

A Study of Using the Principles of Lean, Kaizen, and Six Sigma at the Ocala Police Department to Improve Customer Service to the Community

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Abstract

This research project examines the principles now widely used in manufacturing-Lean, Kaizen, and Six Sigma, and explores how they would apply to the day to day operations within the Ocala Police Department. This study presents the results of a survey administered to both sworn and non-sworn supervisors of the Department and presents their current problems and views regarding the principles and how they would apply to their respective areas of responsibility. This study presents a positive view supporting the concept that using the methodologies of Lean, Kaizen, and Six Sigma could benefit the Ocala Police Department and improve its customer service.

Introduction

In 1979, executive Art Sundry stood up at a management meeting and said, "The real problem at Motorola is that our quality stinks!" (Harry, 2000). It took courage to make that statement, but that was what ultimately led to the development of Six Sigma. Their thinking was revolutionary. Most companies believed that producing a "quality" product meant high production costs. Motorola realized that if done right, improving the quality of their products could actually reduce their costs. This forced them to focus on their product design and production process.

In the field of law enforcement we have customers-the taxpayers. Service industries such as police and fire are often overlooked when it comes to improving the quality of their "product" which is service to the "customer" the citizen- not necessarily the arrestee, but the victim. Successes in law enforcement are often measured by response times to calls and arrests/citations rather than customer satisfaction with the "product" which is service. Often, if a law enforcement agency stays within its budget, and there is not a substantial increase in crime over the year, it is considered "successful" by those in charge of the city or county government. They are not expected to turn a profit or provide a large return for the invested dollar. Law enforcement is considered essential to the community, therefore they are funded.

Does this mean because we are an essential service profession it isn't necessary to constantly improve the way we function? Service operations now comprise more than 80% of the gross national product in the United States and are growing around the world. That means there is a great deal of information

out there on how to improve service functionality. Why shouldn't law enforcement seek to provide the very best service possible? There has been great resistance in moving away from tradition and moving toward the application of business principles and practices in government. Both "Six Sigma" and "Lean" business philosophies can be applied to service oriented agencies and have been shown to produce remarkable results.

The purpose and rationale of this research is to find out if the principles of Six Sigma, Lean and Kaizen can be used at the Ocala Police Department to improve the processes within the Department and ultimately provide better customer service to the citizens it serves.

In order to understand Kaizen, Six Sigma, Lean's usefulness in the service industry of law enforcement we must first define the terms in a way that is simple and clear to someone other than top management employees in a manufacturing company.

Kaizen

According to Wikipedia (2006), the Japanese usage of Kaizen is "to take it apart and put it back together in a better way." What is taken apart is usually a process, system, product or service. Importantly, kaizen must operate with three principles in place: process and results (not results-only); systemic thinking (i.e. big picture, not solely the narrow view); and non-judgmental, non-blaming (because blaming is wasteful). Everyone participates in kaizen; people of all levels in an organization, from the CEO (in the case of a law enforcement agency, the Chief or Sheriff) on down, as well as external stakeholders (citizens, advisory groups) if needed. The format for kaizen can be individual, suggestion system, small group or large group. The only way to truly understand the intent, meaning, and power of kaizen is through direct participation, many, many times.

Kaizen is a daily activity whose purpose goes beyond improvement. It is also a process that when done correctly humanizes the workplace, eliminates hard work (both mental and physical), teaches people how to do rapid experiments using the scientific method, and how to learn to see and eliminate waste in business processes.

- Some kind of improvement is made every day somewhere in the company/agency
- A process-oriented way of thinking and developing strategies that assure continuous improvement involving people at all levels of the organizational hierarchy
- KAIZEN means ongoing improvement involving everyone
- Must maintain and improve standards
- Establishing higher standards
- Lasting improvement is achieved only when people work to higher standards
- Kaizen is a critical tool supporting companies and organizations in their ongoing improvement activities identified through Value Stream Mapping,

defined by Lareau (2003), as a structured process mapping technique that focuses on locating and assessing hands-on work-time (cycle-time) and waiting (lead) time.

- Kaizen is applied as part of a system level approach to improvement.
- Kaizen events improve company's end to end process through the introduction of flow and pull to improve lead time, process flexibility and customer responsiveness.
- Kaizen events move companies away from traditional lengthy projects where valuable resources spend more time in meeting rooms and completing updates than in making change happen.
- Kaizen is a focused approach that brings critical resources together and empowers participants to not only find the root cause and determine solutions but most importantly to implement the change. Time and effort is spent on the shop floor or wherever the value stream problem exists.
- Kaizen is action focused!

Lean

Lean is simply about creating more value for customers by eliminating activities that are considered waste. Lean works to create process speed by reducing cycle time and improving efficiency by reducing costs. Any activity or process that consumes resources, adds cost or time without creating value becomes the target for elimination. Unnecessary complexity adds costs, time, and waste. One of the important aspects of Lean is the focus on 'system-level' improvements (versus 'point improvements'). It's the system-level work that can dramatically improve a company's bottom line results. This knowledge, combined with the understanding of how to remove waste properly, is critical for any successful Lean implementation.

- Focuses on maximizing process velocity
- Provides tools for analyzing process flow and delay times at each activity in a process
- Centers on the separation of "value-added" from "non-value-added" work with tools to eliminate the root causes of non-value-added activities and their cost
- Provides a means for quantifying and eliminating the cost of complexity

Most often Lean and Six Sigma are implemented together in service organizations because you can't separate quality and speed when improving processes. Both are necessary when working to improve and streamline the way service tasks are completed just as in manufacturing. Six Sigma focuses more on quality, while Lean focuses on speed by streamlining and reducing complexity.

The term "value added" is important to the understanding of Lean. According to George (2003), the term refers to "work that adds to value in the customer's eyes". "Non-value added" would be "work that adds no value in the

customer's eyes". Estimates given in case studies, (George, 2003), for example state that work that adds no value in the customer's eyes typically comprises 50% of total service costs. In theory, by streamlining processes, the customer sees no sacrifice, yet efficiency is improved, and costs are cut.

Six Sigma

The philosophy of Six Sigma is often described as a comprehensive management system. Cavanagh (2000) describes it as a highly technical method used by engineers and statisticians to fine-tune products and processes to a goal of near perfection in meeting customer requirements. The actual term "six sigma" refers to a statistically derived performance target of operation with only 3.4 defects for every million activities or opportunities. Although it is a highly technical approach to improving business strategies, the actual goal-greater customer satisfaction-is simple. Six Sigma simply means a measure of quality that strives for near perfection. It is a disciplined, data-driven approach and methodology for eliminating defects (driving towards six standard deviations between the mean and the nearest specification limit) in any process-from manufacturing to transactional and from product to service. The simplest, clearest definition was also found in Cavanagh (2000):

Six Sigma: A comprehensive and flexible system for achieving, sustaining and maximizing business success. Six Sigma is uniquely driven by close understanding of customer needs, disciplined use of facts, data, and statistical analysis, and diligent attention to managing, improving, and reinventing business processes. The companies that have embraced this philosophy and have achieved immense success are huge corporations such as the following:

- General Electric
- GE Capital
- Motorola
- Bank One
- Lockheed Martin
- Dow Chemical
- Black & Decker
- Federal Express
- Dupont
- Johnson & Johnson
- Microsoft
- National Semiconductor
- Texas Instruments
- Toshiba
- United Technologies
- Apple Computers
- General Dynamics
- Allied Signal

- Hewlett Packard
- Honeywell
- IBM
- Intel
- American Express
- Bank of America
- Bank of New York
- Capital One Financial
- Citigroup
- Deutsche Bank
- Fidelity
- Fleet Bank
- J.P. Morgan Chase
- Merrill Lynch
- Morgan Stanley
- Tower Group
- Wachovia
- Wells Fargo

These are household names familiar to all.

Process improvement and knowing your customer are keys to Six Sigma. Six Sigma measures are never “static.” As the requirements of a customer change, the process must change with it. This gives birth to the term “continuous improvement” which is another cornerstone to the Six Sigma philosophy. Constant evaluation of processes is what puts the flexibility in the system allowing it to change with the customers’ needs.

All of these business strategies have one thing in common. They stress customer satisfaction and the importance of incorporating customer input into the analysis of their processes. Many services processes tend to be slow processes which often mean they are expensive ones. Often they are slow because there is too much work in progress. A great deal of the work, often as much as 80% has to wait while some other task is done (lead time), or some other step is accomplished, sometimes in another department. When employees in service functions actually analyze their processes they tend to find that most of the steps in their processes add no value to the service, at least not in the eyes of their customers.

By using the best points of the three strategies one can begin to see how a service industry or organization can benefit. Kaizen teaches the organization how to tear apart the processes (even the sacred cows) and analyze them. Lean’s focus on speed by cutting down on complexity, redundancy, and non-value added steps, helps rebuild the process. Finally, Six Sigma’s focus on quality allows the organization to rebuild the process in such a way as to avoid reworks (having to go back and correct errors) and to put a method in place for continuous improvement.

Methodology

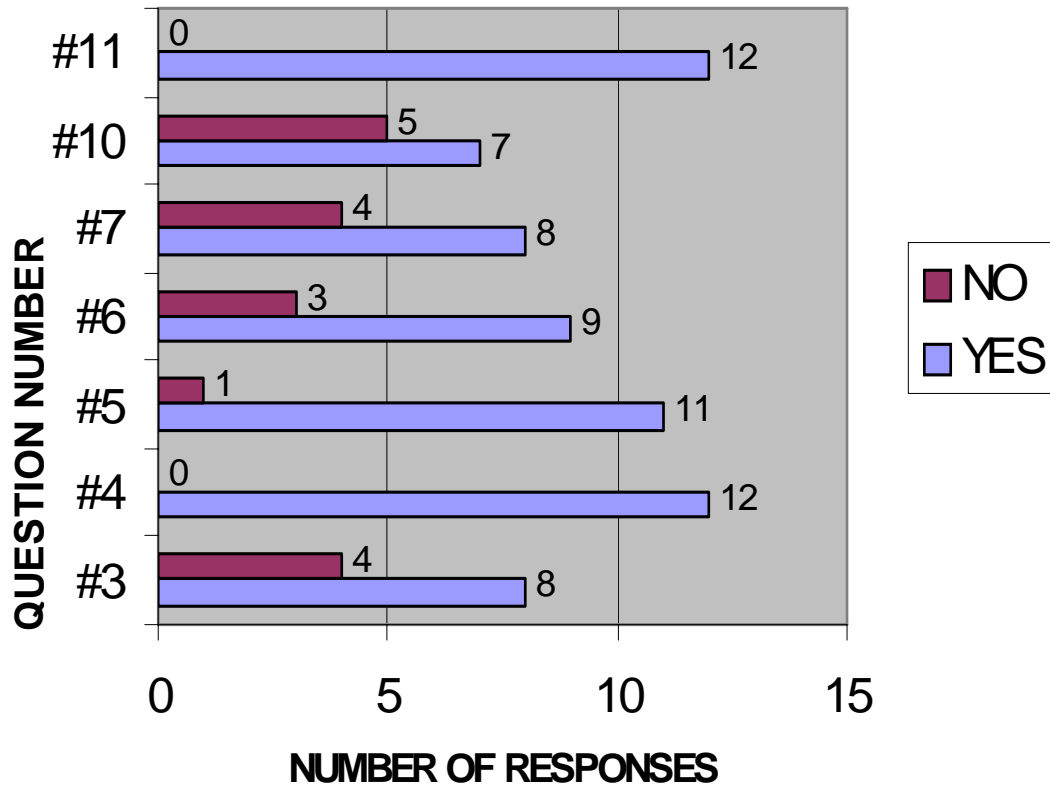
This research included sending a survey to each department head within the Ocala Police Department. First a brief, written explanation of the research purpose was given to the department head as well as a definition of Six Sigma, Lean, and Kaizen. The department heads surveyed were both sworn bureau supervisors and non-sworn administrative department heads. The supervisors surveyed were the decision makers within their respective sections. The surveys involved questions about processes within their respective areas of responsibility. They were asked to identify processes which were cumbersome and labor intensive and weaknesses in the area of customer service. The survey also involved questions regarding processes held up due to waiting on other areas, waste, and redundancy. Finally, they were asked if a management tool that helped them analyze these processes on a continuous basis would be beneficial to their success and to a higher level of customer service.

Results

Twelve (12) different department heads currently employed at the Ocala Police Department were surveyed. Of those twelve, (8) were non-sworn administrative supervisors and four (4) were sworn police supervisors. The eight non-sworn supervisors were responsible for various areas such as Records, Evidence, Communications, Personnel, Fiscal Management, Facilities Management, Supply, Resource Development (training), and Management Information Systems. The four sworn supervisors surveyed were the four Majors responsible for the four "Bureaus" within the Ocala Police Department. Each of these areas has various responsibilities that require personnel to complete labor intensive processes in order to perform their daily tasks. Whether supervising sworn or non-sworn employees, the supervisors must use "processes" in order to complete their tasks on a daily basis.

The answers to the survey are charted below:

SURVEY QUESTION RESULTS



The survey question numbers listed in the chart above requested “yes or no” responses (see survey in appendix). The remaining questions required more elaborate responses or examples.

The supervisors identified twenty-three (23) processes within their respective areas as time consuming and labor intensive:

- Evidence Intake
- Evidence Annual Inventory
- Evidence Tape and CD Copying
- Budget Process
- Disciplinary Process
- Performance Evaluation Process
- Policy Change Process
- Annual Report Process
- Annual Fixed Asset Inventory
- Purchase Requisitioning

- Requests for Training
- Software maintenance, upkeep, and support
- Server maintenance
- Physical Computer Inventory
- Computer Trouble Calls-in Field
- Centralized Computer Trouble Calls-MIS
- Input of Traffic Crash Reports
- Purging of old paper reports
- Payroll Input
- Major building repairs-estimates
- Hiring Process
- Field Training Program
- New Employee Orientation

None of the supervisors mentioned any processes involving the officers and their actual functions on the road such as the arrest process (physical arrest, transport, booking at the jail facility, writing the probable cause affidavit, etc.) or the field reporting approval process (officer calls in report, report is typed by records employee, it is routed to supervisor for approval, sent back to officer for corrections, returned back to the supervisor, approved, send back to records and archived). This was surprising, since these processes are used daily and are notably the most time consuming tasks that the road patrol officers and records personnel perform.

All but two of the surveyed respondents felt that the processes they listed as the most labor intensive could benefit by being broken down and analyzed for efficiency. No explanation was given in either case for not seeing a benefit, while most responding in the affirmative wrote a brief description of how they thought it would help to point out waste and redundancy. Over half of the respondents reported having processes within their sections that could either be combined with other processes or eliminated altogether if they had the time to analyze them and could get approval from the administration to streamline the process.

One subject where all of the respondents agreed was in the area of "lead time issues." All of the supervisors, sworn and non-sworn, reported having their processes held up waiting on other departments to finish tasks. If lead time is considered the time interval between the initiation and the completion of a production process, the main complaint was having to either seek approval or obtain input from others in order to move forward in their process. Depending on others outside their chain of command or influence to complete a task before being able to move forward proved to be the most frustrating for all the respondents. Another area of agreement was the section of the survey which asked whether the respondents had tasks to complete which had become too complex and could be simplified. All but one responded in the affirmative and cited examples such as the Budget Process, the Purchasing Process, the Personnel Evaluation Process, Physical Inventory, Probable Cause Affidavits (Records), and Timesheets. Three-quarters of the supervisors stated that they felt their service to the public would improve if a system were put into place to

regularly review the processes in their area for efficiency and relevance. Two-thirds of the respondents felt time management and personnel shortages were a major issue in their area of responsibility. Saving time by cutting waste, redundancy, and useless complexity appeals even more to those who are faced with daily shortages of personnel.

The survey requested that the respondent list the complaint most often received from the public about the services they provide. Some of the complaints listed were as follows:

- Communications Technicians putting citizens on hold
- Length of time it takes for an officer to be dispatched to a call
- “Why do I have to answer so many questions when I call for a police officer?”
- “Why do I have to repeat the same information when the officer arrives?”
- Employee attitudes during investigations
- Employees returning phone calls to citizens
- Lack of follow-up on investigations
- Training not complete
- Not providing services quickly enough (evidence)
- Cases are not ready when the public comes in to get a copy of them
- Hiring Process takes too long

All of these responses caused each department head a great deal of frustration. Each complaint also involved a “process” (with the exception of employee attitudes). Two of the respondents did not respond to this question because they felt they do not deal with the public because they do not deal directly with the citizens; however, they have customers, which are the employees of the police department, and ultimately their work benefits the employees and the citizens as well.

The respondents listed their weaknesses in customer service as:

- Mistakenly believing we know what the problems are without seeking public input
- Not communicating enough with citizens in reference to their cases
- Failure to provide Law Enforcement to certain events at an additional cost to the public
- Personnel shortages
- Workload
- Inability to provide service in a timely manner because reports are not ready
- Inability to process applicants quickly

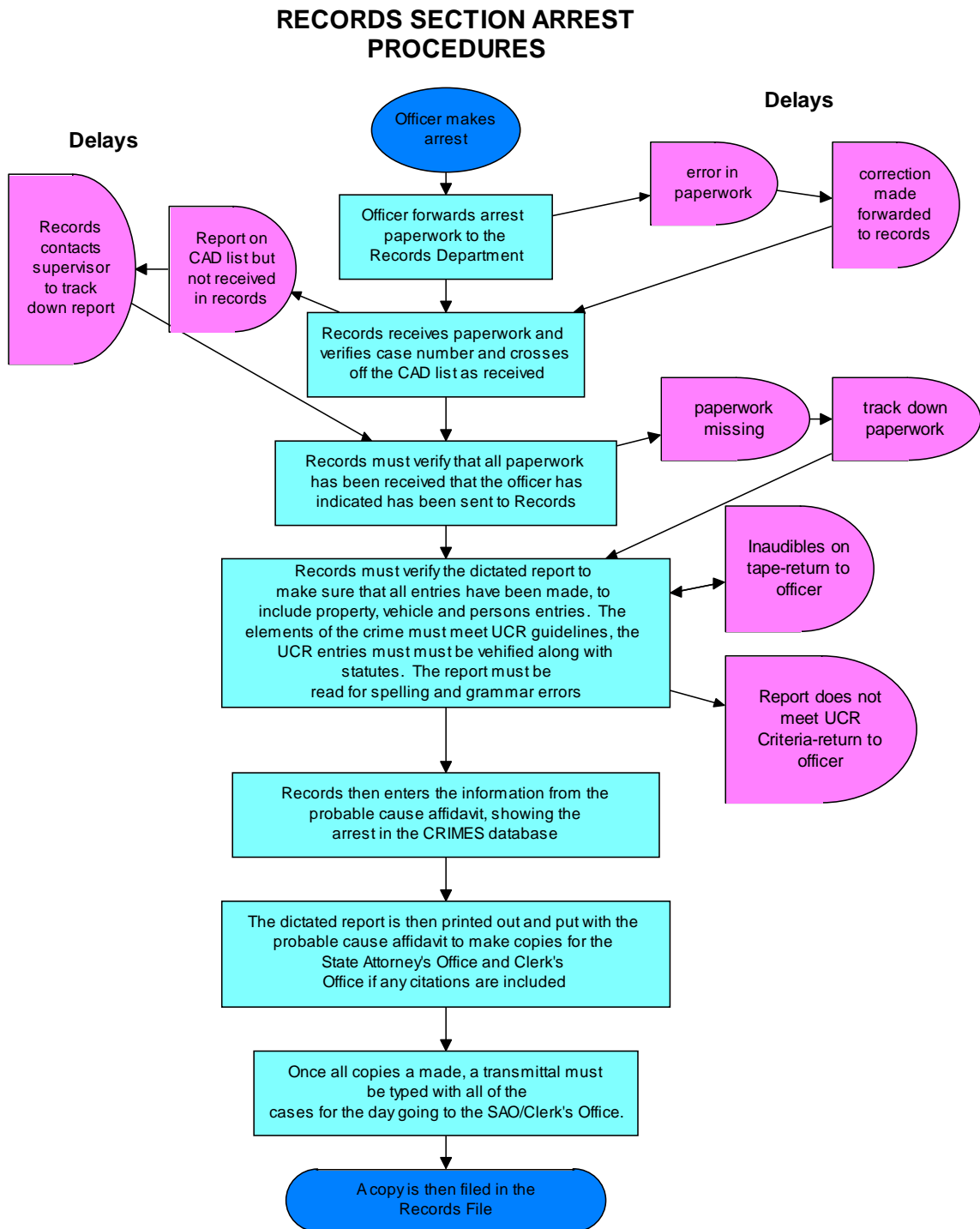
Again, all of these weaknesses point back to processes that were pointed out in the earlier question. Some of these same processes spurred customer complaints within their areas of responsibility causing them to become problems. If a mechanism existed to systematically analyze these processes and look for waste, redundancy, higher chances for errors to occur, non-value added steps, and excess complexity, perhaps these weaknesses could be eliminated. All of the supervisors surveyed responded favorably to the question which asked whether the principles of Lean, Six Sigma, and Kaizen could benefit their section. They are interested in finding out the root causes of the problems and addressing them rather than to continue to apply “Band-Aids.”

Discussion

The results of the survey were overwhelming positive and open to the principles of Lean, Six Sigma, and Kaizen and how they could benefit customer service within the Ocala Police Department. The supervisors were, for the most part; open to the methodology of using proven business methods to solve problems within a public service agency. Their problems were different, but all involved processes, some complex-some simple but all were aware that processes are the key in achieving quality. After reading the introduction they understood that in the manufacturing process the amount of rework and waste material can be measured and the reasons why each occurred can be obtained. However in a service industry or agency such as Law Enforcement, processes dealing with customers and the public are much more difficult to measure, even qualitatively. Customer interactions tend to be much more subjective. Even though the interactions themselves are subjective, the pieces of the process are not. Each process can be broken down into parts. Those parts can be analyzed and evaluated. During this evaluation dependence on other areas should be reduced whenever possible to avoid lead time delays. Many processes have cascading effects. One department's issues impact other departments. When one department holds up a process, another department may be impacted. We are not neutral. Our actions have effects on others and when errors are made, it tends to slow others down. This was the most consistent complaint found in the survey. If one department can find a way to minimize the time it has to wait on other departments, it can cut its lead time dramatically. If mistakes and errors can be reduced, lead time can be reduced dramatically, improving customer service.

After reading and evaluating the surveys, I requested that the Records Supervisor map out the Records Section Arrest Procedures Process. She had identified this existing procedure as one of the main problem areas in her survey responses. I then requested she identify the most serious problems that she encountered in the process and identify where in the process they occurred. I was then able to map them out in such a way as to make it obvious to see that her problems were occurring in places where she had to depend on other divisions (patrol, investigations, and special operations) to provide the records section with data such as probable cause affidavits, other paperwork, traffic

citations, etc. The root causes of the problems become obvious once you map out the process and chart the causes of the delays.



In Six Sigma there is an eight step Breakthrough Process. It is described as follows:

1. Recognize-realize that a business problem exists for which Six Sigma tools may be appropriate.
 2. Define-clearly express the problem and desired final state in written form.
 3. Measure-use historical or prospectively obtained data to adequately characterize current quality, costs, and other factors.
 4. Analyze-apply statistical tools and common business tools to the data to characterize the key drivers of the problem areas identified in the Measure phase.
 5. Improve-develop alternative solutions, evaluate them, and test them on a pilot basis to determine if the desired outcome is being achieved.
 6. Control-determine the best methods for ensuring that any solution is actually working.
 7. Standardize-write a new standard operating procedure and provide training to all persons involved in the process to ensure that the process is carried out according to the standard operating procedure.
 8. Integrate-implement the new standard operating procedure and persistently use the appropriate control measures to ensure that the process is performed in compliance with the standard operating procedure over the long term.
- (Harry & Schroeder, 2000).

This model has been successful in various service industries such as the banking industry and the health care industry. Reducing variability (standard deviation) by having a standard operating procedure (SOP) and having everyone fully trained in that S.O.P. sounds more like a police agency than a business model. Hospitals are seeking to reduce the bottom line by providing excellent customer service, reducing emergency room hold times, improving the registration process, and reducing medical errors.

There are companies all over the United States and all over the world for that matter that specialize in training managers in these philosophies. In Six Sigma, for example, leaders are “black belts” and other less experienced team leaders are “green belts.” One such company, Motorola University, specializes in delivering training around the world, teaching companies and agencies to use Six Sigma to grow market share, improve customer retention, develop new products and services, accelerate innovation, and manage changing customer requirements.

Government at any level, be it local, state, or Federal can implement any one of these strategies to improve customer service and cut costs. A government agency is a service organization and its customers are the citizens it serves. The agency must learn to improve the interactions between the

customers (the public) and the employees, thereby increasing quality and efficiency. The ability to modify human performance in a service environment is a difficult but not impossible task.

The City of Fort Wayne, Indiana was one of the first governmental agencies in the country to embrace the Six Sigma philosophy back in 2000. Now, in addition to Six Sigma training, the City of Fort Wayne offers its employees training in Lean, Activity Based Management, and a variety of professional development topics. According to Mayor Graham Richard, Six Sigma has decreased costs, improved customer service and increased productivity throughout city government. Projects have resulted in over \$10 million of savings or cost avoidance. Fort Wayne implemented the Lean process to some of its customer service processes to cut down wait times and improve efficiency. Two areas of particular interest were ones involving the City Communications Center and another involved the hiring process.

The problem in the Communications Center involved making copies of dispatch center tapes for court purposes. This is a necessary task, however the way they were doing it had some non-value added steps. They removed those steps (after mapping them out and discovering what they were) and improved their technology-digital vs. cassette. After meeting with prosecutors they were also able to agree to utilize a written affidavit to replace court appearances by Communications personnel. This solved their "personnel shortage" issue. They utilized interns/volunteers to copy the remaining tapes. By mapping out the process, looking at the problems in the process, finding the root causes, they eliminated the waste and found solutions.

The second Lean Project at Fort Wayne I found interesting was one involving the hiring process. The hiring process has always been a long and involved one at any governmental agency. Here, like many agencies, applications were taken generically without any opening in mind. Time was wasted sifting through these generic applications. There was duplication of effort. They went to an on-line application that was specific to a job opening and would only be accepted if an opening existed in that area. They obtained new software to automate the process.

Suspiciously absent however, was any reporting on the police department and its progress. In an interview Mayor Richard is quoted "It's been very difficult for us to get buy-in from the police and fire areas-partially because of the culture. There is a strong, paramilitary, hierarchical command, the overtime hour situation, and the constant pressure to do what's most urgent and immediate." (Morgan, 2003). Most police agencies today would face the same obstacles Mayor Richard talks about because we are driven by a culture that is resistant to change. That can be overcome however, if the employee can be shown that the change makes the process simpler and more efficient. People will generally accept change readily if it is explained completely and is logical. It is when change appears to be "the flavor of the week" with little thought behind it that they balk and get frustrated. When employees see changes that are implemented due to data driven statistical analysis, they put up very little

argument. Most employees are willing and open to changes which make their jobs less complicated, improve customer service, therefore reducing complaints, and improve their work environment.

In conclusion, the surveys suggest that the methodologies of Six Sigma, Lean and Kaizen have a place in Law Enforcement and that the supervisors are open to trying to improve their customer service by using these methods. Perhaps, because many of those surveyed were non-sworn and not tied to the paramilitary model that many police supervisors were taught, they are more open to the free thinking and across the board approach necessary in these methodologies. Finding out what the customer wants means communicating with the public on a level that is sometimes difficult for Law Enforcement Officers. It puts them on the defensive, which is definitely out of the comfort zone for any officer.

Fortunately, most of the processes that would benefit from these methodologies are ones that are in areas managed by the non-sworn supervisors. Although the officers would be affected by the changes, most of the work, such as deploying improvement teams, charting/mapping the processes, and problem solving, would be done in these non-sworn areas. They can adapt the methodologies to fit the needs of our organization.

“If people have something to do they believe is worthwhile, they have a purpose, they can make a difference in a very defined and measurable way. If they make that difference, and they’re rewarded, they get energized and motivated and want to come to work and make a difference. And if you can do that for people, that’s the magic.” Geoff Turk. Corporate Six Sigma Champion, Caterpillar, (George, 2003).

Captain Robin Ford has been with the Ocala Police Department since 1990 and is currently assigned as a Captain in charge of the Office of Professional Standards. Prior to coming to Ocala, Robin was employed with the Hallandale Police Department in Broward County for five years. Robin has a bachelor’s degree from St. Leo University and a Master’s Degree in Criminal Justice from the University of Central Florida.

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Appendix A

Survey Questionnaire

Lean, Six Sigma, Kaizen

1. What major processes are within your section that are time consuming and labor intensive?
2. Would these processes benefit from being broken down and analyzed for efficiency?
3. Do you have minor processes within your section that could possibly be combined or eliminated?
4. Do your processes get held up waiting on other departments to finish tasks (lead time issues)?

5. Do you have tasks/processes in your section that are more complex than necessary and could be simplified? (We have always done it that way?)

6. If you were to put a system in place to regularly review these processes, do you think your service to the public would improve by saving time and having less errors?

7. Is time-management/personnel shortage a major issue in your area?

8. What customer complaint do you receive most often about the service you provide which involve processes?

9. What do you think your weakness is in your service to the public?

10. Do you have steps in your processes that are non-value added? Steps that the customer sees no benefit?

11. Do you think using the principles of Lean, Six Sigma, and Kaizen could benefit your section?