

Critical Response Teams and the Office of the Future

A Study of Current work practices and suggestions for a better model

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Introduction:

A few years after the end of the century, a century that brought about among the greatest changes in human lives since the Industrial Revolution, it is time that offices start looking towards the future. As a consequence it is fairly obvious, that artifacts of a bygone era must be eliminated to pave the way for the future. In support of that future, offices and organizations must make a commitment to reevaluate their goals and practices for a more forward looking approach.

As a consequence of a great deal of research in the methods and practices of organizations that deal with a varied number of situations we feel that there is space for improvement in the creation and management of the environment of critical response teams and emergency information requirements. Such teams are found in the departments of the Police Forces, Intelligence agencies, Coast Guard, Search and Rescue Teams, Data Recovery Services and Social Support (Child Services and Medical work Ambulance Services). These teams stand to benefit from new technology and greater efficiency in the use of paper.

Current techniques in critical response teams are based on prevailing practices and on the level of technology that members of the team are comfortable with. A study, conducted by Sellen and Harper, in the work practices of knowledge workers showed that many are resistant to changing their methods to a more paperless office for a variety of reasons many of which are applicable in a Critical Response team. One of the major reasons for not supporting the shift, was that the “shift” was implemented without regard for how current practices worked and without enough analysis in changing work practices to work with the new technologies rather than a generic swap of old with new.

As consultants we propose to evaluate the current practices in place in regards to current management of critical response teams comprising of knowledge workers and experts in their fields of work, and to suggest designs for a Support Environment that implements the best solution. That solution is not limited to the most technological solution but that which works best with the team and gets the job done.

Background:

To better understand the current methods of information gathering and authoring reports it is best if we analyze one form of critical response “knowledge worker” based teams and their methods for authoring work. The Police Department varies from county to county let alone from country to country. However we find that the actual process of police business is not so different. Today paper tends to play a major role in the work of information gathering. “Police work involves many things. Police officers have road traffic management tasks and crowd control, as well as custodial responsibilities.”¹ Their prime function above and beyond all other responsibilities is crime-fighting. Crime fighting may broadly break down into two parts, the actual fighting of crime which entails information gathering, puzzling out clues and other detective work, and the social support backbone such that the police are the first port of call for victims of a crime. Police officers must be able to offer support to an often distraught or disturbed victim while at the same time extracting information that is vital to their job as crime fighters. In addition to gathering information, police officers often find that even the least significant clue is helpful in finding the perpetrator of a crime. This means that all information captured by officers must be widely available to the police force to provide them with the most up to date information possible, giving officers every chance to catch the perpetrator before the trail goes cold.

As road traffic managers, the police are responsible for maintenance of traffic order and the monitoring of parking violations. Parking violations alone account for a great deal of revenue to the city, and it is necessary that police officers make as few errors as possible in recording these tickets to ensure that the city collects its due. To maintain traffic order it is necessary for officers to report on traffic conditions, check flow of traffic and quickly manage the clearing of obstructions. This involves a great deal of report creation and data input into the systems of the Police Database. Custodial responsibilities are what make citizens feel safe, the visible presence of a police officer putting people’s minds to ease that their locality is being patrolled and is safe. However the random placement of police officers would hold no use unless they had data on localities and “inside” information on trouble spots for these localities. To ensure that a

¹ Pg 119 Sellen and Harper

limited number of officers are well spread to reduce the crime rate requires an up to date flow of information and easily available statistics to predict these crime spots. Valid information is a fluid commodity and it is often necessary that officers work fast on such information to prevent its usefulness from going stale. Thus it is necessary that dispatchers and the police officers themselves have access to all the information they need in the process of their respective jobs and departments.

To further illustrate the use of relevant information, police departments regularly have a squad assigned to unsolved cases popularly known as “Cold Cases”. This squad established in nearly every major police department reopens Cold cases to apply new technology and new ideas at the problem, sometimes resulting in solving the crime. A few years ago, police reopened investigation in a murder that had blood of the perpetrator at the crime scene. DNA testing of this blood against known criminals on file resulted in a match for a sex offender on probation at the time. In a landmark trial the DNA evidence alone was enough to convict this criminal, allowing the police to finally close this case and giving members of the victim’s family some measure of closure. The complexities of following up leads long gone cold and looking for clues in crime scenes that was cleaned up many years ago is a painstaking process requiring a great deal of support and information. Thus it is necessary that the police maintain a well sorted and well organized database.

Police Officers are knowledge workers in that they require a great deal of training and time before they become proficient at their jobs. In addition to this they spend time with information and extracting useful information from Data. This is true for all critical response teams like the police, fire and other kinds of departments such that their needs in proper Support Environments are very similar. By listing the specific requirements of the Police Department, it will be possible to extrapolate the required design environment of other critical response teams. The emphasis will be on the functional usage of paper and technology by the knowledge workers and the potential for productivity enhancement from the knowledge workers.

Current Methods Analysis:

In an office of today, paper dominates the surroundings. The walls often have bulletins announcing some event or the other, Post-It notes to remind and notes for

ongoing projects scattered on the desks. Paper supports many aspects of knowledge work, primarily of which is authoring documents. Knowledge workers spend a great deal of time reading and writing, and meeting for the purpose of reading and writing.² In critical response teams the gathering of information and the verification of the veracity of that information is paramount. Document creation is essentially on the computer these days; however drafts tend to be planned on paper, information from paper tends to be used to create the electronic copy and notes and annotations to ideas are placed on the object closest to hand, paper. In the field, knowledge workers will have to collate their notes on paper to integrate into a report later. The information from field work is often sketchy and impossible to verify on the spot. The process of information retrieval especially in critical response teams is often a time based process that unfolds over time.³

As a normal process of work, knowledge workers regularly review their colleagues work. This would ensure that the information remained easily accessible and for conveying the ideas more effectively. This will also provide a compass for data storage and a yardstick for information priority. Most knowledge workers find it easier to print out and review the document on paper. Annotations and notes serve to make the process more personal allowing workers to get “into” a report.⁴ This occurs even when the original document was sent by electronic means. The purpose of this method of review is complex, with many knowledge workers stating that reviewing on paper gave the author a way of easily identifying the reviewer, and that it is better to mark on the paper rather than change the original document even if they were to use the annotation tools in modern word processing software. Hand delivery of documents even ensures that there is good personal communication between author and reviewer. In a critical response team this sort of interpersonal contact could be vital in revealing nuggets of information often considered unimportant on the report. This transmission of knowledge increases the value of the knowledge worker without reliance on electronic means.

Studies reveal that teams of knowledge workers rarely refer back to work done in a team meeting and even if done so, unless a worker that was present at the meeting is available to interpret, it would hold no extractable information. These sorts of minutes

² Sellen and Harper, Pg 60

³ Sellen and Harper, Pg 120

⁴ Sellen and Harper, Pg 62

and documents are very rarely stored after the current case has been completed. These documents are relegated to a cold status, often kept for legal reasons or “just in case”. In a critical response team the status of the case determines the necessity of these team documents. Closed cases are stored with all the material generated by the case. Understandably evidence collected by case cannot be easily stored.

Advantages of System and Design Requirements for Paper Systems:

The current system still holds great preference for paper over a “paperless” office. Knowledge workers are resistant to the change over to new technological means as they feel that new systems do not offer the same advantages of paper based systems. We must analyze these advantages so as to design an environment for problem solving.

The primary advantage of paper is that it is light, mobile and easy to transport. A single sheet of paper also gave a tactile sensation which allowed the reader to use both hands in its manipulation. It afforded flexible navigation through documents allowing readers to quickly skim through for a general idea of the document and for easier reading. It was found in the study that few readers read reports from end to end. The process was more of a give and take, with constant cross referencing to previous tables and Appendices, which required the reader to quickly flip between pages. Computer systems do not have the capability to easily flip between pages, nor does it have the unique paper feeling of using fingers as placeholder devices.

Knowledge workers often have to work with multiple documents at a time, which would require either expanding the size of existing computer screens, making the cost exorbitant, or printing out the documents for easy cross referencing. The multiple switching of windows can be tiring and hard to understand or reference. As stated earlier pattern recognition plays a huge part of iterative and cognitive thought processes.

Paper documents are easily marked using a traditional input device, a pen. It can annotate papers, leave unique identifying marks, and is a source of correction employed by nearly every worker in every sphere of business. Rough Drafts are often corrected on paper and then the changes are implemented online. The speed of input on a paper far outpaces most knowledge worker’s speed on technological devices. Without changing the format of education in school to reflect new technologies, the primary mode of writing will be by pen, not keyboards.

Paper documents help us to smoothly interweave between reading and writing of documents. It has been observed that many workers often take up a document to read with a pen in hand. It also affords us the option of staying on a single window on the computer to type out whatever we need in the creation of a document while reading the requirements from a paper document.

These facts seem to hold true for knowledge workers in all spheres of industry. In addition to this affordance of paper it was found that in critical response teams, paper was used in many additional ways. Paper served as a “holding station” for reports to ensure that more accurate data was input into the system for general sharing. Since reports were created by a time unfolding system, it was sensible to store the data somewhere until it could be used in a useful manner.

Paper documents created in meeting aided in coordinating efforts and bringing unity to the team. Project meetings are often a cover for simply getting coordinated on strategy, which would occur by describing efforts on paper. If they were to use a computer, much time would be wasted while the document was scrolled to the correct position, as opposed to just stating where they were in a document. This brought the emphasis on interaction not staring at a big screen. Paper was used to augment and be augmented by other artifacts.

Paper affords the capability of spreading the information out in 3 Dimensional spaces giving the more intuitive aspects of knowledge work a chance to work. Pattern recognition is an area where the human mind still leads the technological world by leaps and bounds.

Paper can be used as a flexible medium for real time information, one that may be easily changed to reflect current status of a project or item. Such changes are quickly achieved often by making a mark on top of another mark. In addition to this, the fact that a mark exists even if it was scratched off gives off the feeling that the paper version endures. The existence of a mark gives the paper credence and a bit of history, something which cannot obviously be discerned from an online document short of looking at the date modified field. When online documents change, many users are bewildered, assured in their conviction that they were imagining an earlier version, whereas a paper version shows that a change has been made.

Paper documents are impressive in stature, with the feel and texture able to convey a lot of information. Notarized or gilded they impart a personal touch often lost with electronic mailing systems. Each piece of paper has a history that is often free associated in an individual's mind. However unless those experiences and detailed notes are not included with the documents to be filed the knowledge gained in creating the documents is lost and no longer useful to the organization.

Limitations of System and Design Advantages of "Paperless" Technologies:

A single sheet of paper is light, mobile and easy to manipulate but a sheaf of such papers is not as practical. Folders can sometimes run to thousands of pages especially with the large amount of data often available to knowledge workers and their teams. Mobile workers will find it extremely inconvenient to carry this information on their person in book format. However a CD-ROM can hold as much as 20,000 pages of text,⁵ something that is just not possible with paper documents. If the mobile worker so wishes, he may be able to do on demand print outs of the relevant parts of the case. With the current technology, CD-RW media are cheap enough to be used like floppy disks, for document management. This would also allow the mobile worker to access useful information from related cases. Optical Character Recognition has improved the accuracy of Character Recognition to almost 95% and above such that a printed document for a meeting that day can just be scanned and made available to others. A system that can easily delve into the filing system and manage documents would be a boon to knowledge workers.

A Personal Computer has the advantage of displaying moving objects and multimedia files. Such a capability trumps paper which is only capable of displaying static objects often created free hand with a pen. Multimedia documents have the opportunity to transform meetings and other methods of project work and design. With sufficient bandwidth available to a user, it is possible to video conference with a teammate in another part of the country. In addition to video conferencing, a new program called whiteboard has the capability to provide white space available for notes and freehand diagrams that is viewable to both parties. The results of the video are easily captured and saved to a digital file thus producing productive meeting work even when

⁵ ScanDoc FAQ, www.scandoc.com/faq.php

both parties are miles away from each other. In addition to this, we have mentioned that unless the knowledge worker that was a part of the team that originally produced a paper artifact, the knowledge obtainable from said paper artifact would diminish slowly to the company till finally none would have any use for the “Cold” file. By archiving video sessions of these meeting we will be able to reconstruct the workings of these documents and the knowledge will remain within a company no matter how many employees are cycled through. With the decreasing cost of memory storage and increasing performance of compression techniques for video, it would be feasible for companies to place some effort in these new technologies. Increasing bandwidth also mean that storage of such materials at an offsite location does not seriously hamper an employee when he needs instant access to “cold” files. Collaborative effort should be kept as a design constraint to enable good unity and a working team.

Video files ensure that documents never lose relevancy. A little extra time and care spent on archiving video and supporting documents digitally can ensure that users later on will be able to easily access data and retrieve knowledge quickly. The time and knowledge and money expended in prior projects will not be wasted if extra care is taken during the archiving process. A well documented archival process should be a design requirement.

Digital access to reports enables a user to quickly and efficiently search for data. A stack of reports would discourage even the most diligent worker from searching for that one important file. Keyword searches allow users to search by word through all the fields and all the files for the specific case. Boolean Logic gives search technology a lot more power in performing an exact search to increase efficiency and reduce search time. In recent years technology has improved substantially enough that searching for a keyword within a document is also within the realm of possibility. The access time for magnetic and optical media has reduced these search times to acceptable limits as well making it a design constraint.

Online documents afford the capabilities of referencing with the Internet. Hypertext links are selectable links that will open a relevant document quickly and easily for the user. In recent word processing software, adding hypertext links has become

easier than ever. There is very little training involved in the use of Hypertext links; the user will expect a colored text to do something.

Online documents have the advantage of dynamically alterable content. Websites can be updated on the fly and up to the minute information can be offered on the most mundane data through the power of the Internet. Documents are updated in one place and sent out to colleagues around the world instantly. Electronic mail has changed the lives of office goers throughout the world, maybe not always for the best, but it has ensured reasonable quality of service and quick delivery times better than any comparable paper delivery service.

Designing for a Support Environment:

Outlining the advantages and disadvantages of the current system it is easy to see that there is room for improvement. The office reliant wholly on paper is unlikely to perform to optimum productivity. Critical Response teams are in desperate need for a change in practices to increase efficiency. The potential for improvements exist throughout these departments and by integrating what is needed slowly enough to give knowledge workers a chance to integrate and shift with the times. A “paperless” office is not a feasible goal at the present as there are some capabilities not offered by current technological means which can be achieved through the tried and tested method of paper and pen, but for critical response organizations, there might exist a possible hybrid solution.

It is obvious that if a company currently does not possess a digital Document Management system, then it should proceed to acquire and integrate one that is based on the needs of its knowledge workers. Critical Response teams like the police department and other organizations need to be able to access minute pieces of information generated throughout the organization. Such detailed document delivery would ensure that officers would be kept up to date with reports filed by their colleagues with even the most remote connection to an officer’s current case. A Document Management System (DMS) would enable users to retrieve information from reports filed days ago, as well as perform keyword searches throughout the records departments. A generic DMS like Lotus Notes will not be able to offer all the features that a progressive Police Department might need, but it can certainly give a taste of well interfaced networking between teams and more up

to date information than previously possible with paper based systems. Paper would still play a role in holding static and immediately useful information.

Analysis, forensic and otherwise, can report results as they arrive rather than a complete answer on paper later. The labs are important in providing results often vital to crime solving. Other critical response teams will benefit from a digital DMS. Ambulance teams will be able to quickly download the relevant information for any particular condition that a patient may be suffering from. DMS will be able to sort reports by locality, teams, even by incidents on the report thus creating an automatic system for statistical analysis. The human mind may possess a large capacity for pattern recognition, but even the human brain has a threshold limit, and this is where a simple statistical analysis by the computer is invaluable. It should also be able to print out banner sized copies of maps with pin placements so that officers and their teams will be able to get a more tactile feel for the groupings. By printing out the map, we will keep a sense of similarity with the age old processes of working with paper, but these new methods will be heavily augmented with computers.

Police officers can be assigned a new form of portable computers called the PocketPC. Previous attempts to introduce laptops in a United Kingdom Police Department, as a means of going paperless eventually failed as the DMS implemented had no provision for drafts and often enough the officer would struggle with using the laptop as much as solving crime. To circumvent this problem, the new DMS that should be implemented for a Critical Response Organization should have separate interfaces with different features for every department under the organization. The forensics team would have different uses and requirements than the field officers would. In addition to this the Pocket PC to be issued will feature a new form of intuitive input that will function like a note pad. The perfect handheld computer identified for Critical Response Organization field officers is the PDT 8100 series Portable Data terminal from Symbol Technologies.⁶ It offers character recognition such that reports can be written into the terminal without the use of a keyboard or other non-intuitive input device but for those that need it, it has it. It comes bundled with Wireless Fidelity connectivity and a fairly large hard drive. The speed of the device ensures that the officer would have a seamless

⁶ PDT 8100 Portable Data Terminal

Internet and document connection. The Application Program Interface is easily used to create mobile version such that the DMS is accessible in the field. It comes with multiple charge cradles and connectivity is easily upgradeable with a Compact Flash slot.

Traffic violations pull in large revenue to cities but a percentage is lost due to various problems. These problems exist due to the writing of tickets with wrong information, bad handwriting and other loopholes in the paper-based system. To combat this inefficiency, traffic officers should be issued a portable handheld PPT 2800 series Portable Pen terminal from Symbol Technologies. This handheld accepts only pen based inputs making it easier to accept intuitive inputs. It also supports a bar code scanner and wireless device built in. This means that a traffic officer will be able to scan in the bar code from a vehicle registration sticker and print out the ticket with a wireless printer. This will help to recover millions of dollars in lost revenue. In addition to this, with wireless access the data is instantly added to the DMS so the data is logged and accessible.

In the medical field, Accenture Labs have created a method of trans-scripting data from nurse's pads directly and effortlessly to a central database. The technology is described as the Accenture Digital Observations solution ⁷and all it requires is a digital pen and some specially engrained paper. Currently nurses can only monitor their patients reading's manually and if they are concerned about a particular patient's vitals they have to contact the doctor via pager. If this situation was implemented, doctors equipped with a handheld terminal would be constantly logged on the DMS at the hospital and would be able to keep an eye on his patients with up to date information and with notes on progress. Similar to the writing with the digital pen, the whiteboard concept has exploded across America as a collaborative digital tool, best used in meetings. These boards can transcribe data written on the board digitally to a connected computer for storage, review or editing serving as a good knowledge recorder.

Search and Rescue teams equipped with wireless devices can download different types of maps (i.e. topographical, infrared capture etc.) of an area to aid in their operation. The same can be said for the Coast Guard which will need help in organizing their efforts and ensuring good collaborative effort especially during a storm. Field

⁷ Human Performance Enhancement

officers of social support services can be equipped with the handheld terminals mentioned above for similar information benefits when visiting remote areas or for keeping notes on a possible problem area such that when the next social worker arrives, he can keep check into the matter. This helps prevent wards of the government from slipping through the cracks.

Conclusion:

Critical Response teams require reliable systems. Even a small disruption in their support system would result in catastrophic failure especially in the more important processes of Homeland security, protection of citizens and property and other vital areas. When designing a Support Environment, it is important that we keep in mind, the need for as little downtime as possible, and a smooth change to a more modern system. The analysis of current methods of work practices show that it would not be advantageous to shift to a complete “paperless” method of conducting business, as the technology is not capable of taking over every advantage offered by paper. The hybrid model of working seems to possess the best solution and the overall cost for implementing such a solution would be dependent on the layer of penetration needed for testing the solution.

A test of such a hybrid solution is under way at the Los Angeles and New York Police Departments utilizing handheld terminals and other technological tools to augment paper forms and paper work methods. The experiment is expected to pay for itself within a matter of months.⁸ The future of office work practices has truly arrived.

⁸ [Wireless Business & Technology:](#)

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You are currently offline. Some features of the site may not work correctly. Corpus ID: 28847583. Critical Response Teams and the Office of the Future. @inproceedings{2005CriticalRT, title={Critical Response Teams and the Office of the Future}, author={}, year={2005} }. Published 2005. View PDF. In the office of the future, technology will play a central role in enabling employees to return to office buildings and to work safely before a vaccine becomes widely available. Organizations will need to manage which employees can come to the office, when they can enter and take their places, how often the office is cleaned, whether the airflow is sufficient, and if they are remaining sufficiently far apart as they move through the space. To maintain productivity, collaboration, and learning and to preserve the corporate culture, the boundaries between being physically in the office and out of The responses to the survey yielded unexpected insights. Given the speed and scale of the pandemic-related changes and the fact that employers had no time to prepare staff for the shift to remote work, we expected to see a decline in employee productivity. But while some respondents did report such a drop, a surprisingly large number said they have been able to maintain or even improve their productivity.Â What This Means for Employers. Our findings suggest that the future of work will be increasingly hybrid.Â When teams are split between home and office, remote members often feel at a disadvantage during meetings vis-À -vis those who are physically together.