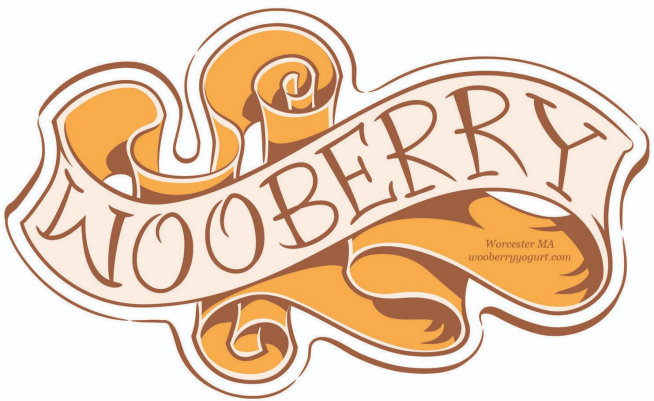


Jellyfish Inc.
Erinn Jambor, Natalie Mohn, Marissa Thomas, Hoang (John) Do

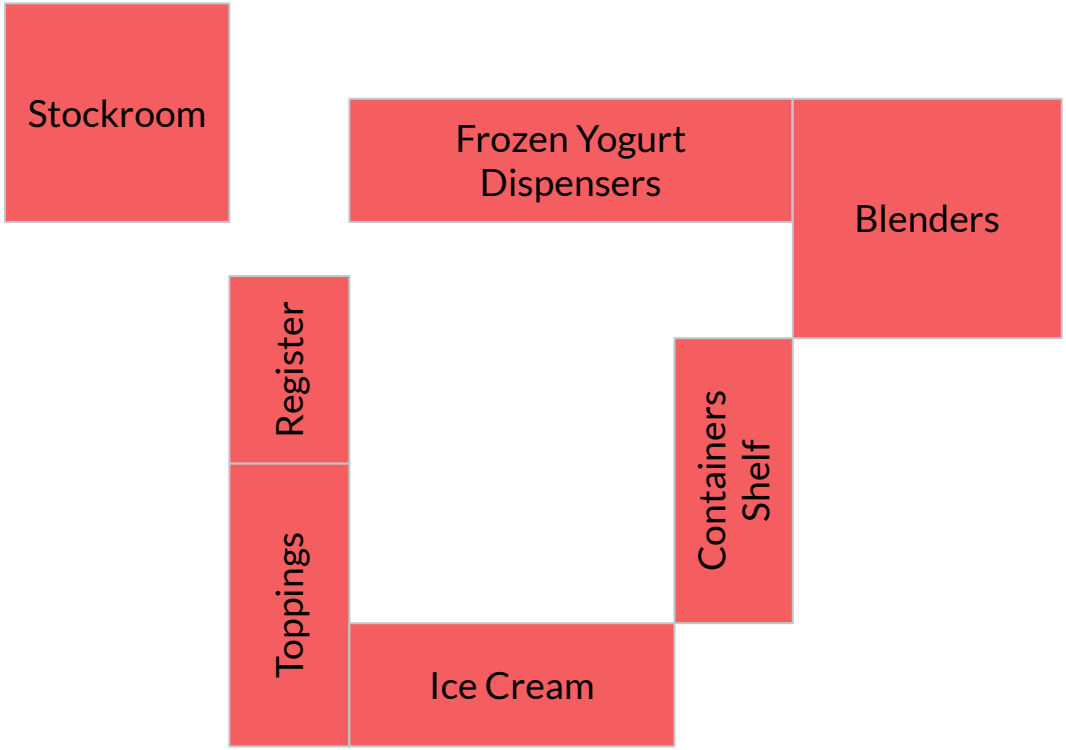
Data Collection

Friday, November 15th, from 7:30 -8:30 pm

Observations to note:

- 1 employee working, 30 people served in 1 hour
- Inconsistent assumptions made when taking orders
- Decently consistent script at each part of process
- ‘Difficult’ customers increase total time

Store Layout

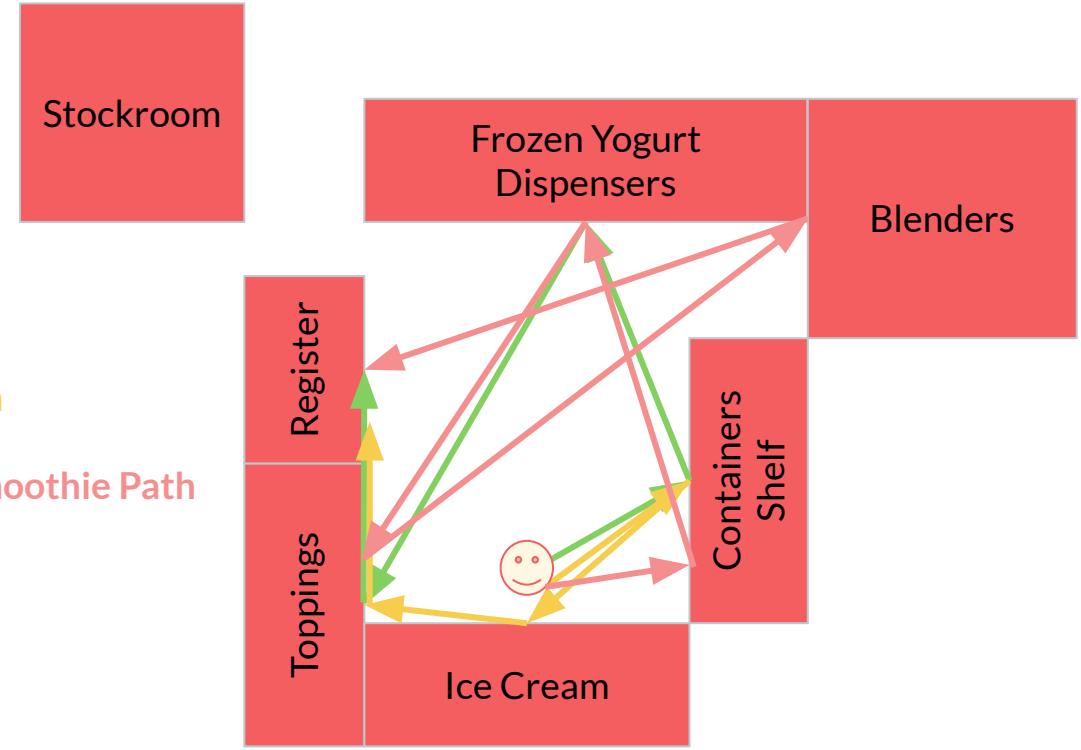


Store Layout

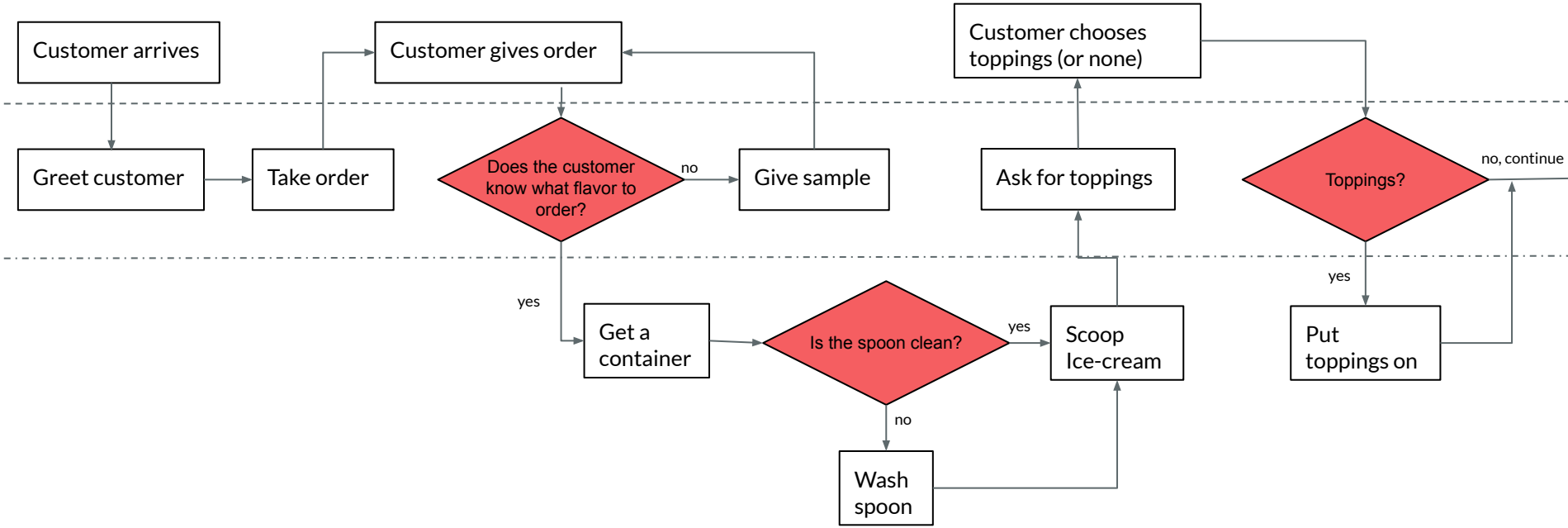
Typical FroYo Path

Typical Ice Cream Path

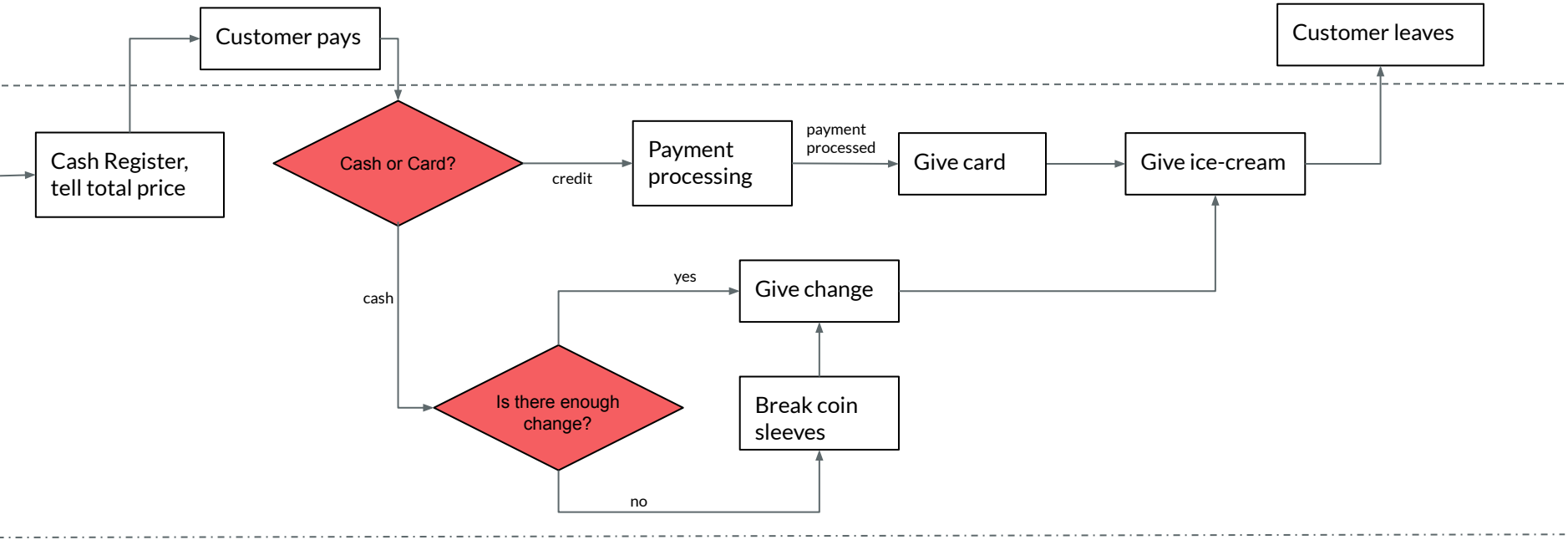
Typical Milkshake / Smoothie Path



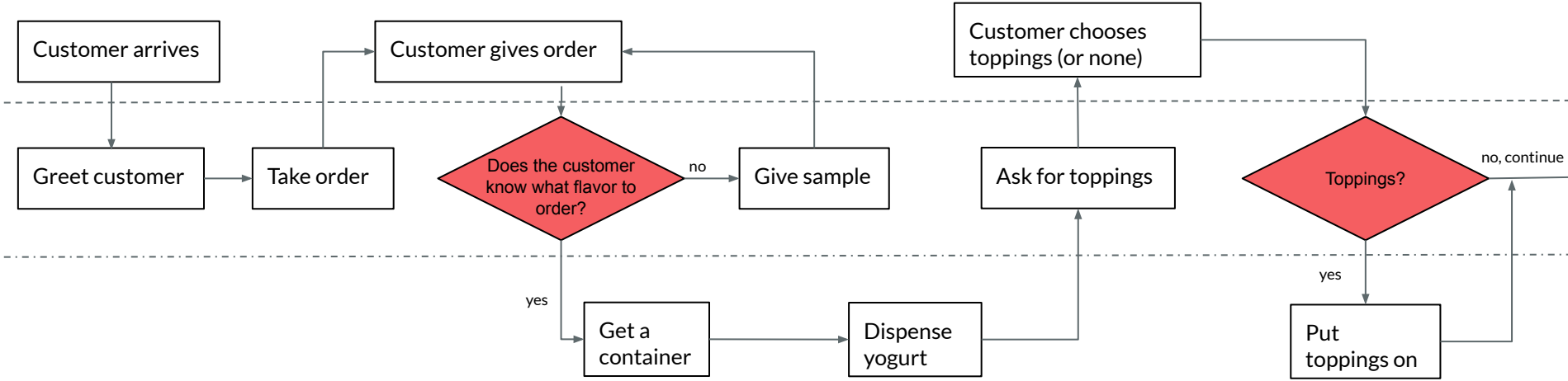
Service Blueprint - Ice Cream



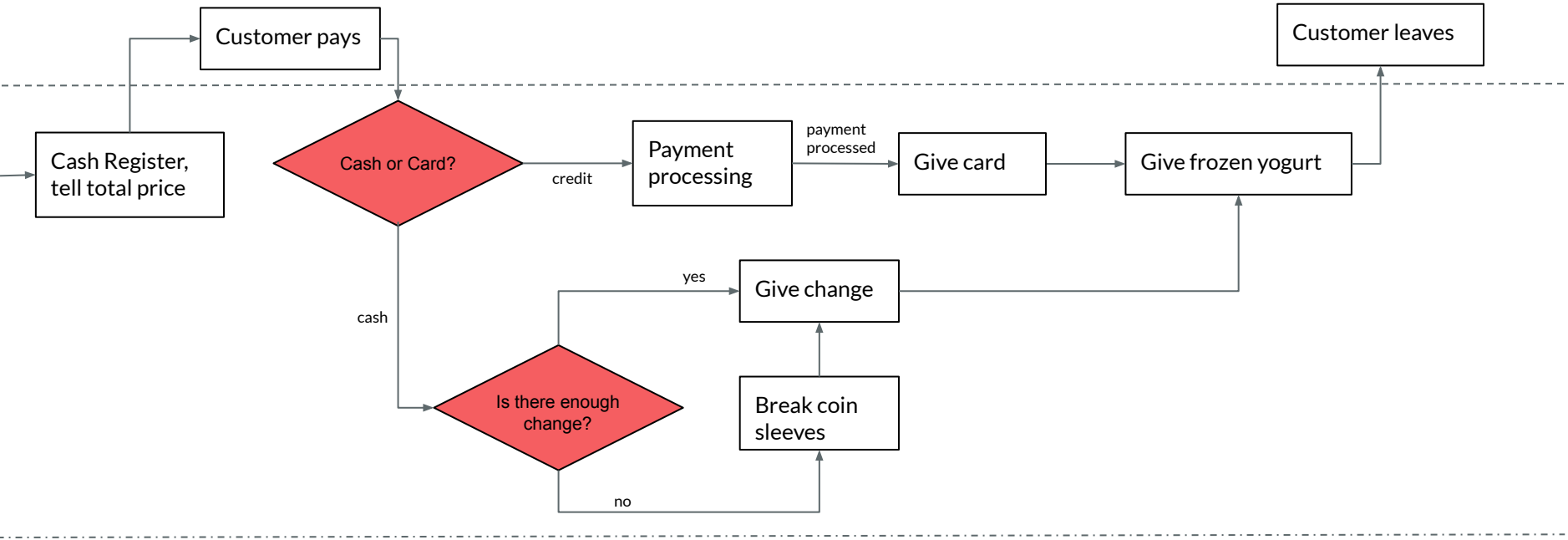
Service Blueprint - Ice Cream



Service Blueprint - Frozen Yogurt



Service Blueprint - Frozen Yogurt



Data Collected

Process Time	Frozen Yogurt	Ice Cream
Order (seconds/customer)	11	15
Dispensing (seconds/customer)	12	23
Toppings (seconds/customer)	20	11
Checkout (seconds/customer)	43	32
Total Seconds/Customer	**83**	**81**

Type	Customers Served
Ice Cream	11
Frozen Yogurt	12
Other	7
Total	*30*

Interesting that there is a difference in times between FY and IC in these two categories

FROZEN YOGURT	Order Time	Dispensing Time	Toppings Time	Checkout Time	Total Time	Observations
Customer 1	29	10	16	32	87	w/ sample
Customer 2	8	7	25	13	13	
Customer 3	25	19	0	21	65	chatting, no toppings
Customer 4	5	14	11	17	47	
Customer 5	5	8	0	15	28	no toppings
Customer 6	4	9	12	140	165	Employee assumed customer was with customer 7 so worker left his order by the register and didn't check him out before starting next order
Customer 7	4	15	28	84	131	not enough change, had to get break coin sleeves
Customer 8	22	15	28	87	152	difficult customer
Customer 9	8	12	15	15	50	
Customer 10	16	17	8	26	67	Cash
Customer 11	5	8	13	41	67	Cash
Customer 12	6	10	84	28	128	had to cut up more bananas
AVERAGE	11	12	20	43	83	

ICE CREAM	Order Time	Dispensing Time	Toppings Time	Checkout Time	Total Time	Observations
Customer 1	24	14	15	38	91	chatting, 1 worker, 5 in line
Customer 2	18	21	7	24	70	W Sample
Customer 3	6	41	0	24	71	no toppings
Customer 4	11	10	0	24	45	no toppings
Customer 5	5	17	5	20	47	
Customer 6	24	15	18	30	87	
Customer 7	10	54	0	30	94	Wash spoon
Customer 8	5	23	15	28	71	cash
Customer 9	38	22	0	25	85	w samples (x2)
Customer 10	5	15	31	20	71	
Customer 11	22	16	29	87	154	difficult customer
AVERAGE	15	23	11	32	81	

Service Level Calculations

	Value	Units
Arrival Rate	23	Customers per hour
Service Rate	44	Customers per hour
Average Service Time	82	Seconds per customer
Average Time between Arrivals	157	Seconds per customer
Ratio of total arrival rate to service rate for single server	0.52	
Average Number Waiting in Line	0.58	Customers
Average Number in System (including any being served)	1.10	Customers
Average Time Waiting in Line	90	Seconds
Average total Time in System (including time to be served)	172	Seconds

λ = Arrival rate
μ = Service rate
$\frac{1}{\mu}$ = Average service time
$\frac{1}{\lambda}$ = Average time between arrivals
ρ = Ratio of total arrival rate to service rate for a single server $\left(\frac{\lambda}{\mu}\right)$
L_q = Average number waiting in line
L_s = Average number in system (including any being served)
W_q = Average time waiting in line
W_s = Average total time in system (including time to be served)
n = Number of units in the system
S = Number of identical service channels
P_n = Probability of exactly n units in system
P_w = Probability of waiting in line

EQUATIONS FOR SOLVING THREE MODEL PROBLEMS

Model 1

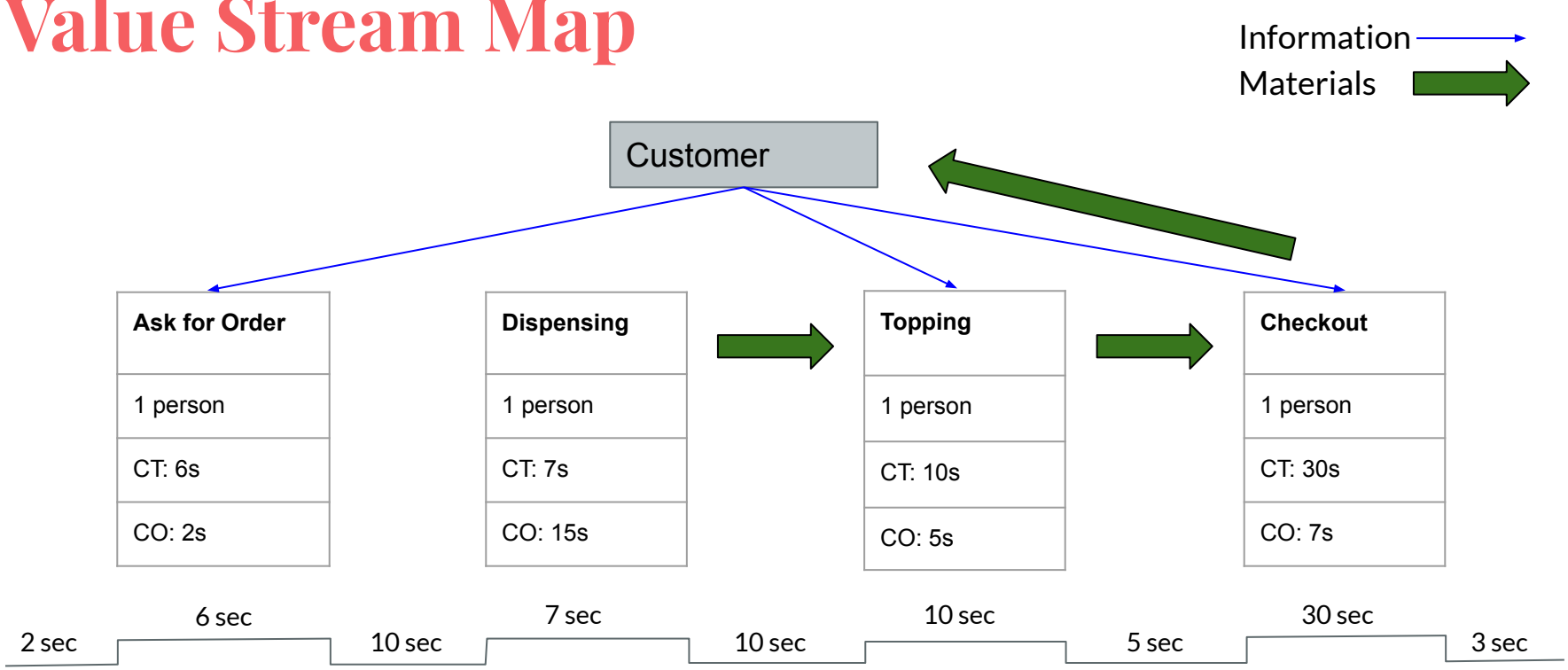
$$L_q = \frac{\lambda^2}{\mu(\mu - \lambda)} \qquad W_q = \frac{L_q}{\lambda} \qquad P_n = \left(1 - \frac{\lambda}{\mu}\right)\left(\frac{\lambda}{\mu}\right)^n \qquad P_0 = \left(1 - \frac{\lambda}{\mu}\right) \qquad (7.3)$$

$$L_s = \frac{\lambda}{\mu - \lambda} \qquad W_s = \frac{L_s}{\lambda} \qquad \rho = \frac{\lambda}{\mu}$$

Plans for the future

- What improvements can be made?
  - More than one employe should be working on a Friday night (probably)
  - Employee should be more consistent in the way they take orders
- What is inefficient about the process?
  - Is the store layout the most effective layout?
- What is the value added/non value added time?
  - Value added:
    - Dispensing and Toppings
  - Non value added:
    - Chatting with customers / small talk
    - Moving between workstations

Value Stream Map



Value Added: 53 sec
Non-Value Added: 30 sec

Improvements

- Analyze previous data to know when peak time occurs so they are prepared
- Signs to show how to move through the ordering process
  - 1. Order flavor of Ice Cream / Frozen Yogurt
  - 2. Decide Toppings while waiting for ice cream
  - 3. Checkout
- Topping labels
  - Easily readable by the customer
  - Customers do not have to guess the name of the topping
- When there are no customers, make scoops in ice cream containers
- Have scoops for every flavor

Comparison to Previous Data

- Peak is in March, April, May
  - According to previous data peak is about 2x as busy as November (when we collected our data)
- Time to complete order should not change, but more orders will need to be processed to decrease bottlenecks
- More employees will need to be added to process more orders
  - 1 or 2 more employees

Signs for Ordering Process

Topping Labels

Pre-Scooped Ice Cream

Scoops in Every Flavor

Conclusion

- Wooberry's process is already decently efficient
- Some small improvements could further reduce wasted time
- Overview of solutions:
  - Increasing number of employees at peak times
  - Visual Controls showing process
  - Labels on the toppings
  - Pre-scooped ice cream