



BUAD 467/667  
Service Management  
Spring 2008

Professor Patrick T. Harker

*Class 6a*  
*Capacity Design IV*

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Outline for the Class

- Claims Processing in Insurance
- *Manzana Insurance*

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## Claims Processing in Insurance

- what are the goals of the claims processing operations? Who's the customer?
- models -- intuition is often wrong! (commercial claims take 60 days less)
- when to throw it at the sharks -- a quantitative approach

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## *Manzana Insurance*

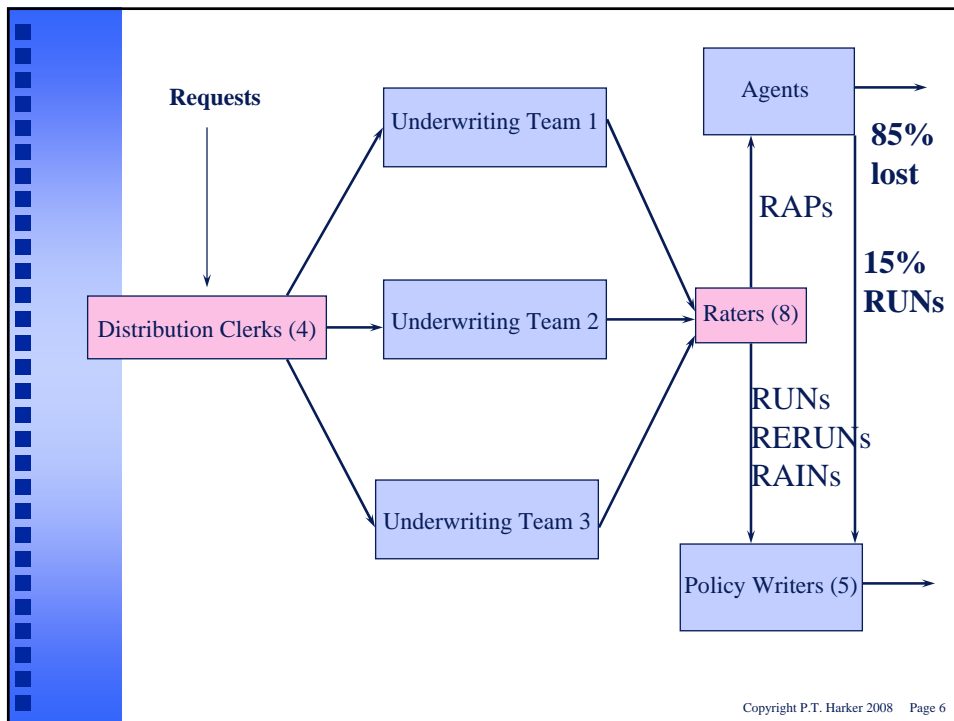
- What's the problem? Where's the bottleneck?
- What is your assessment of the rules used to assign priorities at Fruitvale?
- How to improve performance without "reengineering"
- What are your recommendations for managerial action? In particular, how should Manzana respond to Golden Gate's new policy of one-day service?

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## Profit by Product Line

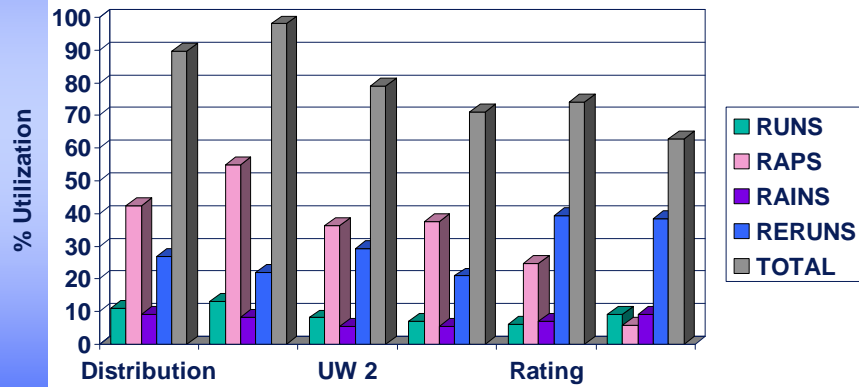
	RUN	RAP	RAP/new	RAIN	RERUN
Clerk	\$14.27	\$12.94	\$86.25	\$9.06	\$5.83
Underwrite	23.62	25.51	170.08	12.24	10.13
Rater	25.17	24.27	161.78	21.83	25.17
Policy	17.16	2.57	17.16	13.05	12.11
Profit	-524.67	-490.64	-3288.06	-302.64	817.88

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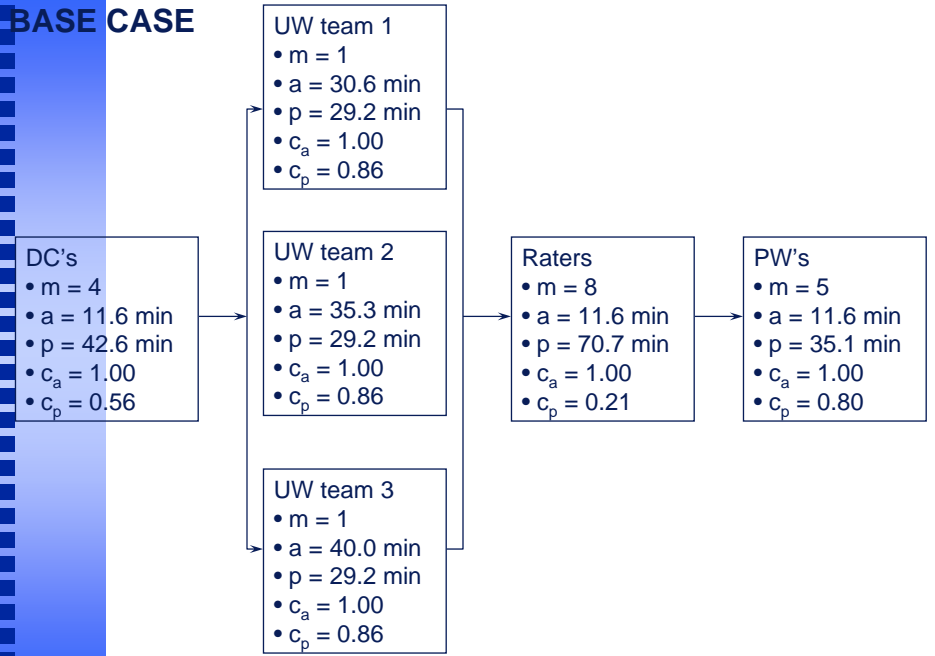
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## Utilization Profiles for Manzana



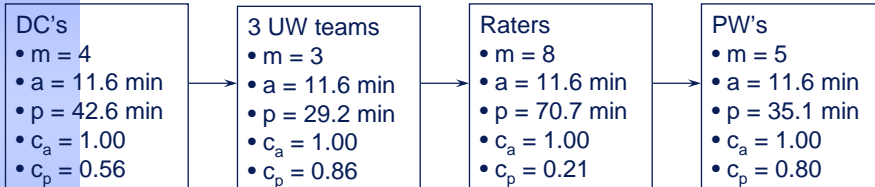
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## BASE CASE

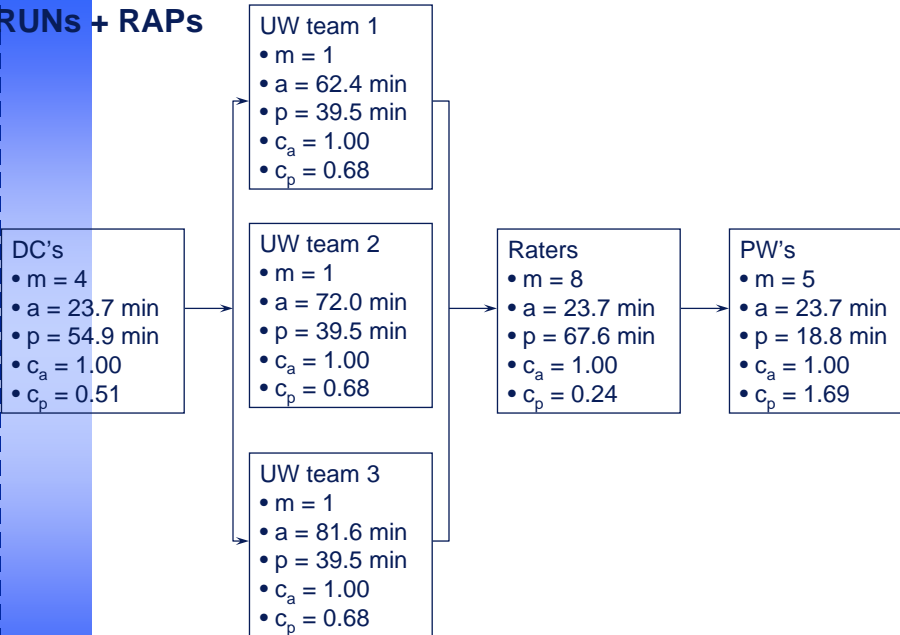


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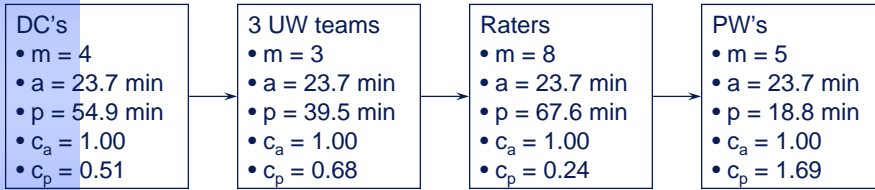
## POOL UNDERWRITERS



## RUNS + RAPs



## POOL UNDERWRITERS FOR RUNs + RAPs



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	averages		std deviations		percent of mix relative probability	RUN	RAP	average		std dev	c.v.
	RUN	RAP	RUN	RAP		0.27	0.73	RUN/RAP	RUN/RAP	RUN/RAP	
DC	68.5	50.0	30.7	24.9				DC	54.91	27.79	0.51
UW	43.6	38.0	32.0	24.5				UW	39.49	26.81	0.68
RA	75.5	64.7	20.5	13.6				RA	67.57	16.44	0.24
PW	71.0		10.3					PW	18.84	31.79	1.69

	averages		std deviations		percent of mix relative probability	RAIN	RERUN	average		std dev	c.v.
	RAIN	RERUN	RAIN	RERUN		0.18	0.82	RAIN/RE	RAIN/RE	RAIN/RE	
DC	43.50	28.00	9.20	6.20				DC	30.74	9.03	0.29
UW	22.60	18.70	11.70	19.80				UW	19.39	18.69	0.96
RA	65.50	75.50	15.90	9.70				RA	73.74	11.69	0.16
PW	54.00	50.10	8.60	9.50				PW	50.79	9.46	0.19

	averages		std deviations		percent of mix relative probability	RU/RAP	RA/RE	average		std dev	c.v.
	RUN/RAP	RAIN/RE	RUN/RAP	RAIN/RE		0.49	0.51	ALL	ALL	ALL	
DC	54.91	30.74	27.79	9.03			DC	42.58	23.79	0.56	
UW	39.49	19.39	26.81	18.69			UW	29.24	25.12	0.86	
RA	67.57	73.74	16.44	11.69			RA	70.71	14.54	0.21	
PW	18.84	50.79	31.79	9.46			PW	35.13	28.21	0.80	

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## Queuing Approximation...

$$\mu = 1/\text{service time} \quad \lambda = 1/\text{interarrival time}$$

$$cv_{\mu} = cv_p \quad cv_{\lambda} = cv_a$$

$$\rho = \lambda / (m\mu)$$

$$W_q = \frac{1}{(m\mu)} * \frac{\rho^{\{\sqrt{2(m+1)} - 1\}}}{(1 - \rho)} * \frac{cv_{\mu}^2 + cv_{\lambda}^2}{2}$$

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## Example of approximation

$$\mu = 60/42.6 = 1.408 \quad \lambda = 60/11.2 = 5.36$$

$$cv_{\mu} = 0.56 \quad cv_{\lambda} = 1$$

$$cv_{\mu}^2 = 0.3136 \quad cv_{\lambda}^2 = 1.00$$

$$\rho = 5.36 / (4 * 1.408) = 0.9512$$

$$W_q = \frac{1}{(4 * 1.41)} * \frac{(0.95)^{\{\sqrt{2(4+1)} - 1\}}}{(1 - 0.9512)} * \frac{(0.56)^2 + 1^2}{2}$$

$$= 2.145 \text{ hours} = 128.68 \text{ minutes}$$

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ALL PRODUCTS (minutes)									
Queue	m	a	p	ca	cp	u	Wq	Lq	
DC	4	11.2	42.6	1.00	0.56	0.95	126.3	11.3	
UW1	1	31.2	29.2	1.00	0.86	0.94	388.2	12.5	
UW2	1	31.9	29.2	1.00	0.86	0.92	284.2	8.9	
UW3	1	38.8	29.2	1.00	0.86	0.75	78.0	2.0	
RA	8	11.2	70.7	1.00	0.21	0.79	10.1	0.9	
PW	5	11.2	35.1	1.00	0.80	0.63	4.9	0.4	
pooled UW's	3	11.2	29.2	1.00	0.86	0.87	50.6	4.5	

ONLY RUNS and RAPS (minutes)									
Queue	m	a	p	ca	cp	u	Wq	Lq	
DC	4	22.9	54.9	1.00	0.51	0.60	7.2	0.3	
UW1	1	63.6	39.5	1.00	0.68	0.62	47.3	0.7	
UW2	1	65.0	39.5	1.00	0.68	0.61	32.4	0.5	
UW3	1	79.1	39.5	1.00	0.68	0.50	75.7	1.0	
RA	8	22.9	67.6	1.00	0.24	0.37	0.3	0.0	
PW	5	22.9	18.8	1.00	1.69	0.16	0.0	0.0	
pooled UW's	3	22.9	39.5	1.00	0.68	0.58	8.3	0.4	

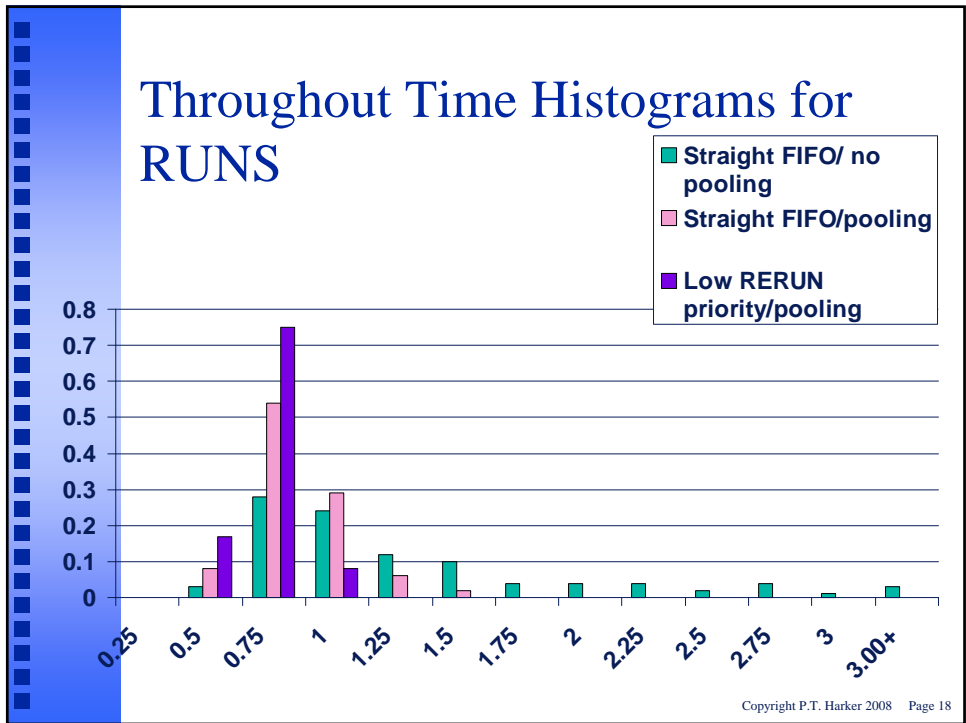
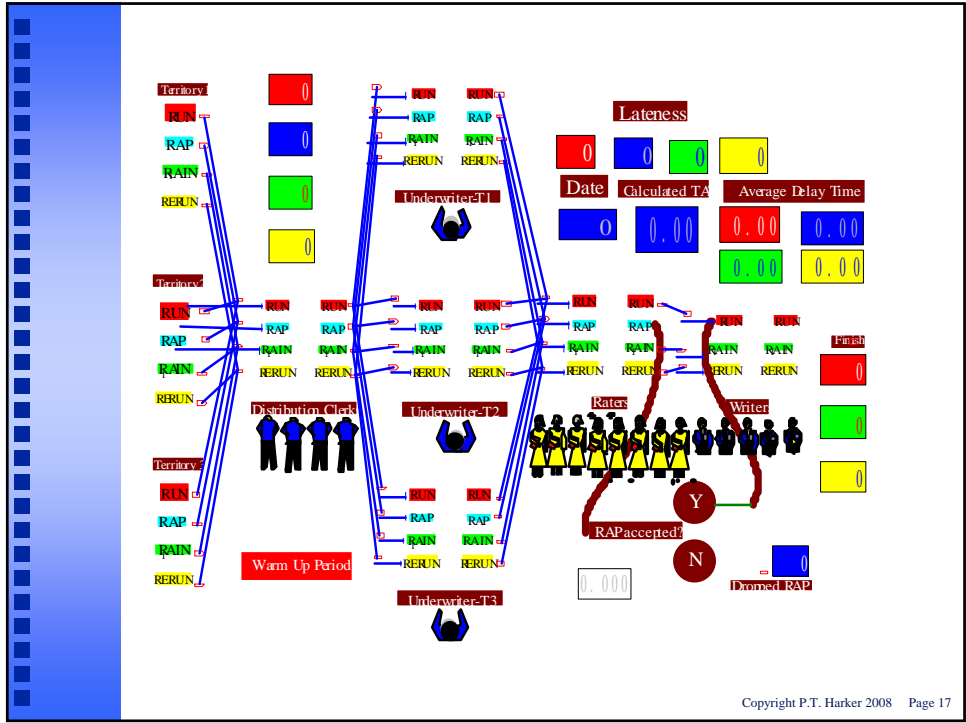
  

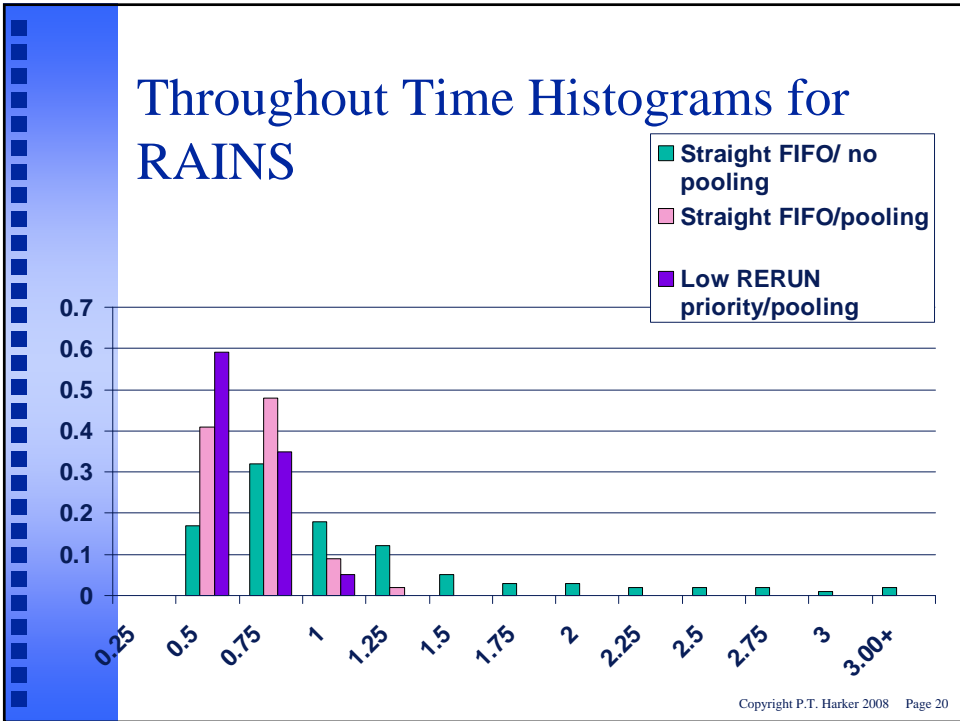
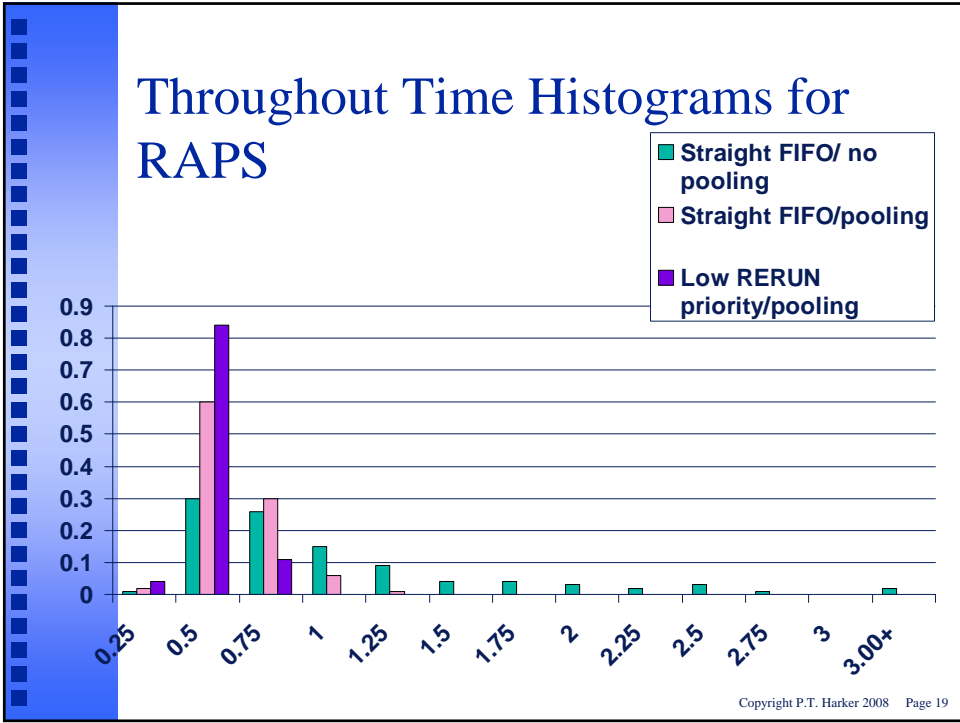
LEADTIME CALCULATIONS (hours)			
Area	ALL products	only Runs and RAPS	
1	11.8	3.9	
2	10.1	3.7	
3	6.6	4.4	
pooled	6.2	3.3	

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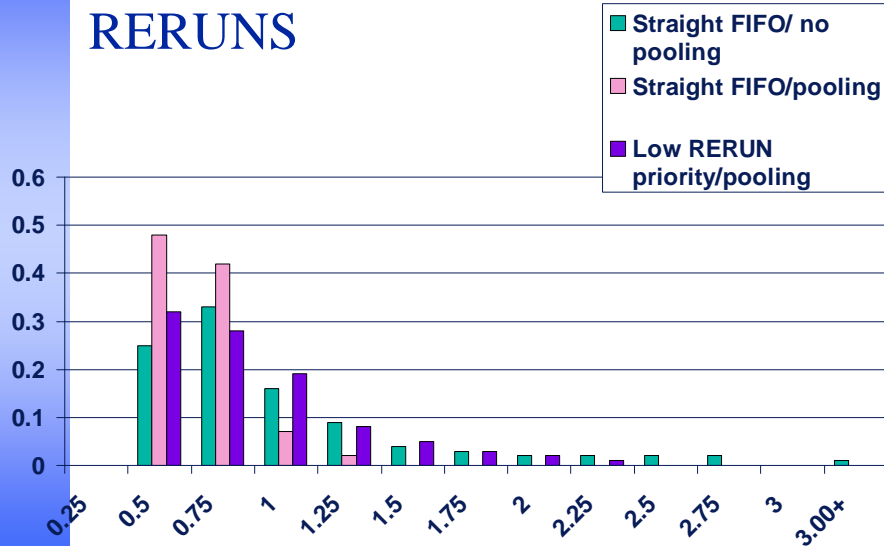
Inputs:		Definitions of terms:						
lambda	5.355	lambda = arrival rate						
mu	1.408	mu = service rate						
Ca <sup>2</sup>	1	s = number of servers						
Cb <sup>2</sup>	0.3136	Ca <sup>2</sup> = squared coeff. of variation of arrivals						
		Cb <sup>2</sup> = squared coeff. of variation of service times						
		Nq = average length of the queue						
		Ns = average number in the system						
		Wq = average wait in the queue						
		Ws = average wait in the system						
		P(0) = probability of zero customers in the system	lambda/mu					
		P(delay) = probability that an arriving customer has to wait	3.803267					
Outputs:		Intermediate Calculations:						
s	Nq	Ns	Wq	Ws	P(delay)	Utilization	(l/u) <sup>s</sup> /s!	sum (l/u) <sup>s</sup> /s!
0							1.00E+00	1.00E+00
1	infinity	infinity	infinity	infinity	1.000000	1.000000	3.80E+00	4.80E+00
2	infinity	infinity	infinity	infinity	1.000000	1.000000	7.23E+00	1.20E+01
3	infinity	infinity	infinity	infinity	1.000000	1.000000	9.17E+00	2.12E+01
4	11.340683	15.143950	2.117775	2.828002	0.893154	0.950817	8.72E+00	2.99E+01
5	1.003528	4.806795	0.187400	0.897627	0.480769	0.760653	6.63E+00	3.66E+01
6	0.271792	4.075059	0.050755	0.760982	0.239014	0.633878	4.20E+00	4.08E+01

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## Throughout Time Histograms for RERUNS



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## Queuing & Simulation Comparison

	<u>Simulated</u>	<u>Queueing</u>
leadtime (no team)	7.05 hours	8.66 hours
leadtime (team)	4.50 hours	5.00 hours

queuing approximations are conservative!!!

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## Simulation Results

Given Data	Simulation Output				
	Dedicated UT, With Priority	Dedicated UT, With Priority	Dedicated UT, Without Priority	General UT, With Priority	General UT, Without Priority
Total # Processed (1990)		Basecase-new	rp-new	gt-new	gtrp-new
RUN	1122	1113	1143	1156	1165
RAP	3079	3047	3123	3016	3062
RAIN	895	927	911	892	899
RERUN	4978	5039	4967	4926	4962
Original RUN*	678	698	674	710	701
Late RUN	0	0	16	0	4
Late RAP	0	0	35	0	0
Late RAIN	2	100	17	7	0
Late RERUN	1170	1544	644	58	0
1 day guaranteed Turnaround Time					
Late RUN		1	160	0	5
Late RAP		1	413	0	0
Late RAIN		342	155	7	0
Late RERUN		1544	644	58	0
* Because the Calculated TAT is almost always 1.0					
1 day guaranteed Turnaround Time					
Late Run Per.		0.09%	14.00%	0.00%	0.43%
Late RAP Per.		0.03%	13.22%	0.00%	0.00%
Late RAIN Per.		36.89%	17.01%	0.78%	0.00%
Late RERUN Per.		30.64%	12.91%	1.18%	0.00%
Average Turnaround Time					
RUN		0.49	0.72	0.45	0.5
RAP		0.45	0.85	0.38	0.49
RAIN		2.26	0.96	0.63	0.58
RERUN		1.81	0.89	0.63	0.55
Average Calculated TAT					
SD		4.375	2.6666	1.0416	1.1041
		0.67713	0.49213	0.19183	0.27666

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## Lessons from *Manzana*

- don't believe "standard times"; know where they come from
- pooling can be a "quick fix" for reengineering a service delivery system
- queuing approximations are a good "first cut" analysis! However, simulation is necessary to "sell" the results.
- downsides of pooling? Loss of "local" knowledge. The USAA story.

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Service Management  
Spring 2008

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*Class 6b*  
*Customer Efficiency Management*

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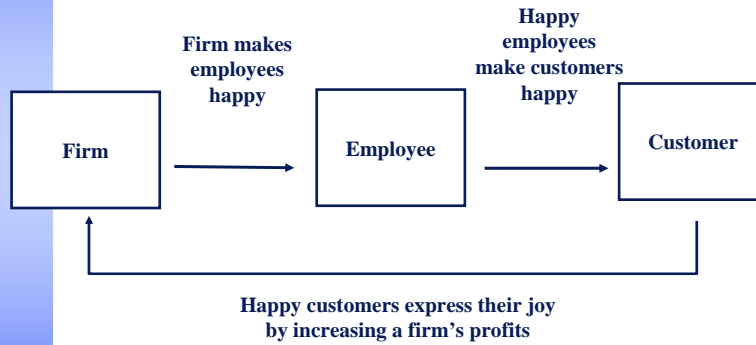


Outline for the Class

- Customer Efficiency Management (CEM)
- eBay: the customer Marketplace
- Lessons from eBay for all Service Organizations

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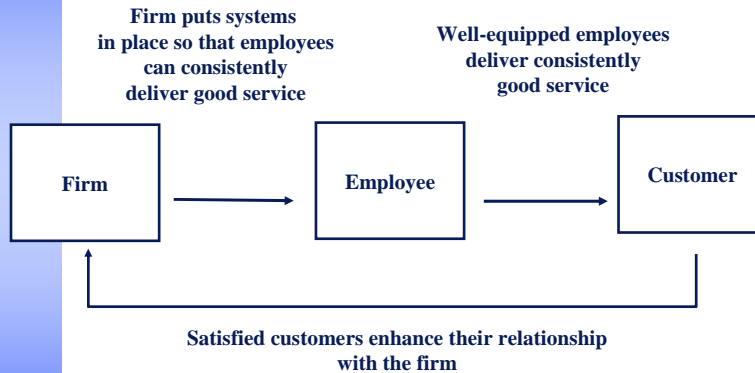
## Simplistic Profit Cycle: Main Focus is on Morale of Employees



*Warning: This can lead to inconsistent customer experiences*

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## Realistic Profit Cycle: Main Focus is on Process



*Firms should provide the ability to deliver consistent service (in addition to having good morale)*

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## The Rise of Profit Segmentation:

*Business Week (2000):*

“... the result is more efficiencies for companies ---  
and more frustration for their less valuable  
customers.”

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## CRM to the Rescue

*Customer Relationship Management (IBM):*

“a business strategy designed to optimize revenue  
and profits by increasing customer satisfaction,  
attracting new customers, retaining existing  
customers, and understanding customers better”

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## CRM is Big Business

- CRM spending will reach \$76.5 billion in 2005, up from \$23 billion in 2000 (Gartner Group 2001)
- CRM application will increase at a 44% CAGR compared to 15.3% CAGR growth in the overall applications market (IDC 2001)

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## Beyond CRM ...

- Customers are true co-producers, not just recipients of a service
- That is, customers can be managed with tools from HR as well as from Marketing.

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## Co-Production

- Physical or virtual presence and labor
- Facilitating the information flow through interactions with the firm and other customers
- Making indispensable intellectual efforts such as choice evaluation and decision-making

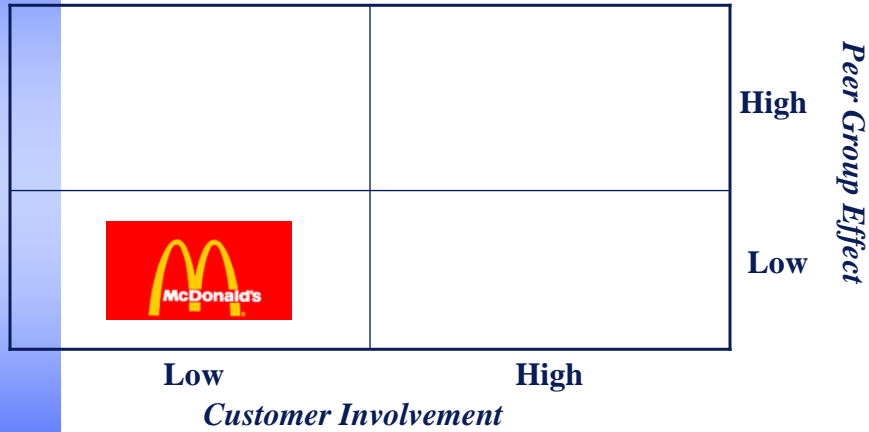
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## Examples of Co-Production

- Haircutting
- Healthcare
- Legal/financial consulting
- Education
- E-shopping
- E-financial service

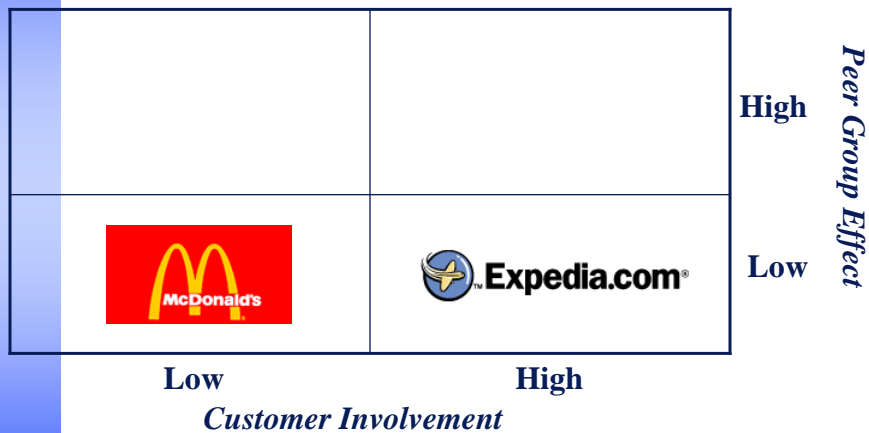
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## The Impact of Peers



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## The Impact of Peers



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## The Impact of Peers

		High
		Low
Low	High	

*Customer Involvement*

*Peer Group Effect*

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## The Impact of Peers

		High
		Low
Low	High	

*Customer Involvement*

*Peer Group Effect*

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## The Impact of Peers

	 	<i>Peer Group Effect</i> <b>High</b>
		
<p style="text-align: center;"> <b>Low</b> <span style="margin-left: 150px;"><b>High</b></span>  <i>Customer Involvement</i> </p>		

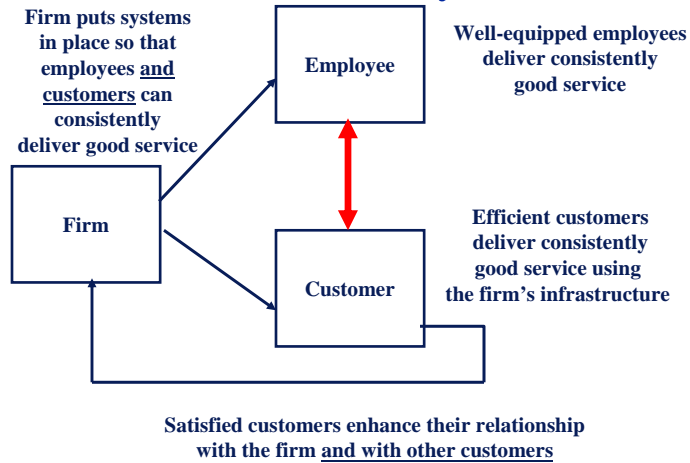
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## Customer Efficiency: Concept

*An efficient customer*  
 is a customer who  
 uses *less* of their resources (time, etc.)  
 while accomplishing  
*more* for themselves.

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## Today's Profit Cycle: Main Focus is on Customer Efficiency



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## Next Class:

- Midterm!
- Homework #2 due