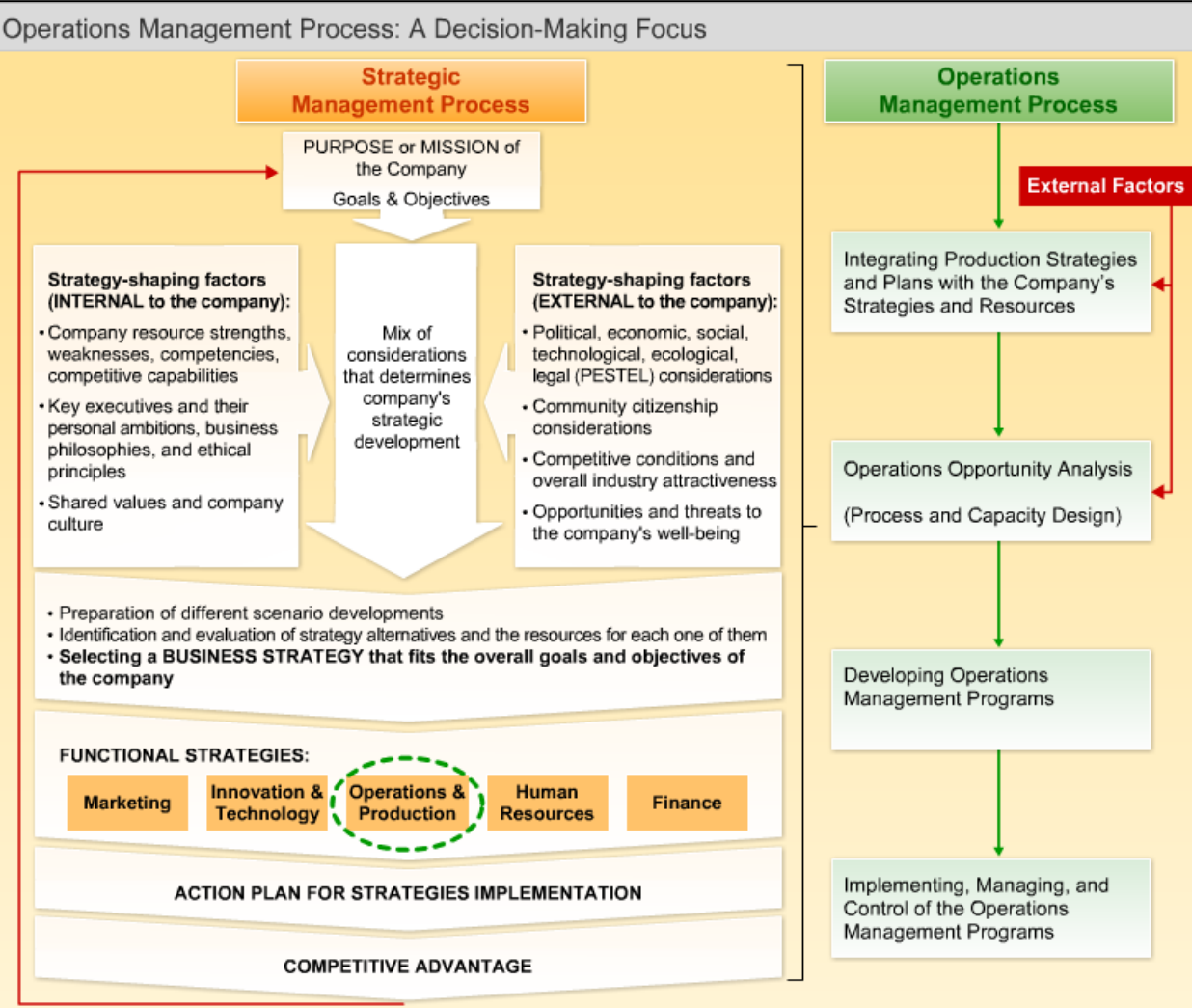
- Relatively new brand
- Social media presence in the local market
- Ability to attract other demographics
- People trust their local places and is hard to change their mindset

Opportunities

- Expand more quality products to the marketplace
- Learn from direct competitors
- Opportunity to sell with more competitive prices

Threats

- Other direct small craft beers
- Consumer preferences may change at any given time
- Competitors have extended portfolios and established customers (included premium and non premium beers)



What is operations management?

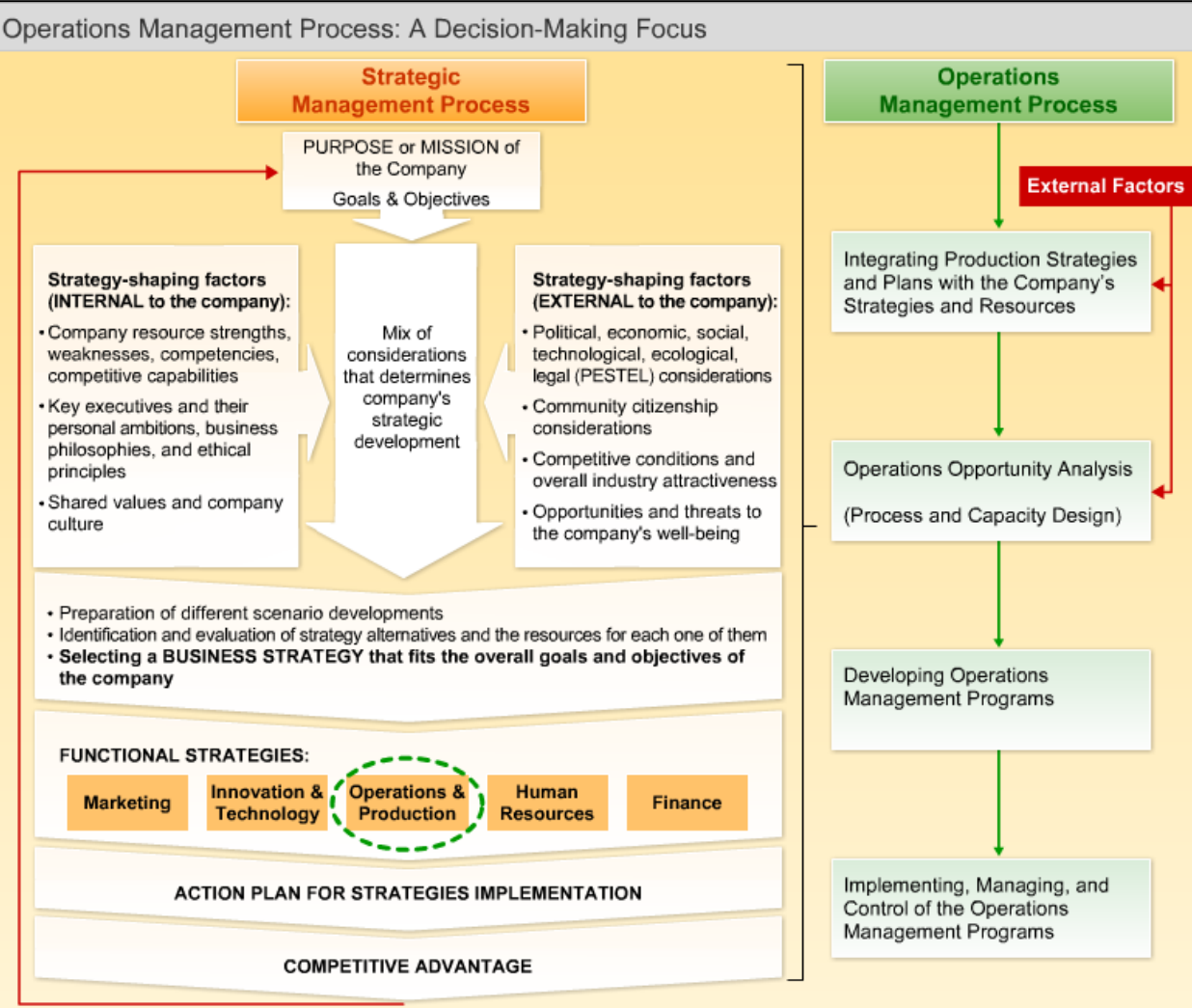
- Production is the process of creation of goods and services
- Operations Management (hereinafter also OM) defined: activities that relate to the creation of goods and services through the transformation of inputs to outputs

All organizations perform (are melting together) at least three of its main functions to create goods and services:

- marketing, which generated demand
- operations/production, which creates the product
- finance and accounting, which tracks how well the organization is doing, pays the bills, and collects the money

Why study operations management?

1. To learn how people organize them selves for productive enterprise
2. To learn how goods and services are produced
3. To understand what operations managers do
4. Because OM is a costly part of an organization



What operations managers do:

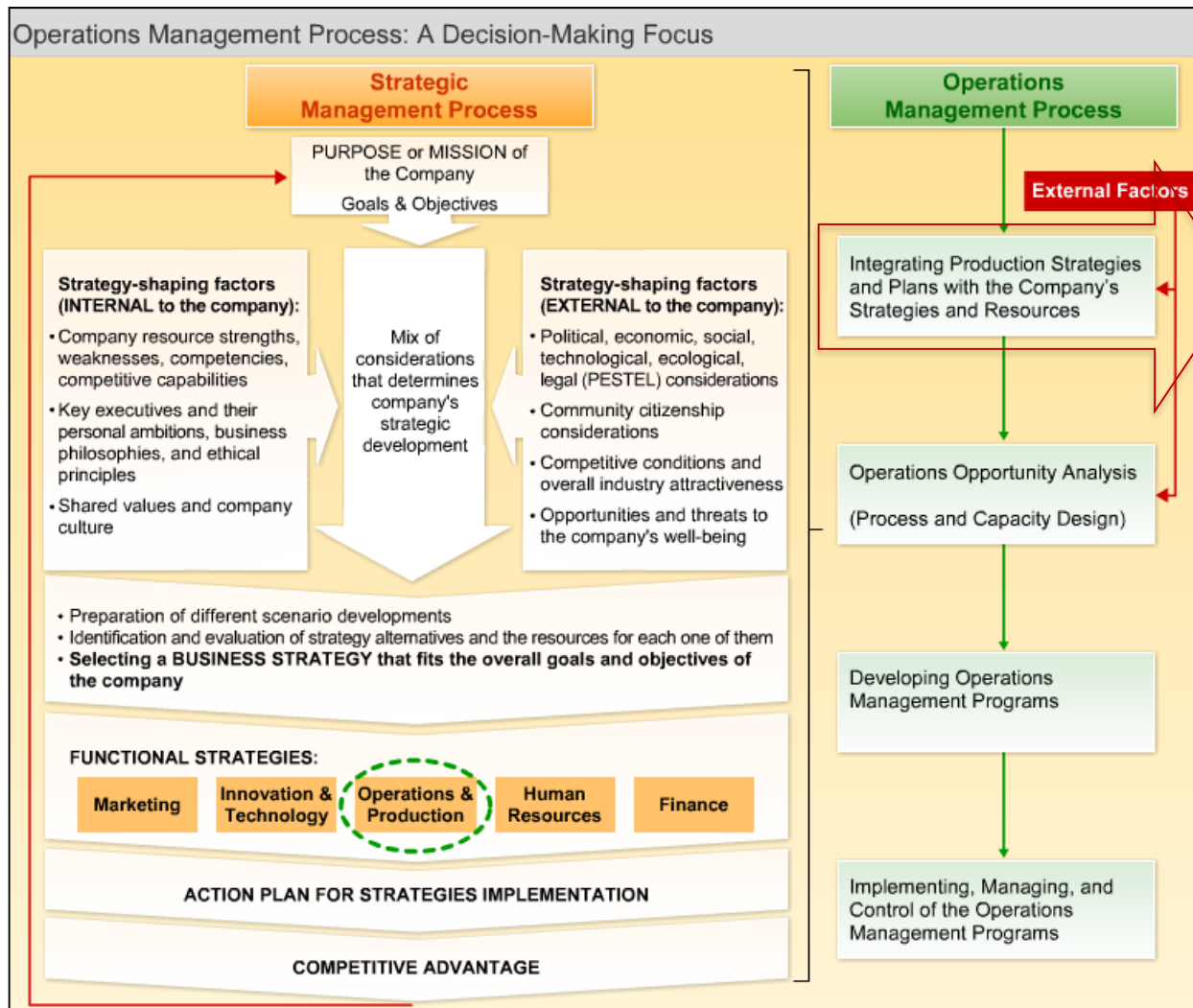
Key Decision Areas

Issues

1. Design of goods and services What good or service should we offer?
How should we design these products?
2. Managing quality How do we define the quality?
Who is responsible for quality?
3. Process and capacity design What process and what capacity will these products require?
What equipment and technology is necessary for these processes?
4. Location strategy Where should we put the facility?
On what criteria should we base the location decision?
5. Layout strategy How should we arrange the facility?
How large must the facility be to meet our plans?
6. Human resources, job design, and work measurement How do we provide a reasonable work environment?
How much can we expect our employee to produce?

Operations Management Process & Corporate Business Strategy:

horizontal and vertical integration of the decision making



Four Process Strategies:

1. **Process Focus:** A facility organized around processes to facilitate low-volume, high-variety production
2. **Repetitive Process:** A product-oriented production process that issues modules (Modules: Parts or components of a product previously prepared, often in a continues process)
3. **Product Focus:** A facility organized around products; a product-oriented, high-volume, low-variety production
4. **Mass Customization:** Rapid, low-cost production that caters to constantly changing unique customer desires

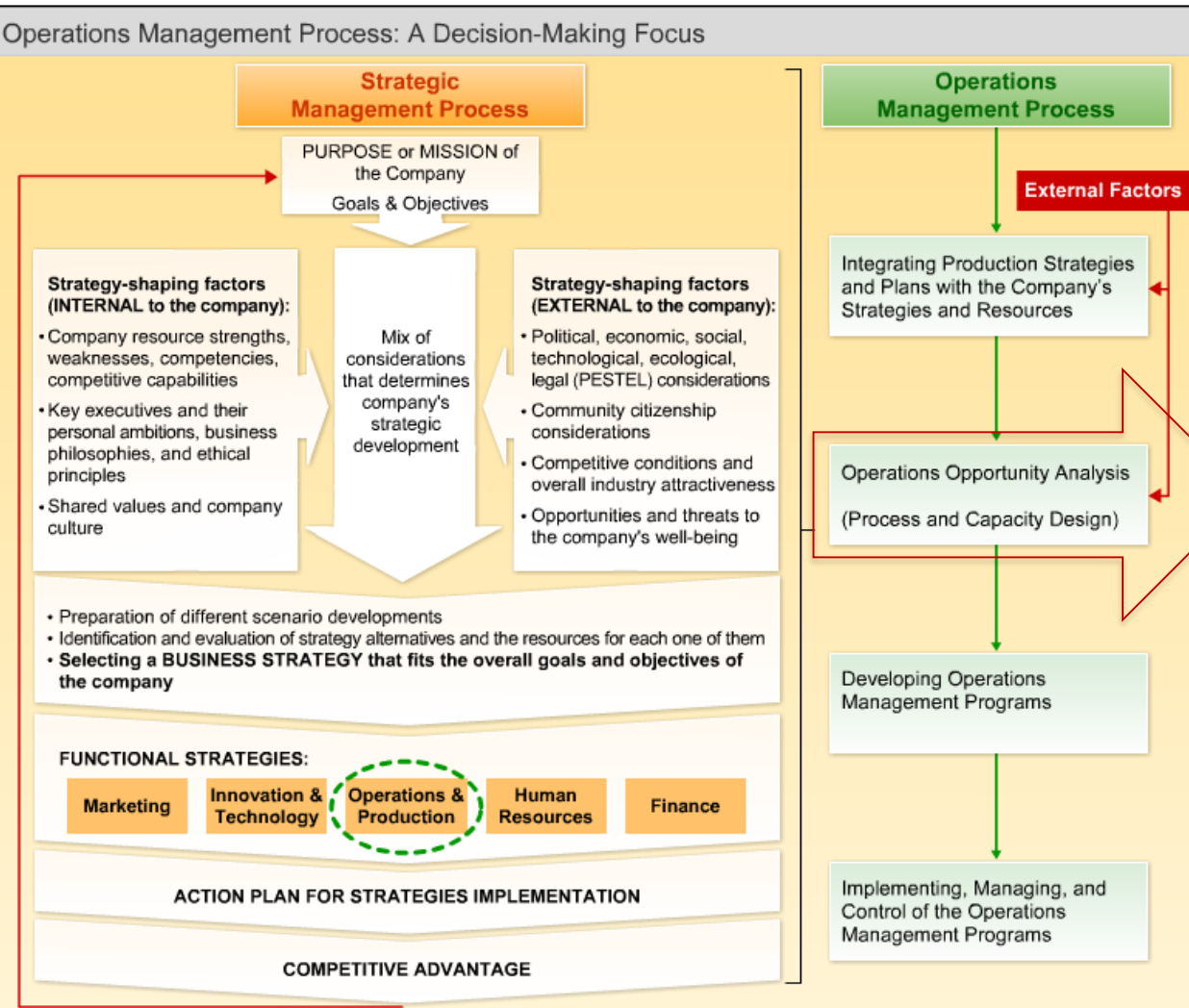
Comparison of process choices:

- **Build-To-Order:** Produce to customer order rather than to a forecast
- **Postponement:** The delay of any modifications or customizations to a product as long as possible in the production process
- **Crossover Chart:** A chart of costs at the possible volumes for more than one process

Process Analysis and Design

- **Flowchart:** A drawing used to analyze movement of people or materials
- **Time-function mapping:** (or process mapping) A flowchart with time added on the horizontal axis
- **Value-stream mapping:** A tool that help managers understand how to add value in the flow of material and information through the entire production process
- **Process charts:** Charts that use symbols to analyze the movement of people or material
- **Service blueprinting:** A process-analysis technique that lends it self to a focus on the customer and the provider's interaction with the customer

Operations Management Process & Corporate Business Strategy: horizontal and vertical integration of the decision making



Constraint Management

Capacity: The 'throughput', or number of units a facility can hold, receive, store, or produce in a period of time.

Capacity Decisions often determine

1. Capital requirements and therefore a large portion of fixed costs
2. Whether demand will be satisfied or whether facilities will be idle

Capacity planning:

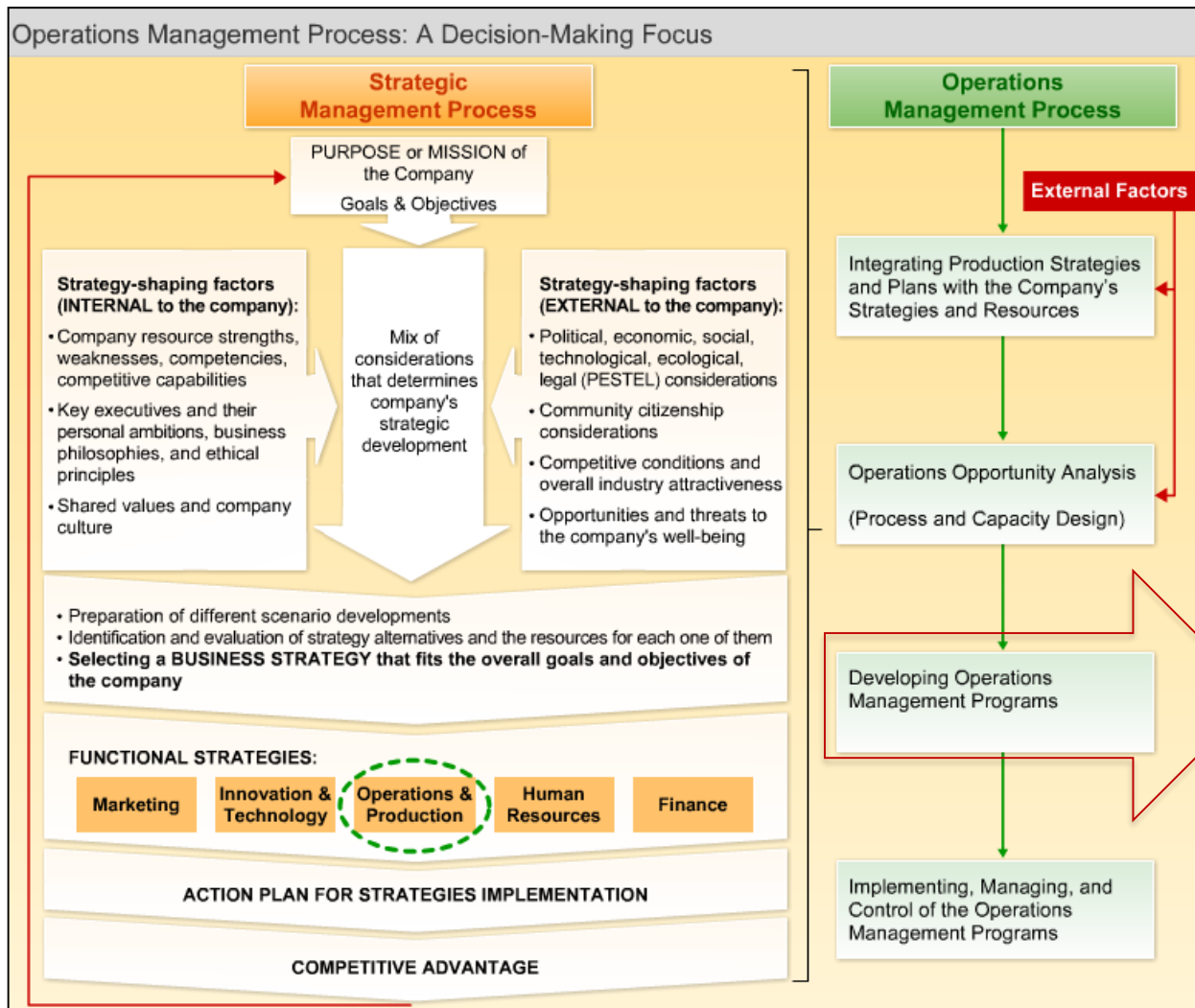
1. Long-range (> 1 year) – adding facilities and long-time equipment
2. Intermediate-range (3–18 months) – adding equipment, personnel, add shifts; subcontracting; building or using inventories
3. Short-range (< 3months) – scheduling job and people, and allocating machinery

Design capacity: The theoretical maximum output of a system in a given period, under ideal conditions.

Effective capacity: The capacity a firm can expect to achieve, given its product mix, methods of scheduling, maintenance, and standards of quality.

Utilization: Actual output as a percent of design capacity.

Operations Management Process & Corporate Business Strategy: horizontal and vertical integration of the decision making



The **main purpose of the operations management programs** is,

- based on the overall business strategy of the company,
- to describe and address all key decision areas and issues (discussed earlier in this module)
- by offering the most rational way for the utilization of the corporate resources in the production and operations of the company.

The theoretical foundations needed for the successful design and implementation of an operations management program are covered in greater details in three of our Boston University online and on-campus graduate programs:

- 'Supply Chain Management'
- 'Project Management' and
- 'Enterprise Risk Management'.

Operations Management Process & Corporate Business Strategy: horizontal and vertical integration of the decision making

Exercise: Using Figure 7.6 and based on the [Business Running Case for AD715](#), describe the process of brewing and distributing of beer in the new BrewPub and analyze an opportunity for improvement in this process.

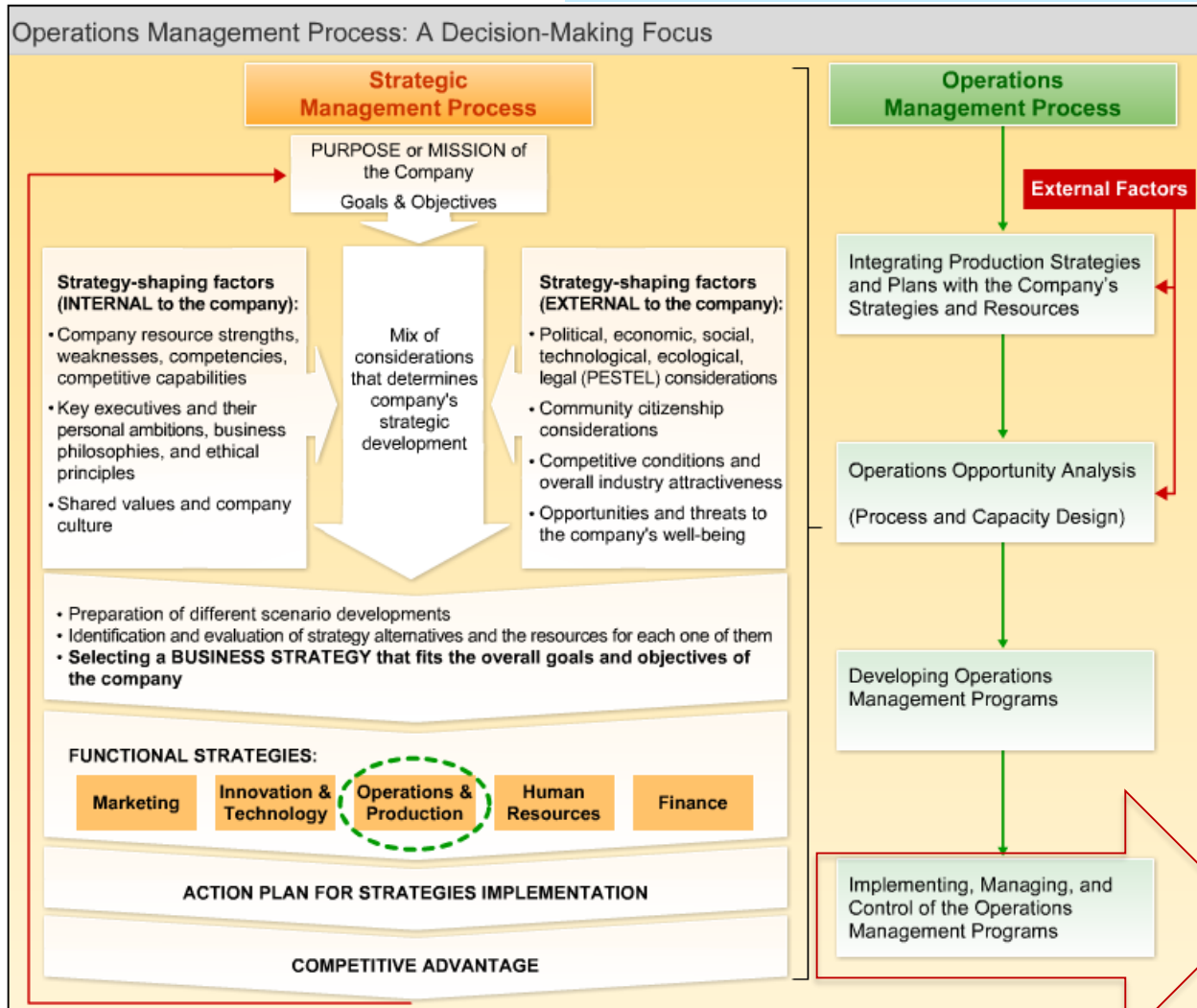
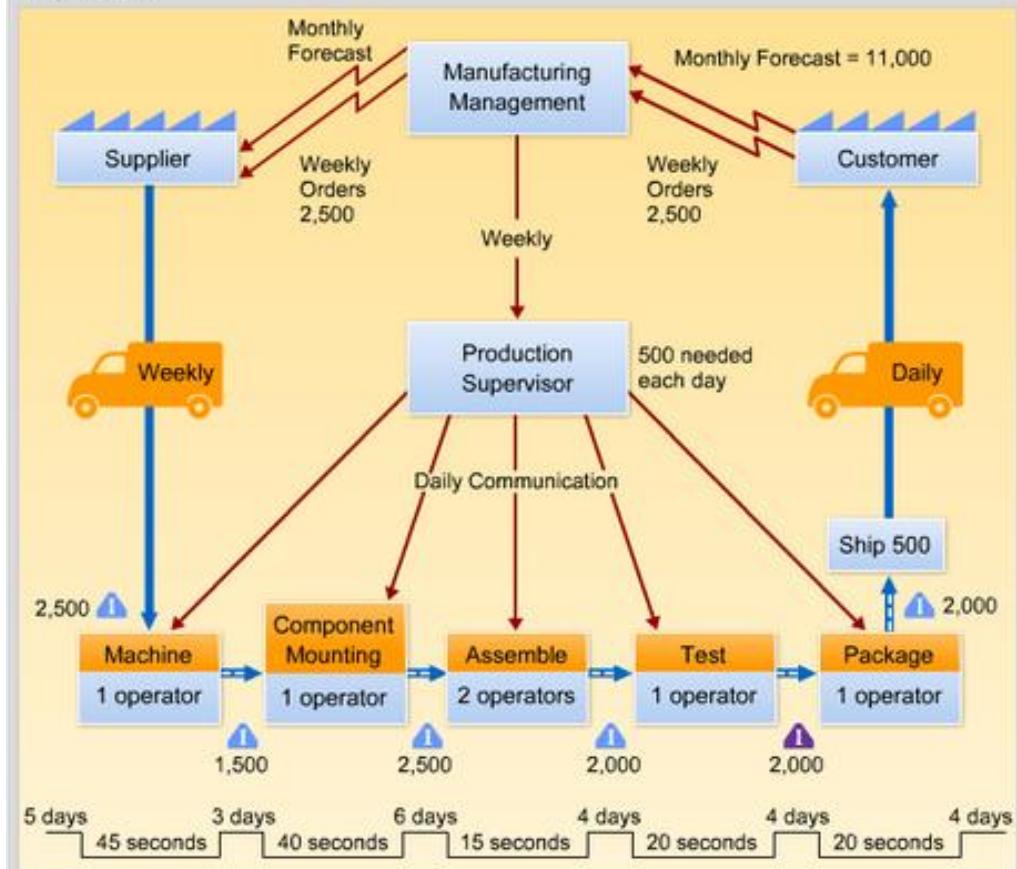


Figure 7.6



Insight ▶ From Figure 7.6 we note that large inventories exist in incoming raw materials and between processing steps, and that the value-added time is low as a proportion of the entire process.

Learning Exercise ▶ How might raw material inventory be reduced? [Answer: Have deliveries twice per week rather than once per week.]

In-Class Team Exercise TW9-1: Applying quantitative and qualitative decision support methods for the selection of starting assumptions for a new decision cycle “Functional Area Operations Management” and for the analysis of the output parameters of the new business project Microbrewery

ACTION PLAN

TW9-1 Task 1: Corporate Management, Operations Management, and Decision Making Explained with the Help of the Business Running Case & the Business Simulation for AD715

FOLDER: Team Exercise W9-1

TW9-1 Task 2: Operations Management and Decision Making Process:
An Example with Constraint Management & Cut-Off Point

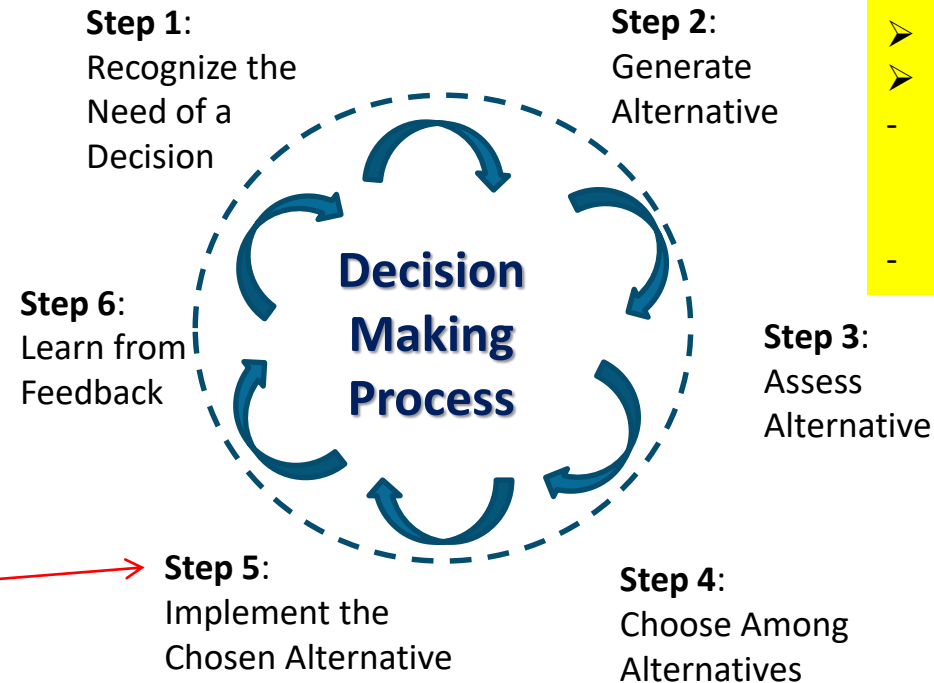
TW9-1 Task 3: Operations Management: Implementing the Simulation v401, tab Mktg-Mgt

TW9-1 Task 4: Operations Management: Implementing the Simulation v401, tab Oper-Mgt

Support Tool: Demo Exercise PART 3 (section: Operations Management and Decision-Making)

ACTION PLAN**Operations Management: Implementing the Simulation v401 – Balancing Supply with Demand****EXAMPLE:** Cutoff Point**Constraint Management:**

- > Capacity planning
- > Capacity analysis
- > Process time

**An Example with Constraint Management
(Reference to Demo PART 3, tab Oper-Mgt)**

- **Generate Values for Technology Utilization** (Goals)
 - Overall Production (ann) [%]
 - Overall Production (months) [%]
 - BEP [\$]
- **Process Design** optimize
- **Capacity Planning** TAB 'Oper-Mgt'
 - Production Structure
 - >>> Targeted Market Size (Prod/FYs)
 - >>> Sales Projections (Prod/FYs)
 - Cost Structure >> Variable Costs

Assess Different Alternatives:

1. Targeted M-Size (Prod/FYs) **only**
2. Sales Projections (Prod/FYs) **only**
3. Variable Costs (Other-C) **only**
4. Combination 1 + 2
5. Combination 1 + 3
6. Combination 2 + 3
7. Combination 1 + 2 + 3
8. Others

Compare Alternatives

- (TAB 'Performance'/Alternatives)
- > Results Indicators
 - > Performance Indicators

Plan B: Recommended
to students who are
not trained to work
with MS Project

Optional:
Implementation
Plan in MS
Project (bb9.1)

IMPLEMENTATION PLAN**EXAMPLE:** L9 Part 2 **3**

ACTION PLAN

Operations Management and Decision Making Process: An Example with Constraint Management & Cut-Off Point

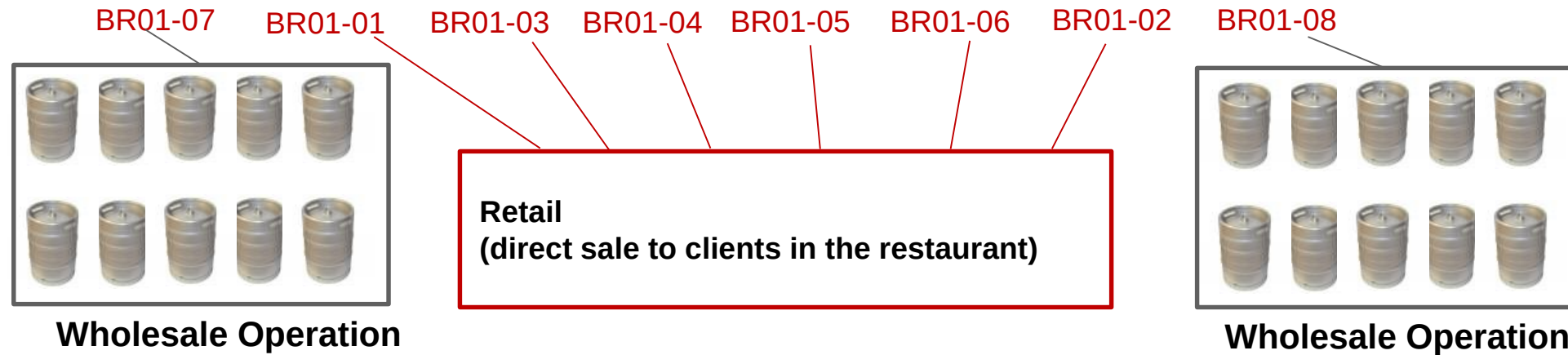
Constraint Management:

- > Capacity planning
- > Capacity analysis
- > Process time

**Combination
fermentation/serving tanks,**
capacity 155galon = 1,240 pints
Process Time
Production Cycle/Tank = 7 days



**Example (B-Sim, Marketing
Management)**



Example: Capacity planning

Example: Capacity analysis

Demo Exercise PART 3



½ Barrel Beer Keg
Capacity = 124 pints

Operations Management and Decision Making Process: An Example with Constraint Management & Cut-Off Point



About the Cut-off point

In the business running case we have 8 production tanks. **Each** tank can hold 1,240 pints (the same as 10 kegs). I can store beer in the tanks - *but only for 30 days*. I really want to sell “a tank’s worth” of beer within 2-3 weeks. Or, I can sell the entire tank to a wholesaler, for **them** to sell in kegs.

Currently in the simulator, the cut-off point is 0.8 for all of the beer types. I need to consider that customers like variety. Offering only two types of beer, for example, would not work for a brew-pub style restaurant.

By saying my cutoff point is 0.8, I am saying that if the demand is less than 0.8 (80% of a tank), then I will not manufacture the beer type for this tank. This is the same as saying **if demand is less than 992 pints, I don’t make this tank of beer**. The opposite is also true – I **will** make the beer if the demand is above 992.

Reducing the cutoff point further is like saying: “*I will manufacture beer of this particular **product even if there is a smaller demand***”. Example: If I reduce it from the existing 0.8 to 0.6, that required demand *drops* from 992 to 744 pints.

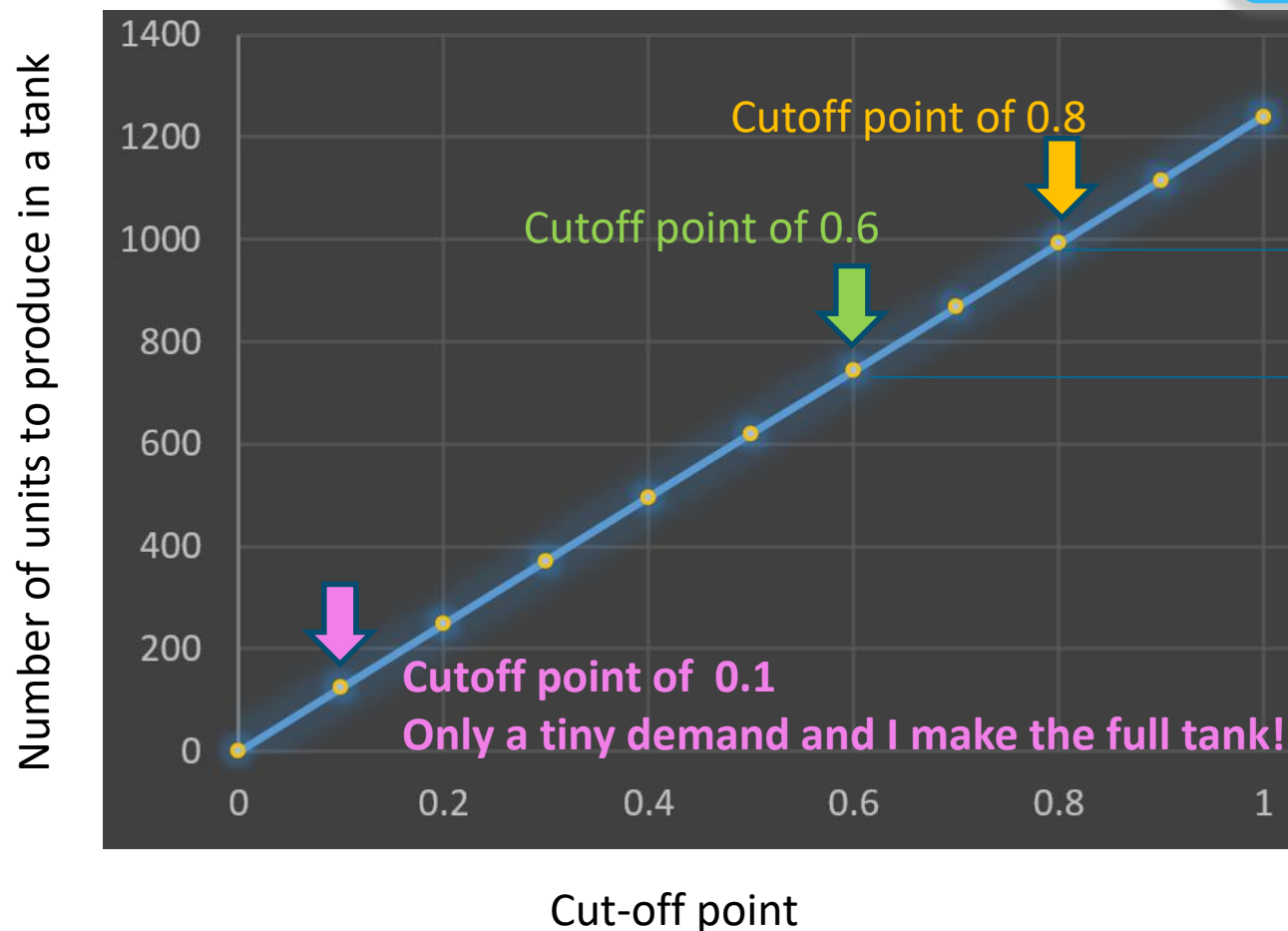
Remember that we have the “Special Offer” to account for ‘leftover beer’ amounts, so that ‘extra’ beer is not fully wasted – you will at least receive reduced revenue from sales of Special Offer beer.

Operations Management and Decision Making Process: An Example with Constraint Management & Cut-Off Point

About the Cut-off point



We have 8 tanks. Let's look at **one**.



Full tank = 1240 units

If demand is 992 units or more,
I make a tank of this beer (and vice versa)

If demand is 774 units or more,
I make a tank of this beer

Lowering the cutoff point...

- Increases the variety of beer
- Increases the amount of waste/leftovers
- It's a trade-off
- Decision tools help you make the proper trade-off



ACTION PLAN

Cycle 2: ANALYSIS

3 Targeted Market Size (per product and FY)

Product ID	Distribution	FY-1		FY-2		FY-3	
		100%	134,654	100%	143,715	100%	152,424
BR01-01	[retail]	25.00%	33663.5	25.00%	35928.6	25.00%	38106.1
BR01-02	[retail]	25.00%	33663.5	25.00%	35928.6	25.00%	38106.1
BR01-03	[retail]	17.00%	22891.2	17.00%	24431.5	17.00%	25912.2
BR01-05	[retail]	15.00%	20198.1	15.00%	21557.2	15.00%	22863.7
BR01-06	[retail]	18.00%	24237.7	18.00%	25868.6	18.00%	27436.4

4 Sales Projections (business unit: next 36 months of operations)

FY-1

		BR01-01 [retail]	BR01-02 [retail]	BR01-03 [retail]	BR01-05 [retail]	BR01-06 [retail]	BR01-07 [wholesale]	BR01-08 [wholesale]
Total Demand	[units]	33,663	33,663	22,891	20,198	24,238	113,659	113,659
Total Supply	[units]	32,280	33,133	21,080	17,360	24,800	109,080	111,947
Excess Demand	[units]	1,384	531	1,811	2,838	(562)	4,579	1,712

FY-2

Total Demand	[units]	35,929	35,929	24,431	21,557	25,869	114,785	114,785
Total Supply	[units]	34,459	34,565	21,080	18,600	24,800	110,621	110,515
Excess Demand	[units]	1,470	1,363	3,351	2,957	1,069	4,164	4,270

FY-3

Total Demand	[units]	35,929	35,929	24,431	21,557	25,869	114,785	114,785
Total Supply	[units]	34,459	34,565	21,080	18,600	24,800	110,621	110,515
Excess Demand	[units]	1,470	1,363	3,351	2,957	1,069	4,164	4,270

Cycle 5: **tab Mkg-Mgt**
(underlying cycle 4)

NEXT

HINT:

The ratio Excess Demand/ Total Demand should be less than +10% or -10%

Example: $1,384 / 33,663 = 4\%$

Plan for possible changes in Cycle 5:

Option 1: For different products and FYs, in Task 3 change the percent for Targeted Market Size (**caution** – this change will affect all three FY's)

Example for BR-1-05: (FY-1 Cycle 2)
FY-1 = FY-2 = FY-3 = 15%

Option 2: For different products and FY's, in section Task 4 change the Percent Monthly Demand if the ratio is greater than 10%

Example for BR-1-05: (FY-1 Cycle 2)
 $2,838 / 20,198 = 14\%$

ACTION PLAN

Cycle 5: tab Mkg-Mgt (underlying cycle 4)

Option 1: For different products and FYs, in Task 3 change the **percent** for Targeted Market Size

Cycle 6:
tab Mkg-Mgt
(underlying cycle 4)

NEXT

3 Targeted Market Size (per product and FY)

Product ID	Distribution	FY-1		FY-2		FY-3	
		100%	134,654	100%	143,715	100%	152,424
BR01-01	[retail]	24.00%	32316.9	24.00%	34491.5	24.00%	36581.9
BR01-02	[retail]	24.00%	32316.9	24.00%	34491.5	24.00%	36581.9
BR01-03	[retail]	17.00%	22891.2	17.00%	24431.5	17.00%	25912.2
BR01-05	[retail]	17.00%	22891.2	17.00%	24431.5	17.00%	25912.2
BR01-06	[retail]	18.00%	24237.7	18.00%	25868.6	18.00%	27436.4

4 Sales Projections (business unit: next 36 months of operations)

FY-1

		BR01-01	BR01-02	BR01-03	BR01-05	BR01-06	BR01-07	BR01-08
		[retail]	[retail]	[retail]	[retail]	[retail]	[wholesale]	[wholesale]
Total Demand	[units]	32,317	32,317	22,891	22,891	24,238	113,659	113,659
Total Supply	[units]	30,729	31,553	21,080	21,080	24,800	108,151	111,047
Excess Demand	[units]	1,588	764	1,811	1,811	(562)	5,509	2,612

$$\text{Ratio} = 1,811/22,891 = 8\%$$

FY-2

		BR01-01	BR01-02	BR01-03	BR01-05	BR01-06	BR01-07	BR01-08
		[retail]	[retail]	[retail]	[retail]	[retail]	[wholesale]	[wholesale]
Total Demand	[units]	34,491	34,491	24,431	24,431	25,869	114,785	114,785
Total Supply	[units]	33,402	33,503	21,080	21,080	24,800	111,678	111,577
Excess Demand	[units]	1,089	988	3,351	3,351	1,069	3,107	3,208

$$\text{Ratio} = 3,351/24,431 = 13,7\%$$

FY-3

		BR01-01	BR01-02	BR01-03	BR01-05	BR01-06	BR01-07	BR01-08
		[retail]	[retail]	[retail]	[retail]	[retail]	[wholesale]	[wholesale]
Total Demand	[units]	36,582	36,582	25,912	25,912	27,436	121,742	121,742
Total Supply	[units]	35,604	35,471	21,080	21,080	24,800	118,156	118,289
Excess Demand	[units]	977	1,111	4,832	4,832	2,636	3,586	3,453

$$\text{Ratio} = 4,832/25,912 = 18.6\%$$

Ratio greater than 10%

ACTION PLAN

Option 2: For different products and FY's, in section **Task 4** change the Percent Monthly Demand if the ratio is greater than 10%

Cycle 6: tab Mkg-Mgt
(underlying cycle 4)

4 Sales Projections (business unit: next 36 months of operations)

	BR01-05 [retail]	BR01-05 [retail]		BR01-05 [retail]	BR01-05 [retail]		BR01-05 [retail]	BR01-05 [retail]
	FY-1	FY-1		FY-2	FY-2		FY-3	FY-3
	Before	After		Before	After		Before	After
Jan	5.00%	0.00%	Jan	5.00%	0.00%	Jan	5.00%	0.00%
Feb	5.00%	0.00%	Feb	5.00%	0.00%	Feb	5.00%	0.00%
Mar	6.00%	0.00%	Mar	6.00%	0.00%	Mar	6.00%	0.00%
Apr	7.00%	5.50%	Apr	7.00%	5.50%	Apr	7.00%	11.00%
May	8.00%	12.00%	May	8.00%	12.00%	May	8.00%	17.00%
Jun	10.00%	18.00%	Jun	10.00%	18.00%	Jun	10.00%	17.00%
Jul	10.00%	18.00%	Jul	10.00%	18.00%	Jul	10.00%	17.00%
Aug	12.00%	18.00%	Aug	12.00%	18.00%	Aug	12.00%	17.00%
Sep	12.00%	12.00%	Sep	12.00%	12.00%	Sep	12.00%	17.00%
Oct	11.00%	11.00%	Oct	12.00%	12.00%	Oct	12.00%	11.00%
Nov	7.00%	5.50%	Nov	11.00%	11.00%	Nov	11.00%	10.00%
Dec	7.00%	0.00%	Dec	7.00%	5.50%	Dec	7.00%	0.00%
Tot	100.00%	100.00%	Tot	100.00%	100.00%	Tot	100.00%	100.00%
Jan	1,010	0	Jan	1,078	0	Jan	1,143	0
Feb	1,010	0	Feb	1,078	0	Feb	1,143	0
Mar	1,212	0	Mar	1,293	0	Mar	1,372	0
Apr	1,414	1,111	Apr	1,509	1,186	Apr	1,600	2,515
May	1,616	2,424	May	1,725	2,587	May	1,829	3,887
Jun	2,020	3,636	Jun	2,156	3,880	Jun	2,286	3,887
Jul	2,020	3,636	Jul	2,156	3,880	Jul	2,286	3,887
Aug	2,424	3,636	Aug	2,587	3,880	Aug	2,744	3,887
Sep	2,424	2,424	Sep	2,587	2,587	Sep	2,744	2,515
Oct	2,222	2,222	Oct	2,371	2,371	Oct	2,515	2,286
Nov	1,414	1,111	Nov	1,509	1,186	Nov	1,600	0
Dec	1,414	0	Dec	1,509	0	Dec	1,600	0
Tot	20,198	20,198	Tot	21,557	21,557	Tot	22,864	22,864
[kegs]								
Jan	1.0	0.0	Jan	1.0	0.0	Jan	1.0	0.0
Feb	1.0	0.0	Feb	1.0	0.0	Feb	1.0	0.0
Mar	1.0	0.0	Mar	1.0	0.0	Mar	1.0	0.0
Apr	1.0	1.0	Apr	1.0	1.0	Apr	1.0	2.0
May	1.0	2.0	May	1.0	2.0	May	1.0	3.0
Jun	1.0	3.0	Jun	1.0	3.0	Jun	1.0	3.0
Jul	1.0	3.0	Jul	1.0	3.0	Jul	1.0	3.0
Aug	2.0	3.0	Aug	2.0	3.0	Aug	2.0	3.0
Sep	2.0	2.0	Sep	2.0	2.0	Sep	2.0	2.0
Oct	1.0	1.0	Oct	2.0	2.0	Oct	2.0	2.0
Nov	1.0	1.0	Nov	1.0	1.0	Nov	1.0	0.0
Dec	1.0	0.0	Dec	1.0	0.0	Dec	1.0	0.0
Total Demand	20,198	20,198	Total Demand	21,557	21,557	Total Demand	22,864	22,864
Total Supply	17,360	19,840	Total Supply	18,600	21,080	Total Supply	21,080	22,320
Excess Demand	2,838	358	Excess Demand	2,957	477	Excess Demand	1,784	544

=1.8%

=2.2%

=2.4%

23

ACTION PLAN

Cycle 6: tab Mkg-Mgt ANALYSIS

Go Back to Sim-Navigator		CurrentCycle 6	Cycle in Calculation 6		Cycle for Monte-Carlo Simulation			
	Cycles	Start	Cycle 01	Cycle 02	Cycle 03	Cycle 04	Cycle 05	Cycle 06
	Underlying Cycles	0	1	2	2	4	4	
	Department	Mktg	Mktg	Fin	Fin	Mktg	Mktg	
Selected metrics for analyzing and evaluating the efficiency of projects or investments								
Total revenue, Total	2,249,203	3,169,761	3,303,854	3,303,854	3,303,854	3,278,151	<	3,336,691
Total Revenue, FY1	700,657	994,927	1,056,921	1,056,921	1,056,921	1,055,638	<	1,070,556
Total Revenue, FY2	749,553	1,058,932	1,082,278	1,082,278	1,082,278	1,088,167		1,094,893
Total Revenue, FY3	798,993	1,115,901	1,164,655	1,164,655	1,164,655	1,134,345		1,171,242
Profit Before Taxes, Total	309,768	1,417,089	1,415,447	1,631,380	1,667,477	1,648,073	<	1,694,777
Profit Before Taxes, FY-1	111,786	454,127	469,237	521,447	530,266	530,012	<	541,526
Profit Before Taxes, FY-2	107,159	477,247	463,893	530,013	541,122	544,903		551,629
Profit Before Taxes, FY-3	90,823	485,716	482,318	579,920	596,089	573,158		601,622
Net Profit (After Taxes), Total	201,349	921,108	920,041	1,223,535	1,250,608	1,236,054	<	1,271,083
Net Profit (After Taxes), FY-1	72,661	295,182	305,004	391,085	397,700	397,509	<	406,144
Net Profit (After Taxes), FY-2	69,653	310,210	301,530	397,510	405,841	408,677		413,722
Net Profit (After Taxes), FY-3	59,035	315,715	313,506	434,940	447,067	429,868		451,217
Invested Capital	(150,000)	(150,000)	(150,000)	(150,000)	(150,000)	(150,000)		(150,000)
Profit BT/Total Revenue (36 Month)	0.14	0.45	0.43	0.49	0.50	0.50		0.51
Net Profit/Total Revenue (36 Month)	0.09	0.29	0.28	0.37	0.38	0.38		0.38
Break Even Point: Months	8	4	4	4	4	4		3
Break Even Point: Revenue	455,686	345,043	393,605	320,962	308,691	308,420		308,107
Ending Cash Balance (End of FY-1)	(77,339)	145,182	155,004	241,085	247,700	247,509		256,144
Return On Investment (ROI)	1.34	6.14	6.13	8.16	8.34	8.24		8.47
Internal Rate of Return (IRR)	16.9%	192.2%	195.4%	257.5%	262.5%	262.1%		267.9%
Discount Rate	5.0%	5.0%	5.0%	5.0%	5.0%	5.0%		5.0%
Risk-Free Rate	1.0%	1.0%	1.0%	1.0%	1.0%	1.0%		1.0%
Net Present Value	33,375	685,223	684,795	958,733	983,065	970,599		1,001,840
Duration (3 year to maturity, 10% coupon Bond)	2.7692	2.7692	2.7692	2.7692	2.7692	2.7692		2.7692
Duration (Project)	1.9007	1.9899	1.9764	2.0029	2.0066	1.9935		2.0026

tab Sim-Report

ACTION PLAN

Cycle 6: tab Mkg-Mgt ANALYSIS

tab Performance

3

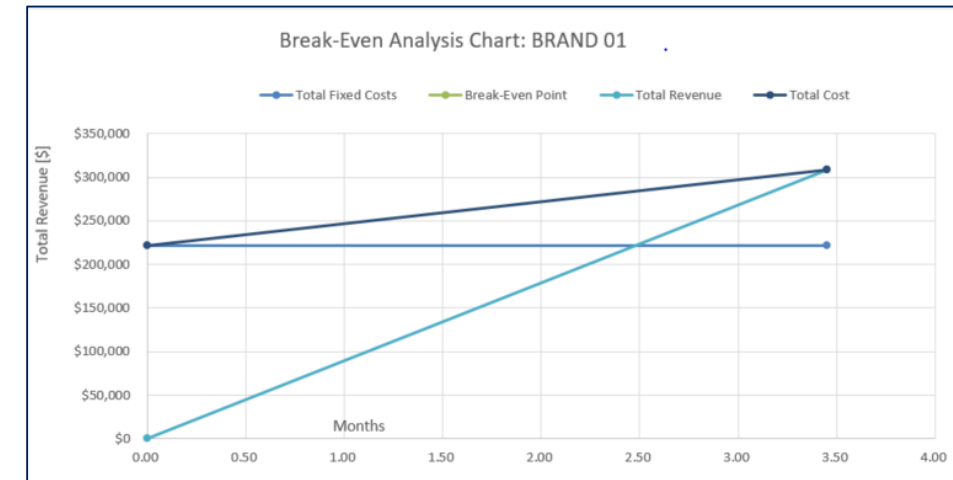
EFFICIENCY RATIOS



tab D-Analysis

1

BREAK-EVEN ANALYSIS



ACTION PLAN

Cycle 7: Changing the Cut-Off Point per Products

Before

After

Product ID	Distribution	Name	Variable Costs			Price (per unit)	Units (Pints)	Cut off point
			Material (per unit)	Labor (per unit)	Others (per unit)			
BR01-01	[retail]	Pilsner	0.37	0.23	0.25	\$5.25	1	0.8
BR01-02	[retail]	Javarian Lager	0.37	0.23	0.25	\$5.25	1	0.8
BR01-03	[retail]	Light Wheat	0.37	0.23	0.25	\$5.00	1	0.8
BR01-05	[retail]	Pale Ale	0.37	0.23	0.25	\$5.00	1	0.8
BR01-06	[retail]	Bock Dark	0.37	0.23	0.25	\$5.00	1	0.8
BR01-07	[wholesale]	Pilsner	0.37	0.23	0.25	\$1.80	124	0.8
BR01-08	[wholesale]	Javarian Lager	0.37	0.23	0.25	\$1.80	124	0.8
BR01-09	[retail]	Special Offer	0.37	0.23	0.25	\$4.00	1	1

Product ID	Distribution	Name	Variable Costs			Price (per unit)	Units (Pints)	Cut off point
			Material (per unit)	Labor (per unit)	Others (per unit)			
BR01-01	[retail]	Pilsner	0.37	0.23	0.25	\$5.25	1	0.8
BR01-02	[retail]	Javarian Lager	0.37	0.23	0.25	\$5.25	1	0.8
BR01-03	[retail]	Light Wheat	0.37	0.23	0.25	\$5.00	1	0.5
BR01-05	[retail]	Pale Ale	0.37	0.23	0.25	\$5.00	1	0.8
BR01-06	[retail]	Bock Dark	0.37	0.23	0.25	\$5.00	1	0.8
BR01-07	[wholesale]	Pilsner	0.37	0.23	0.25	\$1.80	124	0.8
BR01-08	[wholesale]	Javarian Lager	0.37	0.23	0.25	\$1.80	124	0.8
BR01-09	[retail]	Special Offer	0.37	0.23	0.25	\$4.00	1	1

BR01-01 [retail]	BR01-02 [retail]	BR01-03 [retail]	BR01-05 [retail]	BR01-06 [retail]	BR01-07 [wholesale]	BR01-08 [wholesale]
---------------------	---------------------	---------------------	---------------------	---------------------	------------------------	------------------------

FY-1

Total Demand	[units]	33,663	33,663	22,891	20,198	24,238	113,659	113,659
Total Supply	[units]	32,280	33,133	21,080	19,840	24,800	109,080	111,947
Excess Demand	[units]	1,384	531	1,811	358	(562)	4,579	1,712

Total Demand	[units]	33,663	33,663	22,891	20,198	24,238	113,659	113,659
Total Supply	[units]	32,280	33,133	21,080	19,840	24,800	109,080	111,947
Excess Demand	[units]	1,384	531	1,811	358	(562)	4,579	1,712

FY-2

Total Demand	[units]	35,929	35,929	24,431	21,557	25,869	114,785	114,785
Total Supply	[units]	34,459	34,565	21,080	21,080	24,800	110,621	110,515
Excess Demand	[units]	1,470	1,363	3,351	477	1,069	4,164	4,270

Total Demand	[units]	35,929	35,929	24,431	21,557	25,869	114,785	114,785
Total Supply	[units]	34,459	34,565	22,320	21,080	24,800	110,621	110,515
Excess Demand	[units]	1,470	1,363	2,111	477	1,069	4,164	4,270

FY-3

Total Demand	[units]	38,106	38,106	25,912	22,864	27,436	121,742	121,742
Total Supply	[units]	38,107	37,188	21,080	22,320	24,800	121,853	119,052
Excess Demand	[units]	(1)	919	4,832	544	2,636	(111)	2,689

Total Demand	[units]	38,106	38,106	25,912	22,864	27,436	121,742	121,742
Total Supply	[units]	38,107	37,188	24,800	22,320	24,800	121,853	119,052
Excess Demand	[units]	(1)	919	1,112	544	2,636	(111)	2,689

ACTION PLAN

Cycle 7: Changing the Cut-Off Point per Products

ANALYSIS

tab Sim-Report

Go Back to Sim-Navigator								
	Cycles	CurrentCycle 7	Cycle in Calculation 7		Cycle for Monte-Carlo Simulation			
		Start	Cycle 01	Cycle 02	Cycle 03	Cycle 04	Cycle 05	Cycle 06
	Underlying Cycles	0	1	2	2	4	4	6
		Department	Mktg	Mktg	Fin	Fin	Mktg	Mktg
								Oper
Selected metrics for analyzing and evaluating the efficiency of projects or investments								
Total revenue, Total		2,249,203	3,169,761	3,303,854	3,303,854	3,303,854	3,278,151	3,336,691
Total Revenue, FY1		700,657	994,927	1,056,921	1,056,921	1,056,921	1,055,638	1,070,556
Total Revenue, FY2		749,553	1,058,932	1,082,278	1,082,278	1,082,278	1,088,167	1,094,893
Total Revenue, FY3		798,993	1,115,901	1,164,655	1,164,655	1,164,655	1,134,345	1,171,242
Profit Before Taxes, Total		309,768	1,417,089	1,415,447	1,631,380	1,667,477	1,648,073	1,694,777
Profit Before Taxes, FY-1		111,786	454,127	469,237	521,447	530,266	530,012	541,526
Profit Before Taxes, FY-2		107,159	477,247	463,893	530,013	541,122	544,903	551,629
Profit Before Taxes, FY-3		90,823	485,716	482,318	579,920	596,089	573,158	601,622
Net Profit (After Taxes), Total		201,349	921,108	920,041	1,223,535	1,250,608	1,236,054	1,271,083
Net Profit (After Taxes), FY-1		72,661	295,182	305,004	391,085	397,700	397,509	406,144
Net Profit (After Taxes), FY-2		69,653	310,210	301,530	397,510	405,841	408,677	413,722
Net Profit (After Taxes), FY-3		59,035	315,715	313,506	434,940	447,067	429,868	451,217
Invested Capital		(150,000)	(150,000)	(150,000)	(150,000)	(150,000)	(150,000)	(150,000)
Profit BT/Total Revenue (36 Month)		0.14	0.45	0.43	0.49	0.50	0.50	0.51
Net Profit/Total Revenue (36 Month)		0.09	0.29	0.28	0.37	0.38	0.38	0.38
Break Even Point: Months		8	4	4	4	4	4	3
Break Even Point: Revenue		455,686	345,043	393,605	320,962	308,691	308,420	308,107
Ending Cash Balance (End of FY-1)		(77,339)	145,182	155,004	241,085	247,700	247,509	256,144
Return On Investment (ROI)		1.34	6.14	6.13	8.16	8.34	8.24	8.47
Internal Rate of Return (IRR)		16.9%	192.2%	195.4%	257.5%	262.5%	262.1%	267.9%
Discount Rate		5.0%	5.0%	5.0%	5.0%	5.0%	5.0%	5.0%
Risk-Free Rate		1.0%	1.0%	1.0%	1.0%	1.0%	1.0%	1.0%
Net Present Value		33,375	685,223	684,795	958,733	983,065	970,599	1,001,840
Duration (3 year to maturity, 10% coupon Bond)		2.7692	2.7692	2.7692	2.7692	2.7692	2.7692	2.7692
Duration (Project)		1.9007	1.9899	1.9764	2.0029	2.0066	1.9935	2.0026

ACTION PLAN

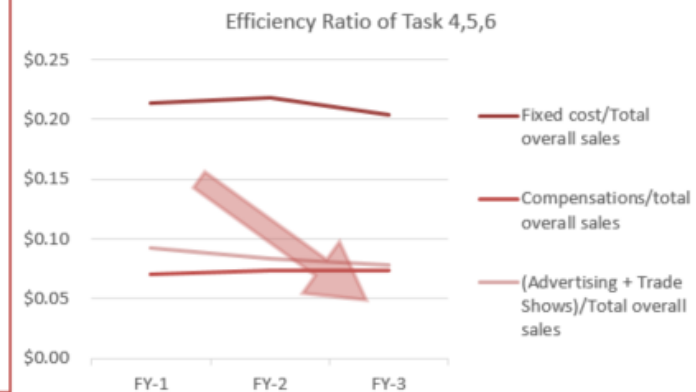
Cycle 7: Changing the Cut-Off Point per Products

ANALYSIS

tab Performance

4.	FY-1	FY-2	FY-3
Fixed Costs/Total Revenue of BRAND 01 [\$]	\$0.21	\$0.22	\$0.20
The company spends \$0.XX fixed costs for the overall sale of \$1.00 from BRAND 01			
5.			
Compensations/Total Revenue of BRAND 01 [\$]	\$0.07	\$0.07	\$0.07
The company spends \$0.XX costs for compensation needed for the overall sale of \$1.00 from BRAND 01			
6.			
(Local Advertising + Trade Shows)/Total Revenue Sales	\$0.09	\$0.08	\$0.08
The company spends \$0.XX costs for advertising & trade shows needed for the overall sale of \$1.00 from BRAND 01			

In a successful decision cycle, efficiency ratios should decrease each year



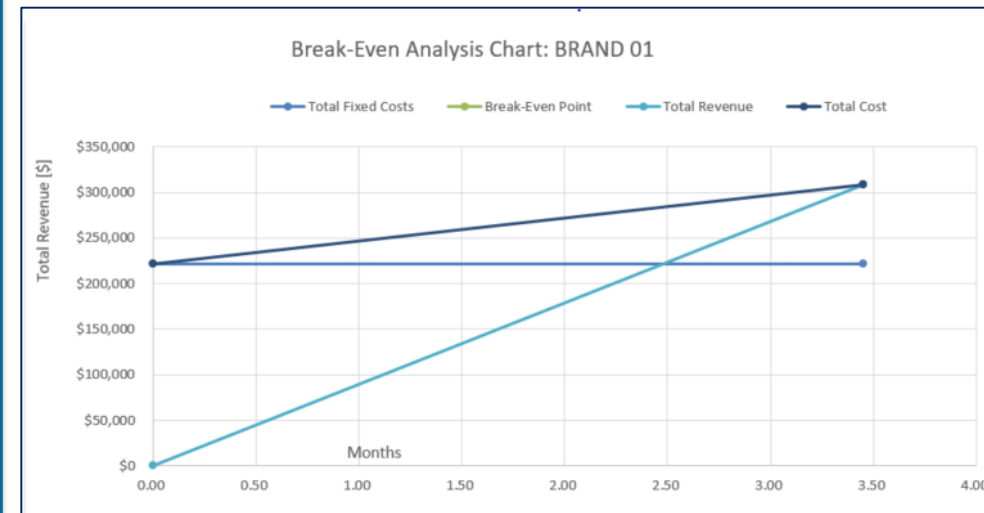
In a successful decision cycle, efficiency ratios should increase each year

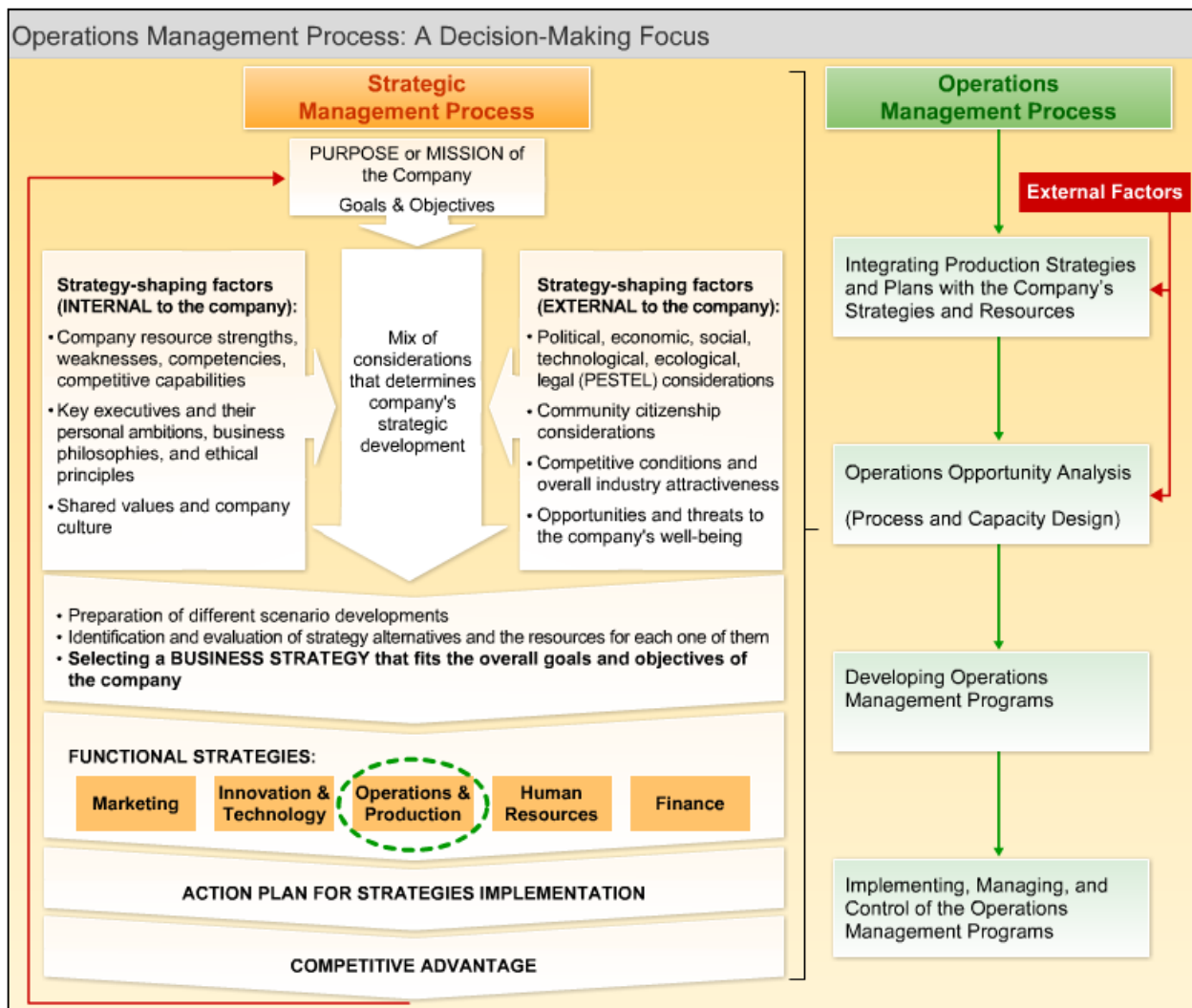
7.	FY-1	FY-2	FY-3
Profit B.T. / Total Revenue of BRAND 01 [\$]	\$0.51	\$0.51	\$0.52
The company make \$0.XX overall profit before taxes for the overall sale of \$1.00 from BRAND 01			

Efficiency Ratio of Task 7



tab D-Analysis





Criteria for Selection of Decision Support Tools

Process analysis and design of the workflow within the new business unit

Capacity and constrain management in the new business unit

Optimization analysis and balance of the demand and supply

Reducing risk with incremental changes

Value-Stream Mapping

Process Charts

DECISION SUPPORT TOOLS

PESTEL Analysis

SWOT Analysis

SWOT Analysis Diagram

Decision Tree Analysis

Sensitivity Analysis

Predictive Analytics

Product/Technology Matrix

Project Mgmt Diagrams

Goal-Seeking Analysis

Risk Analysis

ROI Analysis

Break-Even Point Analysis

Balanced Scorecards

Dashboards

Demo Exercise PART 4

Video Tutorial for AD715:
Optimization Analysis in Solver

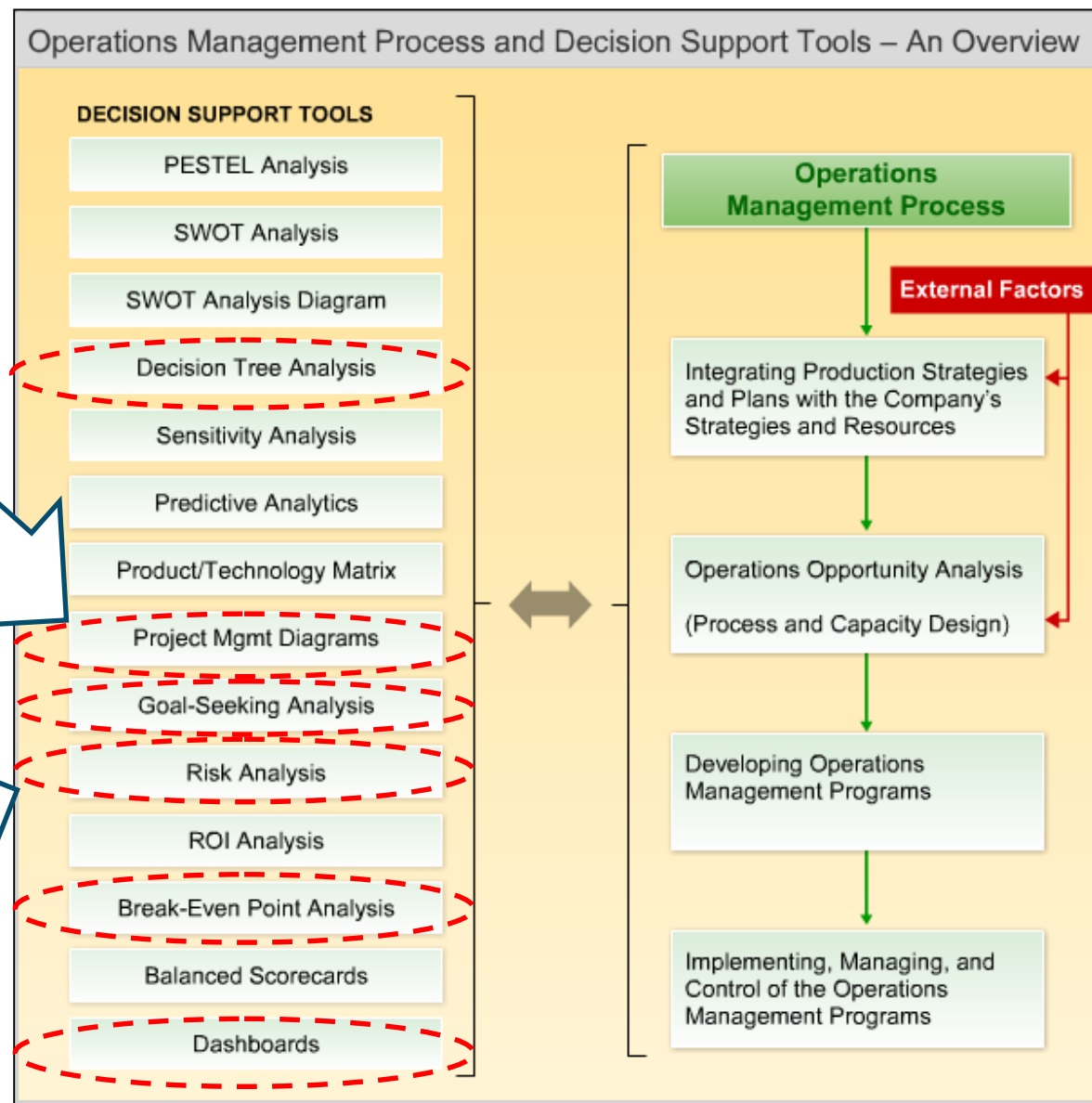
Demo Exercise PART 3

Optimization Analysis in Solver

Video Tutorial for AD715:
Business Simulation – Risk Analysis (MCS)

Demo Exercise PARTS 3 & 4

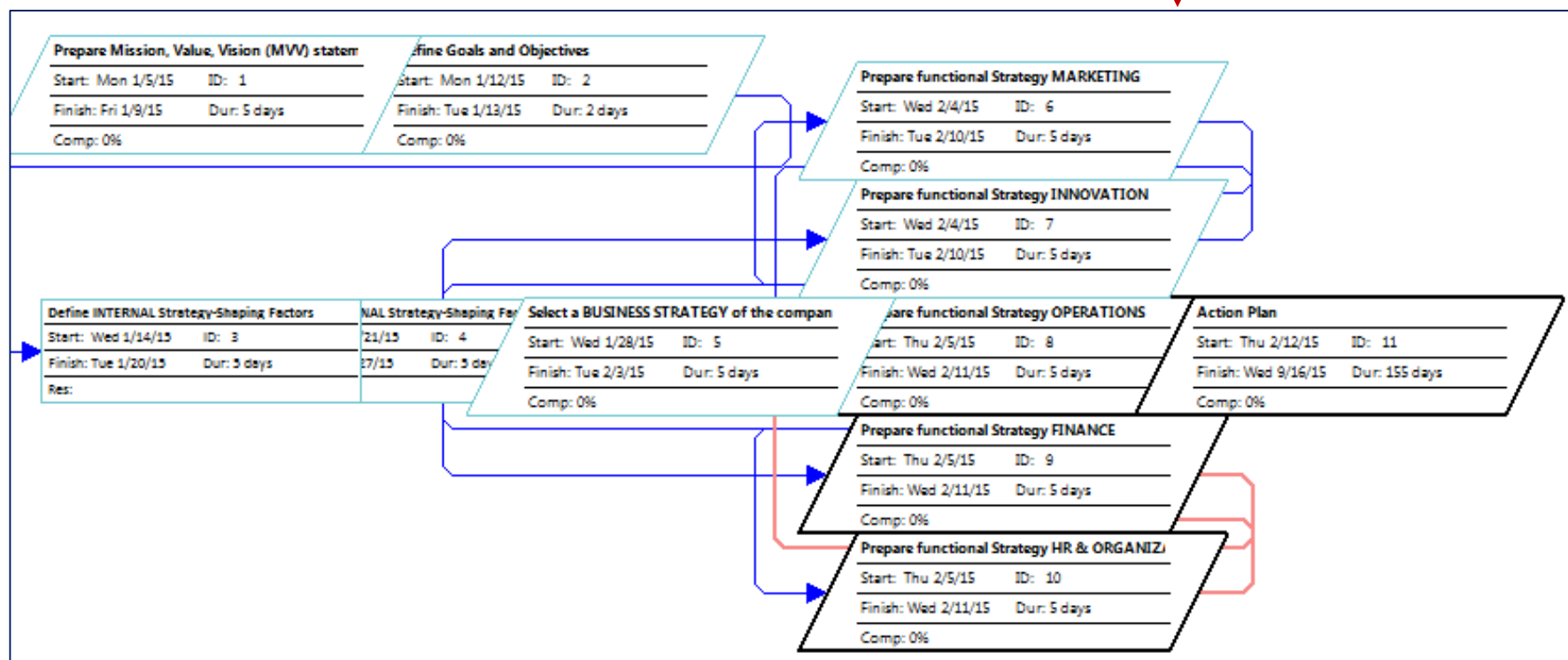
Risk Analysis (MCS)



Assignment 3 Part 2, Section 'Implementation Plan', Working with MS Project

Implementation Plan: An Example

- Implementation Plan in MS Project, Schedule 2015: [Form](#) (mpp) and [Diagram](#) (mpp)
- Implementation Plan, Schedule 2015, Printouts: [Form](#) (pdf) and [Diagram](#) (pdf)



Assignment 3 Part 2, Section 'Implementation Plan' -- OPTION B

OPTION B: Recommended to students who are not trained to work with MS Project

- (i) Complete the **TABLE: Implementation Plan for the Selected Strategy** (see below)
- (ii) Explain the content of your implementation plan (max one page)
- (iii) Include the text in section 5 of the conceptual study (**5. Summary of the results, recommendations, and conclusions**) and attach the table to your managerial report.

TABLE: Implementation Plan for the Selected Strategy

#	Tasks & Sub-Tasks	Duration	Start	Finish	Predecessors	Upfront Funds (\$)
1	Investment decision (based on the results of the conceptual study)					
1.1	Not to invest \$150,000					
1.2	To negotiate different system size and new price					
1.3	To accept the offer and invest \$150,000					
2	Prepare a business plan for the new business unit and secure finances					
2.1	Prepare a business plan					
2.2	Obtain an investment loan from an financial institution					
2.3	Obtain a business (working capital) loan from an financial institution					
3	Purchase the micro-brewery system and arrange transportation					
4	Prepare the production and distribution site for the new business unit					
5	Hire the relevant personnel to operate the brewery					
6	Installation of the system and training of the personnel					
7	Marketing campaign to increase the awareness of the new offering					
7.1	Advertise in local channels					
7.2	Prepare for and participate in local trade shows					
8	Enter into multi-year contracts with pre-selected wholesalers of draft beer					
9	Monitor business metrics closely and take any necessary action quickly to avoid failure					

Discussion Forum W9: Preparation for Assignment 3 PART 2

Complete all W5 Individual & Team Exercises and discuss one or two of the following questions:

- Explain what operations managers do
- Explain the importance of capacity and constrain management in a corporation with the help of short business cases covered in the text book chapter on capacity management
- Demonstrate the concept of capacity and constrain management, explained with the help of the production cut-off point (used in the business simulation, input table "Operations Management")
- In preparation for your team project Assignment 3 Part 2, demonstrate with examples the four process strategies
- In preparation for your team project Assignment 3 Part 2, demonstrate with examples the main characteristics of process analysis and design of the microbrewery production system
- In preparation for your team project Assignment 3 Part 2, describe the process of brewing and distributing of beer in the new BrewPub and analyze the opportunity for improvement of this process
- In preparation for your team project Assignment 3 Part 2, describe how optimization analysis in Solver can help your team preparing and implementing realistic assumptions for key parameters (such as revised prices per products and/or new assumptions for targeted market size per products and fiscal years)
- In preparation for the team project Assignment 3 Part 2, describe how you are planning to prepare and present an implementation plan for the new investment project
- Explain the process of implementing, managing, and control of the operations management programs with the help of an example related to your Team Assignment 3 PART 2
- Operations Management Process & Corporate Business Strategy: explain the horizontal and vertical integration of the decision making with the help of an example from your Team Assignment 3 Part 2
- In preparation for your Team Assignment 3 Part 2, explain your initial plan for selection and application of decision support tools and methods needed for the functional area operations management
- Select one important from your prospective topic from the article “Turning Strategy Into Results”, and discuss how you can use the lessons learned in your Team Assignment 3 Part 2
- Select one important from your prospective topic from the article “What to Expect From Agile”, and discuss how you can use the lessons learned in your Team Assignment 3 Part 2

In-Class Team Exercise TW9-2: Preparing an Implementation Plan with the help of the Process Mapping and/or the Value-Stream Mapping (reference: Heizer Ch. 7)

BEP Analysis

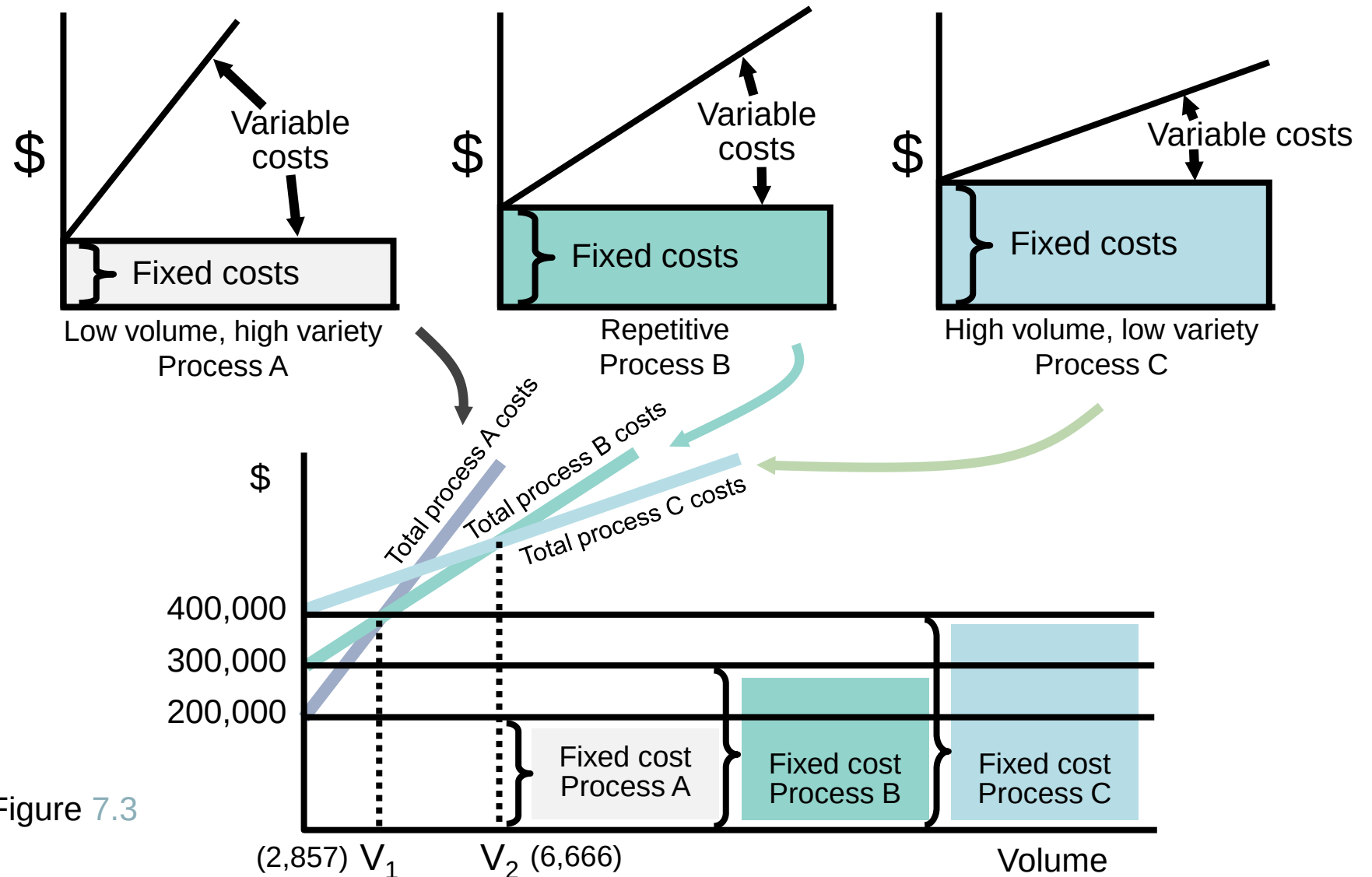


Figure 7.3

Process Analysis and Design

- ▶ **Flowchart:** Shows the movement of materials
- ▶ **Time-Function Mapping:** Shows flows and time frame

"Baseline" Time-Function Map

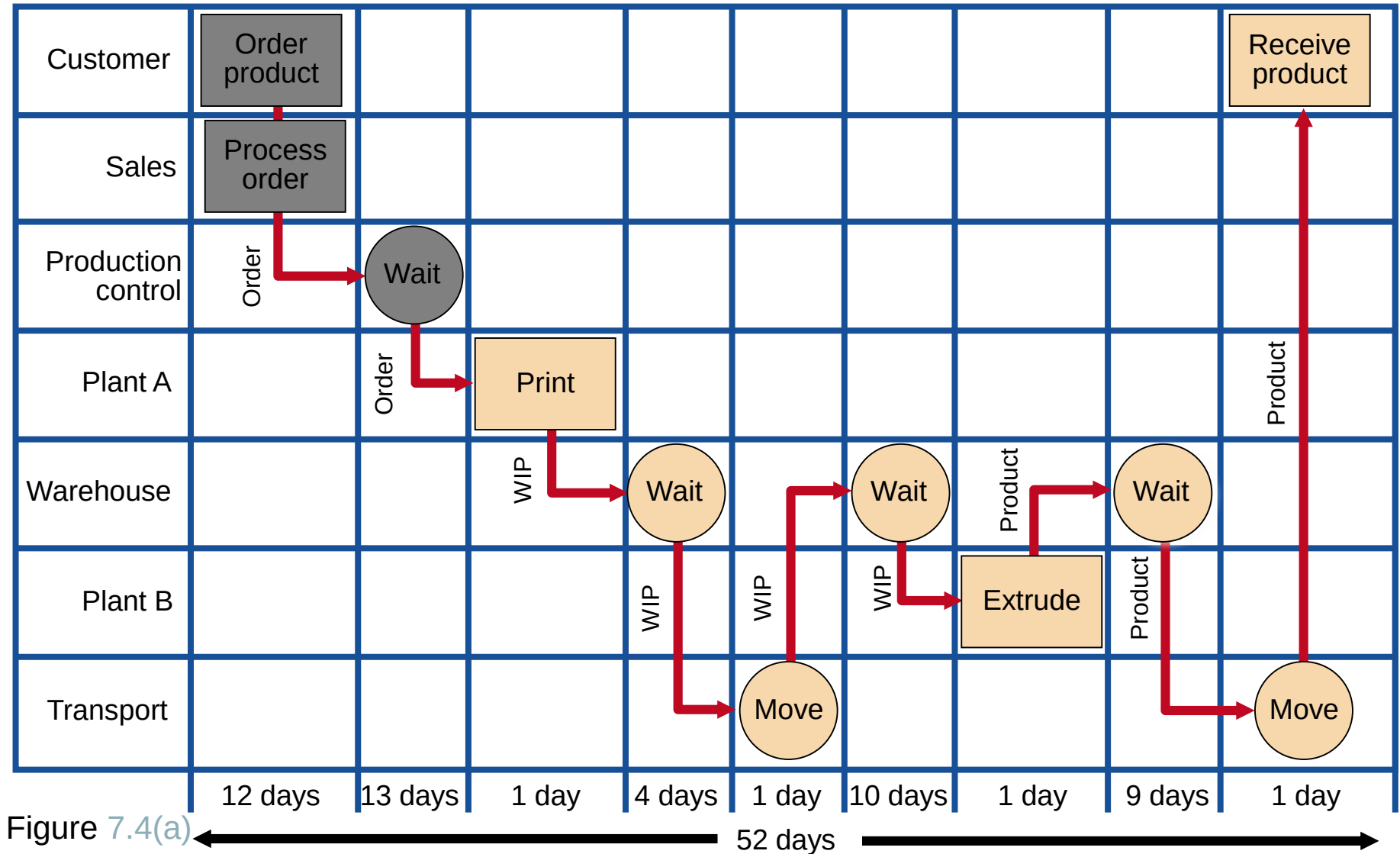
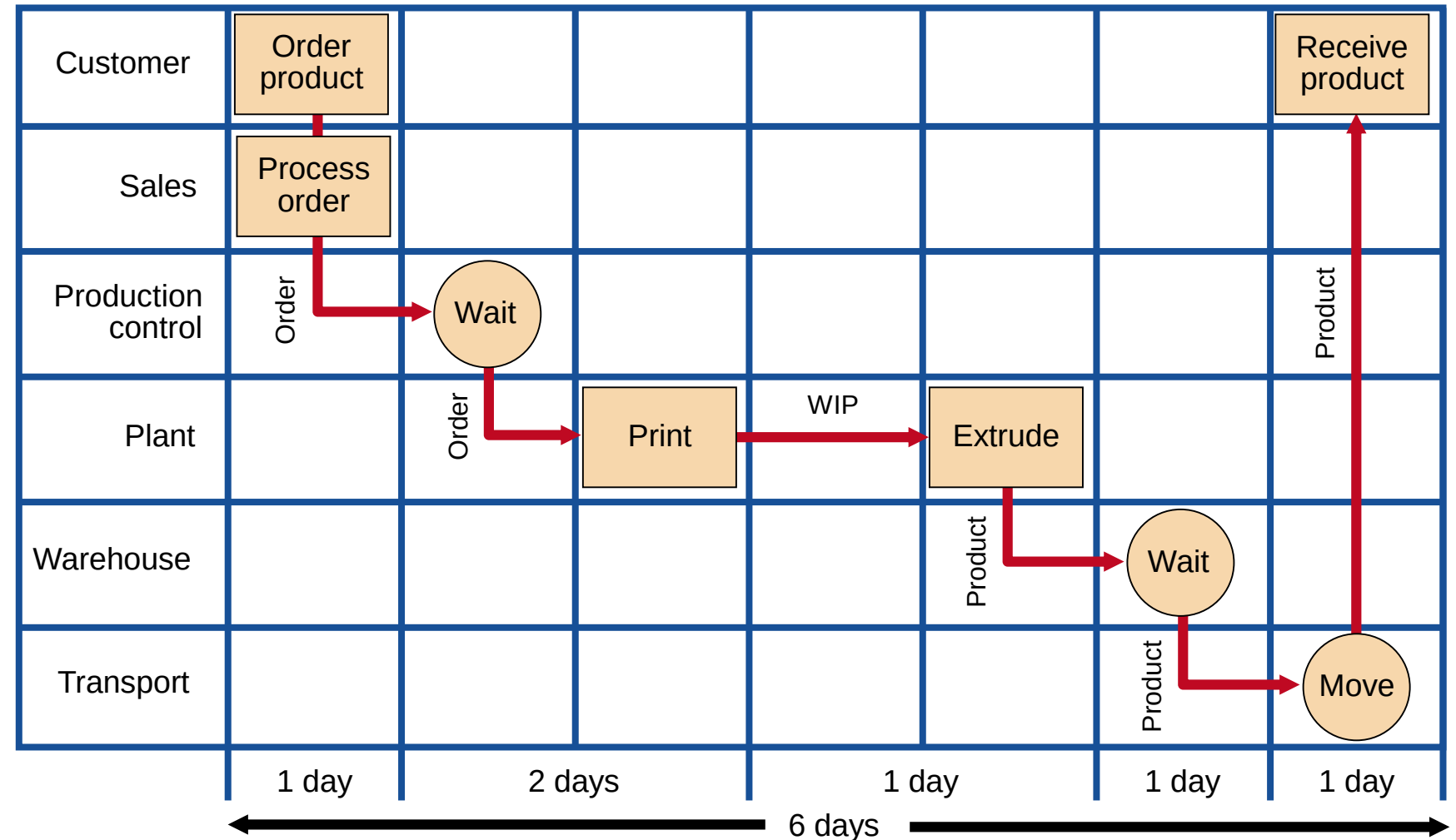


Figure 7.4(a)

Process Analysis and Design

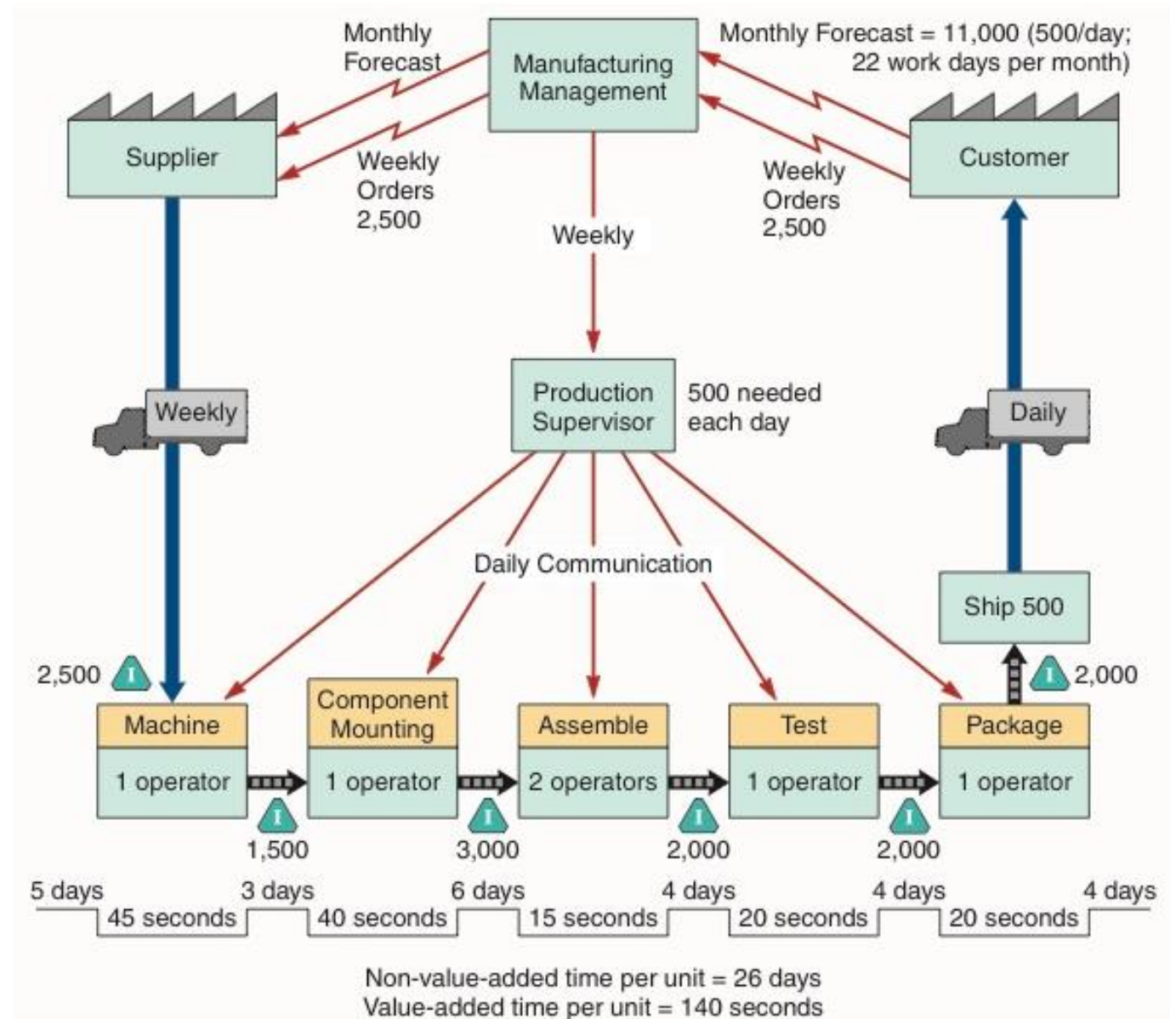
- ▶ **Flowchart:** Shows the movement of materials
- ▶ **Time-Function Mapping:** Shows flows and time frame

"Target" Time-Function Map



Value-Stream Mapping

1. Begin with symbols for customer, supplier, and production to ensure the big picture
2. Enter customer order requirements
3. Calculate the daily production requirements
4. Enter the outbound shipping requirements and delivery frequency
5. Determine inbound shipping method and delivery frequency
6. Add the process steps (i.e., machine, assemble) in sequence, left to right
7. Add communication methods, add their frequency, and show the direction with arrows
8. Add inventory quantities between every step of the entire flow
9. Determine total working time (value-added time) and delay (non-value-added time)



Preparation for submission of the managerial report Team Assignment 3 PART 1



**LIVE
DEMO &
Exercises**

Consultation schedule on Thu Oct-29, place - class Zoom room:

8:00 – 8:30am (T1)
8:30 – 9:00am (T2)
9:00-9:30am (T3)
9:30-10:00am (T4)
10:00-10:30am (T5)
10:30-11:00am (T6)
11:00-11:30am (T7)
11:30-12:00pm ET (T8)

If needed, before the due date for the submission of assignment 3 Part 1, the team should schedule an **additional consultation**

>>> with the **GTAs on Friday Oct-30 between 9am and 12pm ET** and/or
>>> with the section instructor **Dr. Zlatev on Saturday Oct-31 between 10am and 12pm ET**

Plan to prepare and post in the team Discussion Forum a complete **first draft** of Assignment 3.1 as follows (**latest on Saturday Oct-31 by 11:59pm ET**)

Final efforts: polishing (by all team members) and submission (by the team coordinator) of the team assignment 3 Part 1 **on Tue Oct-3 at 11:59pm ET**