

**Pizza Express<sup>®</sup>  
Six Sigma Case Study**

**Pizza Express<sup>®</sup>  
A Six Sigma Case Study<sup>®</sup>**

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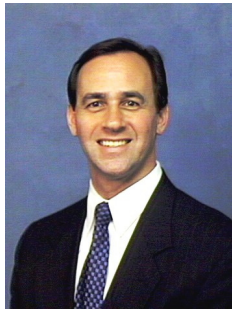


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## Pizza Express® Six Sigma Case Study

*The following Six Sigma case study is designed for small / medium sized business owners to understand the Six Sigma methodology and to apply the basic concepts and tools in their own business. The case involves a typical small business – a pizza delivery company experiencing unexpected financial losses and declining customer service. The primary objective for the reader is to identify and define the core issue(s), appropriately measure, analyze and suggest specific improvement approaches to overcome the operational issue(s) using the Six Sigma DMAIC process: Define, Measure, Analyze, Improve, Implement, and Control. The reader is expected to use the information contained in the case and make reasonable assumptions where needed. A solution guideline is available.*



*Peter J. Sherman is an ASQ Certified Quality Engineer and a Certified Six Sigma Black Belt. He has 20 years experience, including serving as Sr. Black Belt for AT&T's Product Development Group. Mr. Sherman has led Six Sigma initiatives across Product Development, Sales, Fulfillment, Installation, Customer Support, and Billing. He began his career in quality management working in Japan as a visiting M.I.T. Scholar in 1986-87 and is currently lead Instructor at Emory University's Six Sigma Certification Program in Atlanta, Georgia. Mr. Sherman has been published in various journals including iSixSigma and Solutions (part of Journal of Financial Planning) and is the recipient of the 2007 Quality Excellence for Suppliers of Telecommunications (QuEST) 8<sup>th</sup> Annual Best Practices in the Six Sigma category. Mr. Sherman received his Master's in Engineering from M.I.T. and has an MBA from Georgia State University. Mr. Sherman is a member of the ASQ and ISSSP.*

# Pizza Express®

## Six Sigma Case Study

### Background:

Pizza Express is a successful pizza delivery business located in Dunwoody, GA – a small suburban community of middle-income families in Atlanta. Larry Jones, the owner, has been in business for more than 6 years. Pizza Express enjoys an excellent reputation for making quality pizza at competitive prices with fast, convenient delivery service.

Larry was a former Manager at Dominos for several years and knew the business well. When he opened his delivery pizza business, he installed the best ovens and equipment, sourced the highest quality food suppliers, and thoroughly trained the staff. Larry knew the key to success in the pizza delivery business was to deliver the pizzas very quickly once they came out of the oven so that they are hot and fresh when delivered. Pizza Express's policy was to guarantee delivery of your pizza in less than 30 minutes from placing an order. If not, Larry discounted the pizza 100%. The policy worked and the business grew steadily and rapidly (see Financial Summary). The business was highly profitable with 24% Operating Margins!

### Operations:

The key to Larry's fast delivery service and profitability was delivering the pizzas in batches of 4-5 orders since most customers were located in close proximity to each other. Larry kept the business simple – Pizza Express only made and delivered pizza unlike the other chains offering a greater menu variety including pastas, salads and soft drinks. While the menu was limited, customer satisfaction was extremely high. The staff consists of 1 Pizza Chef, 1 Receptionist and 2 Drivers. The chef served as an apprentice to Larry during the 1<sup>st</sup> year and learned the art of preparing and baking pizzas. Larry carefully designed the order taking process and made sure the receptionist consistently repeated the customer name, address, telephone number, order and price to minimize mistakes. The Receptionist took orders, dispatched the drivers, and collected the cash from the drivers. The Chef and Receptionist have been with Larry since 2001, while the drivers generally had a much higher turnover. The Drivers were generally younger men who drove their own vehicle. Larry paid the drivers a base wage plus mileage reimbursement. Drivers had an incentive to make quick deliveries from the extraordinarily good tips from customers. All drivers were given maps. Larry handled overall supervision, purchasing, payroll, and training. Marketing had historically been via word-of-mouth. Larry was proud of the fact that he never spent a lot of money on advertising and marketing.

### Current Situation:

While Larry was satisfied with revenues and income, he knew the operation was not being fully optimized. With the current facility and staff, Pizza Express could easily increase its pizza production by 50%. So, in January 2007, Larry expanded the menu to include calzones and manicotti and high-margin soft drinks. Larry also invested in advertising through newspapers and radio in Dunwoody and the surrounding communities. The results were almost immediate. The advertising generated a significant increase in orders. In fact, Larry added a 2<sup>nd</sup> rollover telephone line and took orders himself.

While orders surged 49%, Larry was surprised to see the 2007 mid-year financial statement showed a loss (\$4,579) – the company's first loss since inception. Larry was receiving significantly more complaints including improperly cooked food, wrong orders, late deliveries and cold pizzas / food. So, in July 2007, Larry called an emergency meeting with his entire team to figure out why profits and service had declined so rapidly and to correct it as soon as possible. He had to move quickly before customers would switch to the competition.

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## Key Financial and Operational Data

	2001	2002	2003	2004	2005	2006	2007 thru June
<b>Revenues</b>	\$150,000	\$217,350	\$301,000	\$407,000	\$505,050	\$567,280	\$460,906
<b>Operating Costs</b>							
Salaries	\$47,840	\$49,036	\$50,262	\$67,279	\$68,961	\$70,685	\$36,226
Owner's Comp.	\$0	\$20,000	\$50,000	\$65,000	\$100,000	\$125,000	\$62,500
Ingredients <sup>1</sup>	\$52,500	\$75,338	\$100,800	\$135,050	\$166,985	\$184,873	\$178,719
Marketing	\$250	\$500	\$600	\$600	\$650	\$650	\$25,000
Supplies <sup>2</sup>	\$3,750	\$5,250	\$7,280	\$9,620	\$12,126	\$13,169	\$18,813
Rent	\$10,000	\$10,250	\$10,500	\$10,750	\$11,000	\$11,250	\$5,750
Mileage <sup>3</sup>	\$3,000	6,300	8,400	11,100	18,200	20,260	33,863
Vehicle Maintenance	\$400	\$560	\$640	\$1,000	\$1,150	\$1,250	\$5,250
Utilities / Janitorial / Maint.	\$4,000	\$4,000	\$4,000	\$4,000	\$4,000	\$4,000	\$2,000
Insurance	\$1,000	\$1,000	\$1,000	\$1,100	\$1,100	\$1,100	\$575
Refunds <sup>4</sup>	\$150	\$326	\$602	\$611	\$808	\$1,135	\$96,790
<b>Total Costs</b>	<b>\$122,890</b>	<b>\$172,560</b>	<b>\$234,084</b>	<b>\$306,110</b>	<b>\$384,980</b>	<b>\$433,371</b>	<b>\$465,485</b>
<b>Operating Income</b>	<b>\$27,110</b>	<b>\$44,790</b>	<b>\$66,916</b>	<b>\$100,890</b>	<b>\$120,070</b>	<b>\$133,909</b>	<b>-\$4,579</b>
% Profit Margin	18%	21%	22%	25%	24%	24%	-1%

<sup>1</sup> Cost of Goods Sold (primarily ingredients) was historically 35% of the average \$10 retail pizza price.

<sup>2</sup> Supply costs historically averaged \$.25 per pizza (cardboard boxes, plastic utensils, napkins, and office supplies).

<sup>3</sup> Drivers are paid \$0.20 per mile for deliveries. Mileage has historically been 3 miles per delivery.

<sup>4</sup> Late deliveries have historically averaged 0.17% of total pizzas. Customers are refunded in full for late deliveries.

Labor	2001	2002	2003	2004	2005	2006	2007 thru June
Chef (currently \$13 per hour)	\$20,800	\$21,320	\$21,853	\$24,960	\$25,584	\$26,224	\$13,440
Receptionist / Cashier (\$9.15 per hour)	\$15,600	\$15,990	\$16,390	\$17,680	\$18,122	\$18,575	\$9,520
Driver (\$6.38 per hour)	\$11,440	\$11,726	\$12,019	\$12,320	\$12,628	\$12,943	\$6,633
Driver (\$6.38 per hour)	\$0	\$0	\$0	\$12,320	\$12,628	\$12,943	\$6,633
<b>Total Salaries</b>	<b>\$47,840</b>	<b>\$49,036</b>	<b>\$50,262</b>	<b>\$67,279</b>	<b>\$68,961</b>	<b>\$70,685</b>	<b>\$36,226</b>

Key Metrics	2001	2002	2003	2004	2005	2006	2007 thru June
Pizzas Per Year	15,000	21,000	28,000	37,000	45,500	50,650	37,625
Pizzas Per Week	288	404	538	712	875	974	1,447
Pizzas Per Day	41	58	77	102	125	139	207
Avg Price Per Pizza	\$10.00	\$10.35	\$10.75	\$11.00	\$11.10	\$11.20	\$12.25
Incremental Pizzas		6,000	7,000	9,000	8,500	5,150	24,600
% Growth in Pizzas		40%	33%	32%	23%	11%	49%

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## Sampling of 100 customer complaints in the past 6 months

Complaint	Frequency
Wrong Order	9
Late Delivery	31
Food Returned - Not Prepared Properly	8
Incorrect Bill	5
Wrong Address	7
Food Not Fresh and Hot	34
Miscellaneous	6
<b>TOTAL</b>	<b>100</b>

## Sampling of Delivery Times

<b>Data Type:</b>	Delivery Times (Variable)
<b>Source:</b>	Customer Database
<b>Format:</b>	see below

Sample No.	Sub-Group (Minutes to Delivery Pizza)		
1	20	25	28
2	90	20	25
3	25	90	20
4	20	28	30
5	115	20	25
6	30	27	18
7	60	110	25
8	21	18	75
9	30	21	27
10	22	60	20