



How can the West 4th NYU Starbucks manage to improve its customer service

Professor Juran, David
Decision Models

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Benedetta Arese Lucini
Gregory Booth
Sanjay Rupani
Rui Silva

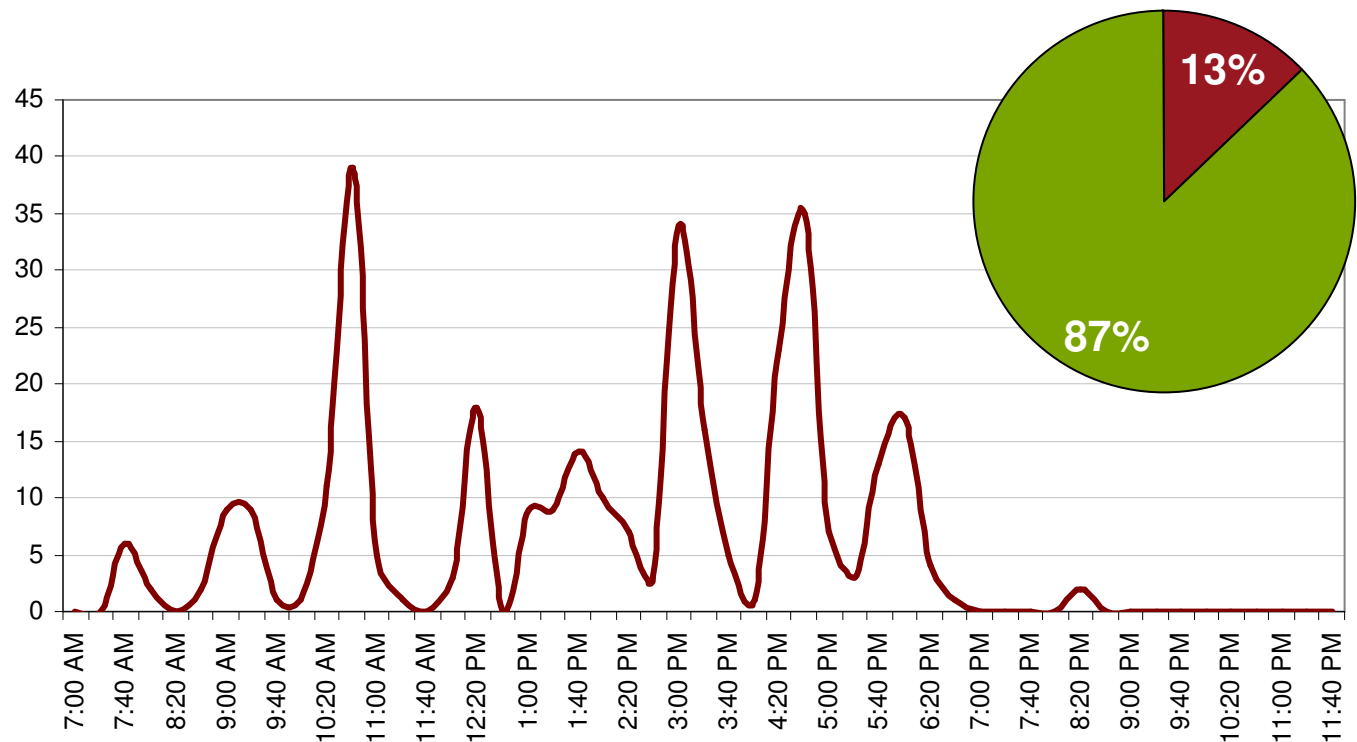
On a normal day, service level at Starbucks is resulting in a loss of up to 320 clients



Long waiting times is driving a high churn rate with potential indirect consequences in customer satisfaction:

Approximately 320 or 13% out of a total of 2,500 customers either give up at the door or after waiting a couple minutes in the line

customers giving up (on every 20 minute slot)



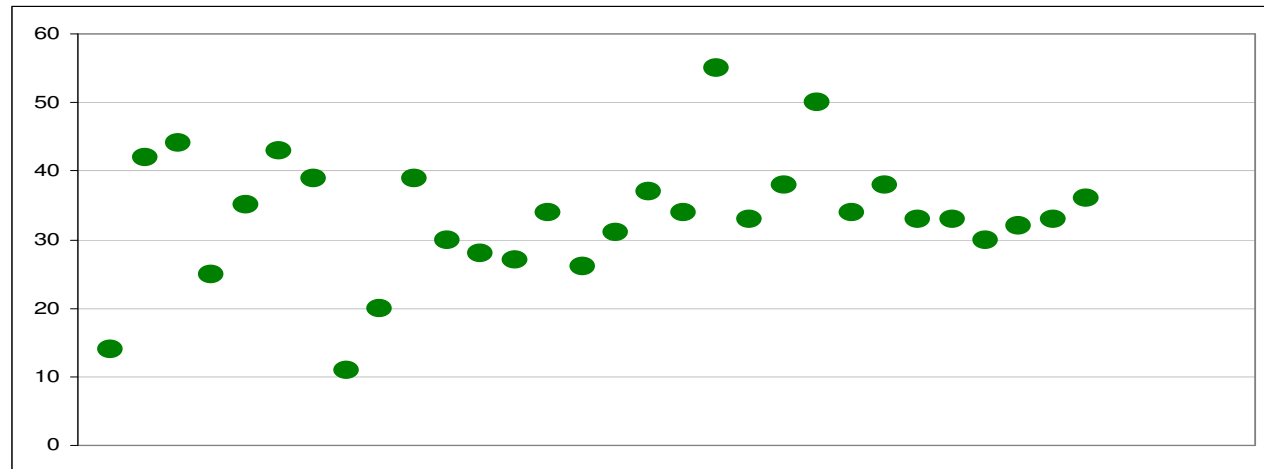
Source: Field measures (number of total customers versus customers giving up across a full day of work, 7 AM to 12 AM)

High volatility across work station's capacity rates decreases overall service level

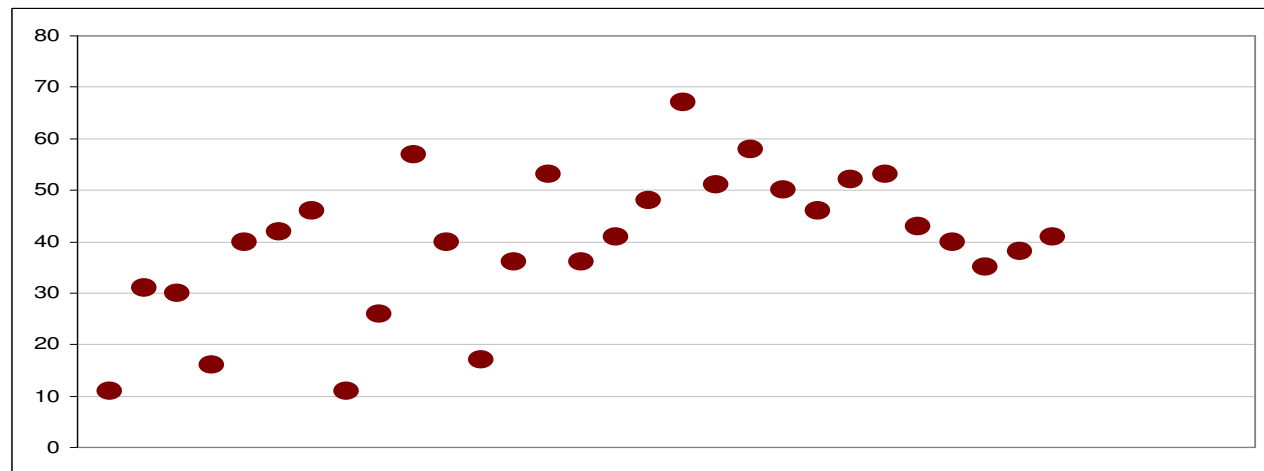


of clients/beverages served* (on a 20 minute slot)

**At the
cashiers**



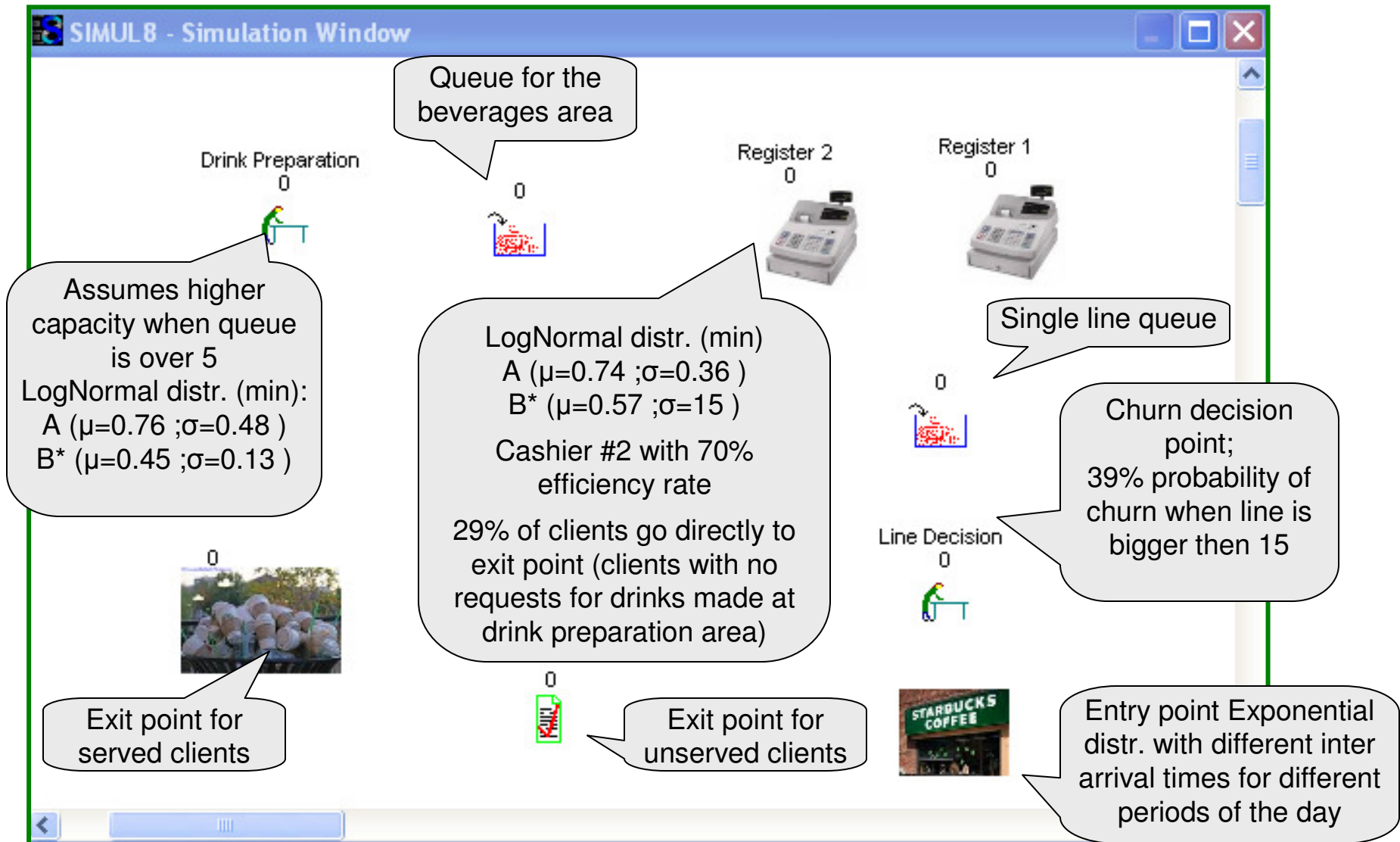
**At the coffee
machines**



* Field measures (27 observations of 20 minute slots between 7 AM to 12 AM, Mon-Thu) during peak times (always people queueing)



The system was simulated using Simul8



* Peak capacity for registers = queue for registers is > 15; Peak for drink preparation = queue for drinks >5

New initiatives would significantly increase service level and potentially eliminate churn



Key performance measures

	Description	Churn	Queuing time (min)	Total time in system (min)
Base case	System <i>as is</i>	13 %	5.76	8.74
10-drink cards	Pre purchased card with 10 equal drinks that can be used to order directly from the beverages area	8 % (-5 pp)	5.65 (-1.9%)	8.74 (-0%)
Priority register	Dedicate 1 cashier to customers paying with Starbucks card or Campus Cash (assumes increase in number of customers using this payment method)	6 % (-7 pp)	4.51 (-21.7%)	7.90 (-9.6%)
Drink Comm.	Intercom in the beverages area printing all orders coming from registers	9 % (-4 pp)	4.63 (-19.6%)	7.87 (-9.9%)
Automated register	Automatic machine for clients who want to order drinks from the beverages area. Assumes previous measure is in place	3 % (-10 pp)	3.81 (-33.9%)	7.41 (-15.2%)

Source: Team analysis



The four initiatives were built into the model according to their specifications

• [BACKUP](#)

Changes in model

10-drink cards

- Model assumes 10% of customers will go directly to the drink area independently of the size of the line for the registers

Priority register

- Assumes 50% of clients would adhere to either Starbucks Card or Campus Cash.
- Second cashier's time per client is set to 0.5 min (fixed).

Drink Comm.

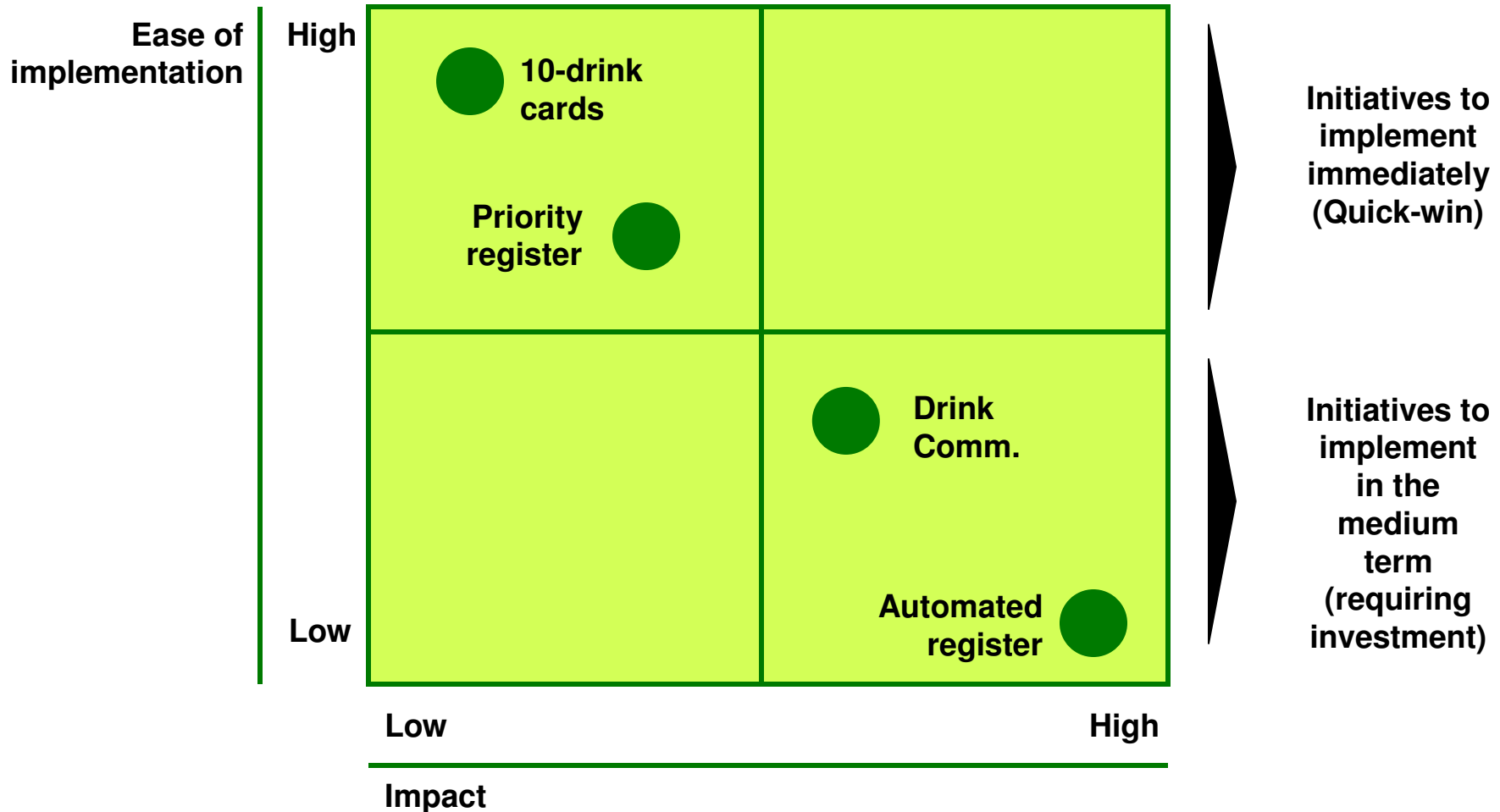
- Assumes a 10% efficiency increase across working stations

Automated register

- Assumes 10% efficiency increase across working stations
- New register (automatic) with same capacity as current registers (conservative approach)
- Assumes 30% of clients only go for drinks and 50% of these would use the automatic vendor machine

All assumptions would need further field analysis for verification

Starbucks should phase-in the 4 initiatives accordingly to their ease of implementation





BACKUP



Field measures

Demand. # of clients coming in. Mon-Thu

	# of People Getting Into		Total Demand
	Line	# of People giving up	
7:00:00 - 7:20:00	15	0	15
7:20:00 - 7:40:00	22	0	22
7:40:00 - 8:00:00	48	6	54
8:00:00 - 8:20:00	14	2	16
8:20:00 - 8:40:00	35	0	35
8:40:00 - 9:00:00	51	2	53
9:00:00 - 9:20:00	97	9	106
9:20:00 - 9:40:00	47	9	56
9:40:00 - 10:00:00	33	1	34
10:00:00 - 10:20:00	33	1	34
10:20:00 - 10:40:00	68	11	79
10:40:00 - 11:00:00	75	39	114
11:00:00 - 11:20:00	37	5	42
11:20:00 - 11:40:00	31	1	32
11:40:00 - 12:00:00	52	0	52
12:00:00 - 12:20:00	63	3	66
12:20:00 - 12:40:00	60	18	78
12:40:00 - 13:00:00	45	0	45
13:00:00 - 13:20:00	54	9	63
13:20:00 - 13:40:00	86	9	95
13:40:00 - 14:00:00	78	14	92
14:00:00 - 14:20:00	37	10	47
14:20:00 - 14:40:00	47	7	54
14:40:00 - 15:00:00	32	3	35
15:00:00 - 15:20:00	87	34	121
15:20:00 - 15:40:00	55	16	71

	# of People Getting Into		Total Demand
	Line	# of People giving up	
15:40:00 - 16:00:00	60	5	65
16:00:00 - 16:20:00	62	1	63
16:20:00 - 16:40:00	64	23	87
16:40:00 - 17:00:00	65	35	100
17:00:00 - 17:20:00	57	7	64
17:20:00 - 17:40:00	54	3	57
17:40:00 - 18:00:00	59	13	72
18:00:00 - 18:20:00	62	17	79
18:20:00 - 18:40:00	50	4	54
18:40:00 - 19:00:00	38	1	39
19:00:00 - 19:20:00	50	0	50
19:20:00 - 19:40:00	39	0	39
19:40:00 - 20:00:00	48	0	48
20:00:00 - 20:20:00	58	0	58
20:20:00 - 20:40:00	39	2	41
20:40:00 - 21:00:00	34	0	34
21:00:00 - 21:20:00	41	0	41
21:20:00 - 21:40:00	38 *	0	38
21:40:00 - 22:00:00	38 *	0	38
22:00:00 - 22:20:00	38 *	0	38
22:20:00 - 22:40:00	38 *	0	38
22:40:00 - 23:00:00	38 *	0	38
23:00:00 - 23:20:00	38 *	0	38
23:20:00 - 23:40:00	38 *	0	38
23:40:00 - 0:00:00	38 *	0	38

* Assumes continuous demand after 9:20 pm



Field measures

Capacity. Mon-Thu

	# of Transactions for ONE cashier	Number of Beverages Served
7:00:00 - 7:20:00	11	8
7:20:00 - 7:40:00	14	11
7:40:00 - 8:00:00	42	31
8:00:00 - 8:20:00	44	30
8:20:00 - 8:40:00	25	16
8:40:00 - 9:00:00	35	40
9:00:00 - 9:20:00	43	42
9:20:00 - 9:40:00	39	46
9:40:00 - 10:00:00	*	*
10:00:00 - 10:20:00	11	11
10:20:00 - 10:40:00	20	26
10:40:00 - 11:00:00	39	57
11:00:00 - 11:20:00	30	40
11:20:00 - 11:40:00	28	17
11:40:00 - 12:00:00	*	*
12:00:00 - 12:20:00	27	36
12:20:00 - 12:40:00	34	53
12:40:00 - 13:00:00	26	36
13:00:00 - 13:20:00	31	41
13:20:00 - 13:40:00	37	48
13:40:00 - 14:00:00	34	67
14:00:00 - 14:20:00	*	*
14:20:00 - 14:40:00	*	*
14:40:00 - 15:00:00	*	*
15:00:00 - 15:20:00	55	51
15:20:00 - 15:40:00	33	58

	# of Transactions for ONE cashier	Number of Beverages Served
15:40:00 - 16:00:00	38	50
16:00:00 - 16:20:00	50	46
16:20:00 - 16:40:00	34	52
16:40:00 - 17:00:00	38	53
17:00:00 - 17:20:00	33	43
17:20:00 - 17:40:00	33	40
17:40:00 - 18:00:00	30	35
18:00:00 - 18:20:00	32	38
18:20:00 - 18:40:00	33	41
18:40:00 - 19:00:00	*	*
19:00:00 - 19:20:00	*	*
19:20:00 - 19:40:00	*	*
19:40:00 - 20:00:00	*	*
20:00:00 - 20:20:00	*	*
20:20:00 - 20:40:00	*	*
20:40:00 - 21:00:00	*	*
21:00:00 - 21:20:00	*	*
21:20:00 - 21:40:00	*	*
21:40:00 - 22:00:00	*	*
22:00:00 - 22:20:00	*	*
22:20:00 - 22:40:00	*	*
22:40:00 - 23:00:00	*	*
23:00:00 - 23:20:00	*	*
23:20:00 - 23:40:00	*	*
23:40:00 - 0:00:00	*	*

* Not relevant since employees were not working at full capacity



Model Inputs (probability distributions)

		Register (1 and 2)		Drinks	
		Mean	Standard Dev.	Mean	Standard Dev.
Base case	Normal	0.74	0.36	0.76	0.48
	Peak *	0.57	0.15	0.45	0.13

		Register (1 and 2)	
		Mean	Standard Dev.
10 drinks cards	Normal	0.74	0.36
	Peak *	0.57	0.15

		Register (1)		Register (2)	
		Mean	Standard Dev.	Mean	Standard Dev.
Priority cashier	Normal	0.74	0.36	0.50	0.00
	Peak *	0.57	0.15	0.50	0.00

		Register (1 and 2)		Drinks	
		Mean	Standard Dev.	Mean	Standard Dev.
Drink communic.	Normal	0.66	0.32	0.68	0.43
	Peak *	0.52	0.13	0.41	0.12

		Register (3)	
		Mean	Standard Dev.
Automated register	Normal	0.74	0.36
	Peak *	0.57	0.15

* Peak capacity for registers = queue for registers is > 15; Peak for drink preparation = queue for drinks >5