IMPROVING CUSTOMER SATISFACTION THROUGH THE MANAGEMENT OF PERCEPTIONS OF WAITING

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Submitted to the Sloan School of Management
in Partial Fulfillment of
the Requirements of the Degree of
Master of Science in Management

at the

Massachusetts Institute of Technology

May 1989

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ABSTRACT

As consumers experience a greater squeeze on their time, short waits seem longer than ever before. If firms can improve customers' perceptions of the time they spend waiting to be served, then customers will experience less frustration and may feel more satisfied with the service encounter. This thesis examines customer perceptions of waiting in line and investigates methods for making waiting more tolerable.

Our research was performed at a branch office of the Bank of Boston. The purpose of the study was to measure changes in customer perceptions of waiting and overall satisfaction under specific conditions. The study was conducted in three phases: the first phase served as a control; the second phase utilized an electronic newsboard to distract customers; and the third phase employed an electronic clock which posted expected waiting times to incoming customers.

Our methodology differed from previous research methods in that we matched individual customer perceptions with their actual waiting times. For each phase of the study, video cameras recorded customer entry and exit times. At the end of each day, the researchers matched the surveyed customers to those on the video tape to determine actual waiting times.

We proved that as perceptions of waiting time increase, customer satisfaction tends to decrease. In addition, increased distractions make the waiting experience more interesting and tend to increase customer satisfaction. We also found that information on the expected time in queue tends to make perceptions of wait length more accurate but does not affect customer satisfaction.

Thesis Supervisor: Richard C. Larson

Title: Professor of Electrical Engineering and Computer Science

ACKNOWLEDGEMENTS

This project involved a great deal of coordination between members of the Bank of Boston, MIT, and outside vendors. We would like to express our gratitude to the many people who helped us complete our thesis.

Professor Richard Larson guided us until our topic was clearly focused and then let us run free. After working with him, queues will never be the same!

Sandra Drought and Marianne Doran of the Electronic Banking Division of the Bank of Boston were with us every step of the way. Without their help we would not have had a thesis. They coordinated all of our interactions with the bank, managed the equipment installations for each testing phase, and met our ambitious time schedule. We can only hope that our real jobs allow us to work with such efficient and enjoyable people.

Ken Paterson and Shelley Schussheim of the Bank of Boston's Market Research Department were instrumental in the design of our survey. They were also quite generous in sharing their industrious interns, Chris McCabe and Eleanor McCoy, who participated in the interviewing and matching processes.

All the members of the 60 State Street branch of the Bank of

Boston helped make the survey process pleasant. Special thanks go to Branch Manager Marilyn McCabe and Teller Supervisor Kathy Santoro for answering all our questions and going beyond their call of duty to help us out.

In addition, many other people at the Bank of Boston provided encouragement and support for our project, especially George Dougan, Carol Thomas, Ken Parks, Gingy Duckworth and Robin Scheu.

Karl Rabke of Camtron installed the Camtron equipment quickly and took the time to educate us about the virtues of his system. He went the extra yard to secure the clock for us in Phase III.

Robert Dannenberg of D/A Technologies solved our matching problem through his ingenious use of video technology. Special thanks for Bob's heroic reprogramming efforts after the two technical wizzes from MIT unplugged the video recorder!

Robert Bergevin, an MIT senior, provided invaluable assistance with interviewing, matching, and data input, as well as lots of moral support. Without BJ, the surfer dude may have passed us by!

Lastly, we would like to thank our families and friends. Our families' promises to read this paper are but one tiny example of

their support. A special acknowledgement to "the other" Dick Larson, who not only tolerated two years of Sloan, including the thesis requirement, but still wants to go through with the wedding! Thanks, also, to our Sloan classmates for driving us to finish this monstrous endeavor. If they had not kept saying "What do you mean, you are not done yet?" we would probably still be working.

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INTRODUCTION

Historically, businesses interested in obtaining high levels of customer satisfaction have focused on using knowledgeable, pleasant servers to deliver high quality products and services to their target markets. In today's environment, this approach is insufficient. Changes in American lifestyles have profoundly altered consumers' values. Today's consumer not only demands quality, but also demands that products and services be delivered quickly. Firms must respond to these changes if they wish to remain competitive.

This thesis will examine customer perceptions of waiting in line, and will focus on methods for making waiting time more tolerable. Rather than taking an operational approach, such as looking at the effects of reducing actual waiting times on customer satisfaction, we focus primarily in the area known as "queue psychology". Our premise is that manipulating customers' perceptions of the waiting experience can be as effective as reducing the actual length of the wait.

WHY IS SPEED IMPORTANT TO CONSUMERS?

The changing demographics of the last ten years have made individuals' time more valuable now than it has been in decades. Americans today work longer, more varied hours than they have since World War II. The past decade has been one of stagnating wages and drastic unemployment shifts. Consequently, many Americans have been forced to work overtime or hold second jobs in order to maintain their middle-class lifestyles. The average workweek has risen from 40.6 hours in 1973 to 47 hours a week in 1988.[1] It follows that during the same period American leisure time has declined from 26.2 to 16.6 hours a week.[2] Furthermore, as the service sector of our economy expands, the structure of the traditional forty hour work week is eroding. Today, weekends are workdays and 24 hour service operations are commonplace.

These economic pressures have shifted consumer values. Since workers have fewer non-working hours, they place a greater value on their free time. This shift can be evidenced by the

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[1]"More time spent winning bread, less enjoying it," Boston Globe, 16 January 1989, p.1.

[2]"Out of Time," Jerome Richard, The New York Times, 28 November 1988, sec. L, p.A25.

increase in time buying and saving services,[3] and by the popular concept of "quality time."

HOW CAN FIRMS ADJUST TO MEET THE NEEDS OF TODAY'S CONSUMERS?

Since customer satisfaction hinges upon the understanding of customer needs, firms must value the preciousness of their customers' time. Consumers consider waiting as inactive, wasted or lost opportunity time. As they experience a greater squeeze on their time, short waits seem longer to them than ever before. Therefore, to attain higher levels of customer satisfaction firms should focus on making customers feel that they are wasting as little time as possible.

This implies that transactions should seem brief so that customers have more free time for themselves. The major ways that this can be accomplished are through operations management and perceptions/expectations management.

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[3]Carol L. Anderson, "Selling Time: Emerging Trends in the Consumer Service Industries," MIT Master's Thesis, May 1988.

Operations Management Approaches

Traditional operations management theory tells us that the way to make customers feel they are spending less time in line is to physically reduce the length of the wait. This can be accomplished by increasing staffing levels or improving employee productivity. Although this approach is certain to produce shorter waits, it is not clear that it will always be effective in improving customer satisfaction. In particular, it is conceivable that customers will not notice that staffing has improved and line waits have decreased; thus their satisfaction with the service provided may not improve. In addition, increasing staffing levels can prove very expensive, particularly in a low-unemployment economic environment.

Perceptions and Expectations Management Approaches

An alternate way to improve customer satisfaction is to directly manipulate customer perceptions and expectations of waiting. The logic behind perceptions and expectations management is that perception is reality. In the case of customer satisfaction, if a customer thinks that he is satisfied, than he is satisfied. Similarly, if a customer thinks that his wait was short enough then it was short enough, regardless of how short or long it

actually was.

A major benefit of perceptions/expectations management is that it is often very inexpensive to implement.

PREVIOUS WORK IN QUEUE PSYCHOLOGY

Empirical research into the psychology of waiting dates back to at least 1955, when Hirsch, Bilger, and Deatherage, studied the effects of auditory and visual backgrounds on perceptions of duration. Hirsch, et al., asked subjects to replicate a tone which they heard in either a quiet or a noisy environment. The researchers observed that short durations tended to be overestimated, while long durations tended to be underestimated. In addition, they found that subjects thought they heard the tone for a longer time in a quiet environment than in a noisy environment.[4]

A more recent study focused on the perceptions of time commuters spent waiting for and traveling on a train in the Boston subway system. Barnett and Saponaro compared customer perceptions and expectations of commuting time with actual observations. They found that while recent construction had not disturbed the trains' operations from their regular schedule, it had upset perceptions. The authors concluded that riders experienced

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[4]I.J. Hirsch et al., "The Effects of Auditory and Visual Background on Apparent Duration," American Journal of Psychology, vol. 69, p.561.

an asymmetry in perceptions: although they were quick to sense a decline in service quality, they were far slower to recognize when the problem had been corrected.[5]

Maister has developed a theory of queue psychology which focuses on a combination of perceptions and expectations management. In particular, he has defined a concept which he calls the "First Law of Service":

Satisfaction = Perception - Expectation[6]

According to Maister,

> ... if you expect a certain level of service, and perceive the service received to be higher, you will be a satisfied customer....there are two main directions in which customer satisfaction with waits (and all other aspects of service) can be influenced: by working on what the customer expects and what the customer perceives.[7]

Maister has proposed eight principles which organizations can use to influence their customers' satisfaction with waiting times:

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[5]Arnold Barnett and Anthony Saponaro, "The Parable of the Red Line," Interfaces, vol. 15:12, March-April 1985, pp.33-39.

[6]David H. Maister, "The Psychology of Waiting Lines," Harvard Business School Note 9-684-064, Rev.5/84, p.2.

[7]Ibid.

1. Unoccupied Time Feels Longer than Occupied Time
2. Pre-Process Waits Feel Longer than In-Process Waits
3. Anxiety Makes Waits Seem Longer
4. Uncertain Waits are Longer than Known, Finite Waits
5. Unexplained Waits are Longer than Explained Waits
6. Unfair Waits are Longer than Equitable Waits
7. The More Valuable the Service, The Longer I Will Wait
8. Solo Waiting Feels Longer than Group Waiting[8]

Larson has observed that a key determinate in satisfaction with the waiting experience is the degree of "social justice". He notes that even if waiting times are very short, customers may become infuriated if the system violates the principle of first in, first out.[9] Larson's research have uncovered several instances where perceptions of queuing have influenced customer satisfaction. For example, he notes that for fast food customers, satisfaction in a single queue system (such as that used by the Wendy's chain) may

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[8]Ibid., p.3.

[9]Richard C. Larson, "Perspectives on Queues: Social Justice and the Psychology of Queuing," Operations Research, vol. 35, November-December 1987, no. 6, p.895.

be higher than that at multi-queue chains (such as McDonald's). Ironically, customers wait longer in a single queue system. Apparently, customers would rather wait in a longer line if they know they will be processed in first come, first served, order. Larson's other observations on the psychology of waiting include stories about banks, department stores, restaurants, airports, elevators, and police emergency systems, to name a few.[10]

Numerous researchers have commented on the influence of service transaction time on customer satisfaction levels. Juran has noted that "a striking feature of the service industries is that the time required to provide service is regarded as an element of quality."[11] He indicates that both the length of the line and the integrity of the queue (i.e., adherence to the "first come, first served" principle) are important components of customer evaluation of the time spent in line.

In addition, several studies have examined the concept of the "time budget" and its effect on consumer purchasing habits. This

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[10]Richard C. Larson, "There is More to a Line than Its Wait," Technology Review, July 1988, pp.60-67.

[11]J.M. Juran and R.S. Bingham, "Section 47: Service Industries," Quality Control Handbook, (J.M. Juran, ed. 1979), p.47-4.

area of research focuses on evaluating how consumers choose among numerous activities, given the constraint of limited available time. An excellent review of the time budget literature is provided by Venkatesan and Anderson.[12]

Bateson has noted that time spent in unpleasant encounters often seems to pass more slowly than time spent in pleasant encounters. Thus, he concluded it is the perception of time, rather than clock time, that is relevant when considering delivery of customer services.[13]

Similarly, Lewis and Klein have studied the presence of "gaps" in the measurement of service quality. Their premise, which builds on the work of many other researchers, notably Parasuraman, Zeithaml and Berry[14], is that there are many differences between the service a company tries to provide its customers and the level of service customers actually believe they

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[12]M. Venkatesan and Beverlee B. Anderson, "Time Budgets and Consumer Services," Service Marketing in a Changing Environment, (Block, Thomas M., et al., ed. 1985), pp.52-55.

[13]John Bateson, "Self-service Consumer: An Exploratory Study," Journal of Retailing, 1984.

[14]Valarie A. Zeithaml, A. Parasuraman and Leonard L. Berry, "Problems and Strategies in Services Marketing," Journal of Marketing, vol. 49, Spring 1985, pp.33-46.

receive. Lewis and Klein empirically tested their hypotheses for two types of service organizations. The authors observed a significant difference between the providers' perceptions of the level of service they delivered and customer perceptions of service delivery.[15]

Two of the world's foremost test sites for experiments about the psychology of queuing are the Disneyland and Disney World theme parks. Disney management realizes that "'There's a real art to line management,'"[16] and does its utmost to make the waiting experience less psychologically wearing. Lines at Disney theme parks are always kept moving, even if only to dump customers into one of a series of pre-ride waiting areas. Newsweek observed that, to influence customer expectations,

> ...the waiting times posted by each attraction are generously overestimated, so that one comes away mysteriously *grateful* for having hung around 20 minutes for a 58-second twirl in the Alice in Wonderland teacups[17]

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[15]Robert C. Lewis and David M. Klein, "The Measurement of Gaps in Service Quality," The Service Challenge: Integrating for Competitive Advantages, (John Czepiel, ed. 1986), pp.35-40.

[16]Dick Numis quoted in Newsweek by Charles Leerhsen, "How Disney Does It," (April 3, 1989) p.52.

[17]Ibid.

Attention to making waiting time pleasurable appears to have paid off: even though Disney's theme park lines get longer each year, customer satisfaction, as measured by exit polls, continues to rise.[18]

[18]Ibid., p.50.

GETTING STARTED

In November 1988, we were referred to the Electronic Banking Division of the Bank of Boston by our thesis advisor Professor Richard Larson of MIT.

At the time, the bank was contemplating installing the Camtron system in several of its branches. The Camtron system measures queuing statistics and uses this information to provide banks with suggestions for improving staffing and service levels. Appendix A contains copies of promotional materials describing the benefits and features of Camtron.

In addition, the Electronic Banking Division had recently begun experimenting with electronic newsboards. The division had installed a board at an off-premise ATM site and management felt it was a great success. They were interested in determining if customers would respond positively to a similar installation in a branch office. Appendix B contains copies of promotional materials describing the benefits and features of the newsboard.

Bank of Boston management had many questions they wished to answer before investing further in these new technologies. They wondered if the equipment worked accurately, how the branch

employees would adopt to the equipment, and most importantly how customers would perceive the improvements. In sum, the bank needed to know if the new technologies would have a noticeable impact on customer satisfaction levels.

Our interests focused primarily on the psychology of queuing. We believed that if we could improve customer satisfaction by manipulating customer perceptions in a real world setting then we could legitimize the use of altering perceived waiting times as a management tool. The Bank of Boston's willingness to adhere to MIT's rigorous thesis deadlines provided an excellent opportunity for us to meet our objectives as well as to answer the bank's questions.

PURPOSE

The purpose of the study was to measure changes in customer perceptions of waiting and overall customer satisfaction under specific conditions. Our study was designed to test the following hypotheses:

1) As the perceptions of waiting increase, customer satisfaction decreases.

2) Increased distractions reduce the perceptions of waiting time, increase customer interest level, and may improve customer satisfaction.

3) Known waits seem less stressful than uncertain waits and may improve customer satisfaction.

In addition, we explored differences between customers' perceptions of waiting and their actual waiting times, as well as how long customers felt was a reasonable waiting time.

METHODOLOGY

OVERVIEW

The study took place in three phases, with the first phase serving as a control. In the second and third phases we manipulated variables we believed would alter perceived waiting times and customer satisfaction levels. The intent of the manipulations were as follows:

PHASE	MANIPULATION	METHOD	INTENT
I	None	No Changes	Control Group
II	Distractions	Newsboard	Improve Perceptions
III	Certainty	Clock	Improve Perceptions

Each phase of the study was conducted at the 60 State Street branch office of the Bank of Boston in downtown Boston. Test dates were chosen to include the heaviest traffic days for the branch. Each phase lasted three days, Wednesday through Friday, of the same week. With the exception of Phase II, phases included either a 1st or 15th of the month, which are the most common paydays. Actual and perceived waiting times and customer satisfaction levels were measured in a similar manner for each

phase.

MEASUREMENT

Measuring Actual Waiting Times

Two video cameras measured actual waiting times. One camera was focused on the queue entry point while the other focused on the point where customers left the line to see a teller. The shots from the two cameras were combined onto one VCR tape which toggled between the entry and exit points. The VCR also recorded the time of day, including seconds, as it filmed.

Perceptions of waiting and customer satisfaction were measured by personal interviews. Researchers questioned customers as they left the teller window. After a subject answered all the questions the researcher jotted down a physical description of the customer and the time of day on the back of the questionnaire. Appendix C contains an example of the type of notes the researchers used to describe respondents.

At the end of each day, the researchers watched the video tape of that day's activity and matched each survey with a customer on the tape. Once a customer was located on the tape, his entry and exit times were recorded. The internal clock feature of the VCR and the researchers descriptions and recent memory of

customers' appearances insured accuracy in the matching process.

To our knowledge, the matching technique was ground-breaking since no prior studies have matched individual perceptions to reality. Instead, most research has focused on matching customer perceptions with average waits during a specified time period. Since actual waiting times can vary widely from customer to customer we believe our matching method provides much more accurate data.

Measuring Perceptions: Questionnaire Design

The questionnaire was designed to measure customer perceptions and satisfaction levels.

Perceived waiting times were obtained by asking customers to specify how long they thought they waited in line to see a teller. Descriptions of the queuing experience were obtained by having customers rate their wait in line with respect to three different attributes on ten point scales. The attributes measured duration, boredom, and stress levels. The customers were also asked an open ended question concerning what they thought was a "reasonable" or "fair" wait to see a teller at that particular branch.

Customer satisfaction was measured by asking customers to rate the overall level of service they received at the branch on the

survey date and usually. Ratings were on a ten point scale, with end points ranging from completely dissatisfied to completely satisfied.

Lastly, customers were asked to specify the types of transactions performed that day and whether or not they had an account with the Bank of Boston.

This questionnaire format was identical for all three phases. However, during phases II and III two questions were added. The intent of these questions was to see if customers noticed the electronic newsboard or clock and to assess if they actually read them. These questions were necessary since if the devices were not noticed we would not expect them to influence customer perceptions.

Appendix D contains copies of the three versions of the questionnaire used for our survey.

MANIPULATIONS

Phase I: Control Study

Although it is difficult to control for all possible factors in a real world setting, every effort was made. This phase measured actual and perceived waiting times as well as customer satisfaction under normal conditions. Normal conditions imply that operations

are at their usual levels. That is, the teller staffing is not abnormally up or down, the computers are working, and the physical surroundings remained the same. The attempt of this phase was to obtain a benchmark for the rest of the study.

Phase II: Increased Distractions

The device used to distract the banking customers in this study was called SilentRadio. SilentRadio is a large, black, electronic board measuring 36" x 6" which displays 2 lines of bright red digital print.

Two electronic newsboards were hung above the glass shields which protect the tellers. This location was chosen so that the boards would be visible to all the people in line. Each newsboard simultaneously cycled through transmissions of fifteen minutes of up-to-the-minute news and information interspersed with five 21-second Bank of Boston advertisements.

Appendix B contains a description of the SilentRadio system.

Phase III: Increased Certainty

The optional electronic clock feature of the Camtron system was used to provide information to customers about the expected length of their wait in line.

The clock consists of an 8" x 12" sign which states that "Expected wait in this line is n minutes." The estimated wait number, n, is displayed by a red electronic digital readout which is updated every few seconds. The clock was situated at the entrance to the queue facing customers as they entered the line.

In a nutshell, the Camtron system computes estimated waiting times by measuring when a customer enters and exits the queue as well as session time with the teller. From these statistics, Camtron applies queueing theory principles to compute expected waiting times. Camtron claims that the clock is accurate within 10%.

Appendix A contains a description of the Camtron system.

SITE SELECTION

The bank selected its 60 State Street branch for the test site. This site is a large, busy, full-service branch which has twelve teller windows and twenty employees. The layout is long and narrow with the queue occupying the length of the teller counter. Most of the customers work in the downtown area and frequent the bank during their workday.

In addition to its heavy traffic level, the branch was chosen because of its willingness to participate in the study and the high

level of dedication and competence of its staff.

SAMPLING TECHNIQUE

The layout of the bank allows for two possible exit points from the teller counter. During the interview process one interviewer covered each of the two exit points. An attempt was made to question every third customer as they exited. Due to the nature of a real world setting, this was not always possible since some customers did not wish to participate.

Interviewers approached customers by asking them if they would mind answering a few quick questions. In most cases, a cover story was not necessary.

No customer participated more than once during the same phase. However, since the bank has many repeat customers, some customers participated in more than one phase of the study. The researchers do not believe that this factor significantly influenced the test results. In fact, repeat customers may increase the external validity of the study since they are more indicative of a real world situation.

PROJECT MANAGEMENT

Since we designed the study to have equivalent days in each

phase, adhering to the project schedule was crucial to the success of the project. If the necessary equipment was not in place by the specified date then we ran the risk of losing a key testing day, such as the first or fifteenth of the month, which could have skewed the results.

We managed the study by distributing copies of our workplan to key players each week and by maintaining frequent telephone contact. Appendix E contains a sample workplan which includes the major tasks and dates involved in our project.

Data collection during the three testing phases required over 100 hours of work. This figure includes 2.5 hours of interviewing time and 3.5 hours of video tape reviewing time for two researchers present on each day of the study. At least one of the authors was present at all times, but they were often assisted by either a bank intern or an MIT student. In total, five interviewers were involved. We are confident that since a primary researcher was present each day there is little chance that the use of other interviewers biased our results.

RESULTS

This chapter details the findings of our study. In general, our numerical results support our original hypotheses. In addition to describing our analytic observations we have included many qualitative findings. We believe that these personal observations not only support our general arguments, but will also serve to enhance the reader's understanding of the situations we studied.

ANALYSES ACROSS THE THREE PHASES

During the course of this study we conducted 324 personal interviews with customers at the Bank of Boston's 60 State Street branch. Of these interviews, 116 were conducted during the control phase, 103 during the electronic newsboard phase, and 105 during the electronic clock phase. For analysis purposes we omitted responses from 14 newsboard phase respondents who said they did not notice the newsboard installation. Similarly, we did not include responses from the 33 electronic clock phase respondents who said they did not notice the time indicated by the electronic clock. Table 1 provides summary statistics for the 277 questionnaires included in our analysis.

TABLE 1

Summary Statistics For All Respondents

	Phase I (Control)	Phase II* (Board)	Phase III** (Clock)	Total
# Responses	116	89	72	277
Actual Wait				
% 0-4 minutes	75%	40%	56%	59%
% 4-12 minutes	19%	60%	44%	38%
% > 12 minutes	6%	0%	0%	3%
Avg. Actual Wait (in minutes)	3.6	4.8	4.3	4.2
Perceived Wait				
Avg. Perceived Wait (in minutes)	4.7	6.0	4.6	5.1
Avg. Overestimate (in minutes)	1.1	1.2	0.2	0.9
Avg. % Overestimate	78%	43%	22%	52%
Reasonable Wait				
Avg. Reasonable Wait (in minutes)	5.8	5.9	6.1	5.9
Description of Time in Line (averages on 1 to 10 scales):				
Short/Long	2.9	3.4	3.3	3.2
Boring/Interesting	3.9	5.4	3.8	4.3
Stressful/Relaxing	6.9	6.6	6.8	6.7
Overall Satisfaction (averages on 1 to 10 scales):				
Today	9.1	9.2	9.0	9.1
Usually	8.1	8.1	8.0	8.1
% Bank of Boston Customers	71%	71%	75%	72%

* Only includes respondents who noticed the newsboard

** Only includes respondents who noticed the time indicated by the clock

Actual Waiting Times

Actual waiting times were determined by analyzing video tapes of customers entering and leaving the teller line. Figure 1 shows the distribution of actual waiting times for the 277 customers we interviewed.

Nearly sixty percent of the customers we interviewed waited less than four minutes to be served, and only three percent waited over twelve minutes. On average, survey respondents waited in line 4.2 minutes before seeing a teller. However, average waiting times for all customers were somewhat shorter than 4.2 minutes because we did not interview customers who did not have to wait before being served.

Perceived Waiting Times

To measure perceived waiting times, we asked subjects "How long do you think you waited in line today (in minutes)?" Figure 2 shows the distribution of perceived waiting times for the 277 customers we interviewed.

On average, respondents thought they waited 5.1 minutes to see a teller. Twenty-five percent of respondents believed they had waited exactly five minutes. In general, we observed perceptual "anchor points" at five minute intervals. For example, individuals

FIGURE 1

DISTRIBUTION OF ACTUAL WAITING TIMES

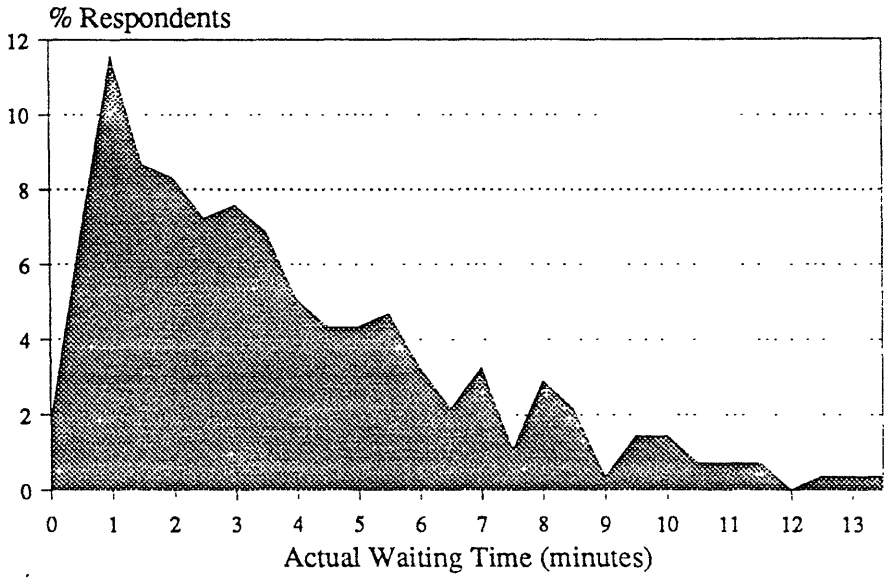


FIGURE 2

DISTRIBUTION OF PERCEIVED WAITING TIMES

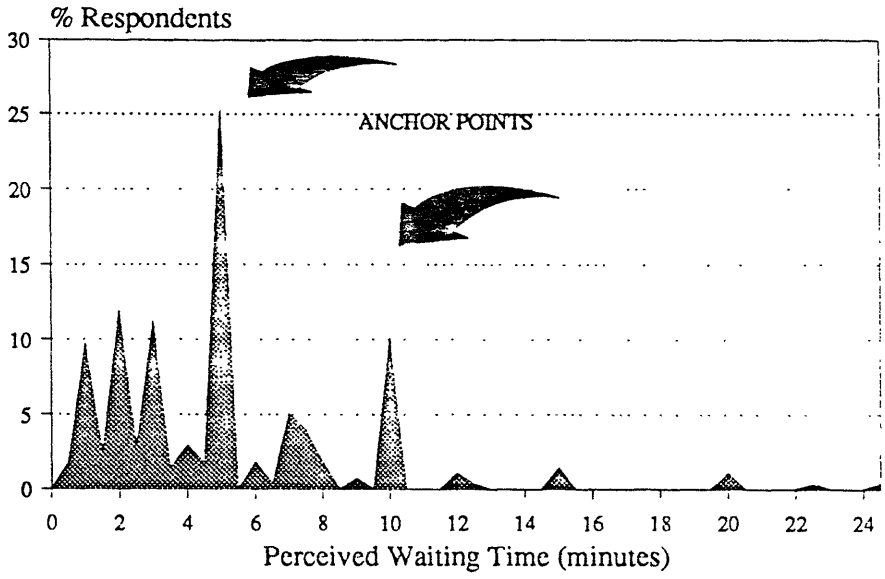
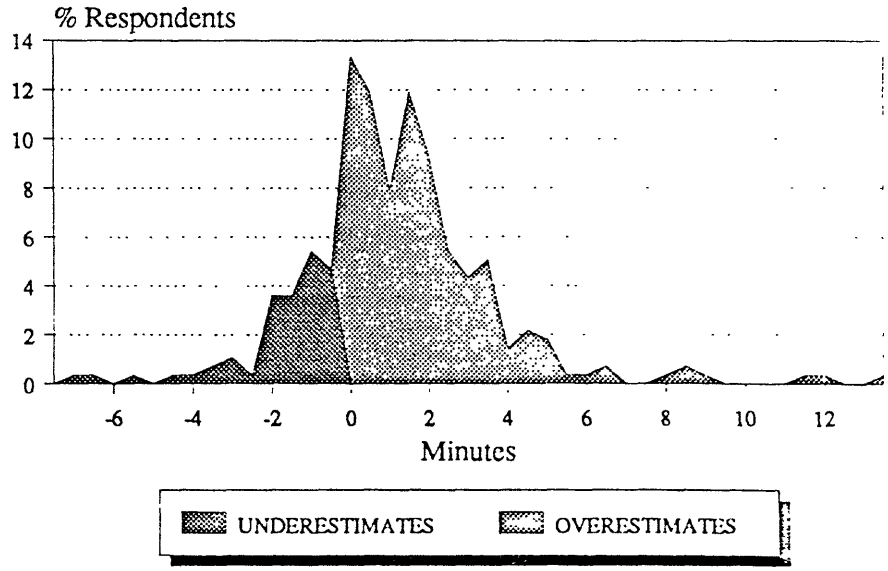


FIGURE 3

DIFFERENCES: PERCEIVED - ACTUAL WAITS



who actually waited from three to six minutes often believed they had waited five minutes, while individuals who actually waited from seven to twelve minutes tended to say they had waited for ten minutes.

As we had expected, our survey confirmed that people tend to overestimate the amount of time they spend waiting in line. Figure 3 shows the distribution of differences between perceived and actual waiting times.

Differences between perceived and actual waiting times were approximately normally distributed, with a mean overestimation of just under one minute and a standard deviation of 2.5 minutes. Customers only tended to overestimate their waiting time if they waited longer than one minute. In fact, waits of less than one minute typically were not perceived to be waits at all.

Reasonable Waiting Times

All respondents were asked "What do you consider a reasonable wait in line at this branch (in minutes)?" Different customers had very different ideas of how long constitutes a reasonable wait. Many said that their concept of "reasonable" varied based on when they came into the bank: for example, they were willing to wait longest during lunch time or on pay day, since

they expected the bank to be busy at these times. Figure 4 shows the distribution of responses to the question about reasonable waiting times.

On average, customers felt that 5.9 minutes was a reasonable amount of time to wait. However, as with perceived waiting time responses, descriptions of what constitutes a reasonable waiting time tended to anchor around five minute intervals. Over forty percent of respondents specified exactly five minutes in their definition of a reasonable wait.

Descriptions of Time Spent in Line

Subjects tended to fall into one of three groups, which we called "watchers", "impatients", and "neutrals". "Watchers" found waiting in line very interesting, and enjoyed observing the people and events going on at the bank. "Impatients", on the other hand, could not think of anything more boring than waiting in line. In general, they considered the waiting experience a complete waste of time. "Neutrals", as their name indicates, fell somewhere in the middle of the other two groups. Individual impressions of the time spent in line were affected by the group to which the respondent belonged, as well as by other factors such as how time-pressured the subject felt at the time of the interview.

FIGURE 4

DISTRIBUTION OF REASONABLE WAITING TIMES

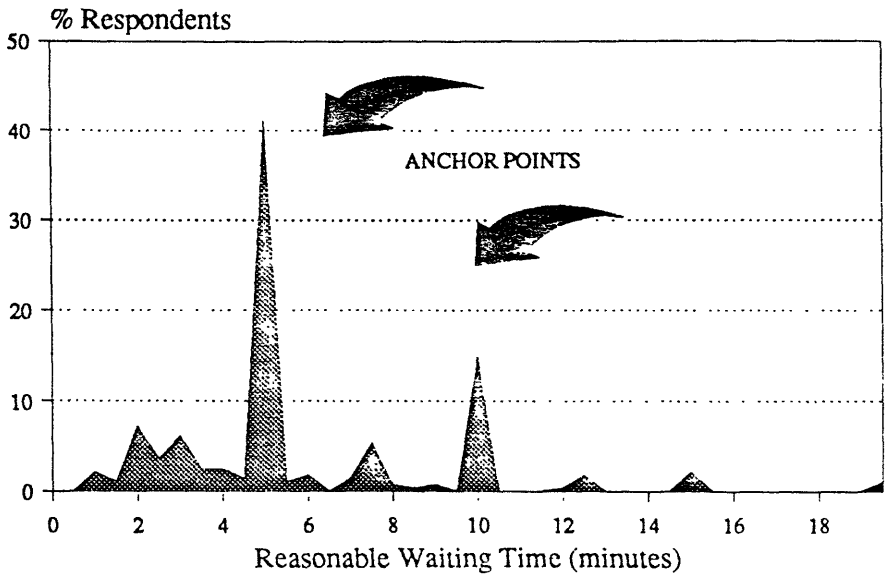
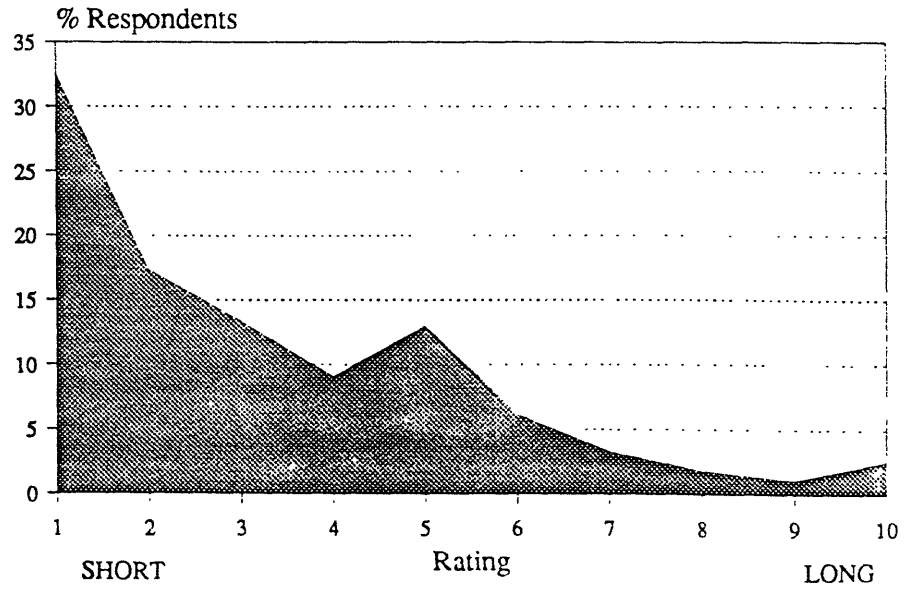


FIGURE 5

CUSTOMER IMPRESSIONS: LINE DURATION



Length of Time in Line

When asked to describe the wait in line on a ten point scale ranging from short to long, respondents generally felt their waits were relatively short. Figure 5 shows the distribution of how customers felt about the wait, on the "short to long" scale.

On average, customers rated the length of their wait as a 3.2 out of 10. Eighty-five percent of respondents rated the wait a 5 or less in length.

Interest Level

Customers were asked to describe how interesting their wait was, on a scale from 1=boring to 10=interesting. Figure 6 provides the distribution of responses to this question.

The majority of respondents rated the interest level of their wait as a 1 (26%), 5 (22%), or 10 (11%). We associated responses in these three categories with the "impatients", "neutrals", and "watchers", respectively. On average, respondents rated their wait as a 4.3 on the ten point boring to interesting scale.

FIGURE 6

CUSTOMER IMPRESSIONS: INTEREST LEVEL

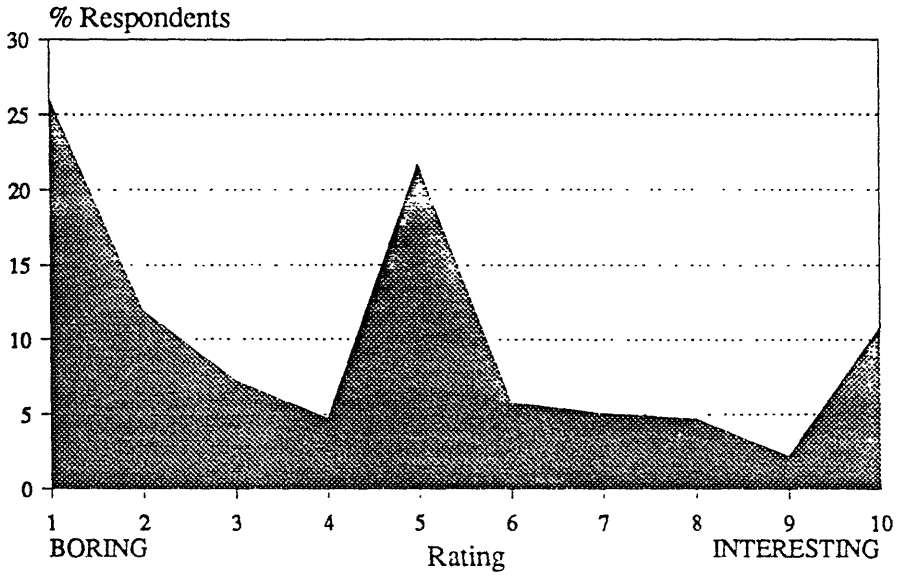
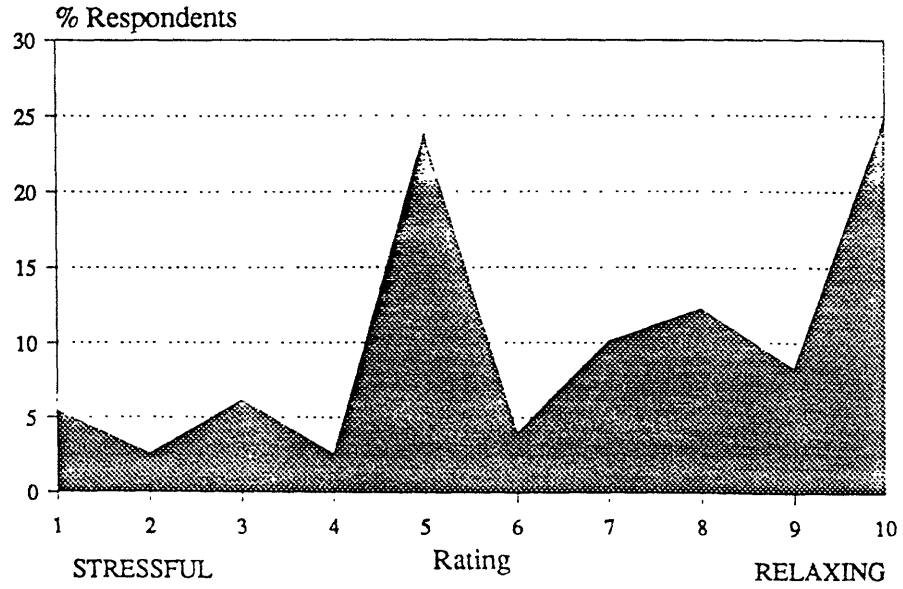


FIGURE 7

CUSTOMER IMPRESSIONS: LINE STRESS LEVEL



Anxiety Level

Customers were asked to describe the waiting experience on a ten point scale ranging from 1=stressful to 10=relaxing. Figure 7 provides the distribution of responses to this question.

The majority of respondents did not find waiting in line to be a stressful experience. The average response to this question was 6.7, and eighty-three percent of subjects responded with a 5 or greater.

Overall Customer Satisfaction

All respondents were asked "How satisfied are you with the overall service level at this Bank of Boston branch?" They were questioned about overall satisfaction on the interview date as well as during previous experiences at the branch. Figures 8 and 9 provide the distribution of customer responses regarding overall satisfaction.

In general, we found that customers love the Bank of Boston's 60 State Street branch. The bank received an "overall customer satisfaction today" rating of 9.1, with sixty-four percent of respondents indicating their satisfaction was a 10. "Overall customer satisfaction usually" received an 8.1 rating, with forty-one percent of respondents rating it a 10. As a result, it was difficult

FIGURE 8

OVERALL SATISFACTION ON SURVEY DATE

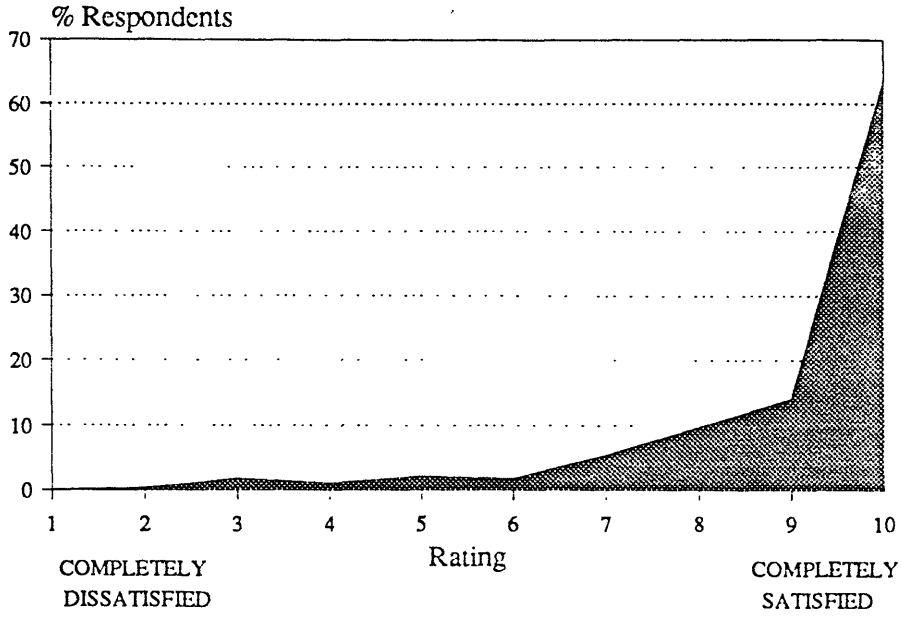
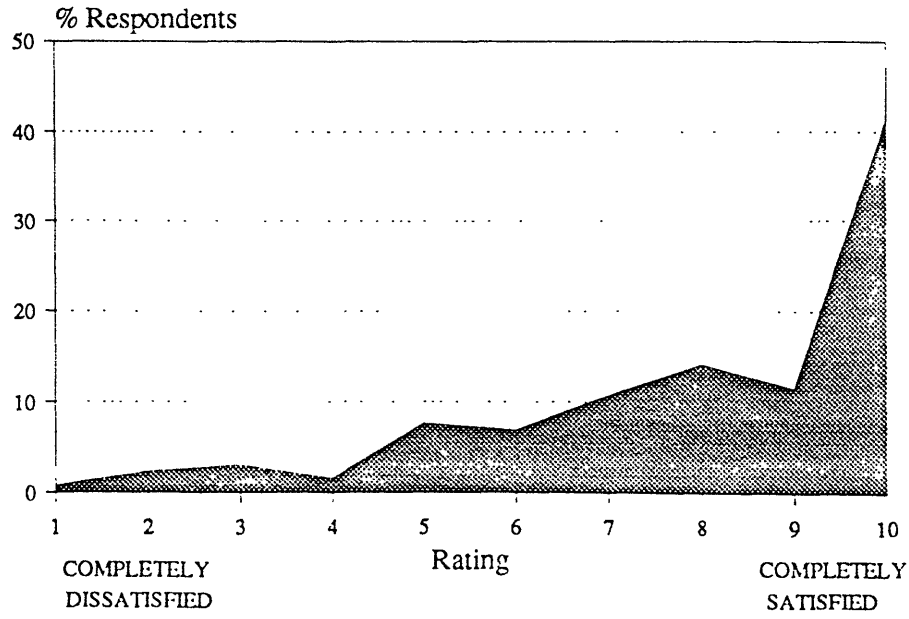


FIGURE 9

USUAL OVERALL CUSTOMER SATISFACTION



to detect effects of the installation of the electronic newsboard and clock on customer satisfaction; there simply was not much room for improvement.

Several customers commented that they do not mind waiting as long it looks like the tellers are working as hard as they can. Customers tended to become annoyed if they saw several unstaffed teller windows or if tellers were present but not serving customers.

Account Holders vs. Non-Account Holders

72% of respondents were Bank of Boston account holders. The remainder of the sample was primarily individuals who cash their paychecks at the bank each week. Customer perceptions of waiting time and overall satisfaction were not dependent on whether the customer had an account with the Bank of Boston.

Transaction Types

Table 2 lists the number of respondents who performed each of twelve different transaction types. The total number of transactions is greater than the number of respondents because some customers performed multiple transactions.

Customer perceptions of waiting time and overall satisfaction did not depend on the type of transaction performed.

TABLE 2

Customer Transaction Summary

Transaction	Number of Respondents	Percent of Respondents
Check Cashing	156	56%
Deposit to Checking	113	41%
Deposit to Savings	31	11%
Withdrawal from Savings	15	5%
Loan Payment	5	2%
Credit Card Advance	3	1%
Certified or Cashier's Check	3	1%
Traveler's Check	3	1%
Bond Cashing or Purchase	3	1%
Foreign Currency Transaction	1	<1%
Registered Check	1	<1%
Other	14	5%

CORRELATIONS BETWEEN THE VARIABLES

All of the relationships between variables discussed in this section are significant at the p=.05 level. Appendix F contains the correlation coefficients and significance level information on which these descriptions are based.

Correlations with Actual Waiting Time

Changes in actual waiting time tended to influence customer perceptions. As expected, as actual waiting times increased, overall customer satisfaction tended to decrease while customer stress levels tended to increase. In addition, as actual waiting times increased both perceived waiting times and reasonable waiting times increased. Thus, customers recognized they were waiting longer, but also indicated that they were willing to wait longer. This phenomenon may have occurred because customers' definitions of what constitutes a reasonable wait were based on the length of the current service encounter.

Correlations with Perceived Waiting Times

As with actual waiting times, increases in perceived waiting times were associated with decreases in customer satisfaction as well as with increases in stress levels and definitions of a

reasonable wait. In addition, increases in perceived waiting times were associated with larger overestimations of the time spent in line. This finding makes intuitive sense, since for any two individuals whose actual waiting times were comparable, the individual who overestimated his wait by a larger amount also thought he waited longer than the respondent who overestimated by a lesser amount.

Correlations with Overall Customer Satisfaction

In addition to the previously mentioned relationships between actual and perceived waiting times and satisfaction, several other variables impacted overall customer satisfaction.

Overall satisfaction with the service received on the survey date was correlated with descriptions of what constitutes a reasonable wait and usual satisfaction. Customers who had a longer definition of a reasonable wait tended to be more satisfied than customers with a shorter definition of "reasonable". In addition, customers who are were usually satisfied were more likely to be satisfied with the service on the survey date. This may have been the case because customers used their survey date satisfaction rating as a reference point for rating their usual satisfaction.

Interest and stress levels of the wait also affected overall customer satisfaction. High interest levels and low stress levels were associated with high levels of customer satisfaction, both on the survey date and usually.

Customer satisfaction appeared to be dependent on how closely reality matched expectations. During the study several customers commented that the teller lines were much shorter than usual, and thus they were very satisfied.

COMPARISONS BETWEEN THE THREE PHASES

In order for us to make comparisons between the three survey phases it was important that the only factor on which respondents differed be whether or not they were exposed to the items we were manipulating (i.e., the electronic newsboard and clock). Specifically, actual waiting times should have been equivalent across the three phases. However, due to differences in traffic in the bank during these phases respondents differed in how long they actually waited in line. We controlled for this problem by looking at two subgroups of our sample when comparing control respondents to newsboard and clock respondents. One subgroup includes the 163 customers who waited less four minutes, while the other includes the 107 customers who waited from four to twelve

minutes. We omitted responses from control phase customers who waited over twelve minutes since all newsboard and clock phase respondents waited less than twelve minutes. Appendix G contains the T-statistics and significance levels associated with all statistical comparisons discussed in this section.

Among subjects who waited less than four minutes, control phase subjects waited an average of 2.0 minutes and newsboard and clock phase subjects waited an average of 2.2 minutes. Independent T-tests comparing the mean control phase wait to each of the electronic clock and newsboard phase mean waits indicated no significant differences at the p=.05 level. However, the significance levels with which the null hypotheses were not rejected were relatively weak. Since the control mean was less than the manipulated mean, if any statistical bias was introduced in comparing these two groups it would tend to make the newsboard and clock seem less effective in improving perceptions and satisfaction than they actually were. This is true because the average wait in phases II and II was higher than the average control phase wait, and higher actual waits are associated with decreased satisfaction and longer perceptions of waiting.

Among subjects who waited from four to twelve minutes control phase subjects waited an average of 6.7 minutes, newsboard

phase subjects waited an average of 6.5 minutes, and clock phase subjects waited an average of 6.9 minutes. Independent T-tests comparing the mean control phase wait to each of the electronic clock and newsboard phase mean waits indicated no significant differences at the p=.05 level. The significance levels with which the null hypotheses were not rejected were quite strong.

In addition to differences in actual waiting time, we were concerned that our results might be affected if different phases had different transaction type or account holder/non-account holder mixes. However, statistical tests showed that the transaction mix and account holder to non-account ratio were relatively constant across the three phases of our study, and thus did not influence our results.

The division of respondents into "less than four minutes" and "four to twelve minutes" groups may have some operational significance. Since customers typically said they were willing to wait about five minutes, but tended to overestimate their waits by about one minute, they actually may only be willing to wait about four minutes before they consider the length of the wait to be unreasonable. Thus, the first group could be viewed as customers who waited a reasonable amount of time, while the other group

waited longer than they thought was reasonable. Tables 3 and 4 contain summary statistics for the two subgroups we studied.

Impact of the Electronic Newsboard

During this phase, two electronic newsboards were installed above the teller stations. These boards presented news, weather, sports, and other information for respondents to read while waiting in line to be served by a teller.

87 control phase subjects and 36 newsboard phase subjects waited in line less than four minutes before being served by a teller. 22 control phase subjects and 53 newsboard phase subjects waited in line from four to twelve minutes before being served by a teller.

Installation of the newsboard did not significantly impact perceived waiting times or the amount by which respondents overestimated their waits. There were also no differences in control and newsboard customers' descriptions of the wait on a 10 point scale ranging from 1=short to 10=long. Thus, the newsboard did not appear to influence customer perceptions of the length of the wait.

However, the newsboard did make the time spent in line much more palatable. Interest level (measured on a 10 point scale

TABLE 3

Summary Statistics For Respondents Who Waited Less Than Four Minutes

	Phase I (Control)	Phase II* (Board)	Phase III** (Clock)	Total
# Responses	87	36	40	163
Actual Wait				
Avg. Actual Wait (in minutes)	2.0	2.2	2.2	2.1
Perceived Wait				
Avg. Perceived Wait (in minutes)	3.2	3.5	2.9	3.2
Avg. Overestimate (in minutes)	1.2	1.3	0.7	1.0
Avg. % Overestimate	98%	75%	44%	80%
Reasonable Wait				
Avg. Reasonable Wait (in minutes)	5.6	5.8	5.4	5.6
Description of Time in Line (averages on 1 to 10 scales):				
Short/Long	2.1	1.9	2.5	2.2
Boring/Interesting	3.9	5.0	3.9	4.2
Stressful/Relaxing	7.1	7.3	7.0	7.1
Overall Satisfaction (averages on 1 to 10 scales):				
Today	9.3	9.5	9.4	9.4
Usually	8.1	8.0	8.2	8.1
% Bank of Boston Customers	75%	81%	80%	78%

* Only includes respondents who noticed the newsboard

** Only includes respondents who noticed the time indicated by the clock

TABLE 4

Summary Statistics For Respondents Who Waited Four To Twelve Minutes

	Phase I (Control)	Phase II* (Board)	Phase III** (Clock)	Total
# Responses	22	53	32	107
Actual Wait				
Avg. Actual Wait (in minutes)	6.7	6.5	6.9	6.7
Perceived Wait				
Avg. Perceived Wait (in minutes)	7.7	7.7	6.7	7.4
Avg. Overestimate (in minutes)	1.0	1.2	-0.3	0.7
Avg. % Overestimate	18%	21%	-5%	13%
Reasonable Wait				
Avg. Reasonable Wait (in minutes)	6.4	6.0	7.0	6.4
Description of Time in Line (averages on 1 to 10 scales):				
Short/Long	4.3	4.4	4.3	4.4
Boring/Interesting	3.8	5.6	3.6	4.6
Stressful/Relaxing	6.6	6.1	6.4	6.3
Overall Satisfaction (averages on 1 to 10 scales):				
Today	8.5	9.0	8.6	8.8
Usually	7.8	8.2	7.7	8.0
% Bank of Boston Customers	50%	64%	69%	63%

* Only includes respondents who noticed the newsboard

** Only includes respondents who noticed the time indicated by the clock

from 1=boring to 10=interesting) increased from 3.9 to 5.0 for customers who waited less than four minutes (p=.086), and from 3.8 to 5.6 for customers who waited four to twelve minutes (p=.021), when the electronic newsboard was present. Figure 10 shows the effects of the electronic newsboard on customer interest levels.

When asked to describe the wait in line on the boring to interesting scale many respondents indicated that the line was usually very boring, but having the newsboard to watch made it much more interesting. After the newsboard was removed many customers noticed that it was gone and said that they wished the bank would reinstall it.

Correlation analysis indicated respondents who spent a greater percentage of their time in line watching the newsboard were more interested and relaxed than other customers and tended to overestimate the length of their wait by a smaller amount. The relevant correlation coefficients and significance levels appear in Appendix F.

In addition, overall satisfaction with the service received from the bank on the survey date increased from 9.3 to 9.5 for customers who waited less than four minutes and from 8.5 to 9.0 for customers who waited from four to twelve minutes when the

FIGURE 10

NEWSBOARD CREATES MORE INTERESTING LINE

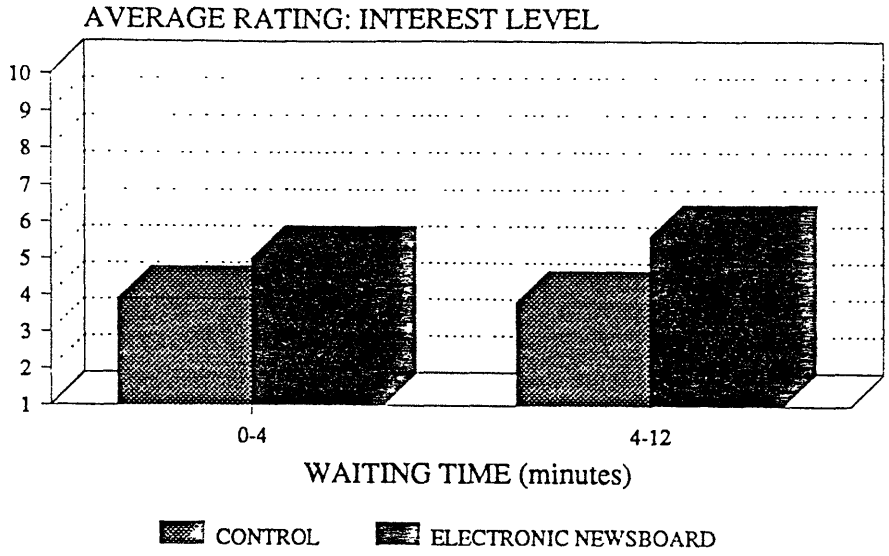
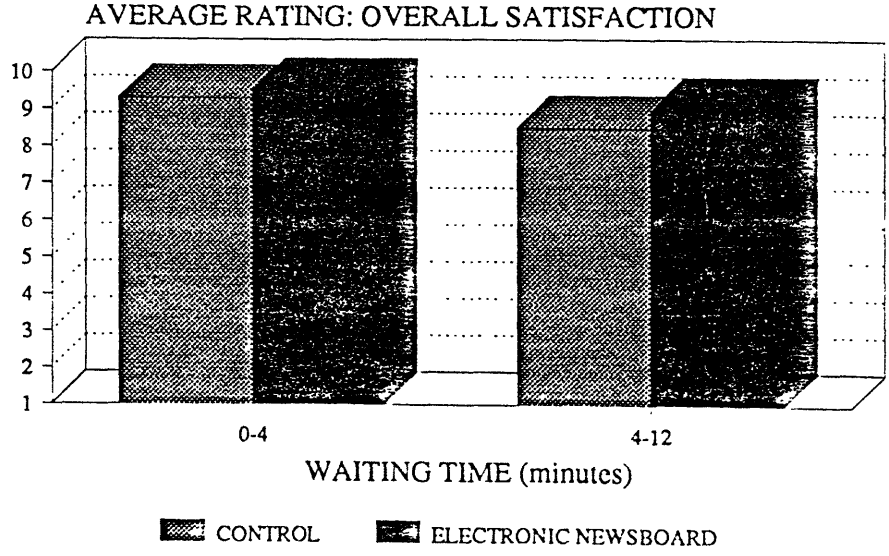


FIGURE 11

SATISFACTION HIGHER WITH NEWSBOARD



newsboard was present. While the increase was not significant at the p=.05 level the trend was clearly in the hypothesized direction. Figure 11 compares average ratings of overall customer satisfaction on the survey date for the control phase and the newsboard phase respondents.

For the most part, customers seemed very positive about the installation of the electronic newsboard. However, other events in the bank may have had a greater influence on their satisfaction levels. In particular, on one day several of the tellers were closed for long period of time around the lunch hour, while another processed an abnormal number of lengthy transactions. As a result, some respondents mentioned that they liked the newsboard but were aggravated that there were so few tellers open during the lunch hour.

Installation of the newsboard had a noticeable physical effect on the line. Normally, customers in line stand facing the back of the person in from of them. This line formation often has the symbolic effect of crowding.[19] In order to view the electronic newsboard customers had to either twist their heads or turn their bodies so they stood shoulder to shoulder. In so doing, customers

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[19]Barry Schwartz, Queuing and Waiting, (University of Chicago Press, Chicago, 1975), pp.177-8.

may have subconsciously experienced the effect of being less crowded.

In addition, during the newsboard phase customers tended to stand completely still with their arms relaxed at their sides. During other phases of the study subjects were extremely fidgety, and were constantly moving around and touching their faces and hair.

Impact of the Electronic Clock

For the third phase of our study an electronic clock was installed at the entrance to the teller line. This clock informed respondents of how long they should expect to wait before being served by the teller.

87 control phase subjects and 40 electronic clock phase subjects waited in line less than four minutes before being served by a teller. 22 control phase subjects and 49 electronic clock phase subjects waited in line from four to twelve minutes before being served by a teller.

Regression analysis indicated that the clock did a reasonable job of estimating the actual amount of time individuals would wait

in line. The resultant regression equation,

Clock Indicated Wait = 0.92 + 0.95*(Actual Wait)

has an adjusted R-squared of 0.63. This regression implies that the electronic clock tended to overestimate actual waiting times by about one minute.

Installation of the electronic clock appeared to influence perceived waiting times and overestimation of waiting times. Specifically, perceived waiting times were lower for the clock phase respondents than control phase respondents (2.9 minutes vs. 3.2 minutes for subjects waiting less than four minutes, and 6.7 minutes vs. 7.7 minutes for subjects waiting four to twelve minutes). Clock phase respondents also tended to overestimate their wait by less than control phase respondents. While these differences are only borderline statistically significant they are clearly in the hypothesized direction. Figure 12 shows the differences in average overestimates of waiting time between the control phase and clock phase respondents.

There are two reasons why the clock may have improved the accuracy with which customers estimated how long they waited in line. Since the clock was fairly accurate, customers may have

FIGURE 12

PERCEPTIONS MORE ACCURATE WITH CLOCK

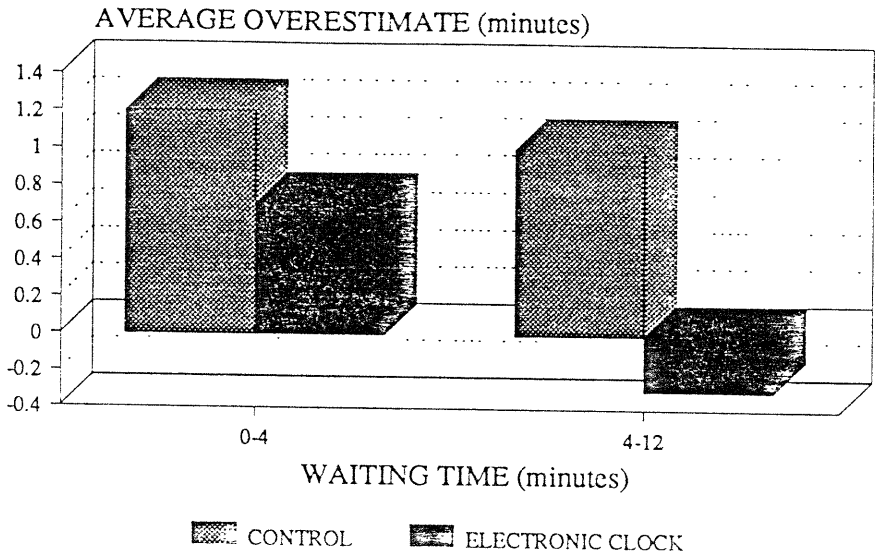
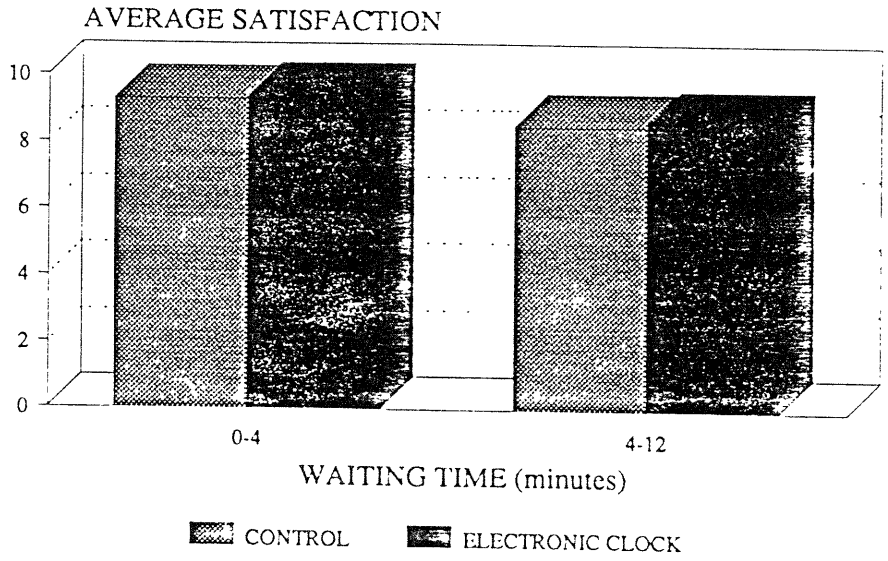


FIGURE 13

CLOCK DOES NOT AFFECT SATISFACTION



believed what the clock told them and thus their perceptions were more accurate. Or, the presence of the clock made customers more time conscious, and thus made them more aware of exactly how much time they spent in line than usual.

We had hoped to find that the installation of the clock reduced customer stress levels, since we hypothesized that a known wait would be less stressful than an unknown wait. However, there was no difference between the control phase and clock phase respondents in their description of the time spent in line on a scale from 1=stressful to 10=relaxing.

In addition, although the clock appeared to improve customers' ability to estimate the length of their wait it did not improve their overall satisfaction with the service they received at the bank. This may be because the presence of the clock made respondents more aware of the time they were wasting standing in line, which could have negate the benefits of knowing in advance how long they would have to wait. Figure 13 compares overall satisfaction levels on the survey date for the control phase and the clock phase respondents.

We observed that customers liked to play "beat the clock" and felt like they were "winning" if they spent less time in line than the clock had indicated that they would. Although the majority of

the clock had indicated that they would. Although the majority of respondents "beat the clock" (since the clock tended to overestimate waiting times), some customers became annoyed when their wait was longer than that suggested by the clock. In addition, the customer balking rate appeared to increase during the electronic clock phase. In other words, more people looked into the bank, saw the clock, and left (presumably because the wait was too long) than did so when the clock was not there. Perhaps making customers more aware of the time they would have to spend in line made that time seem longer.

A FINAL NOTE

Throughout the electronic newsboard and clock phases of the study several customers commented that service had improved dramatically over the last few weeks and that lines were much shorter than they had been in the past. Some even commented that they thought the improvements were due to the addition of new staff members (even though there were no additional staff at the time they made the comments!) These observations may have surfaced because the installation of the Camtron system affected teller productivity or because February was a slower month at the bank than usual. However, these perceptions may have occurred

simply because customers were being entertained and interviewed and felt that the bank cared about their concerns.

SUMMARY OF MAJOR FINDINGS

In general, our findings supported our preliminary hypotheses. However, there were a couple of surprises. The major findings of our study were:

1) As perceptions of waiting time increase, customer satisfaction tends to decrease.

2) Increased distractions make the waiting experience more interesting and tend to increase customer satisfaction.

3) Information on expected time in queue tends to improve the accuracy of customer perceptions of waiting but does not influence customer satisfaction.

Overall, customers tended to overestimate the time they spent in line by about one minute and considered waits of five minutes or less to be reasonable.

SOURCES OF ERROR

Although our study revealed several enlightening points concerning the management of the perceptions of waiting, there were some weaknesses in our research. This section discusses the sources of error in our work and suggests remedies for avoiding them in future studies.

THE CAMTRON SYSTEM

The Camtron system was installed in the Bank of Boston's 60 State Street branch the same week we began conducting customer interviews. Originally, we thought that if the system was installed during all three phases of our study then its effects would be constant and not affect customer perceptions or satisfaction. However, this was not the case.

Prior to our study, the tellers would call "Next!" in order to serve the next customer in line. The Camtron system provided lights at each teller window which automatically blink to indicate that the teller is free and ready to serve the next customer. The system also supplies a screen which flashes stop-and-go signs with directional arrows to help customers find the available teller. Customers immediately noticed that "something new" was

happening in the bank and they approached open tellers more quickly. Consequently, this resulted in less idle time for the tellers and queue lengths decreased as productivity improved.

In addition, the Camtron flashing light system is a device which can be considered a distraction in itself. Although the newsboard was much more interesting to watch than flashing lights, the Camtron lights may have positively influenced customer interest levels as well.

We feel the flashing lights associated with the Camtron system provided the greatest source of error in our study, and believe the effects of the electronic newsboard and clock may have appeared stronger if the Camtron system had not been running concurrently.

THE QUESTIONNAIRE

Measuring Perceptions

When asked to specify how long they thought they waited in line to see a teller, respondents tended to anchor their answers around five minute intervals. That is, actual waits between three and six minutes were estimated to be five minutes and those between seven and twelve minutes wait were estimated as ten minutes. This natural "rounding" tendency may have distorted our

measurement of perceived waiting times. The use of a scale ranging from zero to fifteen minutes may reduce this problem because it would force the participant to choose a specific number rather than anchor at five or ten minutes.

Measuring Stress

The question which attempted to assess customer stress levels while waiting in line did not measure what we intended. The endpoints on our scale were "stressful" and "relaxing". The survey results averaged about 6.8 on a ten point scale. Although this suggests that waiting in line at the bank was more relaxing than stressing, we feel that the results are inconclusive. In fact, many participants laughed at the question.

Our intent was to prove that if people were better informed about the length of their wait, then they would feel less stressed. Based upon our experience, we feel that stress is a function of the perceived demands or rush that a person feels at a given point in time. Therefore, to test if reducing uncertainty via informed waits affects stress levels, stress should be measured by more indirect means.

Measuring Satisfaction

Many of the 60 State Street customers are repeat customers and were quite satisfied with the bank. Since their customer satisfaction ratings were high (an average of 9.1), it was difficult to measure links between changes in the perceptions of waiting and customer satisfaction levels. Perhaps a broader rating scale would better detect changes in perceived service levels. However, although our results were inconclusive in this aspect, its better to have happy customers and no survey results than great research results and dissatisfied customers!

THE INTERVIEW PROCESS

Timing Bias

Since the survey was administered after the customer completed his transaction with the teller, the survey results may have been slightly biased. Once being served by a teller, it is often difficult to recall the duration or experience in line. Furthermore, the teller's attitude strongly influences customer perceptions of service. Therefore, our survey question concerning satisfaction with the overall service level of the branch may have been used by respondents to rate their interaction with the teller rather than one's satisfaction level with the queue length and teller service

combined.

Self-Selection Bias

Unfortunately, the subjects who were extremely rushed or irritated were the least likely candidates to take the time to complete the survey. Fortunately, there were not too many of these types of customers.

Seasonal Bias

February and March are traditionally two of the bank's slowest months. Since all of our data collection occurred during these two months actual waiting times may have been shorter than normal. Thus, we may not have accurately captured how customers feel when they wait for the usual amount of time.

Effects of Interviewer Presence

It is possible that our constant presence in the bank over a six week period may have influenced the results. Asking customers for their input on customer service is an act of service in itself and may have been recognized by some participants, resulting in higher satisfaction ratings.

MANAGEMENT IMPLICATIONS

From our observations and the empirical results of our study we have developed a list of suggestions which may help managers improve customer perceptions of waiting. It should be noted that waiting is only one element of the customer service mix and that other factors significantly influence perceptions. For instance, server competence and attitude, transaction speed, and the available physical resources employed play a major role in the formation of customer opinions.

ISSUES TO CONSIDER

Every line is a little different. Therefore, when attempting to manage customer perceptions of waiting one should consider the entire experience from the customer's point of view. Important issues include:

1) **Fairness:** Can newcomers cut in front of customers who arrived before them, or is the line first come, first served?

2) **Interest Level:** Is there a lot of activity going on? Are there interesting events happening which the customer can watch while

in line?

3) **Customer Attitudes:** What kind of time pressures do customers face? Do they only have their lunch hour or are they on vacation without a care in the world?

4) **Environment:** Is it uncomfortable to be waiting? Does the customer have to stand in the cold or bake under the sun?

5) **Value of Service:** How important is the end result of the transaction to the customer? Could it easily be obtained elsewhere? Can the customer come back another time or is the item urgent?

In sum, put yourself in the customer's shoes: what would make waiting less frustrating for you?

SUGGESTIONS

Based on our research we have formulated ten suggestions for managers. Some of our recommendations are direct offshoots of our results, while others are based on qualitative observations and previous work in the field of queue psychology.

<u>Suggestion 1:</u> Do not overlook the effects of perceptions management: consumer concern about waiting is growing.

There is no limit to the amount of frustration which waiting can cause. Cities are becoming more crowded, the work week is expanding, the economy is worsening and people need more free time to deal with their frustrations. Now, more than ever, superb service is the key to success. Using perceptions management to improve customer satisfaction is only a tool, but it works.

<u>Suggestion 2:</u> Determine what is an acceptable waiting time for your customers.

The nature of each situation varies. One minute of waiting in a bank may go unnoticed whereas one minute of being on hold on the telephone can be infuriating to the customer. In a bank setting, customers only recognize that they are waiting if the duration is greater than one minute. Therefore, there is no need to increase staffing to reduce all possible waits.

A scale ranging from short to long such as the one used in our study may be useful to assess the relative perceived length of waiting time. Assessing acceptable waits will help managers set operational objectives, and if they are met, will improve customer

satisfaction.

Suggestion 3: Install distractions which entertain and physically involve the customer.

When choosing instruments to distract customers, we recommend trying to actively involve the users. For example, piped-in music or live piano players may create a more pleasant atmosphere, but they are passive and do not rope the customer into the activity. We also suggest keeping the content of the distraction light-hearted and fresh so that customers remain interested and entertained for many visits.

The SilentRadio used in our study proved to be an effective tool for managing perceptions. It was inexpensive, easy to operate, and did not disrupt normal operations. In additional, since most customers had to stand still to read the screen they became physically involved with the distraction and did not mind waiting as much. The placement of the screen also forced the customers to turn slightly in order to read it. This had the subliminal effect of being out of line, as they stood shoulder to shoulder rather than front to back. Customers preferred the light content of the media such as horoscopes and tabloid headlines to the more informative headline news. SilentRadio can also be used as an advertising tool.

The essence is, if you must make your customers wait, you can at least make it fun.

Suggestion 4: Get customers out of line.

In many cases, customers can be served without having to stand in line. Whenever this can be achieved, both company and customer can benefit. For example, queues can be avoided by advance reservations, service by mail or telephone, or better automation.

In banking, there are many ways to conduct transactions without using a teller. For instance, direct deposit, ATM's, automatic loan payments, and check cashing machines have already proven to be sound technologies. The challenge to bank management is to increase customer awareness and usage of these tools. Capitalizing on the benefits of saving time may prove to be an effective means to reach potential customers of these services.

Suggestion 5: Only make people conscious of time if they grossly overestimate waiting times.

There is a tradeoff between the accuracy of perceptions of waiting and the awareness of time. In the bank situation, perceptions were fairly close to reality. This may have been due to

the customer's past experience with the branch, ease of assessing the situation, or the shortness of the queue. Whatever the case, informing customers of their expected waiting time backfired. The clock made people more aware of the waiting time and encouraged many of them to play "beat the clock" with a cynical attitude. We also observed an increase in balking rates.

However, there may be numerous applications where the customer has no previous experience with the queue or the service provided and information on expected time in queue may be helpful. For instance, it is nearly impossible for an airline passenger to know when his plane will take off when it is sitting in the middle of the runway. Another example is being put on hold on the telephone. How do you know if and when you will be connected to the proper party? In both cases, Maister's principle that an informed wait is better than an uninformed wait may still hold.

Suggestion 6: Modify customer arrival behavior.

Customers are often aware of peak times before they arrive at a service location, yet they go there during peak hours anyhow. If some customers could be convinced to arrive during off-peak times, everyone would be better off. To achieve this, signs explaining

when off peak hours occur could be posted in stores. Servers could also mention when lines are shorter to customers who have waited an inordinate amount of time. In addition, incentives could be utilized to encourage off-peak arrivals.

Suggestion 7: Use your resources in a visible manner.

This suggestion is much easier said than done. The principle here is that visibly unused capacity is noticed by customers and it frustrates them. "Unused capacity" refers to both physical resources and servers. For instance, visible, unstaffed teller windows and cash registers may have negatively impacted customer satisfaction. Similarly, servers who are not serving customers are also perceived as unused resources. Even though a server may be processing a transaction for a customer, if the server is not physically near the customer the event may be misconstrued by customers who are waiting. Those who wait think the servers should be serving them!

From this principle, managers should adopt several policies:

1) Keep idle employees out of view.
2) Conduct activities which do not involve customer interactions out of the customers' sight.

3) Staff resources closest to the exit point of the queue first. This practice creates a better first impression for the customer.

4) Keep unused physical capacity out of view (i.e. portable cash registers for Christmas season).

Suggestion 8: Segment customers by personality types.

In our study, we observed three distinct types of customers: "watchers", "impatients", and "neutrals". "Watchers" do not mind waiting in line. They find the natural hustle and bustle of the bank entertaining and would prefer a friendly teller with a smile to a shorter line. However, "impatients" place more emphasis on the length of the queue in their definition of overall satisfaction.

The needs of the "impatient" group could be met though innovative products, services, and educational programs which either avoid or reduce the waiting experience. The airline and hotel industries have responded to this need through club memberships which provide express check-in and check-out policies. Some retailers satisfy convenience-seeking consumers by creating express check-out cashier lines. New businesses of the 1980's have proven that people are willing to pay more for services which save

them time.[20]

Suggestion 9: Management must adopt a long term perspective.

Our research showed that overall customer satisfaction was rated significantly lower on an historical basis than on the survey date. Furthermore, although satisfaction improved on a daily basis as the study progressed, historical satisfaction did not. From this, we conclude that it takes a tremendous amount of "good days" before customers' historical opinions change. This implies that managers much take a long term approach when attempting to improve perceptions. Short-term fixes do not seem to have long-term effects.

Suggestion 10: Never underestimate the power of a friendly server.

Although waiting is an important factor, the influence of a competent, friendly server can not be overemphasized. We mention this because even though we feel that waiting is an issue worth addressing, managers should not lose their perspective. Servers

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[20]Anderson, "Selling Time: Emerging Trends in the Consumer Service Industries."

should continually be trained and rewarded for their service, since their efforts can overcome many of the negative effects of waiting.

RECOMMENDATIONS FOR FURTHER RESEARCH

This section outlines several topics which we feel merit further research. Some of our ideas come directly from our study while others surfaced along the way. The field of perceptions management is wide open and has potential for breakthrough research and useful management applications.

1) It would be interesting to compare customers' expected length of time in queue to their perceived and actual waiting times. Such a study may provide insights into what firms can do to match customers' expectations and perceptions to reality. Presumably, fulfilled expectations would result in increased customer satisfaction levels.

2) The effects of our manipulations should be studied over time. For instance, was the electronic newsboard such a success because it was a novelty or would customers perceive the same benefits from it over a long period of time?

3) We observed distinct "watchers" and "impatient" groups, whose opinions of waiting in line differed widely. Perhaps if

researchers could develop methods for segmenting customers by personality type businesses could introduce new products or programs to better serve these groups.

4) Follow-up analysis might explicitly calculate the financial and intangible benefits of increased service productivity and compare those benefits to that of an electronic newsboard or other distracting gimmicks. Our hunch is that a cost/benefit analysis would show that the electronic newsboard is relatively cheap.

5) Researchers should explore merchandising techniques and other instruments which distract customers. SilentRadio is a great tool, but if everyone used it its freshness would wear off and it would no longer be effective. We are confident that there are many alternatives already on the market waiting to be discovered. Furthermore, devices should be placed carefully so that they are visible to the majority of customers and if possible give people that "out of line" feeling. Strategic placement of devices may differ from one application to another, but the concepts behind them may not.

6) It is possible that perceptions of waiting differ when a customer is waiting to see a human server rather than a machine.

One way to explore this further would be to conduct an experiment similar to ours at ATM sites. In all likelihood, the "impatients" are more apt to use ATM's and have a shorter tolerance for waiting. We would also recommend measuring balking rates in this type of study because ATM users have more flexibility in their banking hours which may influence usage patterns.

APPENDICES

APPENDIX A: Camtron description and promotional materials

APPENDIX B: SilentRadio description and promotional materials

APPENDIX C: Back of Questionnaire

APPENDIX D: Questionnaires used during the three phases of study

APPENDIX E: Project workplan

APPENDIX F: Correlation statistics

APPENDIX G: T-Statistics

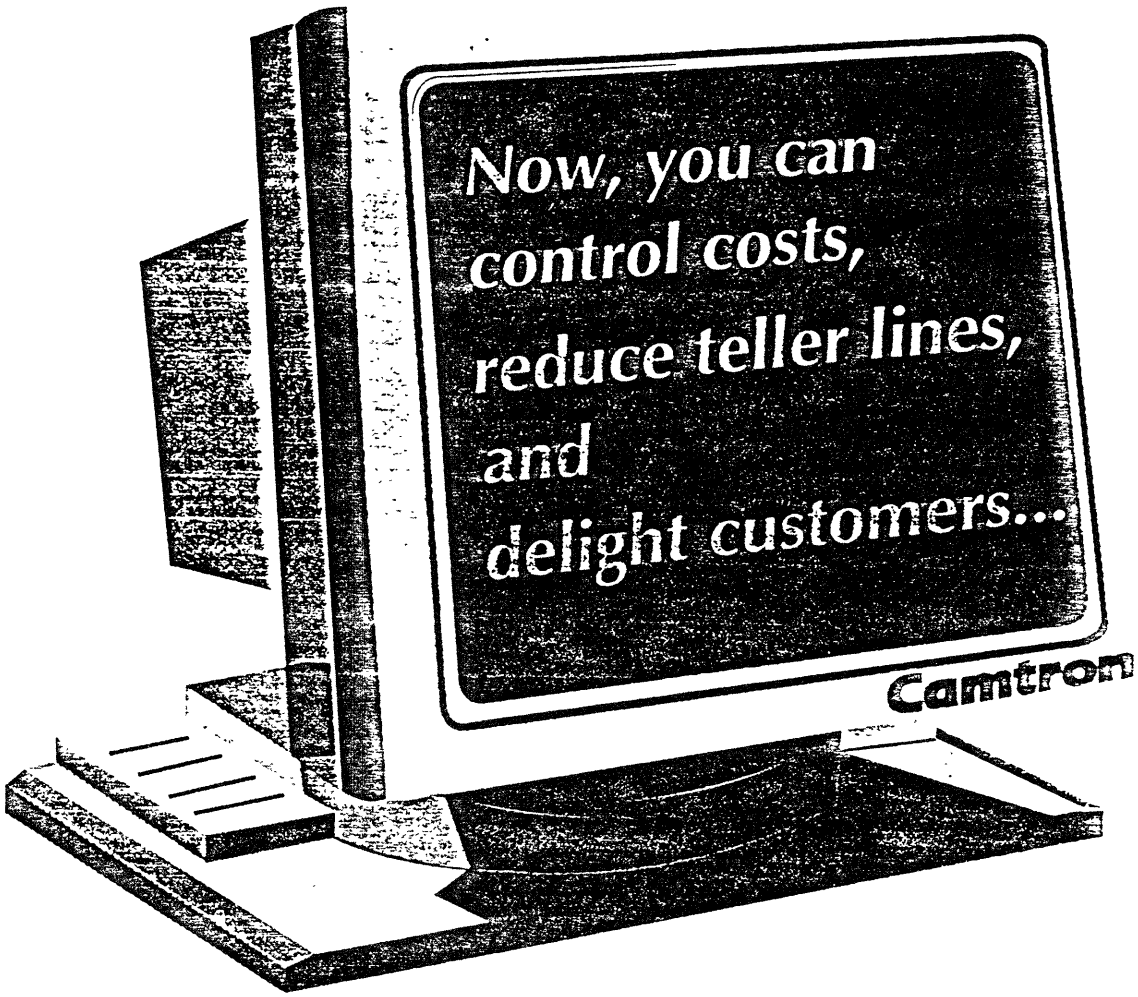
APPENDIX A:

CAMTRON DESCRIPTION AND PROMOTIONAL MATERIALS

During the course of our study, the Bank of Boston was conducting a pilot study of the Camtron system. Camtron is a queue management tools which monitors customer arrival and service rates. Queue statistics are then used to help banks reduce customer waiting time and/or staffing costs and increasing teller productivity.

The following pages contain copies of some of Camtron's promotional materials. They provide insight into the features of the Camtron system, as well as some of the company's claims about the benefits provided by its product.

An optional feature of the Camtron system is an electronic clock which tells customers how long they can expect to wait in line before being served. We incorporated this clock into the third phase of our study of customer perceptions of waiting.



All with one
remarkable new system

Let us prove that we can help you...

If you try our System, you'll see the benefits in action. So let us install it in as many test branches as you wish, collect data for at least 25 working days, analyze the data, and present findings about your current staffing and line wait situation.

We'll then generate new teller schedules for a four-week period. Once you've implemented them, you'll most likely be able to reduce lines, control costs, or **both.**

The charge for the pilot program is minimal, and the **entire cost** can be applied to any future equipment order. What's more, you risk nothing because--at the **minimum--** you'll gain invaluable insight into the functioning of each test branch. You'll have new data, deeper understanding, and the necessary tools for greater efficiency.

Other uses for the System.

The Line Wait Control System can also be used to gather information and shorten lines in the platform area or at automatic teller machines. Please call for more information.

Act today!

When you install the Line Wait Control System, you'll have an important advantage over your competition. There's never been a better time to be at the leading edge of banking technology.

So call us today at (201) 808-9233. Or write to 389 Passaic Avenue, Fairfield, New Jersey 07006.

We'd like to show you the future.

Camtron

The Line Wait Control System collects three basic pieces of information using electronic **sensors** connected to Camtron's Compustat computer. The System is simple and **automatic**.

First, sensors at the beginning and end of the teller line count customers entering and leaving.

Second, sensors at each teller station measure the time each customer takes with the teller.

Third, a **traffic directional system** indicates the next available teller and includes each teller in the on-duty total. (This device serves a dual purpose. It not only provides valuable data but, **by itself**, also speeds the teller line.)

Immediate and future benefits.

Information is continuously collected in 15-minute increments during the entire time the branch is open. And it forms the basis for revised teller scheduling.

But the System also allows the display of important information on a large terminal screen right in the branch. This makes it a real-time tool for the **immediate** branch situation.

A full-page printer can produce a wide variety of reports with line wait and staffing details for review and analysis. An **alarm** feature even lets a supervisor know that help is needed **now**. For example, a teller has a question...or the waiting time of the last customer in line is unacceptable.

Look into your branches from afar.

We'll also give you modem access to allow off-site communication with a branch. This permits a remote manager to look at the immediate branch situation (current waiting times, lines, and staffing), analyze data, or send schedules.

Camtron

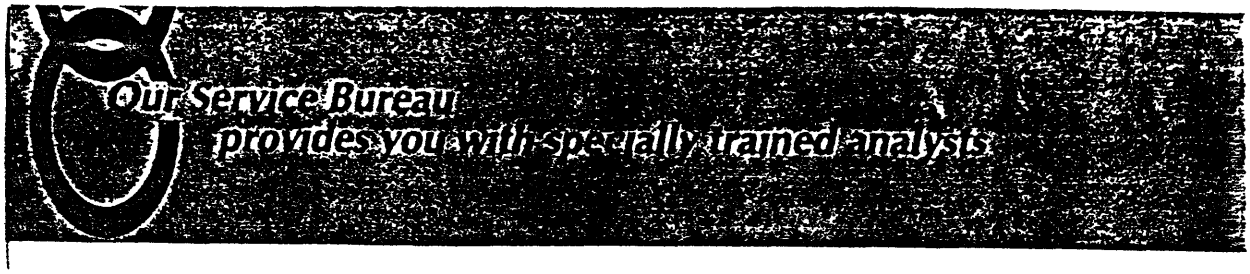
We'll give you customer service that's second to none

We're committed to supporting you as you introduce the System to your staff...collect initial data...understand each branch's unique character...communicate initial findings...and implement new teller schedules.

Our hardware servicing is vital, too. Since accurate data is the key to success, our contracts can **guarantee** next-business-day servicing by Camtron technicians who know how to diagnose, test, and repair the System.

We'll also work with **your** staff to teach them how to trouble-shoot--using the System's self-diagnostics feature to correct minor problems. That means in many cases a service call won't be necessary and virtually no data collection time will be lost.

Camtron



Of course, controlling back office staffing costs is as important to you as teller staffing. So our management package includes the data analysis you'll need. What you **won't** need is additional staff to use the System.

We'll analyze:

- Service levels before and after new teller schedules.
- Line wait data every four weeks after the new schedules or according to your needs.
- The accuracy of data to assure that the System is being used correctly.

With our analyses, you can eliminate teller scheduling from your operations staff duties. And you'll have the confidence that schedules are based on **accurate, complete, historical data,** with any potential problems caught quickly and corrected.

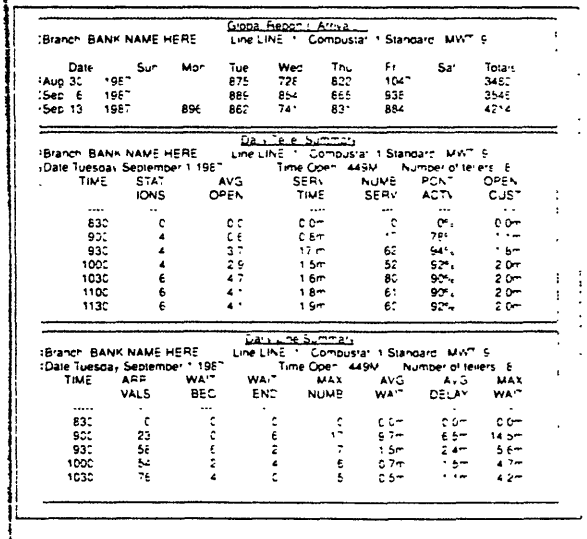
Comtron

A complete range of information and management reports

You need information on the three contributing factors to lines: customer arrivals, time spent with the tellers, and the number of tellers available at any given time. This data is available in 12 written reports and eight graphic reports.

These reports include:

Arrivals, average time spent with a teller, average wait, and maximum wait in half hour intervals; how long each teller was available, how many customers were served, and the average time with each customer; a comparison of arrivals on the same day of the week for five weeks; the percentage of customers who waited each number of minutes from one to 30 minutes.



Graph Report : Arrivals

:Branch BANK NAME HERE Line LINE 1 Computstar 1 Standard MWT 5

Date	Sun	Mon	Tue	Wed	Thu	Fri	Sat	Totals
:Aug 30	198[illegible]		875	728	820	104[illegible]		3480
:Sep 6	198[illegible]		886	854	666	938		3544
:Sep 13	1987		896	862	741	83[illegible]	884	4264

Daily Tele Summary

:Branch BANK NAME HERE Line LINE 1 Computstar 1 Standard MWT 5
:Date Tuesday September 1 198[illegible] Time Open 449M Number of tellers 6

TIME	STAT IONS	AVG OPEN	SERV TIME	NUMB SERV	PCNT ACTV	OPEN CUST
830	0	0 0	0 0m	0	0%	0 0m
900	4	0 6	0 8m	47	78%	1 1m
930	4	3 7	17m	62	94%	1 8m
1000	4	2 9	1 5m	52	92%	2 0m
1030	6	4 7	1 6m	80	90%	2 0m
1100	6	4 1	1 8m	61	90%	2 0m
1130	6	4 1	1 9m	60	92%	2 0m

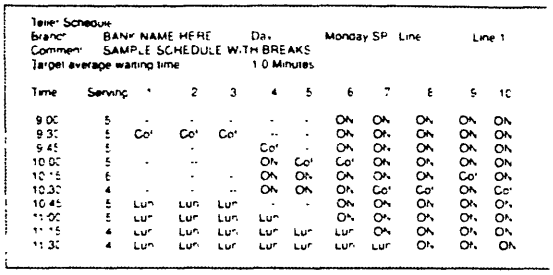
Daily Tele Summary

:Branch BANK NAME HERE Line LINE 1 Computstar 1 Standard MWT 5
:Date Tuesday September 1 198[illegible] Time Open 449M Number of tellers 6

TIME	ARR VALS	WAIT BEG	WAIT END	MAX NUMB	AVG WAIT	AVG DELAY	MAX WAIT
830	0	0	0	0	0 0m	0 0m	0 0m
900	23	0	6	17	9 7m	6 5m	14 5m
930	58	5	2	7	1 5m	2 4m	5 6m
1000	54	2	4	6	0 7m	1 5m	4 7m
1030	76	4	0	5	0 5m	1 1m	4 2m

Every four weeks you'll receive a package of reports on all aspects of line wait control. If required, you can purchase additional reports separately.

Realistic teller schedules



Teller Schedule
Branch BANK NAME HERE Day Monday SP Line Line 1
Comment SAMPLE SCHEDULE WITH BREAKS
Target average waiting time 1 0 Minutes

Time	Serving	1	2	3	4	5	6	7	8	9	10
9 00	5	-	-	-	-	-	ON	ON	ON	ON	ON
9 30	5	Col	Col	Col	-	-	ON	ON	ON	ON	ON
9 45	5		-		Col	-	ON	ON	ON	ON	ON
10 00	5	-	-		ON	Col	Col	ON	ON	ON	ON
10 15	6		-	-	ON	ON	ON	ON	ON	Col	ON
10 30	4	-	-	-	ON	ON	ON	Col	Col	ON	Col
10 45	5	Lun	Lun	Lun	-	-	ON	ON	ON	ON	ON
11 00	5	Lun	Lun	Lun	Lun		ON	ON	ON	ON	ON
11 15	4	Lun	Lun	Lun	Lun	Lun	Lun	ON	ON	ON	ON
11 30	4	Lun	Lun	Lun	Lun	Lun	Lun	Lun	ON	ON	ON

Each month, we'll generate schedules showing how many tellers need to be available each half hour of every business day. By matching teller availability to the branch's traffic patterns, you can reduce lines, control staffing costs, or... most likely...**both.**

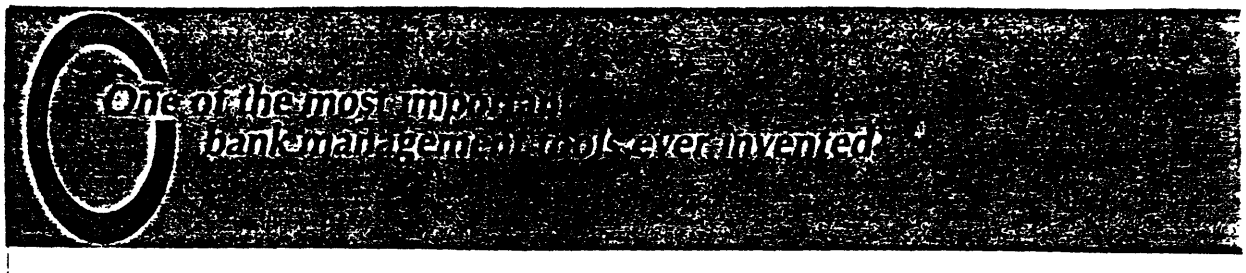
Schedules clearly show when each teller should have lunch and take breaks. What's more, all schedules are easy to read and can meet all OSHA regulations.

In-branch assistance

The System provides a display of important information on a large terminal screen right in the branch. That allows managers to immediately adjust staffing to meet unusual situations without waiting for new schedules to be generated. This is accomplished by using key data such as:

- Number of customers currently in line.
- Waiting time of next customer to enter the line.
- Teller schedules in effect for that day.
- Number of tellers actually open and the number that **should** be open.
- Current average and maximum waiting times.
- Number of arrivals--actual and forecasted.
- Service time--actual and forecasted.

Camtron



Though you already know it, a recent survey showed that long teller lines are the #1 customer complaint – and one of the main reasons that people move their accounts. Of course, unhappy customers also lower **employee** morale.

But now there's a solution. It's called the **Line Wait Control System**, and there's ***never*** been anything like it.

First, the System gathers key data.

At a given branch, you need to know:

- How many customers are entering the teller line and when.
- How much time each customer takes with the teller.
- How many tellers are available at any given time.

These details are gathered continuously and reported in half-hour increments to determine how long customers are waiting. Then we analyze the information to generate new teller schedules that match the branch's traffic patterns and teller resources.

Our system is vastly superior to more traditional visual or manual analysis. That's because it's more accurate...and **continuous.**

The result? Maximum staffing efficiency.

1...If your customers are satisfied with present line waits, you may be able to save money by reducing staff, while maintaining the same level of service.

2...If customers are **not** presently satisfied, you can improve service by reducing the lines.

3...Most likely, you'll control costs **and** reduce lines.

We'll give you full support.

- **Information and management reports.** Every four weeks you'll receive new teller schedules and reports on all aspects of line wait control.
- **Service Bureau.** We'll provide manpower to handle computer work, generate information, monitor quality, and analyze results.
- **Customer back-up.** We'll assist branch staff on an ongoing basis including installation, introduction and implementation of new teller schedules.
- **Hardware.** Electronic sensors and traffic directional system will collect data **automatically** whenever the branch is open for business.

Many leading banks have discovered the System.

Our customers include many major U.S. banks: Citibank, Chase, Mellon Bank, Citicorp Savings of Illinois, Citicorp Savings of Florida, Goldome, Fidelity Bank, First Chicago and State National.

Analyses have show that, on average, line waits have been reduced by up to 50%. What's more, many banks have been able to reduce teller staffs by an average of one full time teller.

About Camtron.

Camtron, part of the Frisco Bay Group, operates offices throughout North America. The company has been serving the banking and financial marketplaces for almost two decades with information, computers, and security products and services.

Try us in your branches!

We'd like you to experience the benefits of the Line Wait Control System for yourself. So we'll install it in as many test branches as you wish, collect and analyze data, generate new teller schedules, and analyze results after four weeks.

The cost per branch is minimal and can be applied to future purchases. And the insight you'll gain about the workings of your branches will be invaluable.

Camtron

APPENDIX B:

SILENTRADIO DESCRIPTION AND PROMOTIONAL MATERIALS

A major component of our study was the use of an electronic newsboard to manipulate customer perceptions of waiting. The newsboard was positioned so that customers could read news, sports, weather, Bank of Boston advertisements, and other information while they waited in line.

For the purpose of our study, we used a product called SilentRadio. SilentRadio is a division of Cybernetic Data Products, the world's largest producer of indoor electronic moving message displays and systems.

The following eight pages contain copies of some of SilentRadio's promotional materials. They provide insight into the features of SilentRadio, as well as some of the company's claims about the benefits provided by its product.

SilentRadio . . . an informative, entertaining news and information service reaching millions of customers in retail and service establishments every day.

SilentRadio . . . a timely, targeted advertising medium delivering an audience ready to make immediate buying decisions—on products ranging from packaged goods to financial instruments to beverages.

SilentRadio . . . as addressable as direct mail—as timely as telemarketing. Ad campaigns can be custom-tailored by location type, by zip code, by demographics. Ad copy can be changed with the ease and speed of a word-processed letter.

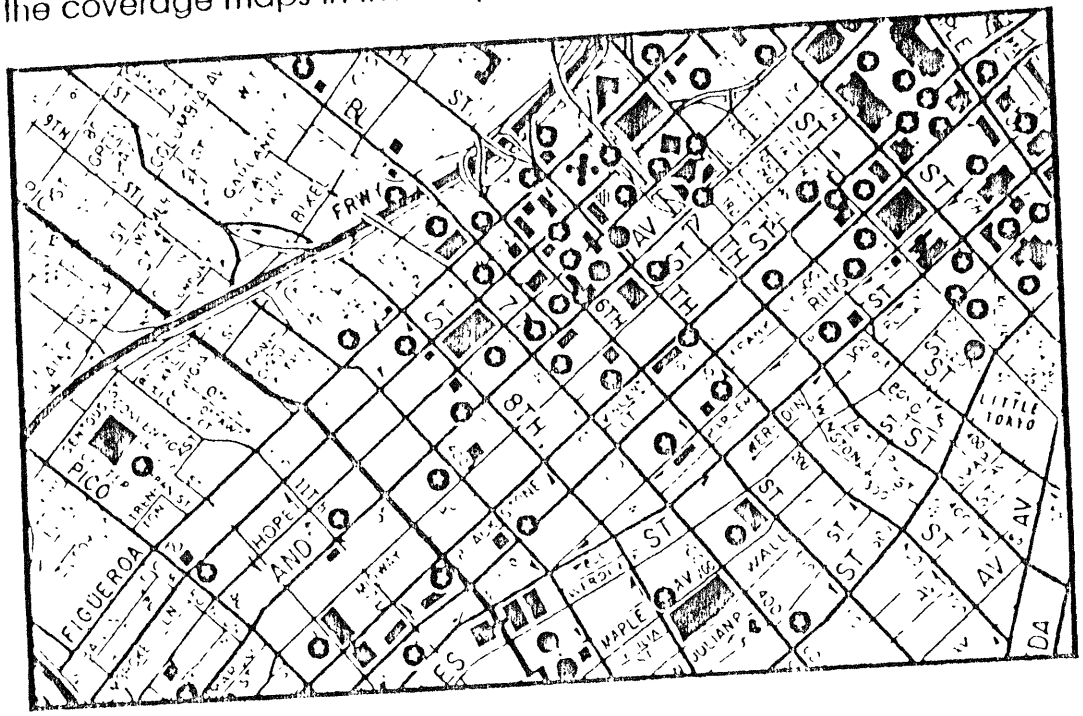
SilentRadio . . . cost-efficient support for any campaign reaching any target market.

SilentRadio . . . molded to the client's needs and the lifestyles of today's audiences.

NETWORK COVERAGE

Where is SilentRadio? Wherever there is a captive audience: financial institutions with waiting-line environments, mass market retailers with multiple checkout arrays, drinking establishments, restaurants, fitness centers, and hair salons. SilentRadio is uniquely capable of delivering precise segments of the buying public to any advertiser.

Thousands of retail and service establishments are part of the SilentRadio Network. Examine the coverage maps in the left pocket for a more detailed look.



ADVERTISING APPLICATIONS

Advertising applications of the SilentRadio Network are as numerous as the network is flexible. With the capability for custom coverage packages and timely content changes (copy can be changed as frequently as desired), the medium's range of applications is limited only by the user's imagination.

Awareness and Support . . . campaigns can be supported with the inexpensive frequency and efficient reach of a medium which speaks to the consumer where no other networked medium does.

Point-of-Purchase . . . potential customers can be influenced when they're closest to making buying decisions.

Product Sampling . . . sampling can be encouraged with great efficiency at the actual point of product availability.

Product Promotions . . . response can be stimulated with impressive cost-efficiency.

Test Marketing . . . test narrowly-focused product introductions or campaign theme variations.

AUDIENCE REACTION

The average traffic at qualifying SilentRadio locations is 500 people per day. In Los Angeles alone the total traffic within the SilentRadio Network surpasses 6,000,000 people each week.

Recently, an initial phase of audience research was completed under the auspices of Starch INRA Hooper. The audience reaction to SilentRadio is substantial and productive.

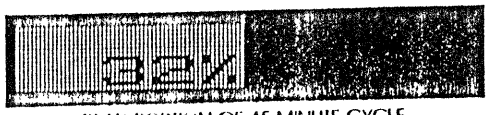
In the test locations, 32% of the total traffic read at least a portion of the 15-minute SilentRadio news and advertising cycle. And 25% of the SilentRadio readership was able to recall, without aid, a test ad within the cycle for Taster's Choice coffee.

In financial institutions, drinking establishments, and service establishments, 57% read at least a portion of the SilentRadio cycle. In these institutions—which make up a large majority of the SilentRadio network—the immediate recall of Taster's Choice was measured at 35% of the reading audience.

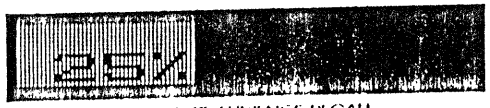
Ask your representative for more information about the SilentRadio audience.

NOTES ON AUDIENCE REACTION

AT ALL TEST LOCATIONS

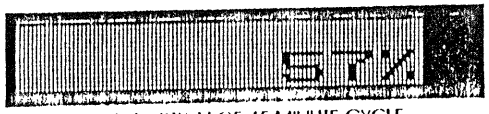


READ PORTION OF 15-MINUTE CYCLE



IMMEDIATE AUDIENCE RECALL

AT FINANCIAL, SERVICE, AND DRINKING ESTABLISHMENTS



READ PORTION OF 15 MINUTE CYCLE

IMMEDIATE AUDIENCE RECALL

LOCATION BENEFITS

For participating business establishments, SilentRadio provides a number of exceptional benefits. It offers an informative diversion to clientele and supplies an effective mechanism for internal advertising and promotion.

Customer Entertainment

SilentRadio is a refreshing advance in customer entertainment—whether amusing the patrons in a cocktail lounge or alleviating the tedium of waiting in line. In fact, two recent studies of SilentRadio in financial institutions have underlined the medium's effectiveness:

- Research by New York's Citibank demonstrated a 400% decrease in perceived waiting time. Without the displays, the perception of waiting time was twice that actually measured. With the displays, the perception was one-half the actual waiting period.
- In a survey of 150 managers of financial institutions, 84% reported improved customer attitudes regarding service. The managers also indicated that 85% of customer opinions about SilentRadio were highly supportive of the service.

Direct Customer Communication

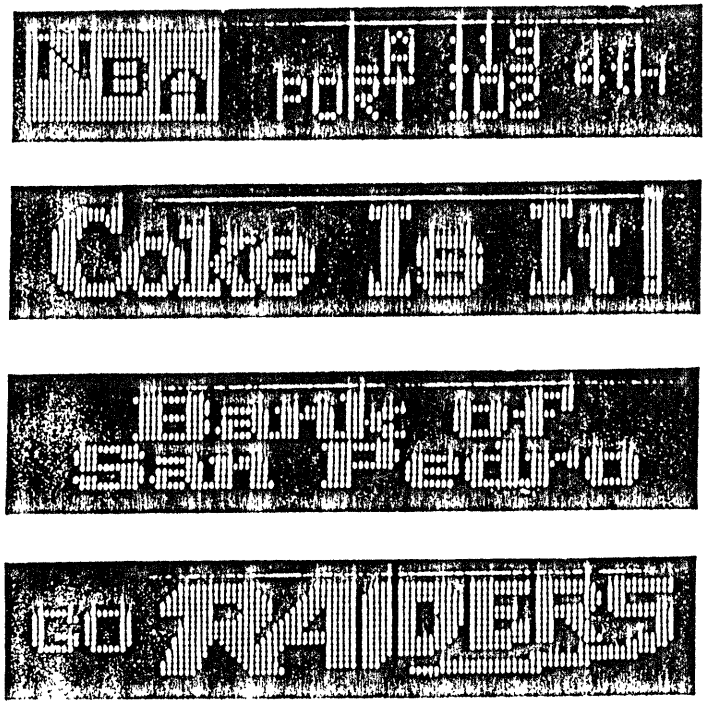
SilentRadio is also a timely and efficient tool for an establishment to communicate with its customers. Through the use of advertising space, businesses present special sales, introduce new products, and announce upcoming events. Chain retailers and multiple-branch financial institutions find SilentRadio to be a powerful, cost-effective, and flexible promotional tool; a medium which can provide an instant in-house advertising network.

AD PRODUCTION

A SilentRadio advertisement is more than a commercial—it's an appealing, attractive light show which is impossible to ignore. Brilliant red characters and crisp graphics make each ad a striking display of light and motion.

SilentRadio is a powerful tool for ad production. Logos, graphics, *and* animation can all be used to create productive messages. Text is available in twelve different typeface sizes, and can be unveiled to the reader through a wide variety of animation-like sequences.

The use of graphics and animation on the SilentRadio Network is primarily reserved for ad messages, giving them greater impact and assuring their distinction from the news material which surrounds them. Further, to maintain a fresh presentation or to present timely offers, ad copy can be altered or updated as frequently as desired.



SPECIFICATIONS

Display Matrix:
15 Rows by 112 Columns 1,680 Individual Cells

Typefaces:
12 Standard Character Sizes Plus Custom-created Logotypes

Display Dimensions:
35 3/4" long
7" high
3 3/8" deep

Presentation Modes:
Standard Travel
Scan Right to Left
Inverse Text & Graphics
Split Screen
Scroll Up/Down
Wipe Up/Down
Wipe Left/Right
Unveil
Twinkle
Dissolve/Interlace
Flash On/Off

Graphics/Animation:
Unlimited creation of graphic frames.
Graphic frames can be animated.
Graphics and animation sequences can be inserted as part of text.

NETWORK OPERATIONS

Editorial

The ongoing drama of world events, local affairs, and sports competition is the essence of SilentRadio's audience appeal. The SilentRadio Network's continuous coverage is coordinated from the SilentRadio NewsCenter in Los Angeles. At this facility, the global efforts of major wire services, together with syndicated reports and contributions from correspondents in SilentRadio Network cities, are shaped into the up-to-the-minute reports which the network's all-news and all-sports services provide.

Distribution

All media are the results of technological development. Such is the case with SilentRadio. Innovations by the network's parent, Cybernetic Data Products, led to the powerful broadcast distribution system upon which SilentRadio is based. All editorial and advertising content is delivered to each location in each city using previously-unused portions of television or radio signals. The SilentRadio Network is fully addressable—each location can receive and display a unique mix of advertising and editorial content.

COMPANY BACKGROUND

SilentRadio is a division of Cybernetic Data Products, the world's largest producer of indoor electronic moving message displays and systems. The company's products can be found throughout the world in financial institutions, airports, restaurants, shopping malls, industrial plants, and educational institutions.

Cybernetic Data Products is the only manufacturer of electronic displays which internally incorporate television or radio receivers for the distribution of content.

Following the development of SilentRadio, an interest in the company was acquired by General Instrument Corporation (NYSE), a leading producer of cable television and data communications systems.

The company was founded in 1979 by Max Fox and Michael Levin, respectively the company's President and Executive Vice President.

NATIONAL HEADQUARTERS

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Chatsworth, CA 91311
(818) 998 1800

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NEW YORK
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(212) 751-9020

CENTRAL CALIFORNIA
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Santa Maria, CA 93456
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(415) 341-9083

CHICAGO
1101 North Tower Lane
Bensenville, IL 60106
(312) 860-9777

LAS VEGAS
2300 Paseo del Prado
Building C, Suite 306
Las Vegas, NV 89102
(702) 871-8006

PHILADELPHIA
3600 Conshohocken Ave.
Philadelphia, PA. 19131
(215) 473-9060

APPENDIX C:

BACK OF QUESTIONNAIRE

This worksheet was used to determine actual waiting times. As customers were interviewed, the researchers jotted down a physical description and the time of the interview. At the end of each day the interviewers matched these descriptions to the customers on the video tape and recorded the customer entry and exit times.

Date: 3/2/99

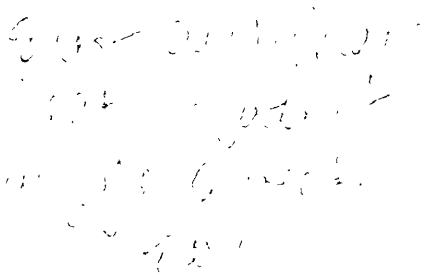
ID # 250

Interview Time: 12:52

(BRM) KLK BJ Int1 Int2

Sex: (M) F

Description:



Line Entry Time:
(hour:minutes:seconds)

12:52:57

Line Exit Time:
(hour:minutes:seconds)

12:54:13

Actual Waiting Time

_____ mins _____secs

APPENDIX D:

QUESTIONNAIRES USED DURING THE THREE PHASES OF STUDY

SURVEY

1. How long do you think you waited in line today (in minutes)? _____

2. On a scale of 1 to 10, how would you describe the time that you spent in line:

   a) 1 (short) 2 3 4 5 6 7 8 9 10 (long)

   b) 1 (boring) 2 3 4 5 6 7 8 9 10 (interesting)

   c) 1 (stressful) 2 3 4 5 6 7 8 9 10 (relaxing)

3. What do you consider a reasonable wait in line at this branch (in minutes)? _____

4. On a scale from 1 to 10, with 10 being the highest, how satisfied are you with the overall service level at this Bank of Boston branch:

	completely dissatisfied									completely satisfied
a) Today:	1	2	3	4	5	6	7	8	9	10
b) Usually:	1	2	3	4	5	6	7	8	9	10

5. What transaction(s) did you perform at the bank today?

   ___Check Cashing
   ___Deposit to Checking
   ___Deposit to Savings
   ___Savings Withdrawal
   ___Loan Payment
   ___Credit Card Advance
   ___Foreign Currency Transaction
   ___Registered Check
   ___Certified/Cashier's Check
   ___Traveler's Check Purchase
   ___Bond Cashing/Purchase
   ___Other (specify):_____

6. Do you have an account with the Bank of Boston? Yes No

7. Other Comments:

Thank you for taking the time to help us with our survey!

SURVEY

1. How long do you think you waited in line today (in minutes)? _____

2. On a scale of 1 to 10, how would you describe the time that you spent in line:

   a) 1 2 3 4 5 6 7 8 9 10
   short long

   b) 1 2 3 4 5 6 7 8 9 10
   boring interesting

   c) 1 2 3 4 5 6 7 8 9 10
   stressful relaxing

3. What do you consider a reasonable wait in line at this branch (in minutes)? _____

4. On a scale from 1 to 10, with 10 being the highest, how satisfied are you with the overall service level at this Bank of Boston branch:

	completely dissatisfied									completely satisfied
a) Today:	1	2	3	4	5	6	7	8	9	10
b) Usually:	1	2	3	4	5	6	7	8	9	10

5. Did you notice the electronic newsboard today? Yes No

   If so, how much of your time in line was spent watching the newsboard?

   1 2 3 4 5 6 7 8 9 10
   none all

6. What transaction(s) did you perform at the bank today?

   ___Check Cashing
   ___Deposit to Checking
   ___Deposit to Savings
   ___Savings Withdrawal
   ___Loan Payment
   ___Credit Card Advance
   ___Foreign Currency Transaction
   ___Registered Check
   ___Certified/Cashier's Check
   ___Traveler's Check Purchase
   ___Bond Cashing/Purchase
   ___Other (specify):_____

7. Do you have an account with the Bank of Boston? Yes No

8. Other Comments:

Thank you for taking the time to help us with our survey!

SURVEY

1. How long do you think you waited in line today (in minutes)? _____

2. On a scale of 1 to 10, how would you describe the time that you spent in line:

a)	1 short	2	3	4	5	6	7	8	9	10 long
b)	1 boring	2	3	4	5	6	7	8	9	10 interesting
c)	1 stressful	2	3	4	5	6	7	8	9	10 relaxing

3. What do you consider a reasonable wait in line at this branch (in minutes)? _____

4. On a scale from 1 to 10, with 10 being the highest, how satisfied are you with the overall service level at this Bank of Boston branch:

	completely dissatisfied									completely satisfied
a) Today:	1	2	3	4	5	6	7	8	9	10
b) Usually:	1	2	3	4	5	6	7	8	9	10

5. Did you notice the electronic sign indicating your expected waiting time?

Yes _____ No_____

If so, what did it say when you joined the line? _____ minutes

6. What transaction(s) did you perform at the bank today?

___Check Cashing
___Deposit to Checking
___Deposit to Savings
___Savings Withdrawal
___Loan Payment
___Credit Card Advance
___Foreign Currency Transaction
___Registered Check
___Certified/Cashier's Check
___Traveler's Check Purchase
___Bond Cashing/Purchase
___Other (specify):_____

7. Do you have an account with the Bank of Boston? Yes No

8. Other Comments:

Thank you for taking the time to help us with our survey!

APPENDIX E:

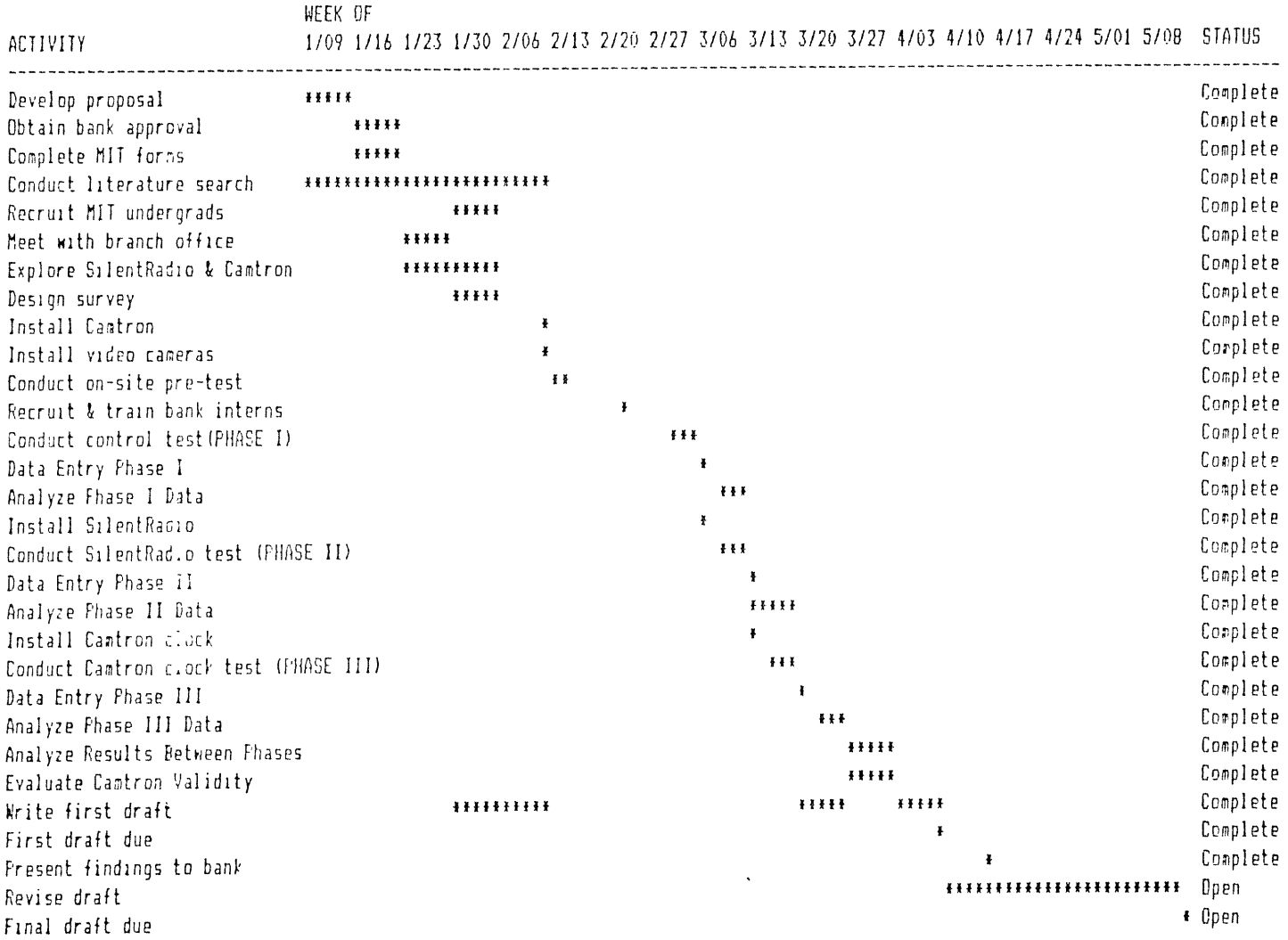
PROJECT WORKPLAN

APPENDIX E:

IMPROVING CUSTOMER SATISFACTION THROUGH THE MANAGEMENT OF PERCEPTIONS OF WAITING

THESIS PROJECT WORKPLAN

4/30/89



APPENDIX F:

CORRELATION STATISTICS

These three pages contain correlation data for the variables we studied. The information is provided in the following format for each pair of variables:

Correlation coefficient
(Number of Respondents)
P-value

APPENDIX F:
CORRELATION STATISTICS

	ACTWAIT	PERCWAIT	REASWAIT	DIFF
ACTWAIT	1.00 (277)	.75 (277) p=.000	.13 (276) p=.018	-.09 (277) p=.066
PERCWAIT	.75 (277) p=.000	1.00 (277)	.28 (276) p=.000	.59 (276) p=.000
REASWAIT	.13 (276) p=.018	.28 (276) p=.000	1.0 (276)	.27 (276) p=.000
DIFF	-.09 (277) p=.066	.59 (277) p=.000	.27 (276) p=.000	1.0 (277)
TODAYSAT	-.24 (277) p=.000	-.18 (277) p=.002	.10 (276) p=.048	.03 (277) p=.313
USUALSAT	-.03 (261) p=.331	-.02 (261) p=.368	.10 (260) p=.057	.00 (261) p=.481
Q2A	.58 (277) p=.000	.60 (277) p=.000	-.07 (276) p=.429	.18 (277) p=.022
Q2B	.02 (277) p=.361	-.05 (277) p=.199	.03 (276) p=.330	-.10 (277) p=.043
Q2C	-.18 (277) p=.001	-.22 (277) p=.000	-.01 (276) p=.429	-.12 (277) p=.022

ACTWAIT = Actual Waiting Time
PERCWAIT = Perceived Waiting Time
REASWAIT = Reasonable Waiting Time
DIFF = Difference: Perceived - Actual Waiting Time
TODAYSAT = Overall Satisfaction on Survey Date
USUALSAT = Usual Overall Satisfaction
Q2A = Customer Impression of Line Length (Short to Long)
Q2B = Customer Impression of Interest Level (Boring to Interesting)
Q2C = Customer Impression of Stress Level (Stressful to Relaxing)

	TODAYSAT	USUALSAT	Q2A	Q2B	Q2C
ACTWAIT	-.24 (277) p=.000	-.03 (261) p=.331	.59 (277) p=.000	.02 (277) p=.361	-.18 (277) p=.001
PERCWAIT	-.18 (277) p=.002	-.02 (261) p=.368	.60 (277) p=.000	-.05 (277) p=.199	-.22 (277) p=.000
REASWAIT	.10 (276) p=.048	.10 (260) p=.057	-.07 (276) p=.123	.03 (276) p=.330	-.01 (276) p=.429
DIFF	.03 (277) p=.313	.00 (261) p=.481	.18 (277) p=.001	-.10 (277) p=.043	-.12 (277) p=.022
TODAYSAT	1.0 (277)	.54 (261) p=.000	-.32 (277) p=.000	.25 (277) p=.000	.29 (277) p=.000
USUALSAT	.54 (261) p=.000	1.0 (261)	-.08 (261) p=.103	.26 (261) p=.000	.24 (261) p=.000
Q2A	-.32 (277) p=.000	-.08 (261) p=.103	1.0 (277)	-.15 (277) p=.005	-.34 (277) p=.000
Q2B	.25 (277) p=.000	.26 (261) p=.000	-.15 (277) p=.005	1.0 (277)	.36 (277) p=.000
Q2C	.29 (277) p=.000	.24 (261) p=.000	-.34 (277) p=.000	.36 (277) p=.000	1.0 (277)

ACTWAIT = Actual Waiting Time
PERCWAIT = Perceived Waiting Time
REASWAIT = Reasonable Waiting Time
DIFF = Difference: Perceived - Actual Waiting Time
TODAYSAT = Overall Satisfaction on Survey Date
USUALSAT = Usual Overall Satisfaction
Q2A = Customer Impression of Line Length (Short to Long)
Q2B = Customer Impression of Interest Level (Boring to Interesting)
Q2C = Customer Impression of Stress Level (Stressful to Relaxing)

	NEWSTIME
ACTWAIT	.06 (89) p=.303
PERCWAIT	-.11 (89) p=.156
REASWAIT	-.11 (88) p=.161
DIFF	-.21 (89) p=.026
TODAYSAT	.01 (89) p=.464
USUALSAT	.02 (82) p=.424
Q2A	.02 (89) p=.425
Q2B	.32 (89) p=.001
Q2C	.29 (89) p=.003

ACTWAIT = Actual Waiting Time
PERCWAIT = Perceived Waiting Time
REASWAIT = Reasonable Waiting Time
DIFF = Difference: Perceived - Actual Waiting Time
TODAYSAT = Overall Satisfaction on Survey Date
USUALSAT = Usual Overall Satisfaction
Q2A = Customer Impression of Line Length (Short to Long)
Q2B = Customer Impression of Interest Level (Boring to Interesting)
Q2C = Customer Impression of Stress Level (Stressful to Relaxing)
NEWSTIME = Amount of Time Customer Spent Watching the Newsboard

APPENDIX G:

T-STATISTICS

The following two pages contain results of T-tests comparing the control phase responses to the newsboard and clock phase responses.

APPENDIX G:
T-STATISTICS

EFFECTS OF ELECTRONIC NEWSBOARD

Respondents Who Waited Less Than Four Minutes

	Control Phase			Newsboard Phase				
	#	Mean	Std. Dev.	#	Mean	Std. Dev.	T-Value	p-value
ACTWAIT	87	2.0	1.0	36	2.2	1.1	-1.08	.286
PERCWAIT	87	3.2	1.9	36	3.5	2.1	-0.80	.424
DIFF	87	1.1	1.8	36	1.3	1.8	-0.31	.761
REASWAIT	87	5.6	3.3	36	5.8	3.4	-0.30	.764
TODAYSAT	87	9.3	1.2	36	9.5	1.1	-0.84	.401
USUALSAT	84	8.1	2.2	33	8.0	2.3	-0.28	.782
Q2A	87	2.1	1.6	36	1.9	1.3	0.71	.482
Q2B	87	3.9	2.8	36	5.0	3.4	-1.75	.086
Q2C	87	7.1	2.9	36	7.3	2.7	-0.32	.751

Respondents Who Waited Four To Twelve Minutes

	Control Phase			Newsboard Phase				
	#	Mean	Std. Dev.	#	Mean	Std. Dev.	T-Value	p-value
ACTWAIT	22	6.7	2.3	53	6.5	1.8	0.40	.695
PERCWAIT	22	7.7	3.9	53	7.7	3.4	-0.01	.993
DIFF	22	1.0	3.5	53	1.2	3.0	-0.26	.794
REASWAIT	22	6.4	2.8	52	6.0	3.7	0.43	.671
TODAYSAT	22	8.5	2.2	53	9.0	1.8	-0.87	.389
USUALSAT	20	7.9	2.8	49	8.2	2.1	-0.49	.630
Q2A	22	4.3	2.2	53	4.4	2.1	-0.21	.833
Q2B	22	3.8	3.1	53	5.6	2.8	-2.42	.021
Q2C	22	6.6	2.7	53	6.1	2.7	0.70	.488

ACTWAIT = Actual Waiting Time
PERCWAIT = Perceived Waiting Time
REASWAIT = Reasonable Waiting Time
DIFF = Difference: Perceived - Actual Waiting Time
TODAYSAT = Overall Satisfaction on Survey Date
USUALSAT = Usual Overall Satisfaction
Q2A = Customer Impression of Line Length (Short to Long)
Q2B = Customer Impression of Interest Level (Boring to Interesting)
Q2C = Customer Impression of Stress Level (Stressful to Relaxing)

EFFECTS OF ELECTRONIC CLOCK

Respondents Who Waited Less Than Four Minutes

	Control Phase			Clock Phase				
	#	Mean	Std. Dev.	#	Mean	Std. Dev.	T-Value	p-value
ACTWAIT	87	2.0	1.0	40	2.2	1.0	-1.08	.282
PERCWAIT	87	3.2	1.9	40	2.9	1.5	0.88	.381
DIFF	87	1.1	1.8	40	0.7	1.4	1.65	.103
REASWAIT	87	5.6	3.3	40	5.4	3.1	0.21	.836
TODAYSAT	87	9.3	1.2	40	9.4	1.2	-0.29	.770
USUALSAT	84	8.1	2.2	38	8.2	2.1	-0.19	.847
Q2A	87	2.1	1.6	40	2.5	2.2	-0.92	.360
Q2B	87	3.9	2.8	40	3.9	2.8	0.01	.991
Q2C	87	7.1	2.9	40	2.3	2.3	0.16	.871

Respondents Who Waited Four To Twelve Minutes

	Control Phase			Clock Phase				
	#	Mean	Std. Dev.	#	Mean	Std. Dev.	T-Value	p-value
ACTWAIT	22	6.7	2.3	32	6.9	2.2	-0.34	.738
PERCWAIT	22	7.7	3.9	32	6.6	3.1	1.03	.311
DIFF	22	1.0	3.5	32	-0.3	2.0	1.49	.147
REASWAIT	22	6.4	2.8	32	7.0	3.4	-0.78	.441
TODAYSAT	22	8.5	2.2	32	8.6	1.8	-0.22	.828
USUALSAT	20	7.9	2.8	31	7.7	2.7	0.18	.858
Q2A	22	4.3	2.2	32	4.3	2.1	-0.04	.966
Q2B	22	3.8	3.1	32	3.6	2.8	0.25	.801
Q2C	22	6.6	2.7	32	6.4	2.6	0.25	.801

ACTWAIT = Actual Waiting Time
PERCWAIT = Perceived Waiting Time
REASWAIT = Reasonable Waiting Time
DIFF = Difference: Perceived - Actual Waiting Time
TODAYSAT = Overall Satisfaction on Survey Date
USUALSAT = Usual Overall Satisfaction
Q2A = Customer Impression of Line Length (Short to Long)
Q2B = Customer Impression of Interest Level (Boring to Interesting)
Q2C = Customer Impression of Stress Level (Stressful to Relaxing)

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