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RECRUITMENT STRATEGIES FOR DOD  
INFORMATION TECHNOLOGY MANAGERS

by

Sonja A. Johnson

September, 1994

Thesis Advisor:

Barry A. Frew

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Recruitment Strategies for DoD  
Information Technology Managers

by

Sonja A. Johnson  
B.A., Stanford University, 1980

Submitted in partial fulfillment  
of the requirements for the degree of

MASTER OF SCIENCE IN INFORMATION SYSTEMS MANAGEMENT

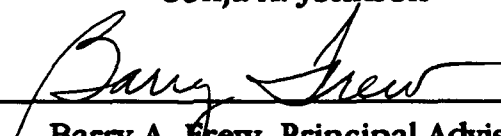
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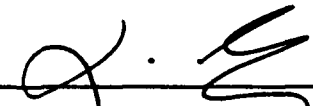
Author:

  
Sonja A. Johnson

Approved by:

  
Barry A. Frew, Principal Advisor

  
David R. Henderson, Associate Advisor

  
David R. Whipple, Chairman  
Department of Systems Management

## ABSTRACT

Information technology (IT) continues to rapidly change in an unpredictable manner. DoD's success in responding to its mission, given a sure reduction in resources, will be determined largely by how well it leverages information technologies. DoD IT professionals must provide guidance and leadership in the use of IT as a leveraging tool. DoD has not defined the roles for, or desired characteristics of, its IT professional or work force. Without these definitions, appropriate selections of people into IT positions will be even more difficult. Some HRO programs, initiated to deal with reductions of personnel, have biased the selection of federal government job candidates so that it is difficult to select the best suited, and sometimes even a qualified, candidate. This is particularly troublesome because of the breadth, speed and unpredictable nature of change within IT technologies. This thesis suggests methods for dealing with issues that improve the likelihood of selecting the best candidate for an IT position. It also describes desired characteristics of an IT professional that should be the focus of recruiting efforts and provides recommended interview questions and a skills checklist for use in the recruiting process. It identifies methods for improving recruitment results using today's rules and also suggests ways to change the existing system to get more consistent results when matching candidates with IT professional positions.

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## I. INTRODUCTION

The capabilities and composition of the American work force will dramatically change over the next ten years and will create some of the most encompassing challenges ever faced by the United States. (Wiley, 1992) The main challenge will be to find competent, qualified workers. (Lord, 1989)

As the twentieth century draws to a close, U.S. employers face a mammoth labor crisis. For the first time in decades there is a gigantic mismatch between jobs and the availability of workers to do them. Vicious competition has already begun for all sorts of workers - entry level, skilled, seasoned, professional, and managerial (Lord, 1989).

The Department of Defense (DoD) will likewise be affected by this labor crisis and will face an unprecedented challenge in recruiting capable employees. (Carnevale, 1991) Recruiting is important in any business; in the 1990s, however, "...recruitment will be the factor that will most affect success in achieving business and corporate objectives..." (Curnow, 1989) Not only will recruitment be the biggest single challenge facing personnel managers, but organizations failing to recruit and retain the right people will go under (Curnow, 1989). Thus, in a Department of Defense rightsizing environment, recruiting the right people has become even more critical. This environment mandates that DoD do more with less, and it is essential to have the right people to meet



this management challenge.

Recruiting, however, is only one stage in the human resource development process which has four stages: recruitment, selection, training and retention. (Most literature generalizes both recruitment and selection as recruitment since those recruited may generally be considered and selected. Since this is not the case within DoD, this thesis will consider each a separate process.) Recruitment is getting the right people to apply for the job; selection is choosing the person that best matches job and environment requirements; training an individual either maintains or improves performance and worth; and retention is providing job satisfaction by doing things to keep identified workers productive and motivated.

Successful recruiting depends a great deal on general economic conditions of the country at the time. Benefits and salary ranges are very tangible aspects of recruitment. Less tangible aspects such as managements' enthusiasm and attitude towards the work, workers and work place, flexibility and communication styles can also play a major role in recruitment. These intangibles can often be used as powerful recruitment aids. As employers experience increasing difficulty finding and attracting top candidates, they will find it imperative to develop creative recruitment strategies and to rethink ways to market their companies and their jobs. (Wiley, 1992)

The main challenge for companies is to rethink and restructure their recruiting activities in order to attract competent employees in the face of decreasing educational credentials and dramatic demographic shifts in the work force entrants. Such a challenge broadens the scope of recruiting and requires innovative, improved and multifaceted recruitment strategies (Wiley, 1992).

The author believes that selection is the single most important stage of the human resource development process.

Human resource selection is critical for the management of organizations because choosing employees is necessary in all organizations, and the quality of choices often affects organizations for decades. Poor selection is not just a waste of time; it costs employers much money, year after year (Chang, 1991).

Recruiting, training and retention are important stages because without them an organization is not likely to achieve a stable and proficient work force. Regardless of how well you do those things, however, if the wrong people are selected for a job, the human resource process will fail. Repairing this failure will require inordinate effort in training.

Training is a powerful tool that can facilitate win-win scenarios for both employer and employee. It can be used by an employer as a reward and/or a means to develop individuals' skills. Training helps an employee remain motivated and challenged and improves an employee's promotion potential by expanding his/her skills. While training alone cannot guarantee success, inadequate training alone can guarantee failure. (Frew, 1994)

Retention of top performers is good for any company.

Because monetary incentives are important, however, long-term retention may not be realistic. One of the author's premises is that a successful human resource development process focuses on the value of employing high achievers, even if for shorter periods of time. A process that supports and retains mediocre performers for longer periods of time is less effective. This premise is based on the author's observations and experience as a manager in a number of organizations. This is not to suggest that a company should encourage high turnover; retention should be managed to maintain a well-rounded work force.

While changing demographics impact the pool of talent available to employers and competition for workers becomes more intense, (Lord, 1989) finding people for the information technology (IT) environment will become even more difficult since IT continues to rapidly expand and evolve in an unpredictable manner. At the same time, IT is becoming more strategically oriented in terms of an organization's bottom line. Information Technology has evolved at a rapid rate and changed the way organizations do business. (Information Resources Management Service, undated) Correspondingly, the information systems (IS) occupation has become more difficult and complex. "It is much harder to be an IS professional today than it was 10 years ago. It is a quantum difference." (Hildebrand, 1991) The IS occupation is also one of the fastest growing sectors in the U.S., assuming substantial

importance in the emerging information age. (Orlikowski, 1989)

The degree to which a company leverages information technology often separates the successful from the unsuccessful. The information systems work force, in particular information systems managers, are what DoD relies upon to provide this IT leveraging.

The government is changing the way it does business. The goal is to create a government that works better and costs less. Information technology will play a big part in helping us reach this goal, but it is the people that use and manage the technology that are key (Information Resources Management Service, undated).

The skills, abilities and expertise of those individuals using and managing information systems will have to grow to keep up with technology.

It is this increased criticality and focus on IT leveraging that causes the author to focus her attention on this issue. While much of this thesis may have government-wide application, its primary focus will be DoD. This thesis identifies the current DoD IS work force and recommends to DoD managers how to recruit and select most effectively.

## **II. THE DOD INFORMATION SYSTEMS WORK FORCE**

In the past, data processing personnel tended to be lumped into a single group called computer programmers (Moore, 1991) and an individual needed to have the word "computer" in his/her job title in order to be considered part of the information systems work force. Today, the phrase IS work force generally describes a group of individuals using computers and/or other information technologies to perform significant portions of their jobs. Based on job title, it is relatively easy to determine the likelihood that an individual uses a computer or information system in the performance of his/her job. For example, a Dental Hygienist is not likely to use a computer or other information system to perform a significant portion of his/her job while the portion is significant for an Office Automation Assistant. It is much more difficult, however, to quantify a significant portion. This is especially difficult when determining group affinity or membership. For example, many Librarians do not use IT at all in the performance of their jobs; other Librarians are very proactive in implementing and using effective information technologies. Thus, including a job series (a recognized occupation or job title denoted by a numerical code - i.e., 334 Computer Specialist) such as Librarian in the IS work force is, at best, a guess - that the individual uses

computers and/or other information technologies to perform his/her job and that the portion is significant.

The Office of the Assistant Secretary of Defense for C3I's OASD(C3I) September, 1992 draft report "Information Systems Education, Training and Career Development" numbers the Department of Defense Information Systems work force at 74,285 civilians and military officer equivalents. Of this number, 29,856 are in a job series entitled Computer Specialist and 2,934 are in a job series entitled Computer Scientist. Some of the rest occupy job series entitled Electrical Engineer (13,447), Communications Manager and Specialist (8,772), Librarian (986), Management and Program Analyst (3,825) and Mathematician (1,329). A complete listing of the job series the OASD(C3I) considers to comprise the IS work force is included in Appendix A.

One estimate of the number of federal civilian Computer Specialists is 49,042. As part of fiscal 1992 budget requests, approximately 120,140 computer work years were reported to the Office of Management and Budget; only about a third of this number, however, was accounted for by Computer Specialists (Head, 1992). As noted in Government Computer News, "...it is evident that many people who work with computers are not classified as computer professionals." (Head, 1992) (Note: The DoD IS Work Force breakdown cited earlier was eventually left out of the final report. Perhaps the authors recognized data and definitional problems.) These

and other available data are insufficient to draw conclusions with regard to the IS work force. "...there is little comprehensive or systematic understanding of IS work and IS workers." (Orlikowski, 1989) This lack of data indicates a serious lack of knowledge concerning who comprises the IS work force and what it does.

The OASD(C3I) report represents a shift in thinking. Why? Because it recognizes that IS skills are integral to performing a gamut of positions traditionally not included as part of the IS work force since the word computer was not in the job title. Also, this report appears to have been an attempt to address the issue of how to identify job series requiring a significant amount of specialized computer knowledge. It should be noted, however, that the OASD(C3I)'s list, as shown in Appendix A, is by no means comprehensive; it omits a number of job series. Examples of excluded job series include Office Automation, Computer Operation and Procurement. It seems reasonable, in the Procurement Series, for example, to expect an individual responsible for procuring either small or large computer systems to have some computer knowledge. According to the Information Resources Management Service, one of the main problems with information technology acquisitions is insufficient technical skills of acquisition individuals. (Information Resources Management Service, 1989) Some would argue that someone does not need to understand the subtleties of computers (their platforms or interface considerations) to

procure them. The author would argue that in today's technologically advancing and increasingly complex environment it would be easier to procure compatible and integratable technologies if the buyer had some level of technological knowledge. Similarly, while OASD(C3I) included Management and Program Analysts on their list of job series comprising the IS work force, Budget Analysts were not included. Also, Budget Analysts cannot properly allocate IS fiscal resources without an understanding of IS lifecycle management, nor can they identify correct funds (operation funds versus capital investment funds) for a technology purchase without a technological base from which to draw. Thus, the author has included Appendix B and thinks that it, together with Appendix A, represents a list of job series that more accurately depicts the true composition of the DoD IS work force.

**A. ALTERNATIVE METHODS TO IDENTIFY AND/OR QUANTIFY THE DOD INFORMATION SYSTEMS WORK FORCE**

The author has suggested which job series should comprise the DoD IS work force, but why is that relevant? Four reasons why DoD might wish to be able to identify its IS work force are:

- to identify areas in which to put program money options

The Federal Government invests over \$20 billion a year in information technology, accounting for 1.7% of the total budget in the fiscal year 1993. The Office of Management and Budget (OMB) projects that federal spending on



information technology will continue to grow even as agency budgets are reduced. Such a substantial investment requires a corresponding one in the people that use and manage that technology (Information Resources Management Service).

- to be able to shape an IS force for the future
- to increase the size of the IS pool from which DoD can draw
- to improve and expand IS training and career growth/pathing (an area in which many organizations are weak)

According to an article in PC Week, "...little or no attention is being paid to the career path of many of the most talented and relied upon people in IS departments...IS shops have long been weak on developing career paths, to put it mildly." (Seymour, 1993)

The question remains, however, how can those individuals within the job series suggested, who possess specialized computer skills or knowledge, be identified? Because of the existing complexity of the DoD personnel system, minor changes to the system could dramatically affect a multitude of programs and a domino effect could be devastating to some of those programs. The author has made the assumption that DoD would not wish any changes to negatively impact any existing programs. In other words, DoD's purpose would be to improve knowledge.

The author suggests three alternative methods to identify and/or quantify the DoD IS work force:

1) Create a new occupational group (for example, GS-2200 Information Systems Group.) An occupational group refers to related occupations that are grouped together. A job series generally corresponds to a recognized occupation (Office of Classification, 1992).

2) Add a computing knowledge designator (a label or code used to indicate that an individual possesses a certain degree of computing knowledge) to existing job series (for example, 343 Program Analyst, 343C Program Analyst with computer knowledge) and to open and vacant job billets. (A job billet is a position or slot that can be occupied by an employee.) A designator on a billet would indicate that a specified amount of computing knowledge is required to perform the job.

3) Conduct a survey of tasks actually performed by individuals in existing job series and billets.

The following three sections describe some implementation-specific details so that the reader gets a better mental picture of the strategies suggested.

#### **1. New Occupational Group**

Before creating a new occupational group, it would be essential to specify the training, education, knowledge, experience, demonstrated skills and/or traits required to enter or transfer into the new group. Creating a new occupational group would immediately enable DoD to begin both identifying and quantifying the IS work force as individuals transferred into or joined the new group; at the same time, however, other programs involving the recruitment, promotion, movement and retention of personnel could be negatively impacted.

For example, the Priority Placement Program (PPP),

also known as The Stopper List or stopper, currently gives placement priority to certain individuals - those losing jobs due to reductions in force, individuals returning from overseas assignments and military spouses. Currently all job openings are entered into the PPP system. Additionally, all PPP candidates are entered into the system for up to five job series for which they qualify. Based on job series, it is then determined if there are matches - job openings that match job applications. (This is called matching the stopper or determining if there is a stopper match.) To prevent a negative impact to the PPP, the new occupational group's job series, the old occupational group's job series and all PPP candidates' new and old job series would have to be evaluated for matches. Over time, the creation of a new occupational group requiring computer skills would improve the quality of the matches made by the PPP since the job series would be more reflective of the skills required by the job and the skills of the individual.

Additionally, based on job series alone, qualified candidates may be prevented from obtaining or even being considered for positions for which they would otherwise be eligible. For example, within the same organization, a lateral transfer of an individual is allowed without clearing the stopper list (going through the matching procedure described above) if the individual is transferring within the same job series. Establishing a new occupational group and

job series could preclude an individual in an old occupational group's job series from being able to make such a lateral transfer. This would certainly negatively impact the individual involved by not allowing him/her the opportunity to move into a new position. It is also restrictive from the organization's point of view since it would not allow the organization to use the talents and knowledge of their existing work force. Again, with the passage of time this possibility would no longer be relevant since individuals capable of meeting the requirements of the new occupational group would have had an opportunity to have made the transfer into that group.

## **2. Designator**

As with creating a new occupational group, it would be essential to specify the training, education, knowledge, experience, demonstrated skills and/or traits required both for an individual to obtain a C-designator on his/her job series and for a billet to be C-designated. Once an individual's job series has been C-designated, he/she should continuously occupy C-designated billets or be required to re-qualify for the designator.

Adding designators to individuals' existing job series could afford DoD immediate knowledge of the current size of the IS pool of personnel. Those deemed qualified for the computing designator could immediately be designated.

Those progressing toward qualification and in a designated billet could continue without being negatively impacted by lacking the designator. Over time, the designator would provide increasing accuracy to the size, qualifications and locations of the IS work force.

Based on qualification requirements of computer-related positions and an anticipated increase in complexity of IT, creation of a new occupational group would eventually be recommended. The negative impact of such a creation would be minimal since, as DoD's ability to identify and grow the needed work force improved, those individuals unable to obtain the designator would generally not qualify to move into new, designated positions.

### **3. Survey**

If no change is made in the current job series structure, then it is impossible, without examining each position individually, to ascertain the exact number of individuals comprising the IS work force. DoD will not know who comprises the IS work force and thus, will not be able to consciously plan for ensuring an adequate IS work force in the future.

It would be possible to estimate the size of the IS work force by surveying a statistically significant number of individuals in each job series and determining a percentage for each series requiring significant computer knowledge.

Such a survey would provide DoD with more information than it has now. For example, it would enable DoD to determine if the IS work force was growing or declining, and in which job series. It would only be a snapshot in time, however, and would not provide an on-going source of information. A survey's value would be extremely time-sensitive since most work forces continuously change. A survey would not enable DoD to improve career training or development.

#### **B. RECOMMENDATION**

DoD must first define/identify the training, education, knowledge, experience and demonstrated skills and/or traits required to be a member of the IS work force. Then, the recommended short-term alternative is to establish a designator for each IS billet. The long-term recommendation is to create a new occupational group consisting of all the designated billets. The author suggests that such a group be comprised of the job series listed in Appendix A and Appendix B, with modifications to the names of the specific job series to be more reflective of the computer specialty and to maintain congruency with the current format used by the U.S. Office of Personnel Management (OPM).

It should be noted that although recent attempts to reinvent the government have caused most of OPM's Federal Personnel Manual (FPM) to be discarded, from an implementation standpoint this has had little effect. The FPM contained a

great deal of material, most of it offering advice and discussion versus rules or regulations. Although the advisory material has been discarded, the rules are still the same. Thus, a modification to the current system should maintain congruency with OPM's current format.

### III. THE DOD INFORMATION SYSTEMS PROFESSIONAL

#### A. JOB SERIES

The author has suggested a list of job series comprising the DoD IS work force, but who are DoD's IS professionals? Few authors define IS professional; the Information Resources Management Service suggests that an IS professional must be able to use, manage, plan and acquire information systems and technology. (Information Resources Management Service, undated) Other literature suggests that an IS professional is someone who designs, implements, operates and manages IS resources. (Orlikowski, 1989) The author has used the definition, "IS professionals must have a skill set that enables them to conceive, design, develop, acquire, implement and maintain effective information systems," (Frew, 1994) to evaluate each job series listed in Appendix A and Appendix B. Only seven of those job series listed are likely to contain IS professionals. They are: 334 Computer Specialist, 391 Telecommunications, 392 General Communications, 801 General Engineering, 854 Computer Engineering, 855 Electronics Engineering and 1550 Computer Science. Only very few people are likely to have all of the required attributes in the skill set and yet be listed in the other job series. Even though a Mathematician, for example,



might have considerable knowledge regarding computing, the knowledge, experience, education and training that enable a Mathematician to have that title would generally be in the area of mathematics.

The U.S. OPM Handbook of Occupational Groups and Series lists 446 job series. The likelihood of randomly selecting an IS professional from this group is very small. Appendix A and B list a total of 58 job series, or 13% of the total, that represent the IS work force. While the likelihood of randomly locating an IS professional is higher within this group, the number of IS professionals in these 58 job series is still very small. The seven job series listed above comprise a sub-group within the IS work force where there are very likely to be IS professionals. Thus, IS professionals comprise a portion of the total IS work force; the IS work force is not comprised entirely of IS professionals and Computer Specialists comprise the majority of the IS professional sub-group.

#### **B. SKILLS**

Computer Specialists' grades range from GS4 to GS15. Most of the existing billets are between GS11 and GS13. The highest number of billets is at grade level GS12 with an annual salary somewhat above \$37,000. This is slightly higher than the government-wide average salary of \$34,100 (Head, 1992).

If this describes a typical hiring window for IS professionals, then what are the skills, personalities, education, training and experience backgrounds that should be targeted? "Relative to other occupations, few empirical studies have been documented concerning personality characteristics of information systems professionals." (Moore, 1991) Literature discussing the subject, however, suggests a variety of desirable characteristics and skills. A few of those mentioned include:

- managerial/business skills (Cheney, 1990; Stokes, 1989; Hildebrand, 1991)
- problem-solving skills (Cheney, 1990; Hildebrand, 1991)
- interpersonal skills including bargaining skills, patience, empathy, diplomacy and tact (Stokes, 1989; Radding, 1991; LeDuc, 1986; Hildebrand, 1991)
- diverse interaction skills and team compatibility (Hildebrand, 1991; Wiley, 1992)
- imagination, energy and perseverance (LeDuc, 1986)
- a variation of skills and the ability to select from a repertoire of skills (Grindlay, 1984/1985; Cheney, 1990)

This list is by no means comprehensive. The Partnership for Research in Information Systems Management (PRISM) suggests that there are three types of information systems professionals who need to be sought or developed in the 1990s... They are: high-level business analysts, multi-disciplinary team leaders and super technical people (Sprague & McNurlin, 1993). While high-level business analysts need to

have both company and general business knowledge at a senior-level, multi-disciplinary team leaders should be people who like to work in groups and remain with an entire project to completion. Super-technical people should know at least one technology extremely well (Sprague & McNurlin, 1993). An article in CIO Magazine sums up one discussion regarding desirable skills, "Over the long-term, there are just two skills to worry about: learning to learn and learning to change." (Pastore, 1993) The author suggests that certain skills and traits should be inherent in all IS professionals.

First, and most important, is an ability to initiate, and thrive in, a changing environment. "The computer industry is in a constant state of change, so whatever a computer professional may be doing today, it is unlikely that he or she will be doing the same thing, or working for the same company, in five years." (Hooten, 1993) The importance of being comfortable with change and having an ability to change is a theme echoed throughout information technology literature. "IS professionals are making major change and confusion a way of life..." (Frew, 1994) An article in Corporate Computing describes the dilemma yet another way: "Today's technowhiz is tomorrow's fossil if he or she can't adapt to changing platforms and languages. Smart CIO's are staffing up with people who thrive in ambiguous, unstructured situations." (Speer, 1992)

A similar way to describe this is the degree to which

an individual is resilient. "Resilience is the ability to absorb high levels of disruptive change while displaying minimal dysfunctional behavior. Resilience is the force that allows people to go beyond survival and to actually prosper in environments that are becoming increasingly complex." (Conner, 1993) Thus, in order to be successful in today's environment, the IS professional must be resilient. Five things to watch for when attempting to determine an individual's resiliency are, is he/she:

- positive about self and environment; challenged by the opportunity to succeed rather than finding a reason to fail;
- focused; on a path; in control, not victimized; spending time moving down a path, returning to the path or determining the path;
- flexible with respect to how this focus is achieved; are barriers approached innovatively;
- organized; does he/she define and make order from chaos or become immobilized;
- proactive; does he/she selectively engage change and move into the turbulence versus run away (Conner, 1993).

If an individual is resilient, he/she is very likely to be able to initiate, and thrive in, a changing environment.

The second most important trait is an ability to deal effectively with people. Admittedly this is a somewhat less critical trait for a highly technical person than for a team leader or high-level business analyst. "The stereotypical programmer has little need for social skills, but in real

life, all programmers need to be able to interact with people." (Hooten, 1993) It is the author's premise that while you can teach technical skills, it is much more difficult, and often impossible, to teach people skills within a time frame that will enable the IS professional to be effective. While thriving in a changing environment is a skill or ability, being a "people person" is a trait (a distinguishing feature) of an individual. The time frame necessary to modify an individual's traits (if possible) is much longer than that needed to teach or train a skill or ability (a proficiency or power to do something that comes from training or practice.) An article in CIO Magazine says it differently, "We can always train people in new technical disciplines, but...what we really need are leadership skills." (Pastore, 1993) Leadership skills are only one of the people skills targeted by the author.

Another critical trait is a willingness and ability to learn quickly. Given the pace of change in the current environment that an IS professional must work with and within, he/she must be willing to learn, and should be a quick learner. Corporate Computing suggests, "When hiring, find out how many new tasks a person has leaped into, not how many operating systems he or she knows. It's not just current computer skills that are important; it's how efficiently more can be learned." (Speer, 1992) Along with the requirement to be a quick learner, it is important to emphasize that a

desired attribute of this skill is to learn independently by teaching oneself - using on-the-job experience, manuals, other people or trade publications - and not relying on formal education, training or spoon-feeding.

Thus, the ideal candidate thrives on change, can quickly adapt, is a people person and is a quick, independent learner who is interested in information technology.

There are a myriad nice-to-have skills/traits, however, that should be included on a recruitment requirements list. They are:

- flexibility
- patience
- a positive, enthusiastic, out-going personality
- strong communication skills
- strong management skills, including an ability to motivate others
- comfort with responsibility
- ability to build, lead and play "team" roles
- ability to delegate
- ability to plan and organize, manage time and projects
- ability to self-start
- ability to solve and trouble shoot problems
- ability to parallel process and work with significant numbers of interruptions
- self-sufficiency
- self-motivation

- a "split personality" (i.e., technical, yet a good teacher, independent, yet team oriented)

Although the mix of these additional characteristics is important, it is not critical as long as the base of critical traits and abilities is present. A list of recommended interview questions and a skills checklist are included in Appendix C. It should be noted that many of the traits, skills or abilities listed may be considered to be part of the top three characteristics already discussed. For example, people persons typically have out-going personalities and good verbal communication skills. Independent learners are typically self-starting, self-sufficient problem solvers. Inherent in individuals who thrive on change is flexibility, resiliency and an ability to work in unstructured environments with unstructured processes.

Experience should reflect many of these characteristics. In addition, experience performing as an interface between various groups and professional levels of people, a general business orientation and a customer service background should be emphasized. Experience in a research environment and in recommending the use of specific hardware and software is a plus. It is important to note that specific experience in the type of work being recruited for, or a computer science background, should NOT be required when recruiting an IS professional.

While the current average length of service of federal

civilian employees is 13.5 years, a recent study found that average time on the job for a Local Area Network (LAN) Manager ranged from 18 months to four years. (Butler, 1993) This leads the author to suggest that while a longer track record would be nice to have, a length of experience somewhere between two and four years should be considered adequate for most mid-range IS professionals. A length of experience somewhat longer and commensurate with the length of service of the rest of the work force should be expected for a more senior IS professional.

Although there are always exceptions to a rule, the author suggests that at least undergraduate-level education is positively correlated with success as an IS Manager. "IRM professionals are engaged in an occupation that requires advanced education and training. (Information Resources Management Services) While some graduate education is nice, it is not necessary for success. As with experience, formal education or a degree in computer science or a related field is not necessary. The critical success factors are the skills, abilities and traits already discussed, with experience and demonstrated success following in importance. A distant third is education beyond the undergraduate level; the author suggests that this is true for all levels of IS professionals since two out of the three critical factors for success are traits versus educable skills or abilities.



#### **IV. CURRENT DOD RECRUITMENT PRACTICES**

##### **A. HIRING FREEZE**

DoD has a freeze on hiring actions that has been in effect since January 11, 1990 and is expected to extend it through September 30, 1994. Based on the current environment - downsizing in most cases - the freeze is unlikely to be removed soon.

The author believes the purpose of the hiring freeze is to provide continued employment for as many current DoD employees as possible. Thus, vacated or newly created positions are filled with a rearrangement of the current work force. Over time, as employees have retired and many of the best have been recruited away by more money and/or better opportunities outside DoD, it is the author's opinion that the quality of the pool of candidates from which a DoD position can be filled has declined. "...there is serious erosion in the quality of the human capital base in the United States civil service." (Carnevale, 1991) Although some positions within DoD are exempt from the DoD hiring freeze, their number and nature are not significant enough to significantly impact the quality of the DoD candidate pool. Examples of exempt positions include temporary positions, seasonal positions and positions funded with money from other countries.

## **B. RECRUITMENT SOURCES**

Although OPM literature encourages selection of candidates from a wide variety of selection sources, in reality, the sources of candidates in the current environment include: the Priority Placement Program, internal merit-promotion and three student programs.

### **1. Priority Placement Program**

The Priority Placement Program (PPP) was established to assist employees who have been adversely affected, i.e., employees who have been separated or downgraded as a result of Reduction-In-Force (RIF) or Transfer of Function actions. This program, in most instances, is considered a non-discretionary staffing source (U.S. Office of Personnel Management, p.19).

At most organizations within DoD, a RIF would be based on length of service. (In a few DoD organizations participating in pilot personnel programs, RIFs are based on other criteria including performance, job type and veteran standing.) Performance, skills and abilities and personal traits are generally not considered.

Separations or downgrades as a result of Transfer of Function occur when the responsibilities of an individual are eliminated or shifted to other personnel. It seems reasonable to conclude that the best performers, with the best and most versatile sets of skills, abilities and traits, will

be retained by an organization since they are more capable of absorbing additional responsibilities, while the less capable employee is likely to enter the PPP as a result of a Transfer of Function.

Additional employees likely to be found in the PPP are spouses of military personnel and individuals returning from overseas assignments. These individuals' participation in the PPP is based on circumstance rather than on performance, length of service or other criteria.

## 2. Merit-Promotion

Merit-promotion is considered an internal recruitment source. (U.S. Office of Personnel Management, p.20) Only current federal employees are considered internal. This is misleading, however, because in practice, free movement of employees between all federal agencies is not allowed. An employee must be currently employed by DoD or be on approved leave without pay to be considered under merit-promotion for another DoD position. Merit-promotion is the selection and movement of a candidate from his/her current position within DoD to an equal, higher, or potentially higher position. Potentially higher positions are called career ladder positions. i.e., GS5/6/7. This means that as long as the employee meets time in grade - a minimum amount of time in a grade, typically one year - and is performing at a satisfactory level, he/she must be promoted to the next higher

pay grade. Not promoting the individual would constitute an adverse action - a personnel action that negatively affects an employee.

### **3. Student Programs**

#### **a. Cooperative Education Program (CO-OP)**

The CO-OP program is considered an external hiring source. To be eligible, a candidate must be a student enrolled in a high school, associate, baccalaureate or graduate degree program or a participant in an undergraduate certificate or diploma program of not less than one year (U.S. Office of Personnel Management, p.15). Students may work either alternating or concurrent work/study schedules. According to Human Resources Office (HRO) literature, CO-OP students "...may be converted to career or career-conditional appointments within 120 days after satisfactory completion of the CO-OP program requirements." (U.S. Office of Personnel Management, p.15) In practice throughout the federal government, the offer of conversion to a career or career-conditional appointment is not an option, but a requirement of participating in the program.

#### **b. Federal Junior Fellowship Program (FJFP)**

The FJFP is also considered an external hiring source. This program is for graduating high school seniors who meet financial need criteria and attend school. Students work part-time while attending school and full-time during

vacation periods.

**c. 1040 Hour Appointment**

A 1040 Hour appointee must either be a full-time student attending high school, an accredited college or university, or be a high school science or math teacher. The 1040 Hour Appointment program is considered an external hiring source and, in practice, a student program. The purpose of an appointment must be to assist scientific, professional or technical projects, and the appointee must be pursuing courses related to the field in which he/she will work. Appointments cannot be made for routine trade, labor or clerical positions. An appointment can be made up to the GS-9 level. The appointee may work a part or full-time schedule, but may not work more than a total of 1040 work hours in a calendar year (U.S. Office of Personnel Management, p.18).

**4. Other Sources**

If a position is exempt from the hiring freeze, then two additional external sources of candidates may be considered: reinstatement eligibles and veterans.

**a. Reinstatement Eligibles**

Reinstatement eligibles are former employees with three years of continuous service (career-conditional), veterans who have served at least one day in a career-conditional appointment and former employees with less than three years of continuous service who are applying within

three years from their date of separation (U.S. Office of Personnel Management, p.4).

**b. Veterans**

In general, veterans are individuals who have served more than 180 days of active duty and who have other than a dishonorable discharge. Disabled veterans are those with a compensable disability of 30% or more (U.S. Office of Personnel Management, p.9).

Veterans can be considered at the same time as reinstatement eligibles, but have priority over other external candidates. In other words, if a veteran applies for and is considered qualified for a position, then other external candidates, other than reinstatement eligibles, cannot be considered for the position.

**C. USE OF/RELATIONSHIP WITH RECRUITMENT SOURCES**

Although there are different categories of both internal and external candidates, it is rare for any of the other recruitment sources listed by the OPM to be considered; it would be very unusual in the current system to exhaust the five sources already listed - the PPP, Merit-Promotion, the CO-OP Program, the FJFP and the 1040 Hour Appointment Program - without encountering a candidate who must be selected before others can be considered.

The PPP is enforced via an automated system that generates a list of matches based on job series. The final

decision regarding a match is made by the candidate's HRO. Use of the PPP as a first source for filling all job openings is mandatory.

Good working relationships among all parties involved when using internal merit-promotion as a recruitment source can be helpful. Word-of-mouth can be a powerful recruitment aid, but the finest of working relationships between the recruiting manager and his/her HRO may not impact the quality of the candidate pool.

Each HRO is responsible for developing and building working relationships with local schools and colleges to facilitate and encourage the recruitment of students into federal service. According to the Director of OPM in 1991, "Key to effective recruitment strategies are programs to build student interest in the federal government." (Newman, 1991) Realistically, however, the CO-OP program requires the eventual availability of a permanent billet, the FJFP requires the candidate to demonstrate financial need and the 1040 Hour appointee must not only be a full-time student, but must be working in a position related to his/her studies; these are significant limiting factors. While it is possible to find excellent candidates among these three sources, selection limitations cause these sources to be ineffective if more than the occasional recruitment is needed. Thus, while developing HRO-school working relationships is a positive effort, few HROs devote much time to doing so because results are limited.

The same is true of HRO participation in job fairs. While most HROs generally participate to generate positive public relations, recruiting an individual from a job fair is unlikely because while the candidate may be well qualified for the job, the possibility that he/she would ever be allowed to apply is almost non-existent.

#### **D. DETERMINATION OF SKILLS**

HRO personnel determine who a recruiting manager may consider for an open position. If an individual registered in the PPP is matched with an open position, then HRO personnel follow PPP procedures to place the stopper in the position. If no match is found, HRO personnel begin the process to prepare a certified list of eligible candidates for the position (also known as the cert) for the recruiting manager to select from. Figure 1 shows this process graphically.

##### **1. Qualification Standards Handbook (X-118)**

To begin the process of preparing a cert, HRO personnel look up the job series of the position being recruited in the U.S. Office of Personnel Management Handbook X-118, Qualification Standards Handbook (generally referred to as the X-118) to determine general, and any specialized, experience necessary to qualify for the position. (See Box A, Figure 1.)

Prior to 1988, the X-118 listed a separate, specific standard for each job series. It was restrictive and



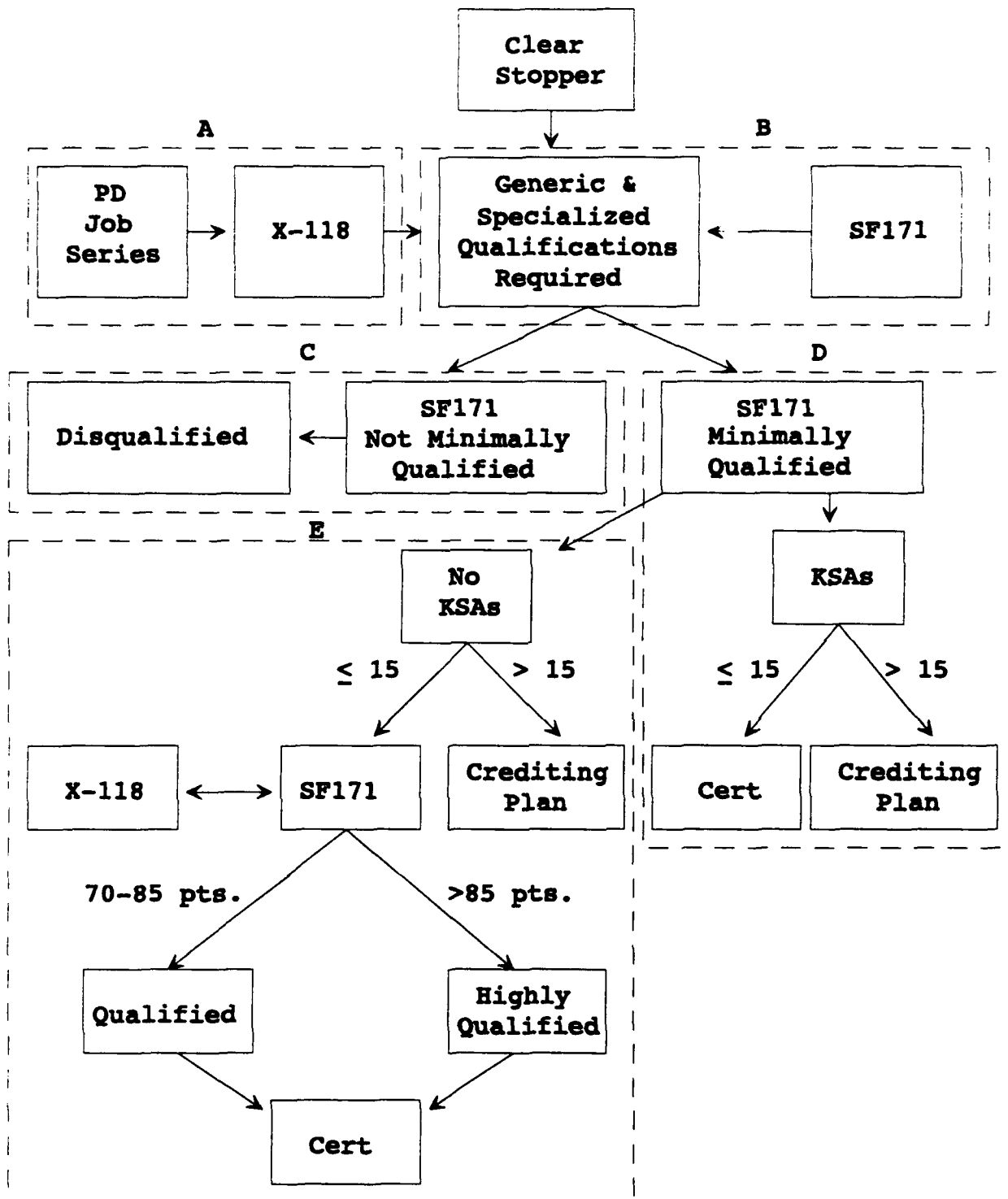


FIGURE 1  
PROCESS FOR PREPARING A LIST OF CERTIFIED ELIGIBLES

limited the number of individuals able to qualify for open positions. Now, however, most job series have been consolidated into four primary, generic sets of general qualification standards. They are:

- clerical and administrative support positions
- technical, medical and program support positions
- administrative, management and specialist positions
- professional positions

(Some series have generic, specialized experience requirements as well.) This change has enabled more individuals to qualify for open positions.

Having determined which general and specific qualifications to use based on the job series, HRO personnel then begin the process of comparing each application (generally known as an SF-171) to the qualification standards. (See Box B, Figure 1.) This first comparison is a subjective, general review to determine whether or not a candidate is at least minimally qualified for the position. Those applications not reflecting at least minimal qualifications are eliminated from further consideration. (See Box C, Figure 1.)

## **2. Knowledge, Skills and Abilities (KSAs)/Crediting Plan**

KSAs are a descriptive list of the knowledge, skills and abilities required to do a job.

Knowledge refers to the content or technical information needed to perform adequately in a job and is normally obtained through formal education, on-the-job training, and information media, such as manuals. Skills are the specific psychomotor processes necessary to meet the current requirements of a specific job. They are manifested through behaviors... Abilities refer to the cognitive factors that represent present capabilities or achievement levels. The productive potential of employees varies through differences in the types and levels of acquired KSAs (Cheney, 1990).

It is optional for a recruiting manager to submit KSAs along with a recruitment action. KSAs must be very similar to the knowledge, skills and abilities listed in the Knowledge Required section of the position description. They are typically a specific description of a required skill, described generally in the PD. (For example, PD: knowledge of word processing software. KSA: experience using WordPerfect 6.0 software.)

A crediting plan is a list of the knowledge, skills and abilities required to perform a position; it includes a description for each KSA of the experience necessary to be a low, medium or highly qualified candidate. HRO staff weight the importance of each KSA. Each application is then compared to the crediting plan, earning a maximum of 110 points (100 plus 10 for veterans preference) based on experience reflected. HRO staff generally perform this comparison, although the recruiting manager may request to do so. Applications earning fewer than 70 points are eliminated from further consideration. If, out of the remaining pool of

applications, HRO personnel consider the number deemed Highly Qualified to be sufficient, then a cert is prepared listing only these applicants. If the pool of Highly Qualified candidates is not considered sufficient, then both those considered Highly Qualified and those considered Qualified will be placed on the cert under the appropriate heading. Individual HRO personnel define how many applicants in a pool is sufficient.

If the recruiting manager submitted KSAs with his/her recruitment request, then HRO personnel review those applications deemed minimally qualified to see if they contain the knowledge, skills and abilities listed as required in the KSAs. Those not reflecting the KSAs are eliminated from further consideration. If the remaining number of applications is 15 or fewer, then HRO personnel prepare a cert. If the remaining number exceeds 15, then the recruiting manager must develop a crediting plan. (See Box D, Figure 1.)

If the recruiting manager did not submit KSAs and the total number of applications considered at least minimally qualified is 15 or fewer, then HRO personnel continue the comparison between the X-118 for the position description being recruited and the SF-171s. Applications earn points based on this comparison. Those with scores between 70 and 85 points are considered qualified for the position. Those earning more than 85 points are considered highly qualified for the position. Applications earning fewer than 70 points

are not minimally qualified, and should have been disqualified in the initial comparison with the X-118; thus, they are no longer considered. A cert is issued with applicant's names grouped under the headings Qualified and Highly Qualified. The scores earned by each application are not shown on the cert.

If the recruiting manager did not submit KSAs and the total number of SF-171s considered to possess at least the minimal qualifications exceeds 15, then the recruiting manager must develop a crediting plan. (See Box E, Figure 1.)

#### **E. SELECTION CRITERIA**

Once a cert is prepared, it and corresponding SF-171s are given to the recruiting manager. He/she may select any individual listed on the cert. Whether or not to conduct interviews, interview techniques, questions and other selection criteria are left to the judgement of the recruiting manager. (If the recruiting manager wishes to conduct interviews, he/she should check with HRO staff regarding interview requirements. If one candidate is interviewed, based on candidate source, some or all may have to be interviewed.)

If the recruiting manager does not find a candidate on the cert that he/she wishes to select, then he/she must cancel and/or reannounce the position. If the recruiting manager chooses to reannounce the position, he/she may change the

amount of time the announcement remains open as well as the search area.

## V. MEASURING SUCCESS

Very little research has been done in the determination of how to measure the success of recruitment actions. Two researchers have concluded that there is a relative lack of research on the contribution of effective staffing practices and that studies in this area have been limited in both number and scope. (Breaugh, 1981; Taylor, 1993)

The author has suggested a set of skills and traits that are relevant to recruiting an IS professional. In addition, the author has suggested an interview format and skills checklist that can be used when evaluating whether a candidate possesses the desired skills and traits. If these suggestions are implemented and an apparent match of candidate skills/traits and job requirements is made, then how can the success of the match be measured?

Some research has focused on group or organizational performance as a measure of recruitment success. Terpstra used profitability and sales growth to measure the success of staffing practices as reflected in annual profit and profit growth of an organization. (Terpstra, 1993) Drake, in his article, "Organizational Performance as a Function of Recruitment Criteria and Effectiveness," discusses the role of recruiters, their common practices and the importance of training the recruiter. He notes, "Through the process of

selection, organizations can conceivably control some of the variables which affect performance." (Drake, 1973) He does not, however, discuss how that performance can, or should, be measured, nor does he provide information or suggestions concerning how to measure organizational performance as a function. A more recent article by Krass uses U.S. Navy unit readiness as a measure of job assignment success. (Krass, 1994) Unit readiness is a measure of organizational performance rather than the success of an individual recruitment action. Additionally, the study characterized personnel by Navy Enlisted Classifications and pay grades, which correspond to DoD civilian job series and GS-level and step, rather than by measuring job performance or capability as a function of personal skills and/or traits. For these reasons, this study's correlation to the author's suggestions is limited, but should be a source of further research since Krass applied optimization algorithms to a problem usually investigated with questionnaires, surveys or observation.

Other research has addressed measuring the effectiveness of different sources of potential employees rather than the performance of the employee themselves. Taylor used employee attendance, performance and tenure to measure the effectiveness of several recruitment sources, but does not discuss measuring job performance. (Taylor, 1993) Breaugh explored relationships between recruiting sources and employee performance, absenteeism and work attitudes, commenting that,



"...although recruiting sources have been linked to employee turnover rate, whether such sources also are systematically related to worker performance, absenteeism, and attitudes (e.g., job satisfaction) has not been documented." (Breaugh, 1981) He obtained absenteeism and performance data from personnel files, using supervisory ratings of quality, quantity, dependability and job knowledge to measure job performance. Attitude data was gathered by a research questionnaire. His study was based on one sample drawn from a single organization, and he cautions the reader against generalizing the results of his study. (Breaugh, 1981) While some correlation to the author's suggestions was found, applicability may be limited both because of its small sample size and since the study evaluated the effectiveness of recruitment sources rather than measuring the success of individual recruitments. This focus could be useful, however, if Breaugh's study shed light upon the value of DoD sources or if it helped determine a relative value of candidates from DoD source pools including the PPP, internal merit-promotion, the CO-OP Program, the FJFP and the 1040 Hour Appointment.

Of the literature surveyed, the most relevant to this thesis is research done by the Air Force Human Resources Laboratory. Teachout isolated on individual job performance to determine relationships between Air Force selection and classification standards and on-the-job performance. (Teachout, 1991) He used measurement data from five sources:

- work samples (Incumbents are required to display the same behaviors as they would on the job (i.e., perform tasks using operational equipment, materials and procedures.) Obtaining work samples is also referred to as hands-on testing.)
- performance interviews (The incumbent is asked to describe, in a show-and-tell fashion, the procedures he/she would follow if performing a task.)
- rating forms (A variety of rating forms are used and are completed by the incumbent, his/her supervisor and peers.)
- written tests
- personnel file data (i.e., training school grades) (Teachout, 1991).

While these sources appear to be measurable, considerable work remains in understanding the reliability, validity, and utility of the measurements. In general, the key research questions center around assessing the quality of individual performance measures. Continuing Air Force research includes evaluating this collection of job performance information more effectively and how to use this information in setting selection and classification standards (Teachout, 1991). In terms of applicability to the recruitment strategies suggested by the author, the Air Force's findings do suggest that performance can be measured, and if they prove to be validated metrics, can be implemented into the author's recruitment strategy. It is important to note, however, that the Air Force is applying the measurements to enlisted personnel within a limited job set without IS functions represented. Thus, Air Force techniques may not be translatable to the DoD

civilian IS environment.

Measuring whether or not a recruitment was successful is clearly an area needing additional research. Although this area of research is not new, the results obtained thus far have not been definitive. In addition, focus needs to be placed on individual performance measures. Stronger research, for longer periods of time, with broader scope is needed and applicability across disciplines should be evaluated.

## **VI. RECOMMENDATIONS AND CONCLUSIONS**

### **A. IMPROVING SUCCESS WITHIN THE CURRENT ENVIRONMENT**

According to an article in Computerworld, "Federal managers must come up with clever ways to work around the government's low pay schedules and outdated personnel policies if they are going to hire and retain qualified information systems employees." (Betts, 1989) Further, "...there are two types of agency managers: those who think the situation is hopeless and those who are working the system to make it work." (Betts, 1989) The following recommendations are provided to assist recruiting managers in hiring the best possible candidate for a position the federal system will allow/support.

Before the recruitment process begins, the hiring manager should evaluate whether anticipated functions of a position are necessary at all and/or if transferring tasks to other employees is appropriate and possible. Other employees may be able to absorb additional responsibilities, allowing them promotion potential, renewed motivation and new challenges. In some cases, this enables a hiring manager to pay top performers more while at the same time reducing the total payroll, cost of benefits and billet count of the organization.

The next step is to ensure that the position description (PD) is current and accurate. After a brief introduction or overview of the job, the PD should include: Major Responsibilities, Knowledge Required, Supervisory Controls, Guidelines, Complexity, Scope and Effect, Personal Contacts, Purpose of Contacts, Physical Demands and Work Environment.

The position description's introduction is not only part of the PD, but is used by the Human Resources Office to develop the job announcement used to advertise a vacant position. The introduction is not used in any way to determine a candidate's qualifications for the position. Thus, although it should be sufficiently specific to pique the interest of those the hiring manager would like to see apply for the job, it should be general in nature.

The Major Responsibilities section is mostly used by the employee and manager once an individual is hired. It is used to communicate to the employee what he/she should actually be doing. The manager also uses this section to develop job standards which are used as the basis for measurement in the performance review process. When the manager and employee disagree regarding performance, proper compensation, the required level of responsibility or the nature of the tasks involved in a job, this is the section that is most closely scrutinized. Although this section is used very little in the recruitment process or by HRO staff,

it should be clear why the duties and responsibilities described in this section require the levels of knowledge and complexity described later. The hiring manager should describe the major responsibilities of the position, with the future use of the PD in mind.

Writing the Knowledge Required section is next. The hiring manager should develop a thorough, and specific, description of the knowledge, abilities and experience a candidate must have to successfully perform in the position. An easier way for the hiring manager to think of this section is to describe the knowledge, skills or abilities an ideal candidate would have when arriving on the job for the first time. While these requirements should be specific, they cannot, for example, prevent otherwise qualified candidates from being considered. (e.g., Knowledge of Naval Postgraduate School minor property procedures required.) Although nothing will prevent the hiring manager from including these kinds of requirements in the position description, they will be ignored in the recruitment process. From a recruitment standpoint, this section is the most critical. It will be used to determine all candidates' qualifications for the position, and will be especially helpful in preventing an unqualified stopper candidate from being placed in the position. The hiring manager should spend most of his/her effort developing this section and be prepared to discuss and defend, relative to the major responsibilities of the position, why the

knowledge, skills and abilities listed are required.

Having come this far in the recruitment process, the hiring manager should have determined precisely what he/she requires of the position. Although these steps are critical to the entire process, they are often overlooked by managers. It is not uncommon for managers to use position descriptions many years out of date.

The remaining sections of the position description are used very little in the recruitment process. Along with the Knowledge Required section, they are used primarily to determine the General Schedule (GS-level) or salary range for the position. The hiring manager may choose to write these sections as he/she did previous sections - by asking himself/herself what will be required of the candidate. Since HRO staff will be looking for key words and descriptions, however, the author does not recommend this method since using a word, or not using a word, HRO staff are looking for can make a difference in the final grading of the position. (e.g., knowledge of WordPerfect 6.0 versus advanced knowledge of WordPerfect 6.0.) A more efficient method is to obtain copies of position descriptions for similar jobs at similar GS-levels and modify the descriptions found there. If requested, HRO staff will generally provide these copies to a hiring manager. Also helpful, or necessary if other position descriptions are not available, are HRO classification guides. HRO staff can provide access to these guides.

The next step is to have the completed position description classified and graded by HRO staff. Classifying a PD ensures that the position title is a correct descriptor of the contents of the PD. Grading a position description involves comparing each section contained in the PD to standardized descriptions. The standardized descriptions each have associated point values. The PD being graded accumulates points, and the total point value is used to determine the GS-level corresponding to that number of points for that job series. The GS-level then determines the range of salary it will cost to fill the opening. Thus, if the position has been fairly and accurately described, the GS-level and corresponding salary should be commensurate with other positions of similar difficulty and responsibility in the GS system. If the GS-level turns out to be different from that expected, the hiring manager can work with HRO staff and modify the PD so it grades at the desired level. This is necessary since it is not unusual for a single adjective to change the grade of a position description. For example, knowledge of C++ programming language versus expert knowledge of C++ programming language. Since a great deal of human discretion and judgement is involved in the classification and grading process, it is not unusual for positions to be graded lower than they really should be based on the classification standards. This is generally due to budgetary limitations which cause managers to be unable or unwilling to pay for



greater levels of responsibility. This can often be a scenario for failure since employee-management expectations will be disparate to begin with. Expectation levels can be adjusted through later communication, but this often still leaves the employee questioning if he/she is being fairly paid for the work he/she does; or, in other words, if his/her position description was rewritten to accurately reflect what he/she does and is responsible for doing, would it grade out at a different level? This affects employee morale, can affect performance and most certainly affects retention.

The next step is to develop a descriptive list of the knowledge, skills and abilities (KSAs) required to perform the job. Since this should have already been done in the Knowledge Required section of the PD, the hiring manager should excerpt the most critical three or four categories of required knowledge, skills or abilities to become the KSAs. This list is most effective if kept to three or four general categories - more than three or four becomes cumbersome and fewer do not generally adequately cover job requirements.

In the past, it was most effective to develop a generic PD with specific KSAs. For example, position description: knowledge of personal computers; KSAs: knowledge of DOS-based personal computers running WordPerfect and Lotus software. In this way, the position description did not have to be rewritten as often - it was a more general description of job requirements and didn't need to be modified to reflect

new software, new versions of software or hardware advances. It was necessary to rewrite the position description only when there was a major change in the job requirements or environment.

Many HRO's do not implement the PPP according to written guidelines or even in the spirit in which it was intended. As a result, it is now necessary to add a great deal of specificity to position descriptions. Stopper candidates are supposed to be able to perform not only the position description, but also any KSAs. In practice, however, HRO's do not always consider the KSAs since HRO guidelines emphasize placing as many individuals as possible. Thus, if the stopper candidate's HRO considers his/her qualifications a match with the requirements listed in the position description, regardless of what is indicated as required in the KSAs, the individual will be matched with the job. Thus, although it requires a great deal of additional work on both the part of the manager and the hiring HRO, the author strongly recommends that a position description be as specific as genuinely warranted by the position. For example, if the candidate must have an expert knowledge of specific software used in the position (e.g., DBaseIV), the position description should include such a statement; it is not recommended to indicate that expert knowledge of database software is required when it is really an ability to use DBaseIV, Version 2.0 that is needed.

If KSAs aren't going to prevent a mismatched stopper from being placed in the job, why develop them? KSAs will be used along with the position description throughout the rest of the recruitment process to determine a candidate's qualifications for the position. Also, developing KSAs is an excellent method by which the manager can focus on what is necessary to do the job. Since the KSAs should be part of writing the position description, this will have been done at an early stage in the recruitment process. Thus, not only will the manager know what he/she wants in a candidate, but should have some idea if the requirements are reasonable and if a qualified candidate is likely to be found. For example, a GS-7 position description that requires advanced level knowledge of the Unix operating system and of DOS-based personal computers sounds reasonable enough on the surface. In reality, however, this mix of knowledge at the GS-7 grade level would be extremely difficult to find. Writing the KSAs as part of the position description should assist the manager in discovering these kinds of mismatches.

At this point, the PD and KSAs are ready to be submitted with a Request for Personnel Action (Standard Form 52) to the HRO (via appropriate channels depending upon activity.) HRO staff will enter the vacancy into the PPP's automated system. Approximately two days later, information will be returned indicating if there are stopper candidates (stoppers) or not (the stopper list is clear.)

If there are stoppers, the hiring manager should request to review the list of candidates. The information available varies depending on what the candidate's HRO entered into the automated system. Sixty three information fields may be entered into the automated system, 42 of which are of interest primarily to HRO personnel. Although many of the remaining 21 fields may be blank, some may include information helpful to the hiring manager. These fields include:

- the stopper's current or last position held
- pay group, series and grade
- education, degree and major
- three most recent job titles, and dates of employment
- five additional job series held, and high and low grades
- two additional information/special qualifications

Variances occur as a result of the individuals and HRO personnel involved in the process.

A candidate's full application (SF-171) may not be obtained until after a job offer has been accepted by the candidate. A candidate cannot be contacted in any way by either the hiring manager or the recruiting HRO until a job offer is accepted.

The hiring manager may request the order in which stoppers are evaluated. Since, despite the rules and the spirit of the PPP, individuals are often mismatched with positions, hiring managers often develop different strategies

to deal with the stopper list. The hiring manager may prioritize the stopper list from most to least qualified, in the hopes that the stopper will be able to perform the job. Or, he/she may prioritize the list from least to most qualified, in the hopes that by the time the least qualified stoppers have been cleared, the most qualified will have already been matched with other positions; thus, the stopper will be clear. Because of the number of individuals forced into the PPP as a result of the current downsizing environment, this situation is not likely. It is important to remember that additional individuals will continue to be added to the stopper list for a particular position until a certificate of eligible candidates is issued. Thus, the author recommends that a hiring manager prioritize the list in the order of most to least qualified candidates.

Next begins an iterative, and very time consuming, process to match or clear the stopper. Although unlikely, this process could be infinite. The recruiting HRO faxes a copy of the PD to the stopper candidate's HRO. The stopper's HRO then has several days to review the PD and the candidate's SF-171 to determine if there is a match - whether the candidate's qualifications match the requirements of the position description. There are no guidelines for how long the stopper candidate's HRO has to review the PD and SF-171, but normal practice is to allow a minimum of four working days.

If there is a match, the stopper's HRO renders a job offer; the candidate has four days to accept or decline the offer. If he/she accepts the position, the hiring manager should request a copy of the stopper candidate's SF-171. If the position is career-ladder or a higher GS-level than the stopper currently holds, then the stopper's manager must release the candidate within two weeks after the job offer is accepted. If the position is the same GS-level as, or lower than, the stopper's GS-level, then the stopper's manager may hold the candidate for up to four weeks from the date the job offer is accepted. The author recommends that a hiring manager thoroughly review the stopper's SF-171 and compare it against the requirements of the position description. He/she should promptly document, in writing, all significant disparities and notify his/her HRO. Once the stopper is in the position, it is imperative that the hiring manager strictly adhere to all customary human resource procedures and timelines. e.g., Written job standards should be discussed and agreed to as soon as possible, but not later than 30 days after the stopper begins the new position.

If any performance problems resulting from the original disparity between the stopper's qualifications and the requirements of the position occur, the hiring manager should begin thoroughly documenting the problems and notify his/her HRO in writing. This should be done as soon as any problem becomes apparent, but not later than 60 days after the

stopper begins the new position. (If the performance problems are not related to the original disparity, a hiring manager should treat the problems as he/she would problems with any other employee.) The hiring manager should request his/her HRO to begin the appeal process to return the stopper to the HRO making the original mismatch.

If the stopper's HRO determines that there is not a match, then the recruiting HRO is notified and the process begins over again with the next stopper on the list. In the meantime, the stopper list must continue to be cleared each day. Thus, generally additional names continue to be added to the list daily, making the process very lengthy. This aspect of the PPP makes it especially unpopular since the hiring manager cannot consider other candidates to fill the vacancy in his/her department until this process is complete. HRO's do not concurrently advertise or announce positions since doing so would entail additional work that might not be necessary if there is, in fact, a stopper match.

If there are no stopper candidates, or the stopper list is clear, then HRO staff will prepare a job announcement. The hiring manager should select an announcement area based on expected response. Duration of the vacancy's opening is determined by the announcement area in the following relationship:

| <u>Area</u>            | <u>Minimum Duration</u>                                                                 |
|------------------------|-----------------------------------------------------------------------------------------|
| Activity Only          | 5 calendar days (except GS13 and above must be announced a minimum of 14 calendar days) |
| Commuting Area         | 5 calendar days                                                                         |
| State-wide             | 10 calendar days                                                                        |
| Navy-wide              | 20 calendar days                                                                        |
| Nation-wide/World-wide | 30 calendar days                                                                        |

The author recommends a hiring manager check with HRO staff toward the end of the announcement period to ascertain the approximate number of applicants. If the applicant pool is unacceptably small, the hiring manager should extend the announcement's duration and/or area of consideration.

Once the announcement closes, the author recommends that a hiring manager contact HRO staff to request a Certificate of Eligibles as soon as possible. The stopper list must continue to be cleared daily until the cert is issued. If HRO staff indicate that they are waiting to issue the cert until mail-in applications have been received, the hiring manager should request that the cert be issued immediately and that a supplemental cert be issued should mail-in applications be received. Although this entails additional effort by HRO staff, it is the only way the hiring manager can stop having to clear the stopper.

If, during the announcement period, a stopper appears



on the stopper list, the author strongly recommends that the hiring manager continue with the process described above and request that the cert be issued as soon as possible after the announcement closes. Otherwise, the position vacancy will, once again, enter the possibly infinite process of clearing the stopper.

## **B. IMPROVING THE ENVIRONMENT**

The recruitment and selection of IS professionals within the current DoD system is ineffective. The current system does not define what it takes to be considered part of the IS work force, nor does it have any method by which it can identify an IS professional within its work force. In addition, even if it did both define and identify IS professionals, the current system would not support the recruitment and selection of qualified candidates.

### **1. Defining/Identifying the IS Professional**

To correct the definitional problem, DoD must identify the training, education, knowledge, experience, demonstrated skills and/or traits required to be considered part of the IS work force. The author recommends that a background reflecting some of all of these areas, with an emphasis on demonstrated skills and/or traits, be required. This should be required since, for example, a background reflecting considerable IT training does not necessarily indicate that an individual can perform a particular task

within an IT environment. Although correcting the definitional problem is beyond the scope of this thesis, suggestions containing some definitional attributes concerning the education, experience and demonstrated skills and/or traits required to be successful as an IS professional are contained in Chapter III and Appendix C.

Having determined what is necessary to be considered an IS professional, a follow-on question is how to identify those individuals possessing adequate levels of specified characteristics. There are a number of ways DoD could address the identification problem. These include:

- conducting an education/training analysis
- conducting a performance report analysis
- conducting a job/billet analysis
- conducting interviews
- testing
- using questionnaires or conducting a survey
- adding a designator to existing job series

Conducting an analysis on all DoD employees, whether it be examining education and training, reviewing performance reports or evaluating jobs and billets, would be prohibitively time-consuming and expensive. In addition, it would not involve the employee in the process. Although interviews would actively involve each employee, again the cost in time and money would be prohibitive.

Testing individuals to determine if they are IS professionals would be partially successful. It could show the extent to which an individual has been trained or educated and/or gained knowledge through experience. Given the amount of debate, however, concerning the validity of tests as an accurate indicator, it seems reasonable to conclude that testing would not be a preferred method of determination. "Using various test instruments...is limited and controversial." (Wiley, 1992)

Using questionnaires and/or conducting a survey would enable an estimation to be made concerning the size of the IS work force. Although this would be helpful in determining if DoD has an adequate supply of IS professionals to meet demand, it would not provide information regarding individual IS professionals - location, qualifications or identity.

Adding a designator to existing job series would, after a phase-in period, identify and quantify the DoD IS work force. In addition, the qualifications and locations of individuals would be known and could be tracked. Implementation of some programs and guidelines, however, would need to be altered. For example, the Priority Placement Program would need to accommodate this new designator. Also, application restrictions based on job series would need to be re-evaluated.

To maximize the information gained by using a

designator, while at the same time minimizing negative impact to other personnel programs, the author recommends that an application process be used to allow employees to apply for a job series designator. Such an application should be structured so as to gain information regarding training, experience, knowledge and experience, yet flexible enough to allow individual applicants to reflect those skills and/or traits they have demonstrated whether on the job, in volunteer activities or in personal interests/hobbies. It should be left to the discretion of the individual whether to use existing material such as his/her SF-171 and performance reports, to complete a separate application or do some combination of the two. At the same time, managers should be allowed to apply for job billet designators. An application would not be necessary; a billet could be designated based on the required training, education, knowledge, experience and demonstrated skills and/or traits listed in the PD and KSAs.

Once an individual has applied for, and earned, a designator, and his/her job series has been designated, he/she should continuously occupy a designated billet or be required to re-qualify for the designator. The billet should be re-evaluated to determine if it should be designated every time a manager recruits for it.

## **2. Selecting a Qualified Candidate**

Even if designators are added to job

series/billets, the current DoD personnel system does not support the selection of qualified candidates. Thus, the following alternatives should be considered:

- Don't change the system; instead, correctly implement current rules/guidelines
- Alter the current system:
  - \* change qualification criteria
  - \* eliminate/modify preference for criteria that don't apply to an applicant's qualifications for a position (veterans preference, PPP)
  - \* move decision making lower (to recruiting manager)
  - \* remove the hiring freeze
- Discard the current system

a. Don't Change the System

Implementing current rules, guidelines and programs as written could significantly improve the current recruiting environment with the least additional expense to the system of any of the alternatives. The PPP should be implemented to put only those individuals in a job who are able to perform the responsibilities listed in a PD and who possess required KSAs; at the same time, the Qualification Standards Handbook (X-118) and KSA guidelines must be implemented to place only individuals on the cert who are able to perform the responsibilities listed in a PD and who possess required KSAs. This would eliminate job mismatches currently forced by the PPP and would improve the program's credibility and the support of managers. (For example, a Computer Specialist, GS-0334 with DOS-based personal computer

experience would no longer be matched with a Computer Specialist, GS-0334 billet that requires Unix knowledge and experience.) At the same time, managers would not be able to by-pass the PPP in favor of pre-determined or not minimally qualified individuals by inflating the job criteria required in the PD and KSAs.

Correct implementation of the rules, guidelines and programs as suggested could result in fewer PPP individuals initially being placed. Over time, however, the author suggests that managers will be more cooperative and supportive of a program that doesn't force mismatched employees into jobs. This could result in the placement of more PPP individuals than in the current system. Instead of fearing inappropriate enforcement of the PPP, managers could consider the PPP an excellent source of candidates.

Strict implementation of the eligibility requirements for a job could limit the size of the applicant pool. This would cause the recruiting manager to reexamine his/her requirements of the position and determine whether or not they were realistic. The author believes this is much preferable to having HRO personnel make such a decision for the manager by arbitrarily lowering recruitment standards. Recruiting managers should be given greater flexibility and empowered to administer their own organizations.

With the current system, however, even if the rules, guidelines and programs are implemented correctly, non-

technical skills will remain very difficult to recruit.

**b. Alter the Current System**

Currently, HRO personnel determine applicant qualifications, and, thus, who a recruiting manager may consider for an open position. The author recommends that HRO personnel make only basic program eligibility decisions, for example, an applicant's eligibility for government service or programs within government service such as student programs. Further, the author recommends that the recruiting manager, outside of this basic eligibility, be empowered to consider all applicants for a position. (i.e., All current, permanent employees should be able to apply, and be considered, for any permanent position they wish to apply for.) This change would significantly improve the speed of the recruitment process and save HRO personnel labor. The increased labor by the recruiting manager would be minimal since he/she would not be required to evaluate those candidates clearly lacking minimal qualifications. In addition, the size of the candidate pool would no longer be a function of the screening provided by HRO personnel; it would instead, be determined by the number of interested individuals.

The current system provides a preference/subsidy of individuals based on criteria that don't apply to an applicant's qualifications. (e.g., PPP and veterans preference) The author recommends that this

preference/subsidy be considered only after an applicant is considered qualified for a position. This would eliminate forced job mismatches and would support the selection of a qualified candidate for a position. Although initially the author would expect fewer placements of PPP and veterans preference individuals, over time the author would expect the programs to gain credibility and be used as viable sources of candidates. In the meantime, participating individuals who have not improved their skills and/or are poorer performers would be forced out of the system. Overall, the author believes this would improve the quality of DoD's work force.

Under the hiring freeze, only current DoD and/or agency employees may be considered for open positions. Removing the hiring freeze would, in most cases, improve the quality of any given pool of candidates. The author recommends instead, that at least during DoD's continued downsizing, hiring freeze restrictions be modified instead of eliminated. That is, hiring managers should first be required to search for a qualified candidate within DoD. Only if he/she is unsuccessful should a candidate be sought outside of DoD. Again, the author believes the recruiting manager should be empowered to make this decision and be required/allowed to justify it should questions arise. This recommendation is equivalent to a very strong "recruit/promote from within" philosophy often practiced by companies outside of DoD. The author suggests that this would provide positive reinforcement



and encouragement to current, well-performing DoD employees. At the same time, non-qualified individuals would no longer be selected and/or forced into positions. Thus, they would perhaps have to leave DoD's employ. This would improve the quality of the pool of DoD employees.

c. Discard the Current System

Eliminating the current system would enable DoD's recruiting managers to recruit and select not only a qualified candidate for a position, but the most qualified. It would provide increased options in all areas - recruitment sources would be unlimited, selection criteria would be determined by the recruiting manager, qualification requirements would change as swiftly as IT is changing and salaries and benefit packages would be flexible and would change to meet the changing supply and demand of IS professionals. In short, DoD would enter the competitive market for personnel.

Such dramatic changes in the philosophy underlying government employ could cause significant negative impacts on employees. Career length job security would become a thing of the past - DoD's work force would not be as stable and secure as it is today. In times of economic stress and a reduced DoD budget, it is possible that DoD would not be able to retain a work force sufficient to continue operation. Although having DoD discard the current system in favor of a

competitive system would probably be a major improvement, such a radical change is unlikely in the near term.

### **3. Conclusions**

DoD should:

- define/identify the training, education, knowledge, experience, demonstrated skills and/or traits required to be a member of the IS work force. Emphasis should be placed on demonstrated skills and/or traits.
- establish a designator to identify members of the IS work force and IS billets.
- Use Appendix C Interview Questions and Skills Checklist to recruit IS professionals.
- implement PPP and Qualification rules and regulations as written.
- empower recruiting managers to administer their own organizations.
- allow recruiting managers to consider any/all interested candidates for positions.
- modify preference/subsidy programs such that they are considered only after determining that a candidate is qualified.
- modify hiring freeze restrictions to allow outside recruitment when a qualified DoD candidate cannot be found.

## APPENDIX A

| <u>Series#</u> | <u>Series Name</u>                                                              |
|----------------|---------------------------------------------------------------------------------|
| 301            | Miscellaneous Administration and Program Series                                 |
| 334            | Computer Specialist Series                                                      |
| 343/345        | Management Analyst and Program Analysis Series                                  |
| 391/393        | Telecommunications Series                                                       |
| 801            | General Engineering Series                                                      |
| 854            | Computer Engineering Series                                                     |
| 855            | Electronics Engineering Series                                                  |
| 896            | Industrial Engineering Series                                                   |
| 1001/1071/1084 | General Arts and Information, Audiovisual Production, Visual Information Series |
| 1410           | Librarian Series                                                                |
| 1515           | Operations Research Series                                                      |
| 1520           | Mathematics Series                                                              |
| 1550           | Computer Science Series                                                         |

Note: 345 and 393 are not valid occupational series

## APPENDIX B

| <u>Series #</u> | <u>Series Name</u>                               |
|-----------------|--------------------------------------------------|
| 080             | Security Administration Series                   |
| 086             | Security Clerical and Assistance Series          |
| 326             | Office Automation Clerical and Assistance Series |
| 332             | Computer Operation Series                        |
| 335             | Computer Clerk and Assistant Series              |
| 341             | Administrative Officer Series                    |
| 342             | Support Services Administrative Series           |
| 344             | Management Clerical and Assistance Series        |
| 390             | Telecommunications Processing Series             |
| 392             | General Communications Series                    |
| 394             | Communications Clerical Series                   |
| 501             | Financial Administration and Program Series      |
| 503             | Financial Clerical and Assistance Series         |
| 505             | Financial Management Series                      |
| 510             | Accounting Series                                |
| 523             | Accounting Technician Series                     |
| 560             | Budget Analysis Series                           |
| 561             | Budget and Clerical and Assistance Series        |
| 802             | Engineering Technician Series                    |
| 856             | Electronic Technician Series                     |
| 895             | Industrial Engineering Technician Series         |
| 1101            | General Business and Industry Series             |

|      |                                                         |
|------|---------------------------------------------------------|
| 1102 | Contracting Series                                      |
| 1104 | Property Disposal Series                                |
| 1105 | Purchasing Series                                       |
| 1106 | Procurement Clerical and Technician Series              |
| 1107 | Property Disposal Clerical and Technician Series        |
| 1150 | Industrial Specialist Series                            |
| 1160 | Financial Analysis Series                               |
| 1411 | Library Technician Series                               |
| 1412 | Technical Information Series                            |
| 1420 | Archivist Series                                        |
| 1421 | Archives Technician Series                              |
| 1521 | Mathematics Technician Series                           |
| 1529 | Mathematical Statistician Series                        |
| 1530 | Statistician Series                                     |
| 1531 | Statistical Assistant Series                            |
| 1654 | Printing Management Series                              |
| 1801 | General Inspection, Investigation and Compliance Series |
| 1810 | General Investigating Series                            |
| 1811 | Criminal Investigating Series                           |
| 2001 | General Supply Series                                   |
| 2003 | Supply Program Management Series                        |

## APPENDIX C

The author has developed the following interview format, list of interview questions and Skills Checklist and recommend their use when recruiting an IS professional. Following this format will increase a recruiting manager's probability of hiring an IS professional with the best set of skills and/or traits.

### Interviewer Instructions:

Introduce yourself and any other individuals present. Make the applicant feel comfortable and welcome (i.e., briefly chat about something of general interest - perhaps a hobby or other interests on the applicant's application, offer a beverage if appropriate.) Do not sit across a desk or table from the applicant - to the side at an angle is preferable.

Provide a brief, descriptive overview of your organization. Do not describe the skills/type of individual being sought.

### Questions:

1. Why are you interested in this position?
2. What are your greatest strengths? Why do you consider them to be your best?

3. What would your current/last supervisor say are your weakest areas? Why?

Allow applicant to begin answering question and then interrupt with, By the way, do you mind if I speak with your current/last supervisor? After applicant answers this, remain quiet and see if he/she goes back to the original question and resumes where he/she left off without prompting.

Do you agree with your supervisor? If so, why? If not, why not and what do you consider your weakest areas?

4. In your answers to the following questions, please feel free to include not only experiences in paid positions, but any volunteer, social organization or other experiences you feel relevant.

Describe a specific situation where you were working on a project or task and the requirements changed. Please describe the project, what changed and what you did. Remember to be specific.

Note to Interviewer: Require the applicant to be specific. Although the silence may be somewhat awkward, allow time for him/her to recall a specific event. Be sure to make a note if the applicant is unable to be specific on more than one

question and/or if he/she continues to answer in generalities despite the instructions given.

5. Have you ever experienced a "personality conflict" with another individual or known someone who didn't like you? If so, who were they, what was your relationship and how did you deal with the situation?

6. Have you ever been assigned a project or job you didn't know how to do? What was it and what did you do? Please describe a specific situation.

7. Have you ever been assigned a goal or project you didn't think could be done or was achievable? If so, what was it and what happened?

8. Please describe the part, or the responsibilities, of your current position (or any position ever held) that you enjoy the most and what about them makes them your favorite.

Conversely, what responsibilities (or aspects of the job) do you enjoy the least?

9. Have you ever held a management or team leader position? If not, please think of a situation where you were a team member and answer the following in terms of how you would have



led the team the same or differently.

What was the project? Describe its scope and the number and nature of the individuals involved. Was the project successful? If not, answer the following in terms of what you would have done differently.

What were several of the most important actions you took to ensure the project's success?

Did you encounter any problems in the course of completing the project? What were they and what did you do?

10. Is there anything else about you that you think we should know?

11. Do you have any questions?

12. Why should we select you to fill this position?

## SKILLS CHECKLIST

(Note to Interviewer: Watch for/observe the following checklist items during the interview and the opposite of the checklist items. For example, the applicant may indicate he/she likes to learn new things, but may indicate a dislike for the current job because it lacks a training program or procedures. Note a Y when you observe, or the applicant claims to possess, a skill/trait listed on the checklist and an N when he/she does not.)

- \_\_\_ initiates change
- \_\_\_ thrives in changing environment
- \_\_\_ thrives on change
- \_\_\_ can quickly adapt
- \_\_\_ flexible
- \_\_\_ does well with unstructured environment/processes
  
- \_\_\_ deals effectively with people
- \_\_\_ is a people person
- \_\_\_ outgoing personality
- \_\_\_ good verbal communication skills
  
- \_\_\_ willing to learn
- \_\_\_ ability to learn quickly
- \_\_\_ independent learner - no spoon-feeding

- \_\_\_ self-starter
- \_\_\_ motivated
- \_\_\_ patient
- \_\_\_ positive
- \_\_\_ enthusiastic
  
- \_\_\_ strong communication skills
- \_\_\_ strong management skills
- \_\_\_ motivates others
- \_\_\_ team builder
- \_\_\_ team leader
- \_\_\_ team player
- \_\_\_ comfortable with responsibility and ability to delegate
- \_\_\_ ability to plan and organize
- \_\_\_ ability to manage time and projects
  
- \_\_\_ problem solver/trouble shooter
- \_\_\_ self-sufficient
- \_\_\_ split personality - technical/teacher, independent/team player
- \_\_\_ parallel process
- \_\_\_ work with interruptions

## LIST OF REFERENCES

Betts, Mitch, "Federal Managers at a Personnel Loss," Computerworld, v.23, p.78(1), May 8, 1989.

Breaugh, James A., "Relationships between Recruiting Sources and Employee Performance, Absenteeism, and Work Attitudes," Academy of Management Journal, v.24(1), pp.142-147, March, 1981.

Butler, Jack, "Portrait of a LAN Manager," LAN Technology, v.9, n.2, p.55, February, 1993.

Carnevale, David G., "Recruitment Strategies in the Federal Government: Missing Links and Representative Bureaucracy," Review of Public Personnel Administration, v.11, n.1,2, p.112-120, Fall, 1990/Spring, 1991.

Chang, Hae-ching and Raymond McLeod, Jr., "The Development of a Computer-Based Decision Support System for use in Evaluating Candidates for the Position of Programmer-Analyst," Proceedings of the 1991 ACM SIGCPR Conference, April 8-9, 1991, Athens, Georgia.

Cheney, Paul H., David P. Hale and George M. Kasper, "Knowledge, Skills and Abilities of Information Systems Professionals: Past, Present, and Future," Information and Management, v.19, n.4, p.237-247, November, 1990.

Conner, Daryl R., "Building Resilient Organizations for Turbulent Times" Presentation, Retooling '93 Conference, Atlanta, GA, December 1-3, 1993.

Curnow, Barry, "Recruit, Retrain, Retain: Personnel Management and the Three Rs," Personnel Management, v.21, n.11, p.40-47, November, 1989.

Drake, Larry R., H. Roy Kaplan and Russell A. Stone, "Organizational Performance as a Function of Recruitment Criteria and Effectiveness," Personnel Journal, v.52(10), pp.885-891, October, 1973.

Evans, Phil, "The Art of Retaining Quality Workers," Network World, v.9, n.34, p.33, August 24, 1992.

Frew, Barry A., "Training and Educating IS Professionals to Manage Information Technology in Changing Organizations," Proceedings, SIGCPR '94, Reinventing IS: Managing Information Technology in Changing Organizations, March 24-26, 1994.

Grindlay, Andrew, "The Information Systems Manager as Statesman," Business Quarterly, v.49, n.4, pp.6-10, Winter, 1984/1985.

Head, Robert V., "Introducing the Typical Government Employee," Government Computer News, v.11, n.14, p.78, July 6, 1992.

Hildebrand, Carol, "Managing the Aftermath: Orchestration Skills Needed," Computerworld, v.25, n.31, p.58, August 5, 1991.

Hooten, Karen, "When I Grow Up...", Computer Language, v.10, n.6, p.99, June, 1993.

Human Resources Office, Naval Postgraduate School, "Guide for Managers/Supervisors on Staffing and Recruitment Programs."

Information Resources Management Service, U.S. General Services Administration, "1000 by the year 2000: A Program to Develop Future IRM Leaders," KML-94-2-I and Information Request Form, undated.

Information Resources Management Service, U.S. General Services Administration, Trail Boss: An Acquisition Management Concept," December, 1989.

Krass, Iosif A., Mustafa C. Pinar, Theodore J. Thompson and Stavros A. Zenios, "A Network Model to Maximize Navy Personnel Readiness and Its Solution," Management Science, v.40, n.5, May, 1994.

LeDuc, Albert L., Jr., "It Takes Eight Models to Mold Information Systems Managers," Data Management, v.24, n.9, pp.34-36, September, 1986.

Lord, Virginia M. and Frank P. Louchheim, "Recruiting Strategies for the 1990s," Employment Relations Today, v.16, n.3, p.227-234, Autumn, 1989.

Newman, Constance Berry, "Good Government Needs Good People," Bureaucrat, v.20, n.2, p.6-10, Summer, 1991.

Moore, Jo Ellen, "Personality Characteristics of Information Systems Professionals," Proceedings of the 1991 ACM SIGCPR Conference, April 8-9, 1991, Athens, Georgia.

Office of Classification, U.S. Office of Personnel Management, "Handbook of Occupational Groups and Series, September 1992," Washington, D.C., 1992.

Office of the Assistant Secretary of Defense for C3I, "Information Systems Education, Training and Career Development Initial Report," September, 1992.

Orlikowski, Wanda J. and Jack J. Baroudi, "The Information Systems Profession: Myth of Reality?" Office: Technology and People, v.4, n.1, p.13-30, January, 1989.

Pastore, Richard, "A Decided Slant," CIO, v.7, n.4, pp.50-56, November 15, 1993.

Radding, Alan, "Let's Make a Deal," Computerworld, v.25, n.7, p.71, February 18, 1991.

Seymour, Jim, "What Can We Do About the Looming IS Career Crisis?" PC Week, v.10, n.7, p.81, February 22, 1993.

Speer, Tibbett L., "The Best and Brightest IS," Corporate Computing, v.1, n.2, p.23, August, 1992.

Sprague, Jr., Ralph H. and Barbara C. McNurlin, Information Systems Management in Practice, 3rd edition, Prentice Hall, Englewood Cliffs, NJ, p. 536, 1993.

Stokes, Stewart L., Jr., "Getting a Foot in the Door: Scrutinize IS to Help Build a Strong Case for Teaching Managerial Skills," Computerworld, v.23, n.43, p.120, October 23, 1989.

Taylor, M. Susan and Donald W. Schmidt, "A Process-Oriented Investigation of Recruitment Source Effectiveness," Personnel Psychology, v.36(2), pp.343-354, Summer, 1983.

Teachout, Mark S. and Martin W. Pellum, "Air Force Research to Link Standards for Enlistment to On-the-Job Performance," U.S. Air Force Human Resources Laboratory Technical Report, AFHRL-TR-90-90, February, 1991.

Terpstra, David E. and Elizabeth J. Rozell, "The Relationship of Staffing Practices to Organizational Level Measures of Performance," Personnel Psychology, v.46(1), pp.27-48, Spring, 1993.

Ubois, Jeff, "Temp Workers Offer High Skill Level; Consistent Quality is Big Advantage," MacWEEK, v.6, n.38, p.12, October 26, 1992.

U.S. Office of Personnel Management, "Guide for Managers/Supervisors on Staffing and Recruitment Programs."

Weber, Thomas E., "Wanted: Genius. First, companies identify the creative leaders of tomorrow. Then they woo them." The Wall Street Journal, May 24, 1993.

Wiley, Carolyn, "Recruiting Strategies for Changing Times," International Journal of Manpower, v.13, n.9, p.13-22, 1992.

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