THE IMPACT OF VOICE RECOGNITION COMPUTER TECHNOLOGY ON POLICE REPORT WRITING BY THE YEAR 1997

by

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COMMAND COLLEGE CLASS XIII

PEACE OFFICER STANDARDS AND TRAINING (POST)

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This Command College Independent Study Project is a FUTURES study of a particular emerging issue in law enforcement. Its purpose is NOT to predict the future, but rather to project a number of possible scenarios for strategic planning consideration.

Defining the future differs from analyzing the past because the future has not yet happened. In this project, useful alternatives have been formulated systematically so that the planner can respond to a range of possible future environments.

Managing the future means influencing the future--creating it, constraining it, adapting to it. A futures study points the way.

The views and conclusions expressed in this Command College project are those of the author and are not necessarily those of the Commission on Peace Officer Standards and Training (POST).

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EXECUTIVE SUMMARY

This futures study analyzes how emerging computer technology can be applied to police report writing. Police report writing has evolved with changes in technology, especially the use of lap-top computers. The continued development of new computer technologies will also bring changes in police report writing, report writing training, records management, and public acceptance. The issue examined is: ***What effect will voice recognition computer technology have on police report writing by the year 1997?***

SECTION I - DEFINING THE FUTURE

The study includes a review of the literature, environmental scanning, interviews of experts, personal experiences, and modified conventional delphi. The result is the development of current trends and potential future events likely to impact the issue question. The seven trends are: 1) Voice Recognition Technology, 2) Cost Effectiveness, 3) Training, 4) Ability to Write, 5) Customer Resistance, 6) Retraining, and 7) Funding. There are four events projected to occur by 1997. Those events are: 1) Windfall Funding, 2) Election of New Sheriff, 3) Transportation System Failure, and 4) Technological Breakthrough.

Three scenarios were developed based upon these trends and events: exploratory(likely to occur), hypothetical (worst case), and normative (desired and attainable).

SECTION II - STRATEGIC MANAGEMENT

A strategic management plan was developed based upon the normative scenario. That scenario portrayed the implementation of voice recognition technology, including expert system preliminary investigation and foreign language translation. A situational analysis was conducted on the environment, strengths and weaknesses of a subject department resulted in an implementation plan calling for three phases of development: 1) establish a partnership, 2) develop the hardware and software, and 3) implement the system.

SECTION III - TRANSITION MANAGEMENT

To manage the change process of getting from today's world to the normative scenario, a transition management plan was proposed. The plan calls for the Sheriff's Department to play a strong leadership role and pull together a partnership between the public and private sectors of government.

CONCLUSIONS

The study concludes that the time to prepare for voice recognition computer technology for police report writing is now. The rapid advances in VRT have reduced the costs, improved the operation, and provided new services such as language translation. Police executives should examine ways to make their departments cost efficient and effective through the use of expert systems, artificial intelligence, and voice recognition data entry.

INTRODUCTION

A background is presented on the need for identifying emerging voice recognition computer technology for police report writing.

SECTION I - FUTURES STUDY

What will be impact of voice recognition computer technology on police report writing by the year 1997?

SECTION II - STRATEGIC MANAGEMENT

A model for a large urban sheriff's department to develop and implement voice recognition police report writing.

SECTION III - TRANSITION MANAGEMENT

A planned transition from a handwritten report writing process to a completely automated voice recognition system, including expert system preliminary investigation and language translation.

CONCLUSIONS AND RECOMMENDATION FOR FUTURE STUDIES

A review of how to obtain an effective future state and what more needs to be done.

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INTRODUCTION

Police administrators from agencies of all sizes are facing reduced budgets and increased demands for service. These demands come from a rapidly changing and ethnically diverse population. The delivery of police services are also being scrutinized by the media, public interest groups, and legislative bodies.

The continuing development of computer technology has had critical impacts on law enforcement. Mobile data terminals in police cars, automatic vehicle locator systems, and computer assisted dispatch are now commonly found in police departments. The use of expert systems and artificial intelligence by police agencies in the United States and Canada is on the increase. Examples can be found in agencies ranging from small rural Alliance, Nebraska to urban Baltimore County, Maryland.[1]

Police report writing has also evolved with changes in technology, especially the use of lap-top computers. The continued development of new computer technologies will also bring changes in police report writing.

This futures study analyzes how emerging computer technology can be applied to police report writing. The issue examined is:

What effect will voice recognition computer technology have on police report writing by the year 1997?

Definitions

To assist the reader in a clear understanding of the research, the following terms are

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[1]"When It Comes to Expert Systems, No Agency is too Small to Lead the Pack," Law Enforcement News. vol. XVII, No.335, April 30, 1991, p.1.

defined:

Customer - The people served by law enforcement in any community. Customers are not defined by race, community of residence, or any other distinction. They may be victims, witnesses, or suspects.

Police Report - Any documentation recorded on a departmental form, or other approved medium (computer disk), and maintained as a permanent record. The police report documents the results of a preliminary investigation. Reports are used to investigate crimes, establish statistical data, crime analyzes, workload management, and to obtain criminal complaints. Reports may be completed by sworn or civilian employees or victims.

Preliminary Investigation - The review of facts and evidence, including interviews, to determine if a crime has occurred and what action is appropriate.

Voice Recognition Technology (VRT) - A speech recognition program that allows the user to speak directly to the computer through the use of a microphone. The computer recognizes the speech and transcribes it using word processing software. VRT may also be used with spreadsheet and data base software.

Expert System - An expert system is a set of computer instructions that represent the knowledge, inferences, and rules-of-thumb used by an expert analyzing information about a particular situation. When applied to data, the expert system will reach the same conclusion an expert would achieve.

Cold Call - There are several factors that make-up what is called a "cold call." They include a lack of physical evidence, long or undetermined time of occurrence, low amount of loss, or any other factors the chief executive may choose. The result is the crime reports may be taken

by telephone or by civilian employees.

Background

Currently officers' reports are handwritten, written on computers, or dictated and later transcribed by clerks. The Fremont Police Department, among others, have incorporated the lap-top computers as part of the mobile data terminal in police cars. The San Jose Police Department has begun a pilot program using the GRiDPAD™ electronic note pad. Officers block print their reports on electronic note pad computers and the data is down-loaded to another computer.[2]

In the evolution of police report writing as outlined above, initial data entry is still completed manually and generally slowly. There have been few steps to automate data entry for preliminary investigation, crime reporting, report writing, and the record management process. In a typical scenario, an customer calls the police department and speaks to a desk officer. The customer tells the desk officer what happened, and the desk officer makes the initial determination if a crime has been committed. The desk officer forwards the call to a dispatcher who dispatches a police officer or civilian report writer to the call. The officer completes the preliminary investigation, then handwrites, types, dictates, or uses a computer to write the report. Finally, a clerk copies and distributes the report or the report is down-loaded to another computer, before being forwarded to investigation, and mandated statistical reporting is completed.

The Idaho Department of Law Enforcement has initiated a state-wide paper-less report writing system. Reports are entered on local PC's using WordPerfect and when completed

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[2]"S.J. Cops to Get High-Tech Assistant," San Jose Mercury, 10 January 1991.

transferred to the mainframe. The Ventura Police Department has used an Automated Dictation System (ADS) for over six years. Officers dictate their reports using a Lanier computer/dictation system. The reports are then transcribed by stenographers. The system allows officers to use telephones in the field, modify their reports while recording, and finally the computer prioritizes the reports for transcription.[3]

Voice recognition technology for police report writing is a futures use of technology in an effort to maintain or improve the quality of service. Officers will speak directly to the computer to write their narratives, rather than using keystrokes. They may do this by speaking into a microphone, by using a telephone, or using a tape recorder. Current technology includes hand-held voice recognition computers.[4] These small units synthesize the operator's voice into keystroke commands. When VRT is coupled with spell check and grammar check software programs, the quality of reports will improve.

In Hugh Mooney's Command College Class 11 independent study, *Planning for the Future Use of Expert Systems to Aid Police Officers by the Year 2000,* he noted:

> "Police use two forms of 'knowledge', individual knowledge based on years of experience, and collective knowledge or information gathered by all officers and stored in police records. The current use of individual knowledge is quite satisfactory, but the use of collective knowledge is dismal. John Eck (1983:xxvi) and others have noted that police consistently fail to take advantage of information stored in their own records systems. The reason for this may be the difficulty in locating and retrieving useful information in a timely manner from a remote and antiquated system."

He forecast there would be great changes with the use of voice recognition technology and

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[3]"Paperless Police Report Writing Becoming a Reality," The Shark Byte, The Tiburon/PSW3, San Francisco, Spring, 1991.

[4]McCarty, Lyle H. "Filter System Gives Computer Voice Synthesis\Recognition," Design News, March 3, 1989, p. 186-7.

expert systems. In some cases, based on VRT and expert systems, the computer may interact with a customer (or field officer) when the customer calls the desk. The computer will ask specific questions and "talk" the customer through the preliminary investigation and report completion. There are some simplified forms of this system available today on a small experimental basis. This use of VRT will allow customers to file reports by telephone eliminating the need to send an officer to take the report and thereby reduce the number of police department employees required to take "cold" reports.

Voice recognition technology will also be able to translate foreign languages into English, both text and audio. When a non-English speaking customer calls the desk, VRT will translate the conversation into English for report transcription or to enable the desk officer to talk to the customer through the computer. The military is currently testing a hand-held VRT computer with a 500 word Spanish vocabulary that is used for in-field translation. It hears and speaks both English and Spanish.[5] By using such technology, field officers will be able to conduct more complete preliminary investigations and therefore write better reports. Current limited technology includes hand-held voice recognition computers that are used to assist people whose hands are busy. These computers have small specialized vocabularies.[6]

If VRT is coupled with video cameras mounted in patrol cars, the officer may be able to complete the police report while video taping the violation or scenario. This should result in improved accuracy in recording incidents.

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[5]Rondell, Steve, President of Voice Computer Corporation, Seattle, Washington, telephone interview, July 30, 1991.

[6]McCarty, Lyle H. "Filter System Gives Computer Voice Synthesis\Recognition," Design News, March 3, 1989, p. 186-187.

These advancements provide opportunities in the future for law enforcement administrators to better utilize resources and improve the quality of service in a future of dwindling revenue.

This study will explore the effect of voice recognition technology. The future appears to include expert systems and language translation. The Alliance, Nebraska Police Department, and others, presently access expert systems through computer keystrokes. The use of VRT to access the same expert system is possible in the future. The use of VRT may allow the integration of expert systems and language translation to improve police report writing. The study includes the effects on report writing training, customer satisfaction, and records management.

SECTION 1

Defining the Future

This futures study is designed to explore what changes Voice Recognition Technology may have in law enforcement's future. Through the use of applied futures research: experience, environmental scanning, interviews with experts, and a forecasting group process; the issue, sub-issues, trends, and events to be analyzed were identified.

> The issue is: ***What effect will voice recognition computer technology have on police report writing by the year 1997?***

The issue question is broad and invites refinement to narrow the scope of this study. During the environmental scanning process, review of the literature, a Nominal Group Technique, and modified conventional delphi, three sub-issues were developed to give focus to this project.

* How will the use of voice recognition technology for police report writing effect report writing training?
* What effect will voice recognition technology have on acceptance of police service (customer satisfaction)?
* What effect will voice recognition technology have on records management systems?

The Scanning Process

The following methods were used to develop the general issue question: environmental scanning, interviews of experts, personal experiences, a Nominal Group Technique, and modified conventional delphi.

Because voice recognition technology is a fairly new and rapidly changing technology, the literature review not only included traditional sources such as magazines, professional

journals, books, final reports (Command College Independent Study Projects), and trade publications; but was expanded to include manufactures' advertising pieces, press releases, and trade show demonstrations.

Interviews of experts from computer manufactures, software developers, law enforcement executives, research institutes, computer retailers, and law enforcement trainers were conducted. A complete bibliography is included in the appendix for review. Seventeen years of personal experience as a deputy sheriff, including a management role in the development and implementation of the automated records management system for one of the ten largest county jails in the United States, twelve years of experience as police trainer, and the author of three books on police report writing training, provided additional insight into the development of the issue.

A delphi is a method for structuring a group communication in a non-confrontational environment to identify trends and events. The process allows a group to rank trends and events and to deal effectively with a complex problem. A modified conventional delphi provides a group of experts, from a wide geographic area, to evaluate the trends and events. In this study both a Nominal Group Technique (NGT) and modified conventional delphi (MCD) were used.

On November 16, 1990, a NGT panel of eight members (see appendix E for a list of participants), identified 20 trends and 10 events, (a complete list is included in appendixes C and D). The group was able to reduce that number to 10 trends and 9 events for further analysis. Continued scanning between the date of the NGT panel and August, 1991, confirmed that the trends and events remained relevant. A modified conventional delphi was selected because it doesn't require the panel members meet face to face, which allowed a broader and therefore

more representative selection of participants. The panel members selected to make the forecasts were selected from a broad perspective both geographically and professionally. A complete list of the panel members is included in Appendix E. The modified conventional delphi was conducted in August, 1991. The participants began with the lists of 10 trends and 9 events and the panel reduced that number to 7 trends and 4 events that were forecast.

Identification of Trends

Trend 1 - Level of Voice Recognition Technology (VRT)
The level of VRT relative to law enforcement needs.

Trend 2 - Cost Effectiveness of Voice Recognition Technology (VRT)
The level of cost effectiveness of VRT for use in law enforcement.

Trend 3 - Training to Use Voice Recognition Technology (VRT)
The level of training needed to use VRT at optimum level.

Trend 4 - Ability to Write
The level of the ability of law enforcement personnel to write police reports by 1997.

Trend 5 - Customer Resistance
The level of customer resistance to VRT.

Trend 6 - Retraining
The level of retraining of existing staff.

Trend 7 - Level of Funding
The level of funding, from law enforcement budgets, for VRT.

Identification of Events

Event 1 - Windfall Funding
The funds to fully implement VRT for police report writing become available. The source of funding isn't considered, however it is given that the funding will not take away from other programs. Examples might include a grant, donation, or joint venture.

Event 2 - Election of New Sheriff
This is the election of a new sheriff. Such a change has significant impact on the political system surrounding law enforcement. A new Sheriff may bring changes and new priorities.

Event 3 - Transportation System Fail
The transportation system, freeways and highways, are so congested that emergency vehicles can not quickly respond to calls for service.

Event 4 - Technological Breakthrough
There is a technological breakthrough in VRT that allows continuous speech operation. The computer will record at normal speech rates.

Trend Forecasting

A trend is a cluster of interrelated events, beginning in the past and emerging into the future. Trends are evaluated in terms of strength.

Strength of trend is estimated relative to a fixed point in time. In this study, the fixed point in time is "Today," which is assigned an arbitrary value of "100". All evaluations therefore are relative to 100. The five years past forecast asked the panel members where the trend was five years ago. The five year future forecast asked for both a nominal (will be) and normative (should be) forecast. The median values for each trend are also included in Table 1.

Trend Evaluation

Trend #	TREND STATEMENT (Abbreviated)	LEVEL OF THE TREND** (Today = 100)		
		5 Years Ago	Today	*Five years from now
1	Level of VRT technology to law enforcement needs	20 - 70 25	100	150 200
2	Level of cost effectiveness of VRT	0 - 90 40	100	150 150
3	Level of training to use VRT	25 - 90 50	100	150 200
4	Level of ability of personnel to write reports	10 - 100 50	100	150 200
5	Level of customer resistance	25 - 150 80	100	105 75
6	Level of retraining existing staff	0 - 75 50	100	150 200
7	Level of funding	10 - 75 40	100	140 200

** Panel Medians

Table 1

*Five years from now - "will be"/"should be"

Trend 1 - Level of Voice Recognition Technology

The analysis of this trends deals with the level VRT to law enforcement needs. According to Dragon Systems, Inc. Vice President of Marketing, Bill Flynn, current voice recognition technology exists that allows the operator to speak at the rate of approximately 40 words per minute. There are several systems available with vocabularies ranging from 7,000 to 30,000 words. These systems recognize both the user's voice and the words that are spoken. The voice is forwarded to the word processing software, which transcribes text as if it had been entered with keystrokes. The disadvantage to such a system is the lack of "continuous speech," or the ability for the computer to "hear" as fast as we normally talk. Flynn feels continuous speech will be available within five years.

Kai-Fu Lee is the head of Apple Computer's speech and language technology group. He envisions notebook or pocket size computers without key boards that understand the spoken word. He feels this technology will be available by the year 2001.[7]

While forty words per minute may not sound significant, it is considerably faster than most transcription methods. According to David Johnson, Director of Services for the Brooklyn Park (Minnesota) Police Department, they recently justified and purchased a Lanier computer dictation system for police report writing. They based their cost savings on a study conducted by Wahl & Wahl that showed that reports would be transcribed at approximately 13 words per minute.[8]

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[7]"Voice Activated Computers Might Assist You With Many Tasks by the Year 2001," Orange County Register, 18 September 1991, p. G2.

[8]"Justification for Digital Dictation System," David Johnson, Director of Services, Brooklyn Park Police Department, Brooklyn Park, MN, Fiscal Year 1991 Budget Document.

The question isn't if the technology exists today, but rather how soon will it be applied to law enforcement. The law enforcement business is small and fragmented when compared to private sector applications. Under current economic conditions the public sector has limited resources.

Based on the trend evaluation from the modified conventional delphi panel (shown in Table 1), most respondents thought the level of voice recognition technology "will be" considerably higher, and the "should be" forecast was double the current level. The projections of the MCD panel, statements of experts in the field, and review of existing technology, substantiate that the level of VRT technology will increase by 1997.

Trend 2 - Cost Effectiveness of Voice Recognition Technology

In the past, funding for both new and continuing projects has had a major impact on the decision making process and that has not changed in today's economy. What has changed is increased scrutiny of the entire budgetary process and politicians' apparent desire to be involved in the daily operation of departments. In the case mentioned earlier, the Brooklyn Park Police Department justified the purchase of a new dictation report writing system based on a projected reduction in overtime. They repeated a process that occurs all across the country in large and small police departments everyday. The budgetary logic is an example of, "doing things the way we've always done it." A simple explanation of the methodology reveals the cost of the new equipment was compared to projected reduction in overtime for report writing, all based on a time and motion study of police report writing.

The concept of measuring cost effectiveness and efficiency has not been widely applied in law enforcement. The use of cost effectiveness and efficiency measurements for voice

recognition technology are complex. The amount of time field officers spend or save writing reports can be measured. But what about the quality of those reports and therefore the effectiveness and efficiency of the department? VRT should improve the quality of those reports for several reasons. Because the officer will be able to speak to the computer the interaction allows a more continuous flow of thought than handwriting or typing. The advantage over mere dictation is the computer will understand what is being said and begin processing information while report writing is still occurring. Through the use of expert systems, artificial intelligence, and neural networks, officers should conduct better preliminary investigations. Improved preliminary investigations should reduce the workload for the investigations detail or allow more emphasis be put on cases with a better likelihood of being solved.

VRT may also open a new era where in some cases (cold calls) informants/victims could speak directly to the computer that records their report. Current technology is in use that prompts officers for appropriate information, including corpus delicti, solvability, and modus operandi when they are typing their reports on computers. The officers enter the information with keystrokes. VRT will prompt the victim (and officers too) for the same appropriate information, thereby eliminating the need to send a field officer. Currently, agencies employee civilians to take crime reports by telephone. The significant difference in using VRT is the elimination of the civilian position. Because the computer can interact with the speaker, it can guide the victim through the dictation process. In this example, the cost effectiveness and efficiency of VRT is overwhelming. The report is taken, prioritized, distributed (electronically), and the case can be cleared, all without involving a department employee. VRT will also allow foreign language translation for taking reports by phone from non-english speakers.

Progress like this will require a significant change, not in technology, but in management perspective. Police executives, city managers, and city councils, need to accept the view that a large initial investment in computer technology is cheaper than hiring additional employees. This is especially true when a clerical position may cost $40,000 per year and a sworn position as much as $97,000 per year[9] In five years those two positions, without salary increase, represent an investment of $685,000. The police chief should be able to justify the investment of $500,000 in VRT technology as a cost savings. The chief's justification requires that he follow through and actually reduce staffing levels or eliminate positions. Traditionally when new systems are installed, there are no corresponding reductions in staffing levels. Police executives must address this issue if they are to effectively use new technologies.

Based on the trend evaluation from the modified conventional delphi panel (shown in figure 1), most respondents thought the level of cost effectiveness "will be" and "should be" equally higher. The projections of the MCD panel substantiate that the level of cost effectiveness of VRT technology will increase by 1997.

Trend 3 - Level of Training to Use VRT

The analysis of this trends deals with the level of training needed to use VRT at optimum level. The MCD panel forecast identical "will be" and "should be" strengths of 150 or fifty percent greater than measured today. The necessary training to actually operate VRT is minimal. Companies such as Dragon Systems and The Voice Connection estimate 1 to 8 hours of training is necessary.

The changes in the level of training come from learning to manipulate the databases and

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[9]Orange County Sheriff Department, FY '91-92 contract costs.

understanding the power of automated systems, rather than from mere operation of the VRT computer. Once the VRT has learned the user's voice, and verified the speaker's access, VRT makes computer operation easy. Officers will need to be trained to think in terms of what's out there, in the system, to help them solve crimes. Traditionally, field officers conduct only preliminary investigations, collecting minimal data, and forwarding it to investigators. Through the use VRT and expert systems, the field officer can take advantage of all previous investigators' knowledge, and in fact the computer will respond to them with questions, suggestions, inferences, and conclusions. The officer may be able to ask the computer system to begin searching for some information, e.g. similar modus operandi crimes, while he continues to dictate the report or continues to collect additional information. The result is that as the officer completes the field report, the preliminary investigation, the computer could begin the follow-up investigation through data base searches. Through the use of computer menu selections, victims could also be asked to complete some follow-up investigation. An examples might be to talk to neighbors and ask if they saw or heard anything unusual during the time of occurrence.

Trend 4 - Ability to Write

The ability of police officer to write reports has been a significant concern for a long period of time. Typically discussions center on the failure of the school system to produce a literate public from which agencies hire police officers. Through the use of VRT with word processing software containing spelling and grammar review, the quality can be improved. VRT will encourage improvement because the office can hear the suggested corrections and possibly be given a brief grammar lesson or explanation of the correction.

A better questions may be, what needs to be improved in today's reports and will VRT do that? VRT will allow officers to improve the accuracy of reports by recording information as it occurs. The dictation of an officer's observations while following a suspected drunk driver may be directly included in the narrative. Translation of statements from non-English speaking victims, witnesses, and suspects will improve the quality of investigations. When an expert system is used in conjunction with VRT, the computer will be able to literally ask the officer about probable cause, corpus delicti, etc., in essence providing a computerized sergeant's review of the report.

Trend 5 - Customer Resistance

The analysis of this trend deals with the level of customer resistance to voice recognition technology. Today in most departments when a customer calls the police, they speak to a desk officer who routes their call for appropriate action. Departments are beginning to use call direction systems that require customers to select from a menu of choices by pushing buttons on their phone to speak to the appropriate officer. In private industry, e.g. banking by phone, these system have been refined to include actual interaction and inquiry by customers. The MCI Corporation is developing VRT for their telephone credit card system. VRT will be used to not only ask questions of the speaker, credit card user, but to voice print and identify the user.[10]

The ground work has been laid and computer technology has already changed the way people do business. The following example of a current use of VRT in Europe provides insight into the uses and acceptability of VRT into American law enforcement.

Lernout & Hauspie Speechproducts (Iper, Belgium) designed the Music Phone system

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[10]Spernow, Bill, Search Group, interview, August 7, 1991.

currently used in Europe by reservation agency "Eurotickets." The system presently integrates bilingual speaker-independent speech recognition (approximately 60% of all callers use rotary phones) and audiotext and voice response. Callers are initially greeted and asked to specify their language (Dutch, French, English, etc.) and to choose their music interest. Menu choices then allow them to request information, news, concerts, and other events, as well as the capability of selecting seats and reserving tickets. In addition to cost savings, Music Phone's popularity and high user acceptance are responsible for its current expansion from 10 to 32 lines.[11]

Based on the trend evaluation from the modified conventional delphi panel (shown in Table 1), the "will be" evaluation shows little increase in customer resistance. The "should be" evaluation actually projects a significant decrease in resistance. Based on the MCD panel evaluation and the Euroticket experience outlined above, reduced customer resistance to level lower than today, seems correct.

Trend 6 - Level of Retraining

The analysis of this trends deals with the level of retraining of existing staff. This trend is an extension of Trend 3 - Training to Use VRT. Existing staff members will require retraining equal to that of new employees to learn to operate VRT. This training is considered "hand knowledge" (new patterns of muscular activity), and is actually minimal as discussed above.

The biggest area of retraining will be "head knowledge" (new patterns of understanding).

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[11]"New Opportunities Opening Up with Large Vocabulary Speech Recognition," Janet Baker, Dragon Systems.

This will require the introduction of a new way of doing business for all levels of the organization. The idea of taking reports by phone, and allowing customers to dictate directly to the computer, may not be easily accepted by some in the organization. Another new concept is the encouragement of field officers to conduct more thorough investigations. VRT using expert systems and artificial intelligence will replace many of the tasks currently completed by investigators.

The MCD panel forecast significant strength (see figure 1) in both the "will be" and "should be" evaluations. The level of retraining existing staff is an area of concern.

Trend 7 - Level of Funding

The level of funding from law enforcement budgets for VRT will certainly be one of the strongest determining factors in the future of VRT use. Current fiscal conditions are not conducive to expansion of public sector budgets. By the same token, it is during times of fiscal constraint that executives must look for new solutions to old problems.

As discussed in Trend 2 above, the measurement of effectiveness carries over into funding. The question of cost must be examined before discussing funding. The Voice Connection is a voice synthesis computer manufacture in Irvine, California, that markets hand-held computers able to synthesize voice to computer keystrokes. Their system has a 1,000 word vocabulary and can identify multiple users. They are currently negotiating their first law enforcement use for capturing time keeping and statistical data. Their system costs range from $895 to $1,495 plus the host computer and necessary software programs.[12] Dragon Systems

[12]Voice Connexion Corp., Elizabeth Briggemean, Senior Sales Representative, telephone interview, November 1, 1991.

most expensive system is less than $9,000.[13]

The cost to implement a small experimental system is not significant. The hidden cost is in the development of the software and automated systems to support a sophisticated VRT report writing & records management system. VRT technology is nothing more than a means to input, access, and manipulate data. If the data is not available, can't be accessed by computer, or departmental software hasn't been developed, then there is no value in VRT.

There is a great variance in the level of funding for various agencies to implement VRT. In an effort to explore those differences, particularly between large and small agencies and their current level system sophistication, the City of Alliance, Nebraska, is offered as an example. It is a small department that is fully automated by today's standards. They have twenty officers, all using lap top computers for crime reports, computer assisted dispatch, and an expert system for burglary investigation. The current state of VRT would not allow Alliance PD customers to make telephone reports directly to the computer, however the department could implement a VRT system for their officers for less than $20,000. While that may not seem like much to some agencies, Alliance spent that amount to develop their entire current automated system. So in that frame of reference, the cost is significant.

Event Evaluation

An event is a discrete occurrence; it either happens or it does not happen. The occurrence of an event can be pinpointed in time.

Occurrence is forecast in terms of percent probability. A forecast of 100% means that the event probably will happen; 0% means that the event probably won't happen by the

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[13]Bill Flynn, Vice President, Dragon Systems.

forecasted time. The word "probably" is important. Nobody can absolutely guarantee that an event will or will not occur by the particular time of forecast in spite of a forecast of 100% or of 0% probability. A 50% probability means that the event has a 50/50 chance; an 80% probability increases the odds to 80/20. Because an event cannot do more than "probably occur", 100% is the top of the probability scale.

Table 2 reflects the results using the MCD panel medians of the events forecast.

Event Evaluation

Event #	EVENT STATEMENT	*YEARS UNTIL PROBABILITY FIRST EXCEEDS ZERO	*PROBABILITY Five Years From Now (0-100%)	IMPACT ON THE ISSUE AREA IF THE EVENT OCCURRED	
				*POSITIVE (0-10 scale)	*NEGATIVE (0-10 scale)
1	Windfall Funding	3	25	9	10
2	Election of New Sheriff	2	80	7	5
3	Transportation System Fails	4	70	0	10
4	Technological Breakthrough	2	90	9	0

* Panel Medians

Table 2

The significance of the positive and negative impacts of each of the events on the issue are shown in the table above. The most significant positive impacts are events #1 Windfall Funding and #4 Technological Breakthrough. The MCD forecast strong positive impacts if those events occurred. The most significant negative impacts are events #1 Windfall and #3 Transportation System Failure.

Event 1 - Windfall Funding

The unforeseen availability of funds to fully implement VRT for police report writing is a possibility. However, the MCD panel's median forecast of a 25% probability indicates their feeling that it isn't highly probable to occur. The panel did forecast a strong positive impact (9)

if the event occurred.

Between the time the MCD was conducted and the final writing of this paper, additional research revealed continued improvement in VRT. The costs are considerably less than considered by the MCD panel. If additional study of VRT for police report writing is conducted, it should include close review of costs and sources of funding.

Event 2 - Election of New Sheriff

The election of a new sheriff represents a dramatic change and has significant impacts on the political system surrounding law enforcement. Typically incumbent officials, especially sheriffs, are returned to office and face little competition. The decision of an incumbent to not run for reelection or his defeat would indicate drastic changes in policy may occur.

The MCD panel felt strongly that there may be change, forecasting 80% probability of the election of a new sheriff. The panel was more evenly split on the effect of the event, forecasting a 7 positive effect and 5 negative effect on scales of 1 to 10.

Event 3 - Transportation System Failure

The failure of the transportation system, including grid lock on freeways and highways, and air quality regulations directly effects emergency vehicles response to both calls for emergency service and routine calls for service. The selection of alternatives may include VRT for taking reports from customers.

The MCD panel forecast that within 4 years there was a 70% probability that the transportation system would fail. The panel saw no positive impacts from this (0), and forecast maximum negative impacts (10).

Event 4 - Technological Breakthrough

The technological breakthrough in VRT that allows continuous speech operation, where the user can speak at normal conversation rates, is necessary for wide use of VRT. The MCD panel forecast that will occur within 2 years, is 90% probable, and will have a strong (9) positive impact on police report writing. Their forecast would seem to be in agreement with experts previously cited in this paper.

Cross Impact Analysis

The purpose of a cross-impact analysis is to assess the impact of the events on the trends and other events. The results are used to select trends and events to develop the scenarios for forecasting the future. During this analysis, the impact is recorded as the percentage of change, either plus of minus, over the original MCD forecast, and represents the maximum impact upon the event or trend.

The cross impact analysis was conducted by a small group that included a police lieutenant, English instructor, and the author. Two of the group members participated as panel members in the MCD. The impact of an event's occurrence upon a trend was estimated in a range of -100% to +100%. The -100% negative impact stops the trend and the +100% positive impact doubles the intensity from the MCD panel forecast.

The impact of each event on the other events and trends is noted by the numbers listed in the "impact totals" column and "impact totals" row of Table 3. The higher numbers in the column (actors) identify the events that have the most impact on other events and trends. The higher number in the row (reactors) show the greatest reaction to each event's occurrence. The cross impact analysis matrix is shown in table 3.

Cross-Impact Evaluation

MATRIX (Panel Medians)					Maximum Impact (% change ±) / Years to Maximum							"IMPACT" TOTALS
**	B1	B2	B3	B4	T1	T2	T3	T4	T5	T6	T7	
B1	X	0	0	0	+50/2	+100/0	+100/0	0	-50/0	-50/0	+100/0	B1 6
B2	+25/2	X	0	0	+50/2	+25/4	+50/3	0	-25/3	-30/3	+50/3	B2 6
B3	+25/4	-30/2	X	0	0	+60/4	0	0	-30/4	0	+60/4	B3 4
B4	+75/2	-10/2	0	X	+90/2	+80/2	+30/2	0	-70/2	-30/2	+60/2	B4 8
"IMPACT" TOTALS												
	B1	B2	B3	B4	T1	T2	T3	T4	T5	T6	T7	
	3	2	0	0	3	4	3	0	4	3	4	

** Legend

B1 Windfall Funding
B2 Election of Sheriff
B3 Transportation System Fails
B4 Technology Break

T1 VRT Technology to Law Enforcement Needs
T2 Cost Effectiveness
T3 Level of Training
T4 Ability to Write
T5 Customer Resistance
T6 Retrain Staff
T7 Funding

Table 3

The cross impact analysis identified three actor events that had the greatest impact upon the other trends and events. Actor events should be the focus of policy action. The impacts of the individual events on trends and other events are summarized:

Event 1 - Windfall Funding

Unexpected or windfall funding for VRT would have positive impacts. If the Event 1 does occur, the sudden availability of VRT would increase by half the strength of the level of VRT relative to law enforcement needs. It would maximize the cost effectiveness of VRT for use in law enforcement and the level of training needed to use the technology. It would decrease the strength of customer resistance and retraining staff trends. Finally, it would maximize the strength of the level of funding trend.

Event 2 - Election of New Sheriff

The election of a new sheriff has both positive and negative impacts on six of the seven trends. It had no impact on any of the other events. The MCD forecast that the election of a

new sheriff would increase by half the level of strength of VRT relative to law enforcement, the level of training necessary, and the level of funding trends. It would increase by 25% the strength of the cost effectiveness of VRT trend. It is forecast that a new sheriff would reduce the strength of the customer resistance and necessary retraining trends.

Event 4 - Technological Breakthrough

A technological breakthrough that would allow continuous speech operation of VRT had eight "hits" or impacted six trends and two other events, making it the strongest actor. The occurrence of this event would increase by 75% the strength of the windfall funding trend. It would also have a modest (10%) increase in the strength of the election of a new sheriff event. The greatest impacts occur in the increases in strength of the trends for level of VRT technology to law enforcement needs (90%), level of cost effectiveness (80%), level of funding (60%), and level of training (30%). The strength of the trends for level of customer resistance will reduce by 70%, as will the level of retraining be reduced by 30%.

Scenarios

Scenarios provide a view of possible futures, based upon the futures research described earlier in this paper. They provide planners, policy makers, and leaders, with a brief look at what might be ahead. The exploratory scenario describes what the future is likely to be without intervention. The hypothetical scenario provides the worst case view of the future. Finally, the normative scenario puts forth a desirable and attainable future.

Exploratory (Likely to Occur) - 1997

Sheriff's Department Seeks

Computer System

The Orange County Sheriff's Department is again seeking the approval of the Board of Supervisors to purchase a voice recognition computer system. The new system will improve records management and the investigation of crimes. The Department's justification includes figures showing a 14% increase, to 500,000 people, in the last five years in the number of people they serve in ten contract cities and the unincorporated area of the county. Currently, civilian officers are taking reports by telephone to reduce the radio traffic on a crowded radio channel. It also reduces air pollution and traffic congestion. These reports are typed on computers, however all field reports are still handwritten.

The outlook for approval isn't bright. The County is still facing difficult financial times because of increased social service costs, reduced revenue from depressed economic times, and the loss of revenue from the continued incorporation of new cities. In 1993 the Orange County Fire District was formed and resulted in the dismantling of the county fire department. The county is now contracting with the new district for fire protection in unincorporated areas and costs exceed available revenue.

Increased gang activity has resulted in a re-deployment of personnel to specialty street patrols. Deputies work in conjunction with Probation Officers and Parole Agents, in an effort to maintain the safety of the public on the streets.

Hypothetical (Worst Case) - 1997

Sheriff's Department Unable to

Answer Calls for Service

In a startling revelation, the Sheriff's Department announced today they would no longer respond to calls for service unless it was a crime against persons, such as assault, kidnap, or

rape. Recent budget cuts and increased demands for service have overwhelmed the department's ability to handle the massive amounts of paperwork being generated. All misdemeanor crimes and crimes against property (e.g. burglary) reports will be handled through the mail.

Harsh economic times during the last five years have resulted in three cities in the county closing their police departments and contracting with the Sheriff. The Sheriff's Department assimilated some police department employees, but received no additional funding to purchase automated systems. The current manual report writing and record keeping system is overwhelmed by more than 100,000 reports being generated from 250,000 calls for service per year.

Because the county-wide public works/public safety 800 mhz radio system was abandoned in 1995 as too costly, limited broadcast time is available for dispatching calls. Only priority one calls are given by radio, and all other calls are held or handled by telephone. The lack of funding has also delayed installation of mobile data terminals in Sheriff's vehicles.

The limited job applicant pool has forced increased hiring of civilian employees to take reports by telephone. The level of their ability to write reports is below standard, and the P.O.S.T. Commission has been unable to fund adequate training programs. In some cases customers may wait for two days to file a theft report.

Normative (Desired and Obtainable) - 1997

Customers Talk to

Sheriff's Bilingual

Robo-Computer

At a special open house today, the Sheriff's Department introduced the most advanced

computer system in law enforcement. The demonstration began when a young deputy sat down in front of a computer terminal in the Emergency Communications Bureau. He put a the small earpiece in his ear, adjusted his microphone, and without touching a key went to work. The computer understood his voice command, identified his voice print, and verified he was scheduled for duty that day.

By using voice commands he answered phone calls and directed customers' requests for service. When one caller reported a theft, the deputy directed her call to the next available "CARS" or Computer Assisted Report-writing System. The computer asked and recorded all of the information necessary to file a crime report. It even completed solvability, prioritized the case, assigned the investigator, and completed statistical reporting.

The next call was tough, because the customer only spoke Spanish. The deputy was able to hear the English translation in his earpiece, and as he spoke English, the customer heard Spanish. The customer's house had been burglarized while he was at work and the suspect left physical evidence at the scene. The deputy dispatched a field unit to investigate.

When the field officer arrived he used a hand-held voice recognition computer that fit in the palm of his hand. It also translated for the deputy. While using the same computer to dictate his report, it was sending real time information by satellite to the station. A computer database search of crimes in the area with similar modus operandi revealed two similar burglaries occurred earlier in the day. Through the use of an optic scanner latent fingerprints were sent to CAL ID and a possible suspect was identified.

The demonstration concluded with a presentation of statistical data that showed that reduced personnel costs off set the cost of the new system.

SECTION 2

Strategic Management

The purpose of strategic management is to guide an organization to a potentially desirable and attainable future. For the purposes of this paper, that future was defined in the normative scenario developed in Section 1. Strategic management is based on a strategic plan, which provides the direction and milestones to guide an organization into the future. Mr. Tom Esensten defines strategic planning as follows:

> A structured approach, sometimes rational, and other times not, of bringing anticipations of an unknown future environment to bear on today's decisions.

While the future is at best uncertain, strategic management in an accepted formal method that stresses the belief that the future can be impacted.

In this section stakeholders in the decision making process are identified, policies are presented for consideration, and a plan for change is developed. The goal of this plan is make the desired and obtainable future come true.

Methods

The following methods were used in the strategic planning process:

1. The Orange County Sheriff's Department (OCSD) was selected as the subject department.
2. OCSD's strengths and weaknesses, and internal and external threats and opportunities were analyzed using a WOTS-UP analysis method.
3. Both macro mission and micro mission statements were developed.
4. Key stakeholders in the change process and their positions were identified using

the SAST technique.

5. A modified policy delphi was conducted to evaluate policies.

Subject Department

The subject department for this study is the Orange County Sheriff's Department. It is a large urban department made-up of 2,300 employees, 1,300 sworn, with an annual budget of $145 million. Orange County the fifth most populous county in the United States and shares boarders with Los Angeles County to the north (the nation's largest county) and San Diego County to the south (the nation's fourth largest county). The department currently provides law enforcement services to approximately 439,000 people in six contract cities and the unincorporated county area. It has grown rapidly and continued to provide innovative approaches to law enforcement and corrections. Examples of their technological innovations include the first DNA laboratory on the West Coast and the first portable laser fingerprint unit. The Sheriff's Drug Use is Life Abuse program was recognized by President Bush as one of the three best in the country. These examples demonstrate a management team that looks into the future and develops strategic plans to impact that future.

Situational Analysis

WOTS-UP analysis is an acronym for **W**eaknesses, **O**pportunities, **T**hreats, **S**trengths, and the **U**nderlying **P**lanning, and is used to determine whether the department is able to deal with its environment. It was used to analyze the issue and sub-issues identified in the futures research, in terms of identified threats and opportunities. It was also used to assess the department's internal strengths and weaknesses.

Using a small group of police managers, the external analysis or the WOTS-UP identified

the following:

Opportunities

The Orange County Police Chiefs and Sheriff's Association provide an opportunity. The group has, over the years, developed a strong working relationship and supported various programs and projects. Examples of their successes include a warrant repository for all warrants in the county, a jail booking fee protocol, new 800 mhz radio system, and the Regional Narcotics Suppression Program.

The software development companies present another opportunity. The development and successful implementation of VRT technology, combined with expert systems, in a large department would be of value to those companies. It would provide them expertise and a demonstration site for the development and sale of systems to additional jurisdictions.

Support from the community served by the Sheriff's Department is another opportunity. The Department has used a community feedback questionnaire program for more than fifteen years. The results of that survey have routinely been positive. The customers are pleased with the quality of service, types of service, and demeanor of Department employees.

The Sheriff's Advisory Council is a group of approximately 700 business and community leaders in Orange County that support the Department and represent an opportunity. These leaders provide both financial assistance, e.g. the Department's mobile command post, Laser Village, and SWAT equipment, and leadership on policy issues and questions.

Threats

The Board of Supervisors presents a threat to the issue and sub-issue. The current fiscal crisis for counties is strongly felt and requires the Board to make decisions based on financial

considerations more so than at any time in recent years. Their need and stated political goal is to reduce the size of county government. While automated systems may assist in that process, the Board may not find it politically palatable to provide the funds necessary to implement the system.

The Association of Orange County Deputy Sheriffs, the labor union, may present a threat. If VRT linked to expert systems were implemented as proposed, there would be a reduction in staffing levels of both sworn (represented by AOCDS) and civilian personnel. The goals of AOCDS and their mission could be jeopardized in that situation.

The County Administrative Office, as an entity, could be a threat. Currently, data processing is one of their responsibilities. If the Sheriff's Department, in cooperation with a software manufacture, developed VRT police report writing, the County Administrative Office may lose, or feel they're losing, part of their responsibilities.

The insurance companies could also be a threat. Because a large percentage of police reports are taken for insurance purposes, any change in the manner those reports are taken or preliminary investigations are conducted, could affect the insurance companies. If insurance companies feel the changes negatively impact them, they could be a threat.

Strengths

Because the Orange County Sheriff's Department has grown so rapidly in the last fifteen years, much of the strength of the department lies in its young progressive-thinking people. These employees are accustomed to change, welcome challenges, and on a percentage basis accurately represent the demographics of Orange County. Specific department strengths include personnel, technological capabilities, and political support.

The department's personnel strengths lie in the fact they provide a wide variety of service and therefore have extensive experience in municipal police services, correctional services, forensic sciences, and support services for a large department. Interpersonal communications skills and community relations are a demonstration of that and are supported by low complaint rates, extensive communication skills training, and a community feedback program in its second decade. Management and supervision skills are demonstrated by an experienced executive management team (over 25 yrs. each) and well educated and professionally trained managers and supervisors.

Technological capabilities are demonstrated in the existing automated systems that include large and small systems developed in-house and by contractors. County data systems resources are also available, including communications systems development.

Political support within the Sheriff's Department stems from the responsiveness of all department employees in providing service to customers. Contract law enforcement cities are essential if the Department is to continue providing police services. Department employees are internally responsive to that issue. The Sheriff has designed a true partnership among the public, private, and not for profit communities. The value of those partnerships is shared within the Department, and that understanding generates the internal political support.

Weaknesses

Because of rapid growth, two related areas of weakness include internal communication and consistency in report writing and preliminary investigation. These weaknesses can be attributed to rapid grown, decentralization, and a significant increase in the number of cities contracting for law enforcement service.

The weaknesses noted in this discussion are primarily internal and can be affected with an appropriate strategic plan.

Adaptability to Change

A "Capability Analysis Chart" was used to assess OCSD's ability to adapt to change and identify strengths and weaknesses. This chart was completed based on interviews of select OCSD personnel (see appendix I). The raters perceive the department as ready and capable for change. The areas of concern or weakness were primarily technology, equipment, and facilities; all of which are to be expected in a rapidly growing organization. The overall positive attitude of the respondents about their skill levels, leadership, and support from contract city governments was refreshing.

Stakeholder Analysis
Strategic Assumption Surfacing Technique (SAST)

Stakeholder analysis and SAST are used together with the WOTS-UP analysis to assess how individuals, organizations, or groups are impacted or impact OCSD's implementation of VRT for police report writing. A person, group, or organization who may appear to have no impact or a positive impact, and in fact has a negative impact is called a ***snaildarter.*** The following list of stakeholders and one snaildarter were developed for analysis:

Board of Supervisors	Labor Associations
Contract City Managers	OCSD Records Division
Judges & Attorneys	Media: Newspapers, radio, TV
Computer manufacturers	Rancho Santiago College

Air Quality Management District (AQMD)

County Administrative Officer (snaildarter)

The stakeholders, their assumptions, and the reasons they are concerned about the issue of the use of voice recognition technology for police report writing are listed below. The Stakeholder Assumption Graph is included in appendix J.

1. Board of Supervisors

   - Receptive to public demand for efficient service
   - Receptive to cost saving programs
   - May be unwilling or unable to increase Sheriff's budget

   Both of the assumptions reflect positive political positions for the Board to take and explain to constituents.

2. Labor Associations for both sworn and civilian employees

   - Protective of members's rights
   - May oppose changed job tasks, new job duties

   Both assumptions reflect the role and purpose of labor unions. The unions would be carrying our their missions.

3. City Managers from contract law enforcement cities

   - Receptive to demand for efficient service
   - Receptive to cost saving programs

   Both assumptions provide the City Managers with proof they are doing their jobs, namely cost efficient law enforcement.

4. OCSD Records Division

   - Receptive to demand for automated systems
   - Receptive to systems that reduce manual workload

The Record Division is operating on a virtually manual system. The development of automated report writing will decrease workload and increase productivity.

5. Judges & Attorneys

   - Generally supportive of improvements in records keeping
   - May request ability to access some cases or files
   - May question reports generated in this manner

Both assumptions offer increased efficiency to the courts and attorneys.

6. Newspapers

   - Generally supportive of improved record keeping
   - May see opportunity for on-line or improved access

Reporters are always seeking additional information and may see the automated system as eliminating one hurdle: the proverbial "can't find the report."

7. Air Quality Management District & environmental groups

   - Support reduced use of paper
   - Support reduce use of autos, saving fossil fuel & reducing air pollution because less officers may be needed on the road

The A.Q.M.D. and environmental groups are concerned about the quality of the environment. Voice recognition computer report writing meets the agenda of those groups.

8. Computer manufacturers

   - Generally support the use of computers which improves their sales
   - May seek a joint venture with the Sheriff's Department to showcase their abilities

- May sell hardware but be unable to deliver effective software

The cost of starting a system would be small to a major computer manufacture, if future sales are forecast.

9. Rancho Santiago Community College

   - Will seek to maintain their long-time training relationship with the Sheriff's Department
   - May seek to develop new college courses based on new training requirements

Both assumptions relate to the College's mission. Involvement in the newest technology is positive for the College's reputation.

10. County Administrative Office (snaildarter)

   - May oppose new computer system if not under his control
   - May attempt to redirect cost savings to another department
   - May oppose purchase costs

The CAO is used by the Board to control elected department heads such as the Sheriff. His office has Data Systems, and they have in the past had difficulties developing computer systems. The Sheriff's Department waited more than ten years for Data Systems to develop the Automated Jail System. The project was brought on line in ten months by a consultant hired by the Sheriff's Department. The lack of control of system development and maintenance, prior development difficulties, when coupled with the Sheriff's Department ability to bring systems on line, may cause resentment.

Mission Statement

The macro mission statement defines the department's areas of operation, expresses

values, and is the foundation for departmental strategies, decisions, and behavior. Because it serves as a guide for behavior, a clear mission statement is essential. The micro mission statement provides the same foundation for a specific area of concern.

Macro-Level Mission Statement

The mission of the Orange County Sheriff Department is:

1. To provide responsive, professional, and caring law enforcement service to all people in the unincorporated areas and contract cities of Orange County.
2. To respond to calls for service promptly, protect lives, and property to the very best of our abilities, initiate and maintain crime prevention programs, and apprehend criminal offenders.
3. All officers and assigned staff are expected to behave in a friendly, helpful, and effective manner as appropriately determined by the circumstances and nature of the duties they may be called on to exercise.

Micro-Level Mission Statement

The mission of the Orange County Sheriff Department for providing police reports to document the facts of an event will be:

1. To accurately and efficiently record the facts of an incident in an appropriate police report.
2. To utilize cost effective and quality efficient procedures and technology for documentation.
3. To provide training and necessary resources for staff to cordially and efficiently write police reports.

4. To efficiently maintain the necessary records and police reports.

Modified Policy Delphi

A modified policy delphi process was used, utilizing six participants from the Orange County Sheriff's Department, an assistant to the city manager, and a college instructor. The results of that delphi are summarized as follows:

Policy I The Sheriff's Department enter into joint venture agreements with a major computer manufacture and software company to develop the system.

Pros	Cons
1. No large capital expense	1. No investment can mean no commitment, lack of support from the Board or CAO
2. Minimum manpower requirement	2. Complaints from other vendors or manufactures
3. Department tied to specific hardware and software companies	3. Another company may bring their system on-line first
4. System customized to meet department needs	4. Department tied to a specific hardware and software company
5. Role of leadership for innovation in technology and application	

Policy II Include funding in the regular departmental budget for the purchase of a fully developed and tested system of both hardware & software.

Pros	Cons
1. No development time	1. High cost that requires immediate payment in full
2. Turn-key operation	2. Delay for purchase until someone develops and tests the system
3. Proven & tested system	3. Leadership role is lost
	4. System may never be developed
	5. System will not be customized

Policy III Enter into joint venture with on the universities in the county to develop the entire system, including hardware and software.

Pros	Cons
1. Lower initial capital costs	1. No investment can mean no commitment, lack of support from the Board or CAO
2. Minimum manpower required	2. Lack of continuity in development if students graduate, transfer, or drop-out
3. Customized system	3. No control over time-table and priorities
	4. Limited resources

Stakeholders' Perception of Policies

Stakeholders	Policies I	II	III
Board of Supervisors	For	Split	Neutral
Labor Associations	Neutral	Neutral	Neutral
City Managers	For	Against	Split
OCSD Records Division	For	Neutral	Against
Judges & Attorneys	Neutral	Neutral	Neutral
Newspapers	Neutral	Split	Split
AQMD	For	Neutral	Against
Computer Manufactures	For	For	Split
Rancho Santiago College	For	For	Against
County Administrator	For	Against	Neutral

Based on the above analysis, Policy I is perceived by the stakeholders to be the most effective. It would provide several opportunities for the Department. The first, and one directly related to the issue, is of course the implementation of VRT for police report writing. But it would also put the Department in a position of leadership in innovation for utilizing a novel approach to implement the system. A third benefit would be the partnership between the Department and the computer industry inviting further projects.

The Policy also provides the opportunity for the Sheriff's Department to build, or in some cases rebuild, coalitions within County government. In particular the County Administrative Office could support the proposal for two reasons: The cost of the system will be less, and the CAO may negotiate a similar partnership for another project.

Implementation

There are three phases to implementation of VRT for police report writing: Establish the partnership agreement, develop the hardware and software, and implementation of the system. A project of this magnitude requires commitment from the Sheriff, and the Captain of

the Records Division is the appropriate rank and position to demonstrate that commitment. His rank gives him access to the executive management team, and he also oversees the processing of police reports and management of the Systems Bureau.

Police reports are written in all Divisions of the Department, including Operations, Corrections, Services, and Forensics. Seventy-five percent of the approximately 2,300 employees may be involved in report writing, and are assigned to fifteen locations throughout the County. Therefore, the Records Division is the appropriate choice for implementation.

The early development, research, and screening, should be delegated to someone with specific expertise in the report writing process and an interest in the assignment. A second discriminator for the choice is the limited management staff in the Records Division. It is recommended that a lieutenant, a middle manager, from the Operations Divisions be utilized in the early development phase. He will have expertise in report writing, department organization, and policy interpretation, that allows him to conduct initial meetings. His position will also be appropriate for assignment, as necessary, to the technical development team needed in the second phase.

The selection of the Records Division Captain and an Operations Division Lieutenant brings together the major Divisions that will be the largest users of the system. It also provides a combining of resources, including financial, technical, and manpower, to implement the policy. The actual steps to be accomplished are: initial discussions, partnership feasibility, technological feasibility, financial or budget discussions, and a final partnership agreement. The process will include steps to introduce the partnership development idea and the system idea to members of the Sheriff's Department, and a similar process for stakeholders outside the

Department.

When the computer system is operational, evaluation will be accomplished through existing management information systems data. The amount of time deputies spend writing reports is currently captured by calls issued, deputy, patrol beat, and contract city. After implementation, the same data can be analyzed for change. Additional data will need to be captured for the number of reports citizens make by phone, which currently is not available.

Time-line:

Because VRT is rapidly changing and there are currently no police report writing applications, it is difficult to accurately determine a time line. Based on today's technology, political environment, and economic conditions, the project should take less than 12 months. The following time line is projected:

60 days	Establish partnership agreement
240 days	Develop hardware and software
60 days	Implement system

SECTION 3

Transition Management

Commitment Strategy

The objective of transition management is to facilitate the implementation of VRT report writing in the Orange County Sheriff's Department. It is important that the transition management plan be well thought out and be used as the road map to move OCSD from the current state into the desired and attainable future state.

Critical Mass

Critical mass is defined as those people or groups, who have an interest in or are affected by the future trends, and if actively in support of the change, ensure that the change will take place. They are stakeholders, however are a smaller group, hence the term critical mass. Their actions or inaction give them the ability to "make or break" the change. The group represents certain constituencies and may be made up of key executives, formal or informal group leaders, or other organizations.

The commitment of the members of the critical mass may defined as one of the following: "block change", "let it happen", "help it happen", and "make it happen." The Commitment Planning Chart (Appendix K) graphically displays the member of the critical mass and depicts their individual current level of commitment (O) toward the plan. The movement to a different level of commitment is depicted by the directional arrow and (X). Cases in which the commitment is already a the desired level are represented by the (OX).

Another important assessment is to determine support for implementation by using a

"Readiness Capability Chart," (Appendix L). This assessment identifies to what degree members of the critical mass are both ready and capable of making change.

Sheriff

The Sheriff has always been supportive of technological advancement in law enforcement. He has regularly sought support and funding from the Board of Supervisors, the Sheriff's Advisory Council, and other groups for continued development. His leadership and formal political support on the local and state level for such a project are necessary for the project's success. Since the project represents a continuation of his views, it is anticipated he will actively support he project. There is no change in his commitment.

OCSD Records Division

The Records Division is operating on a virtually manual system. The development of VRT report writing will decrease workload and increase productivity. They are receptive to the need and importance of automated systems and should support the project. Although no change in their commitment is necessary, the project will certainly offer them assistance by "treating a hurting system" (one that is over worked, understaffed, and facing increased workload) which may move their commitment to a "make it happen" position. While that change isn't necessary, it would certainly improve the prospects of the project's success.

Operations Division Lieutenant

It is recommended that a lieutenant, a middle manager, from the Operations Division be utilized in the early development phase. He will have expertise in report writing, department organization, and policy interpretation, that allows him to conduct initial meetings. His position will also be appropriate for assignment, as necessary, to the technical development team need

in the second phase. It is paramount that he be fervent in his conviction to bring this project to fruition. No change in his/her commitment to the project is necessary.

Computer Manufacturer

There are computer manufacturers and software companies that specialize in law enforcement systems. The opportunity for them to work in partnership with a large metropolitan agency to develop a new system with national sales applications is both financially and professionally appealing. The project gives them an opportunity to be innovative and to showcase their abilities with a minimal cost and the prospect of a profitable return. Their commitment doesn't need to change from "help it happen" to " make it happen." In much the same manner as the Records Division, the computer manufacturers and software companies may in fact move to "make it happen" because of they will be functioning as a role model.

Contract Law Enforcement City Managers

City Managers from contract law enforcement cities are receptive to demand for efficient service and to cost saving programs. Both assumptions provide the City Managers with proof they are doing their jobs and receiving cost efficient law enforcement. While they have no direct impact on the development of automated systems in the Sheriff's Department (explaining their "let change happen" commitment), their movement to a "help change happen" commitment greatly improve the chances of success for the project. In Orange County, the City Managers have taken an active role in specific issues of interest to their cities. In the case of the contract law enforcement cities, the development of this project is of special interest. The movement of commitment by the City Managers will be accomplished by using the "function as role model" action. When the project is complete, the Sheriff's Department and their partners, the contract

law enforcement cities, will receive national recognition.

Board of Supervisors

Board of Supervisors are receptive to public demand for efficient service and to cost saving programs. Both of the assumptions reflect positive political positions for Board members to take back and explain to constituents. There position is similar to that of the City Managers and therefore so is their current level of commitment and the desired change. The same method to move their level of commitment, functioning as a role model, would be used. The Board's position is especially useful to them. If the project succeeds, they win, and if the projects fails, they're not accountable because the entire idea came through the Sheriff's Department.

Transition Management Structure

The most effective management structure for the implementation and transitional phases of this change would be the project manager model. As previously stated, a project of this magnitude requires commitment from the Sheriff, and to demonstrate that commitment the assignment of an Operations Division Lieutenant to the Records Division, as the project manager, would be appropriate. His/her rank gives him/her access to the executive management team. His/her expertise in report writing, department organization, and policy interpretation, allow him/her to conduct initial meetings. His/her position will also be appropriate for assignment, as necessary, to the technical development team need in the second phase. A lieutenant also possesses the management abilities and personal skills to use influence effectively and keep conflict to a minimum.

The selection of an Operations Division Lieutenant, on assignment to the Records Division, brings together the Divisions that will be the largest users of the system. It also

provides a combining of resources, including financial, technical, and manpower, to implement the project. The process includes steps to introduce the partnership development and the system ideas to members of the Sheriff's Department, and the critical mass. While the lieutenant does have a large personal stake in the success of the project, that same personal involvement will ensure that someone has the physical energy and stamina to see the change through to fruition.

Dealing with the issues on an operational level, this person has an appreciation for the feelings of line employees, first line supervisors, and the Department's customers. He/she will be able to present a vision of the future state and what can be achieved.

Technologies and Methods

A major change, such as the implementation of VRT report writing, can create uncertainty and confusion in the organization. There are both positive and negative feelings generated by the project. The key is to identify who has what feeling and how best to address those feelings.

In the case of any automated system, some employees may be apprehensive adjusting to "new things." While this is not as common among younger employees, because they've been brought up with computers, older employees may resist change. Early organization support can be gained through organizational education. The "news" should be widely published that OCSD has entered into joint venture for such a progressive project. The use of the department bulletin, coupled with a video tape presentation for briefings could reduce some of the anxiety. It could also increase interest and support. The tape should include the Sheriff, line level personnel selected for consultation, and the project manager, with a request for input and interest from all employees.

An employee survey could be used to seek not only accurate information for the project, but to collect employee feelings about their workload. The project is designed to relieve heavy workloads and make the job of report writing and record keeping easier. If the results of the employee survey show they are dissatisfied with the status quo, then follow-up information should be given to them showing that and explaining how the new system will relieve that workload. Because the new system will improve record keeping and improve crime analysis, better information will be available to the deputies working the streets. By providing them with this knowledge, they'll be able to see an immediate personal benefit.

Because OCSD has had some difficulty in the past with bringing automated systems on line in a timely manner, in one case taking more than 15 years, the organizational education program should address that issue. It should include demonstrations of any similar systems in operation (including non-law enforcement) and project milestones. During the transition period there should be follow-up information for all employees. The use of bulletin updates can be augmented by open house demonstrations, on-site visits, and progress report briefings.

In the case of this particular project, taking into account OCSD's corporate culture, the selection of the lieutenant project manager may be the single most important techniques. He/she must be the focal point for transitional change. He/she would be looked at for information, support, and resources by everyone in the organization. He/she will be recognized as the "expert" in this area for the department and possibly the nation. While this presents some danger of tunnel vision and project over-protectiveness, this person should possess the interpersonal skills to keep these conflicts at a minimum. He/she must be approachable and respected by all in the organization.

The use of a responsibility charting matrix would be an excellent tool to ensure all the sub-parts are involved and responsibility is assigned to individuals and they are held accountable. This rather simple structure is an excellent guide or checklist to assure a thorough transition.

The project also results in a significant way the public will do business with OCSD. When they call for service, e.g. to report a crime, they will still speak to a desk officer, however they may then be transferred to a computer that will actually "take the report." That change will require innovative techniques. Again the skills of the project manager will be tested. The public education program will have to include: public speaking engagements for community organizations, articles for local newspapers, news stories for local television and radio stations, and possibly human interest stories for special television programs. An extensive direct mailing to all residences served by the Sheriff's Department, immediately prior to implementation will also be necessary. Between that mailing and actual implementation, residents should have the opportunity to call OCSD and test the system. The same test system could also be taken to community meetings, fairs, public schools, and community meetings for residents to experience.

CONCLUSIONS

The focus of this paper was the issue question: *What effect will voice recognition computer technology have on police report writing by the year 1997?* The study was further distilled to focus on three sub-issue questions:

- *How will the use of voice recognition technology for police report writing effect report writing training?*
- *What effect will voice recognition technology have on acceptance of police service (customer satisfaction)?*

- *What effect will voice recognition technology have on records management systems?*

The advances in VRT have been more rapid than estimates in this study. In the United States today, there are minimally six manufacturers of true voice recognition systems capable of recording police reports. There are an unknown number of manufacturers of voice synthesis computers that can be adapted to police report writing and record keeping. By the year 1997 hand-held VRT computers will be in use for police report writing. When VRT is combined with expert systems the quality of preliminary investigations will improve. The coupling of VRT with language translation, as is currently available to the military, will allow officers to conduct thorough interviews where now communications is a problem.

The result will be officers using VRT will take less time and write better reports than those handwriting or typing reports into a computer.

Police report writing training will take a new path. The emphasis will be on preliminary investigation skills, manipulation of databases, and the gathering of information. The current emphasis on writing skills, e.g. sentence structure, spelling, and punctuation, will be reduced because software will correct many of those errors. There is the possible future that English grammar training will be conducted using VRT.

Officers will need additional training in interpersonal communications skills, interviewing, and interrogation. The emphasis on gathering information will require officers to be proficient in those skills. Because VRT will translate languages, officers will be able to effectively talk to people of diverse backgrounds. To effectively communicate with a more diverse population, additional cultural awareness training will be needed.

The effect of VRT on the customers the police serve will depend on the implementation plan and circumstances of the interaction between the customer and the police. A properly implemented system of VRT used to take cold calls or phone reports will not meet with resistance. The improved quality of service, speed of response, and immediate availability of reports, will make VRT a welcomed service. If the true cost savings are well publicized, customers will accept the new technology.

Depending on the nature of the interaction between the customer and the police, language translation alone will make the system accepted. Situations that today may result in frustration of both the customer and the officer because of language barriers will be removed. Customers that may have felt alienated will now be able to receive the same level and quality of service as English speaking customers receive.

The creation of a true "fully-automated" report writing and record keeping system will not occur until VRT is implemented. The ability to input police reports immediately and without additional steps or employees will greatly reduce the workload and improve the quality of records management systems. Hand held VRT computers linked to satellites will for the first time create "real-time" record keeping. Current methods of handwriting, lap top computer entry, or dictating/transcribing, are slower and more costly (as pointed out in the text) than VRT. The software programs exist today in many agencies, including expert systems in some agencies, to process reports, do crime analysis, and complete statistical reporting. There are however, very few departments that have cost efficient and effect methods of entering the data. Reports taken directly from a customer on the telephone by the computer, are cost efficient.

FUTURE STUDIES

The advances in computer technology are occurring so quickly, that suggestions for future studies may be outdated before someone reads this paper. There are however two areas for consideration that arose during this study.

The first is the use of VRT for language translation. The current technology is limited to elite military groups and the computers have small vocabularies. The impact of that technology on law enforcement will be significant.

The second is the development of artificial intelligence systems. The use of AI for solving crimes has just begun to surface. This entire technology is new to law enforcement and should be investigated.

APPENDIX A

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APPENDIX B

INTERVIEWS

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Briggeman, Elizabeth. Senior Sales Representative, Voice Connexion Corp., Irvine, CA, telephone interview, November 1, 1991.

Devereaux, Jack. Captain, Records Division Commander, Orange County Sheriff Department, Santa Ana, CA, numerous in-person and telephone interviews.

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Olson, Ph.D., Bruce. Police Report writing Consultant, telephone interview, August 26, 1991.

Rondell, Steve. President of Voice Computer Corp., Seattle, WA, telephone interview, July 30, 1991.

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APPENDIX C

TRENDS IDENTIFIED by NGT

Trends:

1. Level of cost of voice recognition computers.
2. Level of computer system reliability
3. Staffing levels
4. Level of funding
5. Police community relations
6. Level of change in law
7. Level of multi-language users
8. Level of recruitment pool
9. Level of judiciary changes
10. Level of retraining
11. Level of English language skills
12. Level of training
13. Level of customer resistance
14. Level of workload for records management
15. Level of labor association resistance
16. Level of labor association acceptance
17. Level of system security
18. Level of cultural differences
19. Level of system integration
20. Level of review process

APPENDIX D

EVENTS IDENTIFIED by NGT

Events:

1. Technological breakthrough
2. Windfall funding
3. Mandate to implement
4. Existing records management system fails
5. County bankruptcy
6. Election of a new Sheriff
7. Court case decision
8. No patrol areas for Sheriff's Department
9. Transportation system failure
10. National disaster

APPENDIX E

NOMINAL GROUP TECHNIQUE PANEL MEMBERS

1. Executive from an agency in Orange County.
2. Chief of Police from an agency in Orange County.
3. College English instructor, Orange County.
4. Contract administrator, Orange County.
5. Computer system consultant and CPA, Orange County.
6. Lieutenant from an agency in Orange County.
7. Patrol officer from an agency in Orange County.
8. Assistant to the City Manager from Orange County.

MODIFIED DELPHI PANEL MEMBERS

1. Vice President of a voice recognition computer manufacture, Massachusetts.
2. Systems Officer from an agency in Santa Clara County.
3. President of a voice translation computer manufacture, Washington state.
4. Director of Services from a medium size agency in Minnesota.
5. College English instructor, Orange County.
6. Chief of Police from an agency in Orange County.
7. Patrol officer from an agency in Orange County.
8. Lieutenant from an agency in Orange County.
9. Publisher of police books, California.
10. Consultant & trainer for police and private sector, Minnesota.
11. Records Division Manager from a large agency, Orange County.

CITY of LAGUNA NIGUEL
27821 La Paz Road • Laguna Niguel, California 92656
714 • 643 • 1610 • FAX/714 • 643 • 9071

August 15, 1991

Dear Panel Participant:

Thank you for agreeing to participate in part of the study I am doing for POST Command College. Your specialized knowledge is needed to forecast trends and potential events that are related to the following issue:

Issue:
What effect will voice recognition computer technology have on police report writing by the year 1997?

Sub-Issues:
1. How will the use of voice recognition technology for police report writing affect report writing training?
2. What affect will voice recognition technology have on customer acceptance?
3. What affect will voice recognition technology have on records management systems?

Instructions are contained in the attached instrument, a portion of which needs to be returned to me at your earliest convenience. You will then receive a composite forecast containing the data from all the participants like you. You will then be asked to do a second forecast to complete the process.

Each participant has been carefully selected to achieve a balanced panel; each forecast, therefore, is important as a part of the whole. Most people enjoy thinking about the future through this kind of activity. I shall look forward to receiving your forecast and wish to thank you in advance. If possible please FAX your response to me (714) 643-9071

Sincerely yours,

Joe Davis
Chief of Police

P.S. Any questions? Please feel free to call me collect at (714) 643-7149.

TREND AND EVENT FORECASTING AND EVALUATION

TRENDS

A trend is a cluster of interrelated events, beginning in the past and emerging into the future. Trends are evaluated in terms of strength.

Strength of trend is estimated relative to a fixed point in time. In this study, the fixed point in time is "Today," which is assigned an arbitrary value of "100". All evaluations, therefore are relative to 100.

Example: You want to estimate the strength of the following trend:

> LEVEL OF VOICE RECOGNITION COMPUTER TECHNOLOGY RELATIVE TO LAW ENFORCEMENT NEEDS.
>
> Relative to "Today" (100), what was the level in 1986 as you would estimate it? You decide the level was only about half of what it is today, so your estimate is "50".
>
> You are then asked to estimate what you think the trend level will be by 1997, keeping mind that "Today is always 100". You decide that the trend level will increase; your estimate is "125".
>
> "Think now about what you would like to see happen to the level of this trend five years down the road. In the world of 'possible', what should be the level of this trend by 1997?" Your answer? "The trend should be at a level of 200 by 1997."
>
> Following is a summary of "your" forecast example:
>
> 1986 = 50; "Today" = 100;
> Will be by 1997 = 125; should be by 1997 = 200

The following page contains real forecasts and evaluations for ten different trends as stated.

Please forecast and evaluate the following trends:

1. Level of VRC technology relative to law enforcement needs.

   1986 = _____; "Today" = _____;
   Will be by 1997 = _____; should be by 1997 = _____

2. Level of cost effectiveness of VRC technology.

   1986 = _____; "Today" = _____;
   Will be by 1997 = _____; should be by 1997 = _____

3. Level of training needed to use VRC technology at optimum level.

   1986 = _____; "Today" = _____;
   Will be by 1997 = _____; should be by 1997 = _____

4. Level of employee resistance to VRC technology.

   1986 = _____; "Today" = _____;
   Will be by 1997 = _____; should be by 1997 = _____

5. Level of ability of personnel to write reports by 1997.

   1986 = _____; "Today" = _____;
   Will be by 1997 = _____; should be by 1997 = _____

6. Level of funding.

   1986 = _____; "Today" = _____;
   Will be by 1997 = _____; should be by 1997 = _____

7. Level of customer resistance to VRC technology.

   1986 = _____; "Today" = _____;
   Will be by 1997 = _____; should be by 1997 = _____

8. Changes in law.

   1986 = _____; "Today" = _____;
   Will be by 1997 = _____; should be by 1997 = _____

9. Level of retraining of existing staff.

   1986 = _____; "Today" = _____;
   Will be by 1997 = _____; should be by 1997 = _____

10. Level of staffing.

    1986 = _____; "Today" = _____;
    Will be by 1997 = _____; should be by 1997 = _____

EVENTS

An event is a discrete occurrence; it either happens or it does not happen. The occurrence of an event can be pinpointed in time.

Occurrence is forecasted in terms of percent probability. A forecast of 100% means that the event probably will happen; 0% means that the event probably won't happen by the forecasted time. The word "probably" is important. Nobody can absolutely guarantee that an event will, or will not occur by the particular time of forecast in spite of a forecast of 100% or of 0% probability. A 50% probability means that the event has a 50/50 chance; an 80% probability increases the odds to 80/20. Because an event cannot do more than "probably occur", 100% is the top of the probability scale.

Example: You want to estimate the percentage probability of occurrence of the following event:

> TECHNOLOGY BREAKTHROUGH: cost of voice recognition computer technology drops and it is available for home computers.
>
> "Is there any chance at all that this event will occur by five years down the line?"
>
> "Yes, I think so."
>
> "Then how many years will it be before the probability first exceeds zero?"
>
> "I would say about two and one/half years (2.5 yrs.)."
>
> "And by 1997 what do you think the probability of occurrence will be?"
>
> "My estimate is 25% probability."
>
> "Now let's assume the event actually happens. On a scale of 0 to 10, how would you rate the positive impact of this event on the issue being studied?"
>
> "It would be pretty high - On a scale of 0 to 10, I would rank the positive impact as 9>"
>
> "How about the negative impact if you were to rank it on the same scale of 0 to 10?"
>
> "I would estimate it as 1."
>
> The following is a summary of "your" forecast example: Probability first exceeds zero = 2.5 years; By 1997 = 25%; Positive impact if event occurs = 9; Negative impact if event occurs = 1.

Now, please do a real forecast and evaluation of the following events:

1. Wind fall funding: enough funds are available from an unexpected source for immediate implementation.

   Probability first exceeds zero (year) _____; By 1997 (0-100%) _____; Positive impact if event occurs (0-10) _____; Negative impact if event occurs (0-10) _____;

2. Mandate to implement: judicial order requires implementation because of traffic congestion and/or environmental concerns.

   Probability first exceeds zero (year) _____; By 1997 (0-100%) _____; Positive impact if event occurs (0-10) _____; Negative impact if event occurs (0-10) _____;

3. Existing records management system fails: the department records division workload increases and resources no longer function.

   Probability first exceeds zero (year) _____; By 1997 (0-100%) _____; Positive impact if event occurs (0-10) _____; Negative impact if event occurs (0-10) _____;

4. County bankruptcy: county government declares bankruptcy or insolvency.

   Probability first exceeds zero (year) _____; By 1997 (0-100%) _____; Positive impact if event occurs (0-10) _____; Negative impact if event occurs (0-10) _____;

5. Election: a new Sheriff is elected and take office.

   Probability first exceeds zero (year) _____; By 1997 (0-100%) _____; Positive impact if event occurs (0-10) _____; Negative impact if event occurs (0-10) _____;

6. Court case decision: a ruling is issued requiring immediate implementation of VRC technology.

   Probability first exceeds zero (year) _____; By 1997 (0-100%) _____; Positive impact if event occurs (0-10) _____; Negative impact if event occurs (0-10) _____;

7. No patrol areas: the Sheriff's Department no longer provides field police services, police patrol.

   Probability first exceeds zero (year) _____; By 1997 (0-100%) _____; Positive impact if event occurs (0-10) _____; Negative impact if event occurs (0-10) _____;

8. Transportation system fails: traffic congestion, public transportation fail and gridlock results.

   Probability first exceeds zero (year) _____; By 1997 (0-100%) _____; Positive impact if event occurs (0-10) _____; Negative impact if event occurs (0-10) _____;

9. Natural disaster: a national disaster occurs, destroying existing Sheriff Department facilities.

   Probability first exceeds zero (year) _____; By 1997 (0-100%) _____; Positive impact if event occurs (0-10) _____; Negative impact if event occurs (0-10) _____;

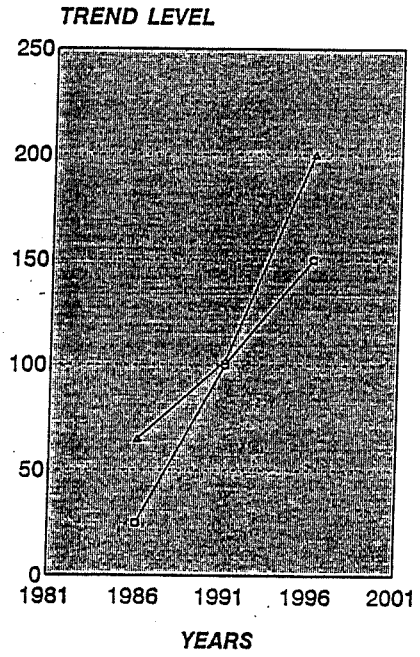
Please mail these pages back to me: 27821 La Paz Road, Laguna Niguel, CA 92656 OR FAX them to me at: (714) 643-9071

...a reminder, I will need your TRENDS page as well as the two for EVENTS. Thanx

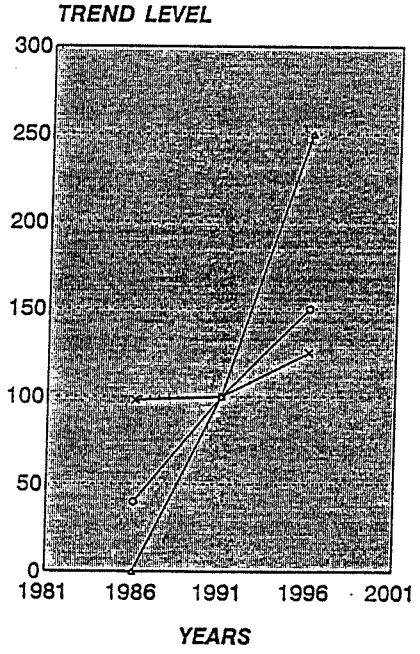
\commcollege\mcdquest

APPENDIX F
TREND EVALUATION GRAPHS

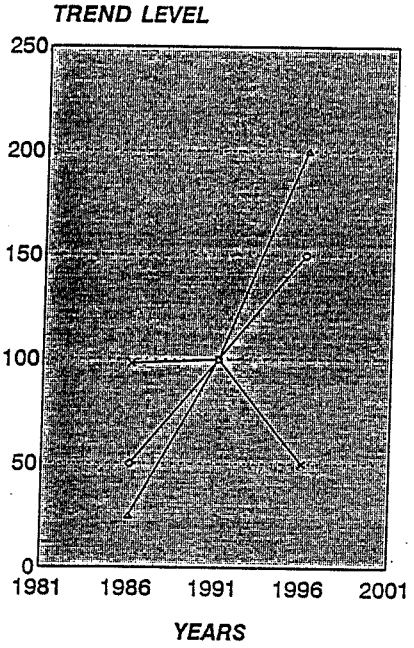
TREND #1

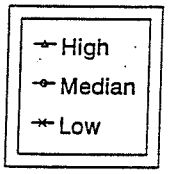


TREND #2



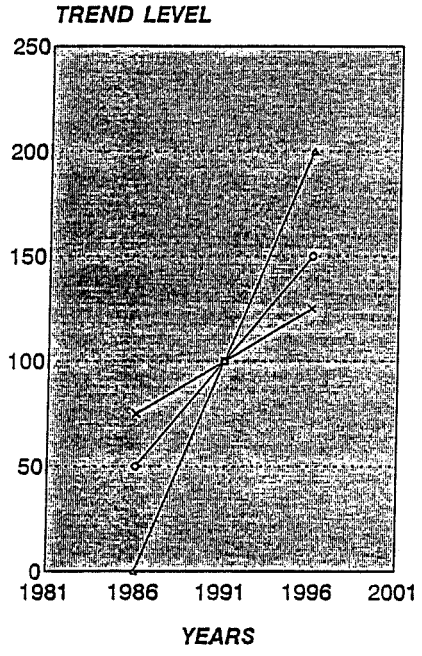
TREND #3





TREND EVALUATION GRAPHS

TREND #4



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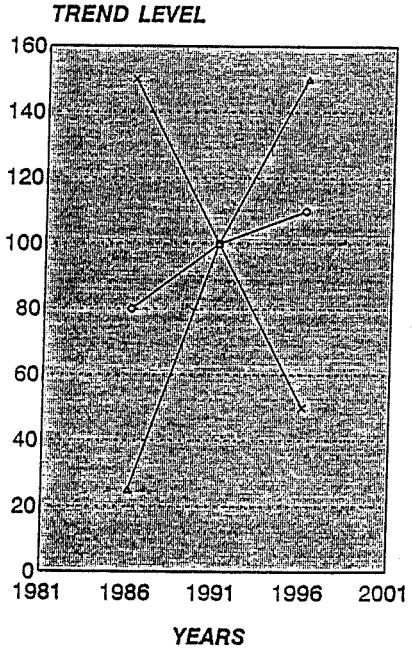

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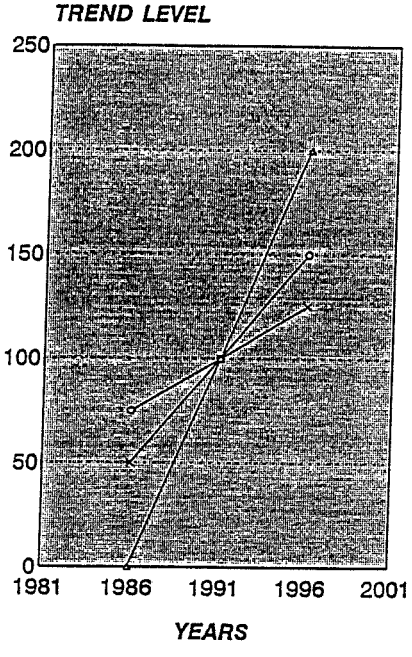

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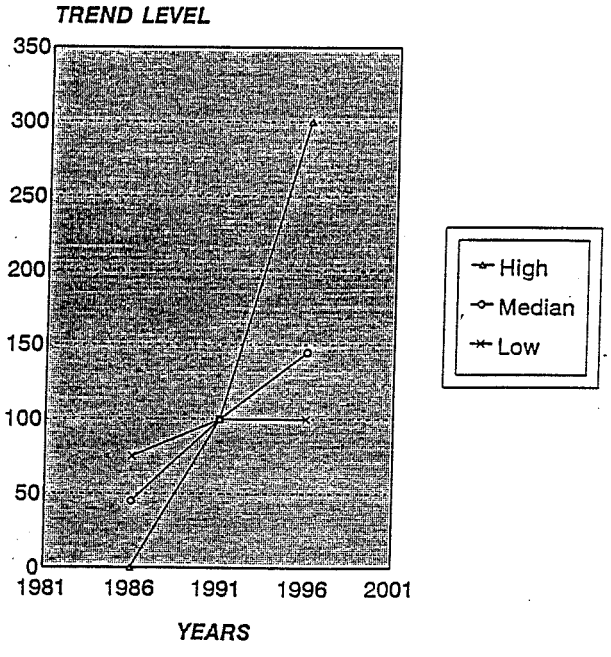
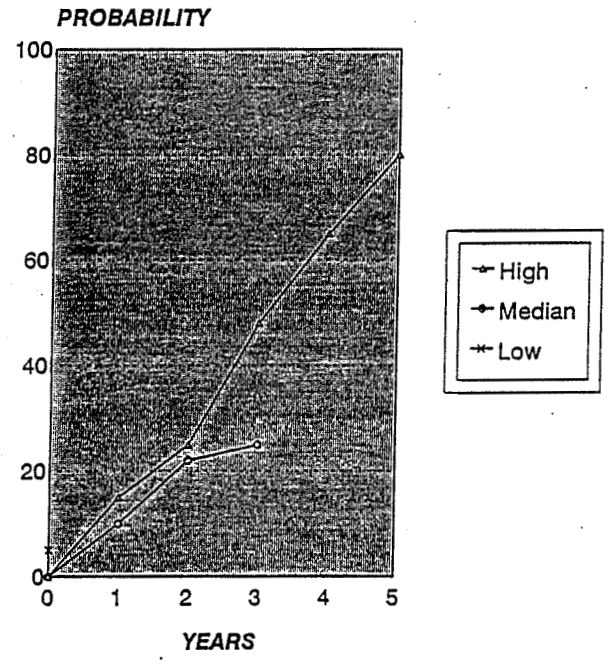
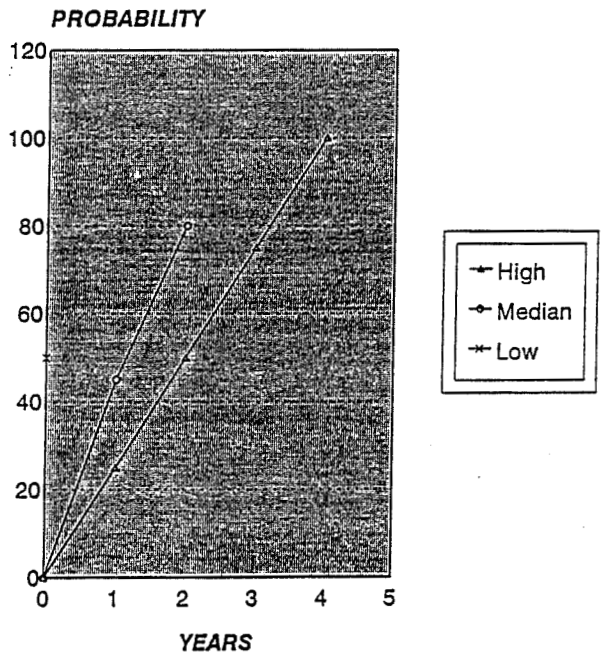


APPENDIX G
EVENT EVALUATION GRAPHS

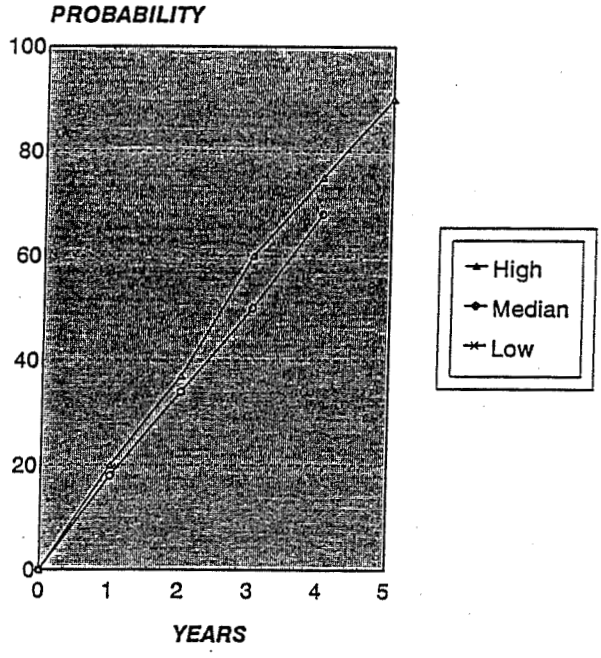
EVENT #1



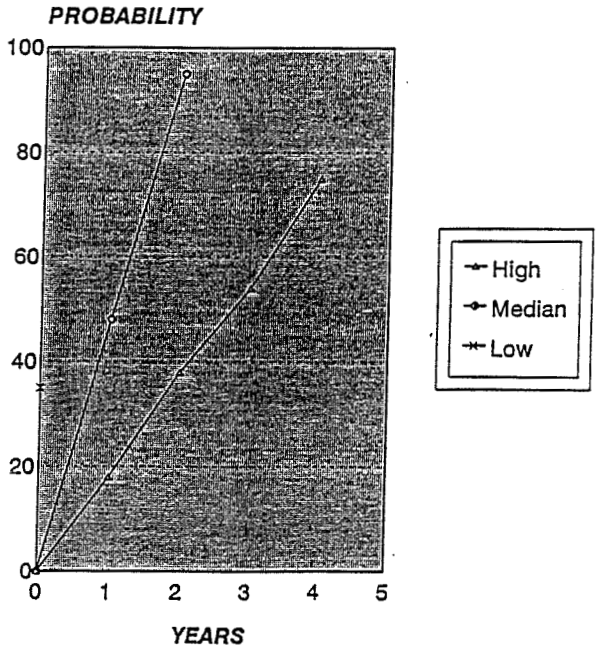
EVENT #2



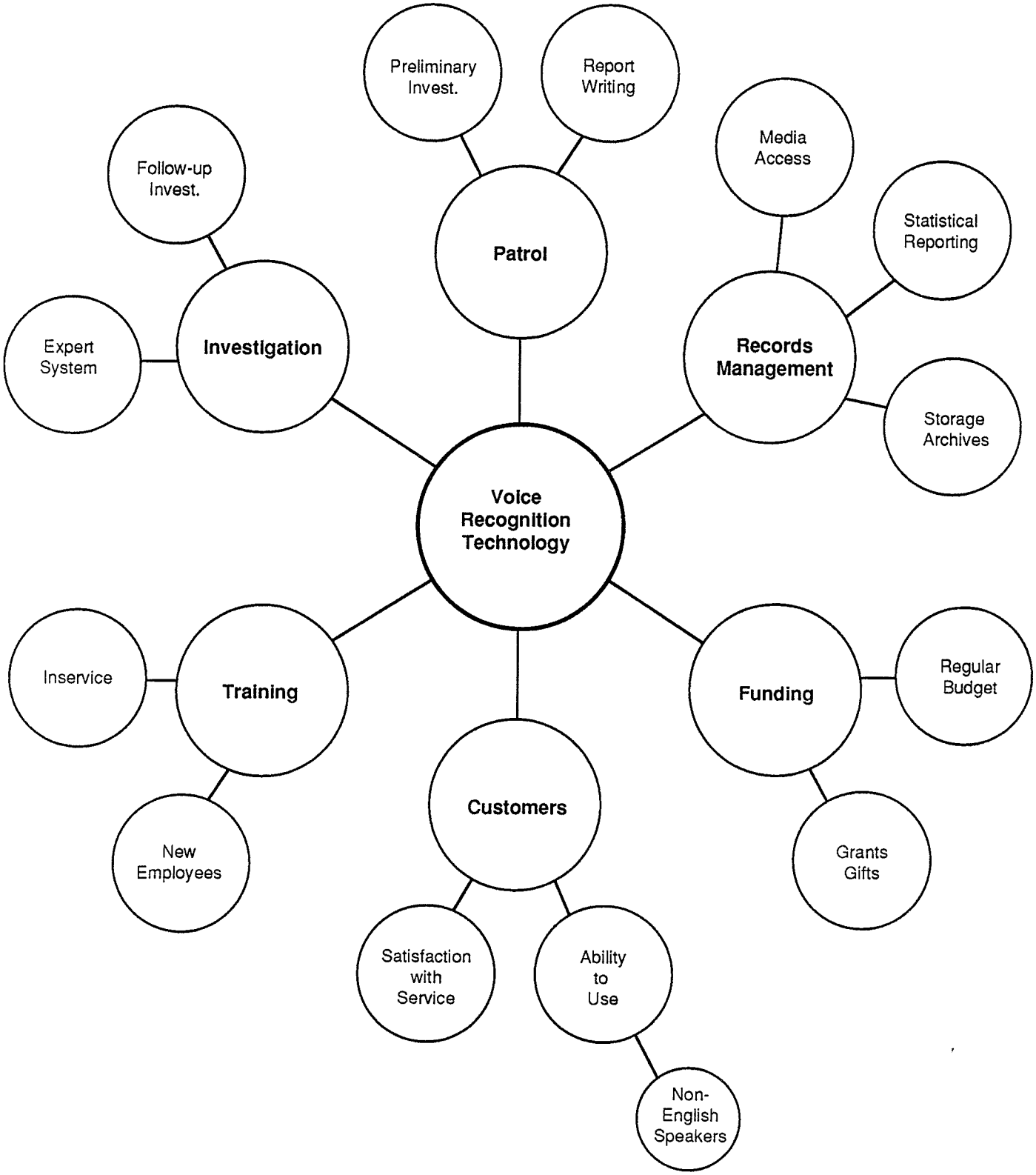
EVENT #3



EVENT #4



APPENDIX H



FUTURES WHEEL

APPENDIX I

CAPABILITY ANALYSIS

STRATEGIC NEED AREA: Voice Recognition Technology

Instructions:

Evaluate each item for your agency as to what type of activity it encourages:

I	Custodial	Rejects Change
II	Production	Adapts to Minor Chnages
III	Marketing	Seeks Familiar Change
IV	Strategic	Seeks Related Change
V	Flexible	Seeks Novel Change

Catagory:	I	II	III	IV	V
TOP MANAGERS:					
Mentality Personality	___	___	___	X	___
Skills/Talents	___	___	X	___	___
Knowledge/Education	___	___	X	___	___
ORGANZIATIONAL CLIMATE:					
Culture/Norms	___	___	___	X	___
Rewards/Incentives	___	___	___	X	___
Power Structure	___	___	___	X	___
ORGANIZATIONAL COMPETENCE:					
Structure	___	___	X	___	___
Resources	___	___	___	X	___
Middle Management	___	___	X	___	___
Line Personnel	___	___	___	X	___

CAPABILITY ANALYSIS

STRATEGIC NEED AREA: Voice Recognition Technology

Instructions:

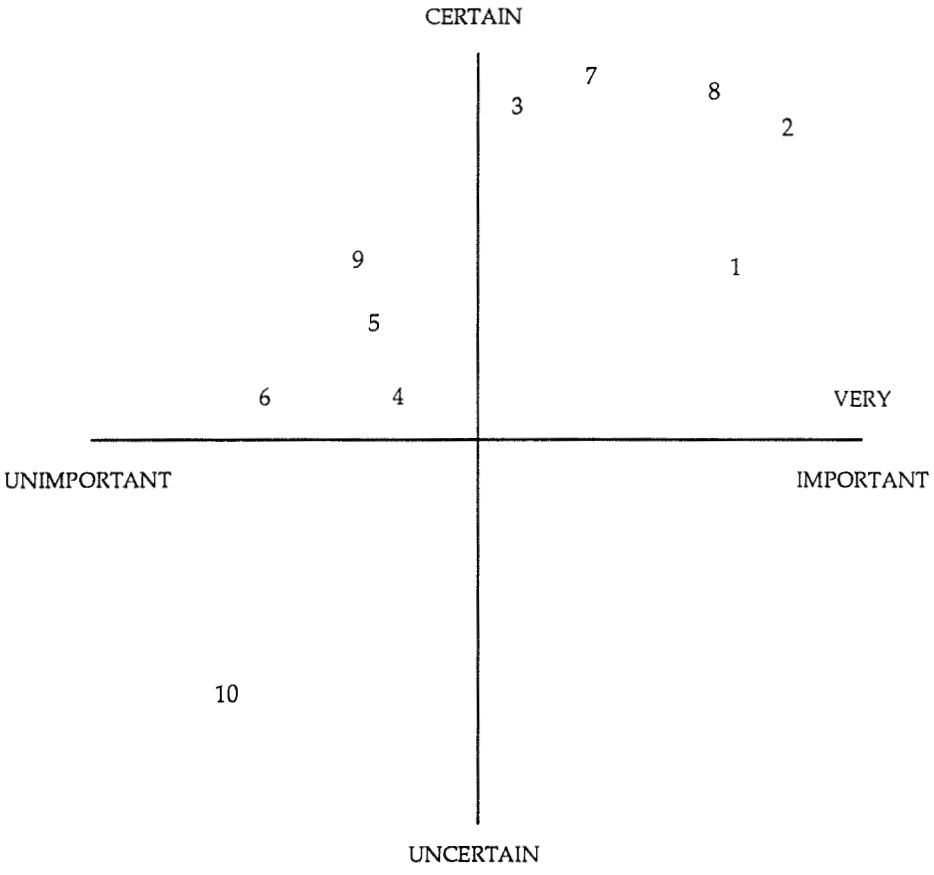
Evaluate each item, as appropriate, on the basis of the following criteria:

I Superior. Better than anyone else. Beyond present need.
II Better than average. Suitable performance. No problems.
III Average. Acceptable. Equal to competition. Not good, not bad.
IV Problems here. Not as good as it should be. Deteriorating. Must be improved
V Real cause for concern. Situation bad. Crisis. Must take action.

Catagory:	I	II	III	IV	V
Manpower		X			
Technology				X	
Equipment				X	
Facility				X	
Money			X		
Calls for Service		X			
Supplies			X		
Management Skills		X			
P.O. Skills		X			
Supervisory Skills			X		
Training		X			
Attitudes		X			
Image		X			
Council Support		X			
City Manager Support		X			
Specialties		X			
Management Flexibility				X	
Sworn/non-sworn Ratio				X	
Pay Scale		X			
Benefits		X			
Turnover	X				
Community Support		X			
Complaints Received		X			
Enforcement Indes		X			
Traffic Index	X				
Sick Leave Rates			X		
Morale			X		

APPENDIX J

Stakeholder Assumption Graph



1. Board of Supervisors
2. Labor Associations
3. Contract City Managers
4. OCSD Records Division
5. Judges and Attorneys
6. Newspapers
7. Air Quality Management District
8. Computer Manufacturers
9. Rancho Santiago College
10. County Administrative Offices

APPENDIX K

Commitment Planning

ACTORS IN CRITICAL MASS	TYPE OF COMMITMENT			
	Block Change	Let Change Happen	Help Change Happen	Make Change Happen
SHERIFF			OX	
BOARD OF SUPERVISORS		O——————X		
COMPUTER MANUFACTURER			OX	
CITY MANAGERS		O——————X		
OCSD RECORDS DIVISION			O——————X	
OPERATIONS LIEUTENANT				OX

APPENDIX L

Readiness/Capability Chart

Fill in the following chart as it applies to your situation. In the left-hand column list the individuals or groups who are critical to your own change effort. then rank each (high, medium, or low) according to their readiness and capability with respect to the change.

	READINESS			CAPABILITY		
	High	Medium	Low	High	Medium	Low
SHERIFF		X		X		
OCSD RECORDS	X				X	
LIEUTENANT	X			X		
COMPUTER MANUF.		X		X		
CITY MANAGERS		X			X	
BOARD OF SUPERV.			X		X	