

**THE IMPACT OF INFORMATION TECHNOLOGY UPON THE  
TRADITIONAL HIERARCHICAL STRUCTURES IN HIGHLY  
BUREAUCRATIC ORGANIZATIONS**

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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 the Command College project are those of the author and are not necessarily those of the Commission on Peace Officer Standards and Training (POST).**

## The Impact of Information Technology upon the Traditional Hierarchical Structures of Highly Bureaucratic Organizations

Information technology is not coming, it is here, it is now, and it is moving and changing every minute. Nearly everyone is using it, and for those few who are not, they soon will be, whether they want to or not. As an example of how societies have integrated information technology into everyday life, consider the following facts:

- A majority of bank transactions are conducted through electronic automated machines rather than through human tellers.
- A majority of long distance telephone calls are made with telephone and credit cards instead of coins.
- A vast majority of retail businesses now accept either credit or debit cards as a form of legal tender.
- Most major retail companies route customer telephone calls initially, often entirely, through an electronic voice mail system *before* interaction with a service representative.

These are but a few examples of information technology and its impact on our

daily business and personal lives.

Information technology is not only changing the way businesses operate, but it is changing business environments, roles and management. Information technology has changed our personal and professional culture on virtually every level. Therefore, whether you are using information technology as an administrator or employee, the goal is to be using it to your advantage. In the 1990's, they term this, "working smarter."

The World Future society has predicted, that the use of information technology as a teaching and learning tool will increase in the years to come. By the year 2000, virtually every individual in certain areas of the world will have access to a computer either in the home or in the work place. They anticipate by the late 1990's, that computers will provide access to all the card catalogs of the world's libraries. This will allow readers access to millions of volumes from distant libraries without ever leaving their homes or offices. The use of virtual reality technology, personal computers with ultra-high resolution screens, 3-D graphics, high-level interactivity, and artificial intelligence systems, will enhance simulation training in all personal and professional fields.<sup>1</sup> For law enforcement agencies, these technologies will translate into interactive tactical planning, computer-aided situational analyses and up-to-the-minute legal information of all types.

In just a few short years our environments will change dramatically, all because of

information technology. Information technology hardware, such as fiber optics, mobile communication systems, digital sketch pads, optical scanners, and voice recognition systems, will all be used as a means to store, receive and analyze data. Through computers, people will be able to visit their doctor for routine maintenance and follow ups. The “wireless hookup” will simplify relocation of personnel, minimize delays in accomplishing new installations, and make it possible for terminal equipment to travel with the individual.<sup>2</sup>

In questioning whether one can avoid the information technology revolution, consider that information technology is here now, and the future promises even more. Organizations of all types are being driven by the information and communication revolutions. As a result, the work place has become a place of constant transformation.<sup>3</sup> Many business organizations exist in a universe of change, and to succeed they must adapt to this ever-changing environment. It has been stated that, “Even the Future Ain’t What It Was. The world in which organizations exist, and will be operating in the rest of this century, is continuously in change.”<sup>4</sup>

Driving the information technology revolution in part, is the concept of doing more with less. This concept has become a trend for businesses and government during the 1990's. American businesses have been downsizing for several years, and according to business leaders, they have not yet reached the bottom of this trend. Governments have downsized by operating with reduced or limited resources. This

downsizing is a result of the taxpayer revolt, competing interests for tax dollars and politicians being too sensitive to constituent demands.

As a result of the shrinking urban budget, modern law enforcement organizations are performing more work with less financial support for human and information technology resources. Within the next five years, individual workloads and public demands for efficiency and effective enforcement are expected to increase. These increases will likely cause law enforcement agencies to change their attitudes regarding priorities and the resources used to meet their goals. The “resource box” is smaller, inescapable and unpredictable in today’s political and economical climate. Ironically, shrinking budgets may cause expensive technological resources to be unavailable.<sup>5</sup>

In the private sector, change has generally been caused by the economics of supply and demand. However, in the public sector, change in highly bureaucratic organizations is caused by political partisanship and political action. This method of change can be painfully slow when compared to change as a result of economic factors. Highly bureaucratic organizations such as governments, are often rigid in structure, hence rapid assimilation to change is often unsuccessful. Successful organizations whether public or private are and will continue to be measured in terms of responsiveness and organizational flexibility.

The existence of information technology and its ever changing nature, has

resulted in an alteration of the methods by which organizations are directed and managed. The free flow of information will in effect disperse control, thus flattening the traditional hierarchical structure within management. This in turn will decentralize organizational structures, internal operations and the decision-making process. Undoubtedly, the free flow of information impacts all law enforcement organizations, and will continue to do so. This presents special challenges for the managers and administrators of these organizations. Some of the challenges resulting from these changes are:

- The shape of the organizations may look different. An analogy to illustrate this is if you were to increase the weight of a deer by several hundred pounds, one may have to shorten its legs in order for it to bear the additional weight.
- Changes in the ways of doing business. The influence of organizational priorities and structure, management style and strategies will change the ways of doing business.
- Organizations will downsize. Downsizing is the reshuffling of the work-force which includes reductions in the number and type of workers. There will be fewer managers, supervisors and workers. In effect the organization will expect the same work output and often more with fewer employees.
- The organization will be more sensitive to the unpredictable “resource box.” The resource box contains the money available for all government organizations.

This box has been shrinking in recent years as a result of a reduction in taxes to support government activities and constituents who have voiced loud concerns to their elected officials about excessive government budgets and a growing trends toward less government.

- The organization's mission statement becomes obsolete and must be rewritten. Some organizations may have to reevaluate their reason to be, while developing strategies for broadening their role.<sup>6</sup>
- Fear of change and a reluctance to engage in organizational change.

There is arguably a significant impact upon highly bureaucratic hierarchial systems as a result of information technologies. Traditionally, high-level policy decisions will be transformed into tasks to be carried out by middle managers. These middle managers will then be required to monitor the implementation of policies and report the results back to top management. Information and knowledge once held by the few, will be dismantled and redistributed to the many, in essence, crossing traditional organizational lines of authority.

This shift in information control presents unique issues regarding organizational control and management. The traditional law enforcement organization is paramilitary in structure, very rigid, with clear lines of authority and control. After decades of use, these well entrenched lines of authority and controls are the conduits

for information flowing to and from top management through several layers of management and supervision. Each layer of bureaucracy provides its own filters and interpretation of the information as it passes through to the top. Furthermore the information received is filtered not only for relevance, but also for protection of all the people who edit and pass on the information. The result is a somewhat distorted and often flaccid picture of reality.<sup>7</sup> When this type of information filtering occurs with frequency, the organizations can plunge out of control while no longer being in touch with reality. However, it is in these layers of bureaucracy that the control and power exist, further supporting the command and control model of management. Information that is gathered from the lower levels is filtered through each layer of the bureaucracy. Each level passes along their interpretation and filtered “product,” upward through the chain of command.

Recent studies regarding the impact of information technology suggest that while technology may extend management control, it also affects social relations by altering communication, role relationships, formats for organization communications and routines. This results in a destabilization of the power balance among organizational segments.<sup>8</sup> Written communications are no longer tightly controlled through multiple layers of review as it progresses through the chain of command. Information that was once controlled as a single document can be disseminated throughout the organization quickly and easily. The Chief can immediately receive a blind “cc” of an

e-mail that was addressed to anyone in the organization. The manger and supervisors that once controlled the information and interpretations no longer have that control.

While there is a managerial assumption that the power and authority relationships between workers, supervisors and top managers will go unchanged by this information technology, there is however, evidence that new technologies frequently *will* alter the relationships. In spite of the fact that the traditional hierarchial structure was designed to give managers and supervisors the authority to carry out and direct the mission of the organization, technologies will nonetheless alter the relationship between the workers, supervisors and top management.<sup>9</sup>

Information technology is a tool that allows information of all types to be free flowing throughout the organization. The resulting loss of control and the power associated with controlling that information is a central theme when examining the impact that information technologies will have on law enforcement organizations.

An examination of predicted changes reveals that these changes will not be negligible. Management and supervision levels in law enforcement organizations will likely flatten, where flattening means there will be fewer levels of managers and supervisors. There will be fewer links, if any, in the chain between line staff and the chief executive. It is projected that by the year 2001, only one person in 50 will be promoted to top management, whereas in 1987, the number was one person in 20.<sup>10</sup> The roles of the average employee will involve participation on a consultative basis

rather than as an individual. Compare this to a thirty year pattern of growth for most organizations, to today's pattern of downsizing. This pattern of downsizing and working leaner ensures the survival of the organization and increases the prospect for future growth.<sup>11</sup>

In this new organizational chart, the number of subordinates will increase from seven to more than twenty. Because of these new information technologies, large amounts of information can be disseminated quickly from top management without the need for layers of authority to interpret and disseminate. Large amounts of information will quickly become available to a larger group of people. This group will then make significant decisions which will arguably be more successful than those decisions formerly handed down from supervisors. These changes in technology make a symbolic statement about current technologies, social roles, status, and the symbolization of authority, as well as, the distribution of power and decision-making.<sup>12</sup>

The impact of information technology on law enforcement organizations of the 90's will be measured on how well the law enforcement administrators manage the transition to this free flow of information across organizational lines. With frequent change being the norm, the response and reaction by the end users in the form of feedback, suggestions and innovation will be the "measurable improvements" within the organization. End users, such as law enforcement officers, will have a means to

communicate and resolve issues as they arise. As a result the end user is now a stakeholder and empowered. Empowerment is the approving, authorizing, and the enabling of others to participate and contribute in the process of change within the organization.

It is predicted that with fewer resources and opportunities for promotions to reward employees, law enforcement organizations will turn to empowerment and stakeholder accountability to provide career satisfaction, a feeling of accomplishment, responsibility for end results, and increased morale. Empowerment as opposed to dependency, is based on access to accurate and complete information. In an organization, this is grounded in the information that guides everyone's actions.<sup>13</sup> Empowerment will be the change that forms a narrow command structure, which will in turn, allow problems to be solved at the lowest possible level while passing on the most important information. The potential advantages of this may include:

- Improved response time and service.
- Fully informed personnel as a means to further reduce the risk of injury to the officer and the public.
- Public has direct contact with law enforcement.
- Law enforcement has a broader constituent base to interact with.
- Ability and opportunities to deal with more issues at once.
- Higher speed and accuracy in identifying and resolving core issues.

- Learning how to accomplish the task, what not to do regarding the task, and how to retain what was learned from the experience.
- Rapidly apply what was learned in one place to others in other locations.
- Integration of learning across the organization.<sup>14</sup>

Regarding information technology and law enforcement, there is a continuing trend toward increasing the amount of information technology. Technological innovations have been hailed as managerial tools used to improve the coordination and discipline of law enforcement officers since before World War II. Innovations were first implemented to improve supervision and control over the officer, respond more quickly, improve the quality of service and record keeping.<sup>15</sup> More recently however, law enforcement organizations have used integrated data bases for information cataloging, storing and retrieving criminal histories, warrants, bulletins, wanted and missing persons, drivers license and registration files, dispatch assignments, inventories, registration, evidence control, case management and management information systems. As systems and technologies improved, law enforcement employed mobile computer and data terminals to increase the flow of *valid* information to the law enforcement officer. This improved the performance and efficiency of the officer. All of these innovations reduce the traditionally time consuming process of message processing and record keeping, and in turn increase the

“visibility” of the law enforcement officer’s activities.<sup>16</sup>

Research indicates the anticipated “computer revolution” in policing has not taken place.<sup>17</sup> Studies suggest that by the year 2001, California law enforcement will routinely use artificial intelligence to analyze data and solve crimes. “Expert systems will issue reports and recommend actions based on data gathered electronically--all without human intervention.”<sup>18</sup> Indeed law enforcement organizations are continuing to evolve from pencil-based technologies to computer-based information technologies.

The current trend is to access the Internet. Access will instantly provide direct contact with the public, other organizations and people anywhere in the world. Officers can communicate with other personnel across the organization that they ordinarily may not routinely come in contact with. The introduction of “e-mail,” the Internet, the World Wide Web and other technologies now provide nearly instant access to information and communication with others.

Studies suggest that the extent of computerization in law enforcement is somewhat difficult to determine with much precision, simply because it is happening faster than published reports can document it. It is probably safe to say that, although applications seem to be virtually universal, the anticipated “computer revolution” in policing has not taken place.<sup>19</sup>

Authors and scholars, Reuben Harris and Richard Beckhard, have questioned

whether the constant change would ever level out. They wrote in their book *Organizational Transitions* that there would be a leveling out of the impact of new technology, however later, they admit that they were wrong. They say that this influence is increasing exponentially and offers both problems and challenges unanticipated by management and those who wrote about it ten years ago.<sup>20</sup>

Information technologies will impact virtually every level of some law enforcement organizations. These technologies could impact everything from crime scene reconstruction to tactical attack plans in emergency situations. All of this information would be available at the remote and onsite location. These information technologies employ artificial intelligence and fuzzy logic, analyze data in relational data bases and examine trends in extremely short periods of time. Large amounts of information that traditionally took hundreds of hours to categorize and analyze, can now be analyzed in minutes. Police departments are using World Wide Webs to solicit and provide information to the public. This is being done through "COPNET."

There is an entire constituency that would likely never come into contact with law enforcement if it were not for information technology. An example of how information technology has entered the home, was illustrated in a recent survey conducted by USA Today magazine. The survey counted the number of households with personal computers and categorized them by ethnic or racial groups, 39.1% of

Asian/Pacific Islanders, 38.6% of white, 20.7% of American Indian/Aleut/Eskimo, 13.1% Hispanic and 11.1% Black have personal computers in their households. Based on generalizations regarding the types of computers these households may have, there is potentially a huge constituency that can be reached through information technologies.<sup>21</sup>

Information technologies have not completely impacted traditional hierarchial command and control models. Some law enforcement organizations have simply not taken advantage of information technologies for whatever reason. The traditional hierarchial model that most law enforcement organizations have utilized for decades is fast becoming obsolete. Middle managers, those who are in between the line supervisors and top management, will all but disappear as the information flows directly to an administrators for analysis. The new information-based systems will enable administrators to direct more functions without middle managers, thus further eroding the role of mid-level managers. There will be computer mediated decision-making groups which will allow more members of the group to participate. The traditional secretarial/clerk will be become a “knowledge” employee, and there will be more civilianization of law enforcement organizations, thus further flattening of hierarchial structure.

There is a reluctance in some organizations to use these technologies. The author was told by peers that some law enforcement organizations discourage the use of

computers, solely out of fear that they may put someone out of work. While this revelation was a surprise to the author, the author knows from his own organization that traditional secretarial roles were converted into information specialist roles and that no one was put out of work in his organization. Furthermore, research indicates that support staff personnel will become technical personnel. However, according to other studies, there were specific predictions about the way that computers will affect the work place such as:

- A decrease in the skills required to perform jobs, implying increasing routinization of work. This amounts to having an overeducated and bored work force.
- An increase in the skill requirements of jobs, implying that many workers will be unable to qualify for available jobs without additional training.<sup>22</sup>
- Potential polarization of constituents between those who have the technology and those who do not. While there are a growing number of households who have personal computers, there will still be a large segment of the population who will not have access to this information technology. The result could very well be polarization, a battle between the haves and have nots. This problem will be further exacerbated by a possible perception in the workforce that the less educated workforces will not have the access nor the skills to use the information technologies in the workplace and thus may find themselves not competitive.

There are casualties that the law enforcement administrator must be prepared to handle. The most visible casualty is that of the middle managers. This group will be squeezed out as a result of the expanded role of line managers who have direct communication with administrators. Within the office environment, there is going to be a disruption of the traditional social organization. There is potential for sterile environments, where less communication and isolation is common. It is difficult to imagine that there could be less communication with the new information technologies described thus far, however, people will not be *talking* to people. People will be communicating via a keyboard. The amount human interaction will be significantly reduced with employees hiding behind words without ever showing their personalities or body language. Names will become faceless computer characters, causing a sterile and isolated atmosphere.

There is also a growing concern that many people are becoming hooked on the seemingly endless numbers of information networks. Untold numbers of people, spend literally hundreds of hours “surfing the net,” never really *talking* to anyone. In effect they become reclusive and even nonproductive. An example of nonproductivity was illustrated in a recent television commercial for an on-line service. The commercial showed a man working at a desktop computer. In the script he says, “I look busy and productive, but actually I have been on an on-line service for hours!” This is a significant and real consequence. The administrator must develop a method

for accountability and routinely engage in *real* human interaction. Video conferences. Telephones with video screens and computers with video displays of the sender and receiver exist today and could easily be integrated into an organization. These technologies will restore the person to person communication. Implementation of these technologies into law enforcement organizations is several years into the future, mainly because of the limited and unpredictable resource box, not due to a lack of technology.

In summary, information technology doesn't relieve the administrator from the responsibility of remembering that the mission of any organization is *delivered* by the people and not merely machines. As described earlier, the environment of constant change is one that few administrators in law enforcement have had to deal within the past. Changes are occurring at a rapid pace, and by some estimates occurring so fast that they cannot be measured. This rapid change will lead to burnout, discord, frustration and anger. Change in and of itself can be the reason for never getting the tasks completed, simply because there is always some sort of technical issue preventing the task from being accomplished. This change can lead to high turn over, which in the long run will be extremely costly in human training resources.

The administrator must develop a plan which provides for consistency in applications and allows for input towards future growth. Furthermore, administrators must have a firm grasp on how much change is needed, and how much change to

impose upon the organization. The real key will be in the ongoing strategic planning for the implementation of these technologies.<sup>23</sup>

While the future may not be what was predicted, the frequency of change demands leaders of organizations to find innovative ways to maintain stability in their organizations, while at the same time, provide flexibility to adapt to the new technologies. These new technologies arguably cannot be stopped. As an administrator, the best game plan is to prepare, plan, manage and direct these new technologies as they arrive. As information technology begins to impact greater segments of the law enforcement organization, well focused strategies will be needed to address the increasing reliance upon them. There will need to be an effective interface with the community on an electronic level and a personal level in order to accomplish an organization's primary objectives. This method of communication will help maintain the public's trust and confidence in all sectors of the law enforcement organization.

While information technology will improve community access to the law enforcement organization, it will make contact easier for some and more difficult for others. Hopefully the result will be that the law enforcement organization keeps the public well informed of their activities, and does so in the most efficient manner. There will also be a need to develop a strategic plan to effectively use advanced technology in concert with flexible organizational structures. This plan will help

manage work, information, and people, while providing a reward system that reflects organizational priorities and individual needs for dignity and growth.<sup>24</sup>

Organizational leaders will need to:

- Increase their computer sophistication in order to survive and be an active part in the organization.
- Develop clear visions of what the institution should look like.
- Understand the organization's interdependency with its outside environment.
- Create flexible organizational structures to manage the work required, the information and the people.
- Effectively use new technologies.
- Publish clear descriptions of strategic plans aimed towards achieving the end state, including, contingencies.<sup>25</sup>
- Create formal and informal networks.
- Develop lateral coordination and cooperation.
- Keep the organization in a constant learning mode.
- Keep communication systems relatively open.
- Ensure that decisions are made based on sources of information and not rank.

Information technologies are tools for the leaders of law enforcement organizations to use. These tools will have drastic consequences for the organization as they will flatten and reshuffle the workforce in the organization. These

technologies are going to need guidance and creativity from the law enforcement administrators in order to use them effectively. While its going to streamline decision making, it will also cause organizational social issues. "Managing complexity requires a strong ability to deal with ambiguity, a talent for managing conflicts, a deep concern for people and their potential, the ability to maintain a balance between reliance on systematic planning skills and gut feeling, and--most important--having a sense of vision."<sup>26</sup> At this point these technologies need significantly more study to determine their effectiveness in serving the law enforcement agency and the constituency it serves.

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