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JIC Assessment and Restructuring Recommendations

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JIC ASSESSMENT AND RESTRUCTURING RECOMMENDATIONS

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This document contains a recommendation and information concerning the Judicial Information Center (JIC) operated by the Ministry of Justice (MOJ) of Egypt It is based upon information gathered during a site visit and meetings with MOJ authorities during early March 1998 It has also been prepared with the experience and consultation of the AOJS project It is divided into six sections

- recommendation,
- management issues,
- organizational issues,
- staffing issues,
- technology issues, and
- operational issues

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Recommendation

A critical and very important part of this report is a recommendation by the AOJS Project that the MOJ engage professional consulting services to strengthen the Judicial Information Center (JIC) management, personnel, and technology capabilities The JIC will be the organization responsible for sustaining and replicating automated systems developed and purchased by the AOJS project The Project recommends strongly that concurrent with the life of the Project that the JIC prepare itself for it's critical Project support role This document will describe the current issues and problems within the JIC that result in this recommendation and will describe the expected outcome of such recommended professional services

This report identifies the problem areas within the JIC related to management, organizational, staffing, technology, and operational issues An earlier JIC Survey Report described the JIC organization and technology inventory in detail This assessment report defines in general terms and descriptions what are the attributes of a well organized and successful information systems development and support organization The end product of the advice, assistance and services of a professional consultant should be similar to an organization like that described in this document

Management Issues

The consultants and MOJ leadership should address four main management issues They are defining the mission of the JIC, articulating the role of the JIC in the MOJ, developing a strategic plan to guide the work of the organization, and oversight of JIC activities

Large, complex organizations sometimes struggle to keep individuals and business units working toward common purposes The larger the organization, the more difficult it is to

communicate and coordinate activities In recent years, it has become fashionable for leaders to take a stronger role in this process by focusing all staff on the mission of the organization A mission statement is a succinct articulation of the reason for the organization's existence More important than the actual text of the mission statement is the process used to create it As staff members at all levels are asked to contribute, it helps them think more seriously about why they do what they do The result is intended to be a stronger team with more focused objectives An experienced consultant can guide the MOJ and JIC staff through this important process

As we met with JIC staff, it became clear that the role and relationship of this group with the MOJ as a whole is not as clear as it ought to be For this reason, we also recommend that any effort to articulate the mission of the JIC include strong participation of MOJ leadership

A strategic planning process also is needed within the JIC Short term plans and actions should move any organization in the direction of its long-term agenda If no long-term direction has been articulated, there is no way for managers to know how to decide Thus, short-term decision making can stymie long-term accomplishment A strategic plan, by definition, covers broad issues over a long term It would be difficult to make strategic decisions about the JIC without involving the leadership of the MOJ In other words, strategic planning for the JIC, if done only with JIC staff, will be meaningless We did review a list of JIC technical assistance requirement, which outlines some short- and long-term priorities This is a good beginning and should be passed along to the consultant who assists the JIC with strategic planning

The creation of a mission statement, refinement of the role of the JIC in the MOJ, and completion of a strategic planning process will provide significant benefits to the courts of Egypt The productivity of JIC staff will increase and they will become more effective members of the MOJ team Once all this work is completed, it would be helpful to reassess how management and policy oversight is provided to the JIC, to ensure that the momentum of change is not lost Again, the consultant that deals with management issues will be in a good position to provide advice and work with MOJ leadership on this issue

Organizational Issues

This section covers the assignment of JIC staff to work groups and some suggestions for improving organizational structure It includes recommendations for the placement of staff to meet court objectives These are only preliminary recommendations, base on a quick review A more thorough analysis is needed before implementing these suggestions

A key organizational issue for the JIC will be to provide for the operations, support and replication of project delivered computer equipment and software This issue is both a short term and long term management problem to be solved In the short term, the AOJS project will be requesting individuals from within the JIC to be assigned to support roles for systems being installed in the NCJS, North Cairo Typing Pool, and in the homes of 80 judges using PCs for legal research The AOJS will define requirements for specific skills and experience for the staff to be assigned to work with the project The JIC will assign individuals best matching the criteria to the AOJS project at a level of effort defined by the project These individuals will be responsible for learning the support and replication skills related to AOJS developed computer hardware, software, application and telecommunication systems These individuals may require

training to develop the basic knowledge and skill sets These individuals will then participate in computer systems implementation and support activities to develop and practice these skills The AOJS project will expect that these individuals will work under whatever management and administrative organization is then currently in place within the JIC

Because the AOJS project cannot intervene in any other management issues, systems development, support, operations, agency reorganization or other activities of the JIC the need for a long-term solution to the replication requirements on the JIC must be solved by the JIC or with consulting assistance We recommend that the JIC with consulting advice define the makeup, scope of work and personnel allotment of a "replication unit" which will be assigned to work with the AOJS project or project system deliverables A "replication unit" need not be a discreet organizational unit but rather a virtual unit whose members have been assigned responsibilities for sustaining and replicating project deliverables Such a unit would be created using staff from various parts of the JIC A "replication unit" project manager should be appointed and empowered and responsible for work task integration Staff should be well trained on the equipment, software and applications involved The JIC should establish operations, support and replication methodologies and standards specific to project deliverables Finally, the "replication unit" must be incorporated into the new management structure that would be a product of the consulting services

Another organizational issue important to JIC is that of legal research The JIC currently attempts to maintain a legal research database of Court of Cassation opinions and provide research capabilities into the data This activity performs poorly and provides very little user satisfaction The United States' courts have found that the costs and resource requirements for attempting to provide similar legal research capabilities are not worth the effort and results Experience has proven that the private sector can and will provide quality research products at reasonable costs when encouraged to do so by the patronage of the courts and other legal professionals It is therefore, recommended that the MOJ with the assistance of the AOJS project seek out and test on-line subscription services and/or CD-ROM products for legislative laws and COC opinions Burdening the JIC with the requirements and responsibilities to provide internet services to the MOJ and courts or produce and update CD-ROM media for legal research are activities and costs that the JIC in its current condition is not equipped to handle with success

Proper organization can help technical staff be more productive If users can interrupt any technical staff person with a question or problem, effectiveness and efficiency will suffer Development staff members who are partially isolated from day-to-day operational problems are able to work faster and produce higher-quality products Typical technical organizational structures include many functions Small groups may have only programmer/analysts, operators, and trainers Larger groups may separate programming and analysis functions, systems programming and applications programming, maintenance and development programming, and hardware and software operational support They also may add auditing, communications groups, PC or local area network support, judicial support, and units that maintain specific applications Management and administrative functions also expand with the size of the technical staff

A major challenge to automation projects is communication (or lack of communication) between court staff and technical people Sound organizational structure is essential to good communication, cooperation, and productivity Employing qualified former court staff in analysis and training roles in the JIC can alleviate communications problems Training technical staff in court operations and procedures also has proved successful in judicial branch organizations in the United States

As court and technical staff have opportunities to work together, the quality of communication can be enhanced Technical training for court staff is essential Initial training in the use of case management applications is not sufficient, in-service training, cross training, and retraining by a dedicated training staff are required Training issues will be addressed in a later section of this report Programmers should spend time working in a clerk's office, and court staff should come to the data-processing area for design meetings and testing Social interaction alone can do much to bridge the tremendous gaps that can exist between these groups

We recommend that the JIC consider creating the following organizational units systems development, operations, user support, and administration A brief summary of each of these units follows

Systems Development

The systems development group should consist of four main functions analysis, programming, testing, and database administration Analysts create specifications for computer programs, prepare system design documents, and test completed programs against their specifications They are generally concerned with three parts of application programs, database structure, business rules, and user interface

Programmers transform the specifications prepared by analysts into working computer code They are also responsible for testing their programs to ensure that they work properly Database administrators are responsible for maintaining the conceptual and structural integrity of data resources by controlling changes to file and record structures

When the number of staff in these work groups becomes unwieldy to manage, larger organizations sometimes divide them into smaller units For example, analysts and programmers are often divided into groups with responsibility for developing new applications or maintaining existing ones

Key individuals often develop specialties within an organization like the JIC Specialties within this group could include management of source and object code libraries to ensure proper version control, research into emerging technology, software development tools, standards development, etc

While analysts are sometimes individuals with prior experience working in a court, they must also have very strong technical abilities The most technically demanding role is that of the programmer The productivity of these individuals varies widely, depending on their ability Good programmers produce several times as much work as average ones, so it is important to acquire the best skills available when hiring for these positions

Operations

We recommend that the JIC consider six functions to be housed in the operations group computer operators, problem management, telecommunications/networks, installation, inventory/contracts, and data entry

Computer operators are responsible for production work, for system backups and maintenance, archiving, running regular reports, and disaster planning The JIC staff should consider locating operations staff in individual courts as applications are installed, coordinating their work from the JIC facility

Problem management is the resolution of hardware and software conditions that keep people from working A single call to a *help desk* should provide all the assistance needed by a system user Help desk staff should contact the necessary hardware or software specialist, or vendor providing maintenance for equipment, as well as tracking the length of time required to resolve problems and providing feedback to a user waiting for assistance

Telecommunications and networking staff are responsible for the equipment and telephone lines that allow computers to communicate with each other These specialists install and maintain local area networks, wide area networks, and Internet services Creation and maintenance of World Wide Web sites could fit in this group, though individuals from many parts of the MOJ should be involved in developing content

A great deal of time is spent unpacking, configuring, and installing equipment, software packages, and upgrades, particularly when new systems are being implemented An installations group can perform these functions and allow other operations staff to avoid the distractions of trying to keep up with problem calls and simultaneously put new systems in place

Keeping track of hundreds of computer components, providing scheduled maintenance, and ordering repairs can be a tremendous undertaking Add to this the myriad of warranties of different length and maintenance contracts, and it is easy to see the need to have a team dedicated to this function Not only can this group facilitate the speedy resolution of problems, they can become experts in the maintenance options available to the JIC and save a considerable amount of money

The tremendous workload of preparing court opinions for electronic publication will continue to require a dedicated data entry staff Even when more and more opinions are created with word processing packages, there will still be a need to verify and format documents for inclusion in electronic databases This function will continue to be a responsibility of the JIC for some time to come

Maintenance of a computer room is also an important responsibility of the operations group More will be said on this subject under the heading of technology issues

The operations group will require a variety of specialists in computer operations, telecommunications, court applications, and so forth The consultant retained by the MOJ can prepare specific job descriptions for these varied responsibilities

User Support

The primary function of the user support group is training Training will be needed for the hardware and system software acquired by the MOJ, office automation applications like word processing, spreadsheets, and electronic mail, and applications programs created by the JIC The development of curriculum for new and in-service courses will be a tremendous undertaking

In addition to training, the user support group also assists in system design and testing, ensuring that new releases of application software are free from defects before being installed for use in the courts Staff also develops reference manuals, training materials, and other documentation needed by system users These individuals also can play an essential role in quality control or auditing functions

A through knowledge of court business and the case management and other applications developed by the JIC is essential for success in this area The ability to teach and develop educational materials cannot be overemphasized

The JIC must establish an equipment, application and user support unit This group should be well trained, personable, good communicators and be willing to help A help desk with telephone, fax and email communications capabilities must be established All automated systems users should be aware of their existence and how to contact them and feel free to ask for assistance The help desk should be the first level of contact for problem resolution Problems that can be diagnosed over the telephone should be solved immediately with the caller Those problems that cannot be solved easily must be researched and higher levels of assistance sought This may involve services provided by maintenance contractors for equipment and software or on-site support personnel, or dispatch of JIC personnel to the problem site In order to manage the workflow of the user support unit and help desk a problem management methodology must be developed, implemented and enforced There are many existing automated help desk record keeping software products and manual management methodologies successfully being used in the information systems profession Careful evaluation and selection of software and methodology that best suits the JIC's requirements should be a priority activity

Administration

The role of management in the success of the JIC cannot be overstated In addition to providing vision, motivation, and leadership to staff, JIC administrators coordinate with other parts of the MOJ, helping to ensure smooth operations There are also a number of substantive functions that belong within an administrative group

Planning is the foundation upon which good management and successful operations are built It is important that JIC staff always have a broad perspective of the initiatives that are being undertaken The planning process provides the priority setting and resource allocation to ensure that the most important work is being done first It also helps minimize the distractions

that come from non-essential tasks that may be suggested from inside or outside of the organization Finally, it breaks complex tasks into simple steps, which helps JIC personnel avoid feeling overwhelmed by the amount of work expected of them

Human resources issues always arise in any organization The JIC is in need of consultant assistance in developing job descriptions, a job classification program, salary scale, and performance planning and management functions, as a part of its human resources package

Budgeting and financial management are an important part of the administration of the JIC While budget preparation and expenditure management are separate activities using a different set of tools, both tasks require JIC leadership to balance policy and operational needs of the organization If MOJ leadership were to make budget preparation decisions and leave execution of expenditure management to JIC staff, many resource allocation problems would result Consolidating both of these activities in a JIC administrative group is an ideal solution This does not, of course, substitute for MOJ's policymaking role in the process

Related to financial matters is acquisition Particularly at times when a great deal of equipment is being ordered, the task of coordinating a large number of purchases can seem overwhelming Having a specialist assigned to acquisition issues will improve the consistency of the process and relieve senior managers of a great burden

Some technical organizations require specialists to compile statistics and perform other research on court information stored in computer systems If this is a need within the JIC, this function should be located in the administrative unit

Perhaps the most important issue affecting the productivity of JIC staff is project management Project management is the execution of the project plan and involves monitoring task completion, work assignments, schedules, budgets, and products Project management tools, while readily available and inexpensive, are very labor intensive to maintain and will benefit from having a specialist assigned

Another role of JIC administration is developing standards and methodologies for accomplishing the work of the organization As technicians are trained in a common approach to work and problem solving, the effectiveness of the group will exceed the capabilities of the individuals Team productivity is enhanced by the quality of tools and methodologies that determine how specifications are designed, how program code is written, etc

Obviously, there is a need for a variety of skills within the administrative unit of the JIC While a judge provides leadership to the JIC, it will always be necessary to have a senior technical director to ensure consistency and to avoid lost productivity during periods of leadership transition Strong technology background and management experience are an essential qualification for this individual

Staffing Issues

Building and maintaining an effective and productive team is a critical element in successful court automation projects Whether the MOJ hires its own staff, uses contractors or

consultants, relies on technical personnel from another government entity, or purchases software from a vendor, the quality of people involved is significant to staying on schedule and producing high-quality products

The project team should include an appropriate mixture of skill levels An organization composed of too many senior programmers and not enough junior- and mid-level programmers will have problems with productivity and staying within budgets Qualified court employees can function well in user analyst, trainer, and auditor positions These people know the organization and the work of the court, and their experience can be extremely valuable in projects The need for experienced senior computer programmers and operations staff in the JIC cannot be overemphasized

A technician who is not familiar with courts and existing court applications and hardware may not become fully productive in the JIC for one to two years Proper training in court organization and procedure, court applications, and hardware and software platforms in use can shorten this time Training is very expensive, but is less costly than ignorance

Technical staff may need training for new hardware, system software, development tools, and court operations Users may require training in systems administration, office automation packages, and the new court case-management application The plan should indicate what training would be offered, who would attend, on which days, at which locations Post-implementation training also should be provided

The best system ever created could be useless to a court if the people using it were not doing their jobs correctly Millions of pounds can be spent on hardware and software, yet the ultimate success of the system depends on the quality of work of the individuals with the lowest salaries and the least training in the courts Good training and quality control procedures are perhaps the most important challenges project leaders will face If training is not effective, the automation process cannot be successful

This training component must be a permanent part of the court In large court systems, full-time staff should be assigned to the task Smaller courts must ensure that someone is given the responsibility to assure that information entering the computer is accurate Regular audits of data input should be performed to identify problems and training needs

Those staff with operational responsibilities need beginning, intermediate, and advanced training to support the system, including security, backups, and troubleshooting Supervisors need beginning, intermediate, and advanced training in the software applications They should be the resident experts in all phases of system operation and should help identify and resolve problems Line staff need beginning, intermediate, and advanced training in the modules of the software application they will use daily If resources permit, cross training in other functions will increase the versatility of staff and promote more flexible assignments Office automation packages are often purchased with systems, training should be provided to those who need to use these functions as well

Training is available from several sources Although the vendor may be the only resource for applications software training, private training consultants and community colleges may offer training in networks, operating systems administration, and generic software, such as word processing and spreadsheets Computer-based training is provided by several vendors, as are videotaped courses and written educational materials These can be cost-effective substitutes for expensive classes Many applications are now providing on-line help and computerized reference materials Courts should move quickly to develop in-house expertise for a permanent training component

There are differences of opinion about how to train most effectively Some feel court staff should get away from their desks, telephones, and responsibilities in the office so they can concentrate their efforts on learning the new system Others believe training is best offered on-site, in the real world The best approach, where practical, may be a combination of the two Initial training should be held off-site Court staff should then have a test system available for practice until the implementation date arrives Trainers should be on-site for one to two weeks after the new system comes up Refresher courses and cross training should follow, either on- or off-site, depending on the nature of the materials to be presented Follow-up training is important because many new questions arise after implementation, and important details can be forgotten in the confusion surrounding new system start-up

Most systems require constant upgrades As programs are improved and features are added, training programs and instruction manuals need to be updated Project leaders should develop a process for keeping these courses and materials current

Documentation for the system reduces the need for staff to remember the details learned in class If they know answers are available and where to look for them, they feel more comfortable with the system more quickly Three types of materials need to be provided application reference materials, training guides, and system information

Application reference materials are the instructions for using the court case-management information system They should be detailed, easy to read, filled with illustrations, and well indexed Users should participate in their development

Training guides are materials used in training They contain more illustrations, exercises, and samples than reference materials and are structured to fit the flow of the training classes They are written at a much more basic level and need not be comprehensive recitations of system features and functions

System information is the collection of handbooks and reference materials provided by the vendor for all the hardware and system software Technical staff will be responsible for most of these materials, but they should be distributed to court staff as needed For example, court employees that do system backups will need operations manuals to assist them in troubleshooting when problems arise Those responsible for laser printers need the instruction manuals for periodic cleaning, changing toner cartridges, etc

Probably the biggest challenge is developing documentation for systems programmed by court staff Like almost every other data-processing application, court systems are developed on limited budgets with little time As problems arise and projects fall behind schedule, project leaders will be tempted to cut corners to keep the project on schedule and within budget Training and documentation, activities at the end of the project that are considered less important than making sure the system is completed and functioning properly, are often neglected

Technology Issues

Understanding and improving technology issues are very critical to the JIC Some general issues concerning basic requirements for facilities, basic infrastructure and equipment are addressed in a generic fashion in this section However, equally important are the technologies that must be developed or customized specifically to the unique nature of each organization, its' mission, staff and capabilities

These organization specific technical issues are those that relate to how the technology staff perform their work A few as examples will be offered as encouragement to the JIC to seek consulting services to perform needs assessments and design specific solutions for these very important technology issues Examples of such issues are, development and enforcement of types and levels of standards (programming, data, equipment, operating system and end user application software), systems compatibility issues, equipment and software upgrade and version control methodologies, evaluation of existing applications, platforms and personnel and options for what to do if they are found lacking

JIC has been dependent on vendor advice for equipment and software decisions and JIC applications have been written by technicians defensive of their products A significant technology issue is the need for JIC management to receive independent assistance to seek the truth about their technical environment, identify the problem areas, and decide what they should do with their findings

Another very important and potentially beneficial or disastrous technology decision that JIC is considering should be researched thoroughly The JIC has proposed to the MOJ that they become an Internet service provider The decision to provide such services and accept the associated cost, support and performance responsibilities is a major step that should be carefully considered before rushing to implementation The same careful considerations should be given to related issues of web site development and operations

When many staff are performing similar duties in disparate ways, confusion and disruption often result The larger and more complex an organization is, the greater need it has for uniform methods of conducting business Even the smallest organizations can benefit from some of the standards and methodologies that have been developed for systems development, maintenance, training, and so forth For example, see *Automating Court Systems*, a National Center for State Courts publication that has been provided to MOJ leaders

Many software tools exist that can speed the applications development process, such as code generators, editors, debuggers, computer-assisted software engineering systems (CASE), fourth-generation languages, and object-oriented database packages Some are included with

system software at no charge, some are inexpensive, and others are very costly Before making major investments, project managers should make sure the tool is needed and will fit with other tools and procedures in use

A final task in this area that could be addressed by a consultant is the adequacy of hardware and software in use by the JIC A complete review, followed by recommendations and priorities would help JIC leadership understand the most important needs of the organization

Facilities

Management of the JIC facility and the court buildings in which technology will be installed is an important topic for JIC management and the MOJ Ten issues are typically problems in computer operations in courts These issues are discussed below

- Heating, Ventilation, and Air Conditioning
- Electrical
- Cabling
- Telephone and Telecommunications
- Furniture
- Noise
- Lighting
- Fire
- Floors
- Radio Frequency Interference

Heating, Ventilation, and Air Conditioning

Building heat, ventilation, and air-conditioning (HVAC), systems should provide a draft-free office with a stable temperature and humidity Computer equipment usually requires an even more controlled and consistent environment Excessive heat or cold can damage hardware, insufficient humidity can cause static electricity and disrupt operations

While the building's HVAC is usually sufficient for PCs, small- to mid-sized network server configurations, and small minicomputers, larger equipment requires more attention Either additional air conditioning must be installed or a computer room must be constructed Dedicated environmental controls are also required if building air conditioning is unavailable at night, on holidays, or on weekends, if the computer cannot be shut down during these periods

Existing systems can sometimes be modified to supply sufficiently cold air Rebalancing the airflow can direct more cool air into the room housing heat-generating disk drives, uninterruptable power supplies, and other equipment Moving thermostats and adding diffusers can help

It is simple to determine the need for air conditioning and other environmental controls Computer manufacturers supply heat output ratings for their equipment in BTUs per hour BTU ratings are also available for room occupants, doors, windows, etc , though these amounts are normally negligible The sum of heat dissipation ratings for everything that will be in the room

(adding as much as 50 percent cushion for future growth) gives the size of air-conditioning unit needed

In computer rooms without raised flooring, either standard or special environmental control units can be purchased Raised-floor units send cold air under the floor, forcing it up through small holes directly into the computer hardware Large mainframes are cooled with water, rather than air, and supercomputers rely on liquid nitrogen for the extremely low temperatures they require

Larger computer facilities will normally have multiple air-conditioning units for the computer room This ensures a consistent environment, even if one unit fails or requires service Computerized environmental monitoring systems can track problems with temperature or humidity, power failures, or water under the floor, and automatically shut the system down and contact a designated individual by telephone

Electrical

Almost every piece of computer equipment needs electrical power Most can be plugged into a standard wall outlet Inexpensive surge protectors can be added to protect a court's investment in PCs and other equipment, but larger devices need protection that is more sophisticated Power conditioners stabilize the flow of electricity, but are usually not a guarantee of protection against lightning strikes and outages

Uninterruptable power supplies (UPS) provide the power conditioning previously mentioned and add protection against a complete loss of electricity They normally provide power for only a few minutes, long enough for an operator to bring the system down in an orderly manner Most power failures are very brief, so a UPS is a good investment for a computer that stores court information, whether it be a PC, minicomputer, or mainframe

There are limitations, however, to the protection and convenience provided by a UPS Battery maintenance is required, and some systems will not allow this to be done without switching the entire system off If there is an extended power failure at night when no one is available to take care of the system, the UPS batteries will be depleted and the system will still crash (although with some systems, an orderly shutdown can be accomplished automatically) On many types of hardware, if power is lost while staff is using a case-management system, the computer will stay up, but the terminals (which are not connected to the UPS) will go down In some computer systems, such a failure can damage or lock system files and may require the system to be restarted, although the processor and disk drives never lost power Despite these limitations, uninterruptable power supplies are still considered a good investment

When building a new facility or remodeling an old one, it is important to check the manufacturer's specifications for electrical power on all equipment that has been ordered, so if in-house lines and circuits are insufficient, others can be added or modified Some hardware requires special receptacles, dedicated circuits, or isolated grounding These specifications, though they make little sense to most people, are easily understood by qualified electricians Sources of electricity for all terminals, printers, PCs, and other office gear to be installed in older

buildings should be checked carefully Improperly polarized or grounded power outlets can cause serious damage or injury

Large facilities will require power monitors and testers as described above If a computer center is shared with a high-priority user, such as a law enforcement agency or emergency response team, diesel generators also will be required to guarantee continuous operation

Cabling

Cabling connects the computer with its peripheral devices, e g , work stations, printers, scanners, modems, disk drives There are two important issues related to cabling what kind of cable to use and how to run it from the computer to its peripheral devices

Cable of one sort or another has been the traditional standard for connecting computers to peripheral devices Coaxial cable, which has a woven ground wire surrounding the data transmission wire or wires to provide protection against interference, has been used extensively, as has a multi-wire standard called RS232, which has been dependable, but is relatively expensive Twisted pair wiring has replaced large cables in many places Twisted pair is a thin telephone wire that can be run along with telephone circuits, reducing installation costs High-speed networking requires a newer shielded wire that allows faster communications than earlier twisted pair configurations One of the latest technologies is fiber optics, in which light is transmitted instead of electricity It is not as susceptible to resistance and interference, and it can permit much faster data transmission Although costs are beginning to decrease, fiber optic technology is still developing and is quite expensive

Personal computer networks often use their own type of cabling Ethernet is one of the most-used approaches Some wireless networks are also being installed and may become more popular Whatever option is chosen, it should match the requirements of the computer or network Different wiring plans may require concentrators, signal splitters, or other devices

In some areas, fire code requires RS232, coax, twisted pair, and other wiring to be run through metal conduit unless it has special Teflon or other approved shielding Project managers or appropriate staff should be familiar with local requirements

Stringing cable in older buildings or between buildings can be quite a challenge Some facilities were not designed to accommodate this type of cabling, and installation can add a great deal of expense to a project For example, sometimes concrete must be x-rayed to locate steel support structures before drilling can take place through cement floors and walls It is important that the project manager not underestimate the time and expense that may be necessary Cost and time estimates for peripheral cabling should be one of the first priorities of the facility preparation process

Asbestos is present in some older facilities This substance is easily dislodged and blown through a ventilation system, so care should be taken to ensure that no asbestos exists before removing ceiling tiles in any building

Telephone and Telecommunications

Communication with a computer at a remote location requires a telephone line Attachment of workstations or printers in remote locations also can be established through the telephone network Telephone lines will be required in nearly every major automation project

Constant communications capability through networks normally requires the use of dedicated (or leased) lines These circuits are rented from a telephone company and are available 24 hours a day, seven days a week On a network, the computer is constantly communicating with the active devices

Periodic or limited-use communications can be accomplished through switched lines When a number is dialed, the telephone company's computer finds available lines and makes a connection If another location were called dozens of times, chances are the signal would use a different path on each occasion

Leased lines, because they are permanent, can be enhanced to improve the speed and quality of communication This process is called conditioning, and conditioned lines cost more than standard ones Most urban areas have made the transition in recent years from analog to digital circuits for data transmissions Digital circuits are much better suited to electronic communications than voice-grade analog lines The next generation of telephone technology will employ fiber-optic cable, which is being installed in some parts of the world

Telephones should be installed in computer rooms and any other work areas so technical staff can support users adequately and communicate with service personnel

Furniture

Until recently, standard office furniture has not been well designed for computer equipment Desks were too high for comfortable typing, and typewriter desk extensions were not wide enough to hold terminals and PCs While keyboard drawers and other accessories may be used to adapt existing desks, future purchases should accommodate computer workstations

Ergonomic factors must be considered There are many negative consequences of prolonged computer use, particularly in situations of inadequate posture or lighting, but back, neck, and eye strain are among the most common Carpal tunnel syndrome, a degeneration of tissues in the wrists and hands, is one of many more serious ailments that can result The court should purchase furniture and design work areas to prevent these conditions

Technical staff may need special furniture Tape and disk storage cabinets, printer stands with acoustic covers, and other equipment should be considered as needed

Built-in or plug-in technology will be used more in the future In the courtroom, the judge may have a computer monitor built into the bench Counsel will require electrical and telephone connections at their respective tables More media systems will be built into courtrooms to view simulations, remote testimony, and evidence Not only will this require the capability to play videocassette tapes or view slides, animation, or other types of computer simulations, but courtroom lighting and display areas must be such that everyone can see the

presentation Control panels may be built into the clerk's work area to control lighting, temperature, recording systems, sound systems, and presentation media

Noise

A well-designed office environment goes unnoticed by its users because they work in comfort and are not distracted The addition of even low noise levels, such as fans in workstations and spinning disk drives, can be troublesome for staff Impact printer noise can make it impossible to carry on a conversation on the telephone

Consideration should be given to noise that will be generated by new or upgraded computer equipment Placing noisy equipment next to busy employees can affect their productivity and morale

In facilities with walls that only go as high as the ceiling tiles, a soundproofing blanket of insulation in the plenum space can improve aural separation If noise is still a problem, a dual wall or a single wall with offset studs may be required

Lighting

Adequate lighting must be provided in all work areas, including computer rooms, if employees are to complete their work In the office environment, glare from computer screens can be a problem Monitors should be turned 90 degrees from strong light sources, and glare protection filters, made of polarized glass or dark, lightly woven fabric, should be provided

Fire

Local building codes will determine the type of fire protection needed when a facility is being modified for a computer system In addition, most vendors can provide recommendations for protection of their equipment Both resources should be consulted before modifying the facility

Water sprinklers are a standard in buildings in many parts of the world While water will douse a blaze, it also will ruin computer equipment There is also some risk to computer operations staff when high-voltage power circuits are present Despite these problems, this type of fire suppression system is widely used If ruining some computer equipment keeps a building from being destroyed, then the risk is probably justified Adequate precautions should be taken to reduce the risk of leaks or accidental discharge A dry system that does not store water in the pipes is preferred to a wet one

Large computer installations have relied on more-sophisticated fire suppression systems that use an inert gas, like halon These systems are more expensive, but can protect computer equipment while controlling a fire The gas in these systems is harmless to people, but some computer manufacturers discourage its use because of thermal shock to equipment that can occur when the room temperature is lowered suddenly by 30 degrees In order for halon systems to be effective, special dampers must be installed to seal the room completely when a discharge occurs Halon systems are now being eliminated throughout the United States because the gas is a factor in atmospheric ozone layer depletion Other types of systems are being developed, however, which will serve as suitable replacements

Fire walls (non-combustible with a one-hour fire resistance rating) and self-closing doors should be a part of every computer room design Fire, smoke, heat, and under-floor water detection monitors should be installed A 24-hour monitoring system that sounds an alarm or places an emergency telephone call also should be considered

Floors

Raised floors in computer rooms perform a variety of functions They allow the hundreds of peripheral device cables, telephone lines, and power distribution wires to be kept out of the way They are required for water-cooled equipment, and they improve the efficiency of air-conditioning systems because cold air can be forced up through the equipment that generates the heat They also safeguard staff from possible exposure to high-voltage electricity Finally, they can protect expensive equipment from damage if flooding occurs

If a raised floor is installed, the court should ensure that handicapped access is provided (with ramps) and that steps, ramps, and rails allow large equipment to be delivered

A final consideration is that whether raised or standard-level flooring is used, adequate drainage must be provided Floor drains must be sufficient in number and location to ensure that equipment and connections will not be damaged by rising water from broken plumbing, discharging sprinkler systems, or leaking roofs or windows

Although smaller systems do not require raised flooring, the choice of floor surfaces or covering is important Flat cable can be laid under carpet tiles with adhesive backing In dry climates, standard carpeting can produce static electricity that can make systems inoperable If carpeting is desired and special carpeting cannot be installed, static protection mats should be purchased They should be placed in any area where static electricity has been a problem To the extent possible, floor surfaces should facilitate moving equipment around the room as necessary to accommodate addition, replacement, or rearrangement of system components

Radio Frequency Interference (RFI)

The U S Federal Communications Commission requires that all computer equipment sold in the United States meet regulations concerning RFI While this is not usually a problem, it is possible that strong RFI signals coming from police radios, airport radar, or commercial radio stations could hamper court computer operations Even if local regulations are not a factor, care should be taken to avoid RFI problems

Operational Issues

Implementing a new court automation system is more like adopting a child than installing a washing machine It cannot be ignored after it is installed, it requires constant care and attention Although computer systems tend to stabilize after the first hectic weeks of operation, unceasing effort is required to ensure that the system meets its goals and objectives

In the following subsections we discuss many operational issues and implicit to each is the issue of recurring cost of operating information systems JIC must develop a greater awareness of the critical nature of planning for recurring costs and the need for timeliness in

responding to recurring requirements for the operations and support of the automation systems (i e supplies, paper, version upgrades, maintaining electrical and telephone services daily, etc) Without sufficient budget and supplies the systems will cease to function As MOJ organizations become increasingly dependent upon the automated systems to perform their work computer system delays and failures will become intolerable

Production

Many new tasks are introduced when a court is automated For example, a new computer system may replace manual completion of the Abstract of Traffic Conviction form But a new task has been introduced, someone must run a program periodically that extracts traffic disposition information and prepares it for the driver's license agency This is a production activity

Production work generally involves running programs to compile statistics, generate forms, reconcile accounts, or prepare information Since these programs usually must read every case in the database, they take a long time and can increase user response time if run during the day Most courts choose to run these types of programs at night

Scheduling production work can be a problem Preventive maintenance on equipment, night court, backups, staff schedules, and other activities can make it difficult to keep up with production activities Fortunately, the computer system can be designed to complete many of these tasks without much operator assistance

Along with the automated production activity comes the need for supplies Order and inventory processes must be established to ensure that the court has the tapes, diskettes, toner cartridges, forms, printer cleaning kits, and other materials needed to keep the system operating

Problem Management

No system is available 100 percent of the time Downtime for computers and peripheral devices, though less common than a few years ago, is going to occur, and plans should be in place to keep the court operational when the system is not Court staff should be the first line of support Because they are trained and have access to manuals and reference materials, they should be prepared to handle many day-to-day crises that arise

A Help Desk should be established for all but the smallest courts The help desk serves as a single point of contact for all users, for any type of problem Users should need to make only one telephone call to report a problem The help desk staff should have access to all the necessary resources to resolve the problem, including programmers, operations staff, and vendor support personnel

When a problem is reported, help desk staff go through a triage process to identify the appropriate method of resolution By diagnosing symptoms, it is possible to learn whether a hardware repair, software upgrade, system restart, program enhancement, or user training is required Often, help desk staff will ask the user to take certain actions to resolve the situation, such as turning the device off and back on Sometimes the system can be accessed remotely and the help desk personnel can view and correct the problem from their own workstations

Some problems are operational and can be addressed quickly, as just listed Some are software related and may require programming and reinstallation of the software application The help desk determines the urgency of the problem before proceeding

After talking to the user, the help desk contacts operations, programming, or training staff, if appropriate A service call may need to be placed with a vendor, if a maintenance contract is in place If multiple vendors are involved, the help desk coordinates their participation to resolve the problem For example, solving a telecommunications problem may require the computer hardware, modem, and telephone companies

The problem call is logged on a form or in a special software program designed for problem management The help desk and management can monitor progress and make the necessary callbacks to the user to keep them informed Automated problem management systems allow the court to track the speed of vendor response and whether maintenance contract provisions are being met They also help establish patterns of problems and solutions, which can be valuable in developing preventive measures

Operational Activities

Certain activities must be performed periodically to keep the system working smoothly and to protect the court against interruption of service and loss of valuable information Some of these operational activities include back-ups, off-site storage, database and disk reorganization, and purges

- Back-up
- Off-site Storage
- Data Reorganization
- Disk Reorganization
- Purge

In most automated systems, the computer stores information in files on disks Because disk drive technology is fallible, backup copies of the disk are made, usually to computer tape Each data transaction (addition, modification, or deletion of information) is made to the data files, or database, and an extra copy is usually made to a log file Because it takes so long to copy the full disk to tape, complete backups of all the disks are only done occasionally Copies of the log file (partial or incremental backups) are usually made daily, copies of the complete database (full backups) may be made weekly A backup of the full system (system backup), with all the programs, operating system, etc , may only be made monthly On computers that do not have large databases, partial backups may include only those files that have been changed since the prior backup

If the system fails and the information on a disk is lost, all the data files are erased and files from the last full backup are restored, or brought back from tape The partial backup log files are also restored, and the transactions are reapplied The only transactions that are completely lost (if the data and log files happen to be on the disk that went bad) are those that

occurred between the time of the last partial backup and the time the disk failed Consequently log files are usually kept on separate disks from the data files

Several generations of each type of backup are normally kept Sometimes corruption in data files is not noticed for several weeks, so the extra protection is important To guard against loss of data through physical damage to the facility, the penultimate generation of full backups is normally stored off-site

Other methods for protecting data include continuous backup, where copies of transactions are written to tape or disk as they occur, and mirroring, where updates are made to two entirely separate databases on different disks Mirroring is most common on local area network systems Fault-tolerant or redundant systems have two entirely separate computers that operate simultaneously If one system crashes, work continues on the other This is an excellent, albeit expensive, form of protection

As information is added and deleted from data files, they become fragmented Data can be scattered in many locations, and the system must work harder to access and store information, increasing response time Disks also must be reorganized This procedure consists of copying the files to other locations (on tape or disk), clearing the disks, and then restoring the files in a location and order that permits efficient access While it is a simple activity, it can take some time when data files are large

Most courts would like to have all the information for all their cases stored on the computer disk forever Unfortunately, this practice is usually too expensive to be practical Just as in a file room, the computer storage resources are limited and must be managed Retention schedules for electronic information need to be developed, as they are for paper records Purging is the process of removing information from computer disks Just because information is purged does not mean it is unavailable Much like sending paper records to an archive facility, courts can remove this information but restore it later, if needed

It is also possible to establish purging routines that only remove less important information, leaving essential case information intact In fact, it is possible to set up a multi-layer purge that moves nonessential information to tape several months or years after the case is closed, then moves the remainder of the data some months or years later Whenever information is completely removed, paper or microfilm indexes should be produced so that archival data can be accessed by case number or party name

Maintenance

When a computer and system software are purchased from a vendor, a long-term relationship is begun The equipment and programs will require installation, upgrades, preventive maintenance, and repairs Though the courts can do some of this work, most could not survive without assistance from the original service or product provider

- Warranty
- Maintenance Contract
- Time and Materials

- Depot Maintenance
- Self Maintenance
- Combination
- Software Maintenance

Most hardware and software products have some type of warranty, which guarantees the product for several months At the conclusion of the warranty, the court has several options It can purchase a service contract that works much like a health insurance policy When the machine is sick (broken), requires a routine checkup (preventive maintenance), or vaccination (upgrade) against a disease, the vendor performs the work at no additional charge to the court These maintenance contracts are probably the easiest, most convenient way to support a system, but are also the most expensive An important issue relating to maintenance contracts is the hours and days of coverage If a court can bring a computer system down during the day for upgrades, installations, and preventive maintenance, it can save a great deal of money over extended coverage provisions that require the vendor to perform these services after-hours

An alternative is the time and materials contract Under time and materials, the court has an agreement with the vendor to come on-site and repair equipment at certain times and under certain conditions The court pays for the cost of the visit, including replacement parts Time and materials contracts are usually less expensive than maintenance contracts, but can be much more expensive if catastrophic problems occur Another disadvantage is that it is difficult to budget for costs that are not known in advance

Depot maintenance is similar to a time and materials approach, except that the court is responsible for taking the equipment to the vendor, and there is no fixed-price agreement concerning labor and material costs Depot maintenance can be a cost-effective alternative for personal computers, workstations, and other small equipment, if there is a good repair facility in the vicinity

Self-maintenance is used when the court has the technical expertise and financial resources to repair its own equipment, install its own software, or purchase replacement equipment

Often, a court will choose some combination of these options, placing essential system components on a maintenance contract, peripherals on time and materials or depot maintenance, and software and inexpensive hardware on self-maintenance One component of a combination strategy that is sometimes used is to purchase a few spare PCs, terminals, and printers, instead of maintenance contracts for all these devices As failures occur, the broken device is replaced with a spare If there is sufficient technical expertise on staff, parts can be cannibalized from the accumulated broken devices The strategy chosen by a court will depend on the relative cost of each option and the amount of staff time that can be devoted to the more time-consuming approaches

If the court case-management information system is purchased from a vendor, the same maintenance principles apply If the court has used its own staff to develop the application, then a new set of issues emerges If a program is not performing as designed, it needs repair These

types of problems are dealt with like a hardware problem, individuals are assigned to fix them, and they work on the problems until they are resolved

Often, the court needs an enhancement a remedial, adaptive, or perfective improvement based on a change in design These types of changes take much longer and, unless the need is urgent, should require approval by the user group or policy committee

Performance Monitoring

Operational aspects such as response time, security and access, backup, network performance, file access, and disk utilization should be monitored System performance standards should be described in the contract, and the court should make sure any problems are addressed before warranties expire To ensure that ongoing performance is monitored properly, several areas need to be watched They include CPU utilization, disk storage, and memory By properly watching system performance, the court can maximize the benefits it receives from its investment in hardware and software Moreover, it can anticipate more accurately the need to upgrade system resources as the workload increases over time

Security

A comprehensive risk assessment should be performed periodically, and a security plan developed to address areas of risk The risk assessment should include physical, personal, hardware, software, and network security Security needs can be visualized as a three-dimensional matrix The three axes are resources, risks, and actions Each cell in the matrix represents an action to address a risk to a resource

There are six resources represented in the matrix They are 1) information, 2) programs, 3) people, 4) procedures, 5) equipment, and 6) facilities The five risks are 1) physical destruction, loss, or theft, 2) intentional modification, damage, or injury, 3) accidental modification, damage, or injury, 4) unauthorized use, access, or disclosure, and 5) failure or interruption The three actions are 1) prevention, avoidance, or deterrence, 2) detection, and 3) recovery, correction, or remedial action

For example, a cell in the matrix represents information, unauthorized use, access, or disclosure, and prevention, avoidance, or deterrence The security plan should address how unauthorized use, access, or disclosure of information (source documents, disk, tape, computer memory, paper output, screen displays, and telecommunications lines) is being prevented, avoided, or deterred

Another cell in the matrix represents a facility, unauthorized access, and detection The security plan should describe how unauthorized access to a facility is detected The security plan should address each of the 90 cells in the security matrix, though some will be covered in much more detail

- Security Plan
- Disaster Recovery

Other excellent works have been published to help develop and implement appropriate security measures At a minimum, a court computer-security plan should include locks and keys for computer areas, equipment, tools, and supplies, inventory of all equipment and software, logs and reports for audit trails, training, enforcement of security requirements, user IDs and passwords, password rotation, security access groups within applications, call-back security on dial-up lines, virus protection, elimination of unauthorized software on the system, and control of public access terminals and access points in other agencies outside the court

A good security plan also should include disaster planning This plan should address contingencies for resumption of service, recovery of vital records, and site restoration Disaster planning for data-processing resources alone is not sufficient, since an operational computer is meaningless unless a court or courtroom exists to use it

Conclusion

The JIC is a necessary and important component of the automation efforts of the MOJ

The JIC suffers from inadequate development and support methodologies, few and poorly enforced technical standards, staff with poor overall technical and application design skills, and poor technical skills cross-training The JIC is an organization that has developed from necessity and not from planning There is no clearly defined mission statement, poor integration of systems, and no organized user support Therefore, the JIC is implementing and supporting systems that need improvement in the construction, functionality, performance and user interface of the programs

The MOJ and JIC should make a commitment to improving the JIC through management reorganization, establishing equipment and software standards, improving technical skill, reviewing, improving or replacing existing equipment and software systems Key to accomplishing this the JIC must develop the ability to set goals and implement planning and enforcement to accomplish them Especially critical to better organization are the establishment of management structures for the administration of planning, personnel, finance-budget, and project management The JIC should organize itself according to organizational norms followed by most professional information systems and technology divisions This would include the formation of the following administrative and functional units A systems development unit would be responsible for the analysis, applications programming, systems programming, testing, software version control, and documentation tasks A telecommunications unit would be responsible for LAN, WAN and Internet systems, web site programming, and local and Internet email systems An equipment, applications and user support unit would manage system problems from a help desk assisted by on-site support personnel and supported by problem management methodologies and applications An operations unit would take responsibility for maintenance of equipment to ensure the availability and operations of the automated systems, manage maintenance contracts, and perform data backup and be prepared to implement disaster recovery plan when required A training unit is critical to planning for and maintaining staff and user skills necessary to their jobs

In order for the JIC to plan for and implement such sweeping changes, advice and assistance is necessary Highly knowledgeable and skilled individuals and companies exist that

can provide the type of professional services required by the JIC A companion document (a Request for Proposals for Professional Services) provided by the AOJS project should be used to solicit, evaluate and contract for consulting assistance The end result of such a services contract should be both a plan and implementation of a new management structure for the JIC organization, an organizational plan to maintain current operations and new planned initiatives, a comprehensive personnel development plan, and a through technical review, assessment, and recommendations concerning the current technology equipment and applications supported by the JIC

The timing for the strengthening and improvement of the JIC is critical The JIC must be capable of accepting, sustaining and replicating the automation products of the AOJS project Consulting services and JIC improvements should begin as soon as possible The JIC is, regardless of its' deficiencies, an operating organization with great potential to live up to all of the expectations and recommendations in this report