MANAGEMENT ANALYST AND PROGRAMMER

DISTINGUISHING FEATURES OF THE CLASS: This is administrative and technical work in management information systems involving responsibility for a wide variety of tasks as assigned, including reviewing, defining and analyzing problems and formulating solutions for resolving those problems which may involve designing and writing computer programs. Work assignments and responsibilities will vary depending on training, experience and skill level. The work is performed under the general direction or supervision of a higher level technical employee and/or department manager and/or assistant. Does related work as required.

TYPICAL WORK ACTIVITIES:
Work activities and complexity of assignments will depend on training, experience and skill level, and may typically include the following:

Develops, designs and writes computer programs, from routine to complex;
Analyses a variety of materials, information and systems (e.g. documents, files, reports, workflow, legal requirements, service requirements) and proposes problem solutions;
Develops cost data and prepares economic evaluation on proposed procedures;
Designs information flow, computer controls, data files and report formats;
Evaluates and recommends usage of vendor software packages;
Recommends type of equipment to be utilized;
Evaluates operating system usage to determine if other usage techniques would achieve more efficient and dependable results;
Installs and/or assists in the installation and maintenance of local area network equipment and network operating systems;
Designs forms;
Prepares written instructions and explanations for the guidance of non-data processing user personnel;
Prepares and conducts training classes for system users;
Prepares flow charts and block diagrams;
Reviews, tests, revises and modifies existing programs;
Prepares instructions for the guidance of computer operators.

FULL PERFORMANCE KNOWLEDGE, SKILLS, ABILITIES AND PERSONAL CHARACTERISTICS:
The level of knowledges required will depend on the competency required for a given task or set of tasks. An individual in this series will be required to have: knowledge of computer program development; knowledge of electronic data processing systems, principles, techniques and methods of application; knowledge of the principles and practices of systems analysis, organization and management analysis, budgeting, accounting, statistical analysis, forms and records management and methods; knowledge of local area network equipment and their operating systems (*); knowledge of data base management systems; knowledge of current job control language and utility programs of a major computer vendor; ability to write and "debug" programs; ability to formulate, transmit, understand and carry out difficult oral and written instructions; ability to reason logically; ability to prepare complex diagrams, flow charts and reports; ability to present ideas clearly and concisely, both orally and in writing.

*To be demonstrated during the probationary period.

MINIMUM OUALTFICATIONS: Varies according to level, as follows:

LEVEL ONE: Two (2) years of experience in work involving systems analysis and computer programming, one year of which must have been using a program development system to write and/or maintain programs in a multi-programming environment which utilized operating systems designed to concurrently process six or more jobs.

Note: Appropriate college credits in computer programming language courses may be substituted for a maximum of six (6) months of the general computer programming work experience on the basis of one (1) credit for one month of experience. (Formal training in the use of computer programming languages provided by business schools or data processing training institutions may be acceptable in lieu of college credits based on an analysis and evaluation of course content and duration). An Associate's degree in Computer Science, Management Information Systems or related field or a Bachelor's degree in any field may be substituted for six (6) months of the general experience.

LEVEL TWO: Four (4) years of experience in work involving systems analysis and computer programming, one (1) year of which must have been using an on-line program development system to write and/or maintain computer programs in a multi-programming environment which utilized operating systems designed to concurrently process six or more jobs. In addition to the one (1) year of programming experience described above, the experience must have included one (1) year of one or any combination of the following:

- using a computer programming language to develop a multi-user on-line computer application
- maintaining a local area network operating system
- acting as the data base administrator for a major data base management system (personal computer data base management systems do not qualify)
- programming application systems using the data base management systems designed for personal computer systems
- developing complex spreadsheet applications to be run on personal computers
- computer programming in the multi-programming environment described above.

Note: Appropriate college credits in computer programming language courses may be substituted for a maximum of six (6) months of the general computer programming work experience on the basis of one credit for one (1) month of experience. (Formal training in the use of computer programming languages provided by business schools or data processing training institutions may be acceptable in lieu of college credits based on an analysis and evaluation of course content and duration). An Associate's degree in Computer Science, Management Information Systems, or related field or a Bachelor's degree in any field may be substituted for six (6) months of the general experience.

LEVEL THREE: Four (4) years of experience in work involving systems analysis and computer programming, including at least one (1) year which must have utilized an on-line program development system to write and/or maintain computer programs in a multi-programming environment which utilized operating systems designed to concurrently process six or more jobs. In addition to the one (1) year of programming experience described above, the experience must have included one (1) year of one or any combination of the following:

- using a computer programming language to develop a multi-user on-line computer application
- maintaining a local area network operating system
- acting as the data base administrator for a major data base management system (personal computer data base management systems do not qualify)
- programming application systems using the data base management systems designed for personal computer systems
- developing complex spreadsheet applications to be run on personal computers
- computer programming in the multi-programming environment described above

Note: Appropriate college credits in computer programming language courses may be substituted for a maximum of six (6) months of the general computer programming work experience on the basis of one (1) credit for one month of experience. (Formal training in the use of computer programming languages provided by business schools or data processing training institutions may be acceptable in lieu of college credits based on an analysis and evaluation of course content and duration). An Associate's degree in Computer Science, Management Information Systems, or related field or a Bachelor's degree in any field may be substituted for six (6) months of the general experience. A Master's degree in Business Administration, Computer Science, Management Information Systems, or related field or Public Administration may be substituted for six (6) months of the general experience.

Individuals at this level must have a thorough knowledge of one or more of the following as demonstrated by having had the amount of satisfactory work experience indicated.

1. The flow, control system, operation and computer programs of one of the County's information processing systems comprised of ten or more computer programs a portion of which are scheduled to run on a weekly or more frequent basis.

    The requirement can be met by two (2) or more years of satisfactory work experience in which the individual's primary activity was the development or maintenance of such a system.

2. The operating system and its utility programs used on the personal computers installed in the County and two or more of the personal computer programming languages or general application programs used by the county.

    The requirement can be met by:

    Having the equivalent of six (6) months of full time satisfactory work experience using, and/or of training others to use, the personal computer operating system and utility programs employed by the County, <u>and</u>

    The equivalent of six (6) months of satisfactory full time experience using each of two or more of the personal computer programming languages or general application programs used by the County.

3. The operating system and its utility programs for one of the computers, other than personal computers, used by the county.

The requirement can be met having had the equivalent of one (1) year of full time satisfactory job experience in which the individual's primary activity was installing, upgrading, or optimizing the throughput of one of the other than personal computer operating systems used by the county.

4. The data base management system used by the County on computers other than personal computers.

    The requirement can be met having had the equivalent of one (1) year of full time satisfactory job experience installing, using, or maintaining the data base management system.

5. The local area network operating system used by the County.

    The requirement can be met having the equivalent of one (1) year of installing and maintaining the network operating system and its equipment.

In addition, the individual's job experience must have included <u>any</u> of the following:

1. One (1) year of experience working on one or more computer based applications which included participation in all of the following: defining system requirements, system design, computer programming, writing user and operating documentation and user training; or

2. One (1) year of optimizing the throughput of a major vendor's multi-programming operating system or in training others to do so; or

3. One (1) year of experience involving the supervision of a Systems Analyst/Programmer or equivalent position.

LEVEL FOUR: Four (4) years of experience in work involving systems analysis and computer programming, including at least one (1) year which must have utilized an on-line program development system to write and/or maintain computer programs in a multi-programming environment which utilized operating systems designed to concurrently process six or more jobs. In addition to the one (1) year of programming experience described above, the experience must have included one (1) year of one or any combination of the following:

- using a computer programming language to develop a multi-user on-line computer application
- maintaining a local area network operating system
- acting as the data base administrator for a major data base management system (personal computer data base management systems do not qualify)
- programming application systems using the data base management systems designed for personal computer systems
- developing complex spreadsheet applications to be run on personal computers
- computer programming in the multi-programming environment described above

Note: Appropriate college credits in computer programming language courses may be substituted for a maximum of six (6) months of the general computer programming work experience on the basis of one (1) credit for one month of experience. (Formal training in the use of computer programming languages provided by business schools or data processing training institutions may be acceptable in lieu of college credits based on an analysis and evaluation of course content and duration). An Associate's degree in Computer Science, Management Information Systems, or related field or a Bachelor's degree in any field may be substituted for six (6) months of the general experience. A Master's degree in Business Administration, Computer Science, Management Information Systems, or related field or Public Administration may be substituted for six (6) months of the general experience.

Individuals at this level must have a thorough knowledge of one or more of the following as demonstrated by having had the amount of satisfactory work experience indicated.

1. The flow, control system, operation and computer programs of one of the County's information processing systems comprised of ten or more computer programs a portion of which are scheduled to run on a weekly or more frequent basis.

   The requirement can be met by two (2) or more years of satisfactory work experience in which the individual's primary activity was the development or maintenance of such a system.

2. The operating system and its utility programs used on the personal computers installed in the County and two or more of the personal computer programming languages or general application programs used by the county.

   The requirement can be met by:

   Having the equivalent of six (6) months of full time satisfactory work experience using, and/or of training others to use, the personal computer operating system and utility programs employed by the County, and

   The equivalent of six (6) months satisfactory full time experience using each of two or more of the personal computer programming languages or general application programs used by the County.

3. The operating system and its utility programs for one of the computers, other than personal computers, used by the county.

   The requirement can be met by having had the equivalent of one (1) year of full time satisfactory job experience in which the individual's primary activity was installing, upgrading, or optimizing the throughput of one of the other than personal computer operating systems used by the county.

4. The data base management system used by the County on computers other than personal computers.

   The requirement can be met by having had the equivalent of one (1) year of full time satisfactory job experience installing, using, or maintaining the data base management system.

5. The local area network operating system used by the County.

> The requirement can be met by having the equivalent of one (1) year of installing and maintaining the network operating system and its equipment.

In addition, the individual's job experience must have included <u>any</u> of the following:

1. Primary responsibility for designing, programming and implementing a computer based system for which the total Management Analyst and Programmer effort required more than one (1) year; or

2. Three (3) years of experience involving the supervision of a Systems Analyst/Programmer or equivalent position; or

3. Three (3) years in the programming of on-line computer applications or three (3) years in optimizing the throughput of a major vendor's multi-programming operating system or in training others to do so or any combination of the two; or

4. Primary responsibility for installing all or a significant portion of a major application software product which included analysis of user requirements, system and program modification (if required), writing user and operating documentation and user training.

<u>NOTE:</u> See attachment for examples of acceptable database management systems, programming languages, office automation products, hardware, operating systems, networking and application systems. These examples are subject to change, commensurate with technological advances.

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<u>Acceptable Knowledge, Skills and Abilities</u>
for
<u>Management Analyst and Programmer Specifications</u>

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<u>Database Management System:</u>
- Sybase, Oracle, <u>Informix</u>

<u>Programming Languages:</u>
FORTRAN, BASIC, C, PASCAL, COBOL, UNIX Shell, SQL, Ingres, HTML, JAVA, PERL.

<u>Office Automation products:</u>
- **PC:** Microsoft Word, Wordperfect, Microsoft Project, Project Workbench, Excel, Lotus 123,Norton Utilities, Power Point, Visual Basic, Access, Visual C++, Visio, Lotus Notes, Crystal Reports.

<u>Hardware:</u>
- **BULL:** DPS7000 <u>et al</u>.
- **IBM:** PC 808x, 80x86, Pentium; AS400; R6000; 319x; 43xx; 308x; 360-370, <u>et al</u>.
- **HP:** Pentium 166, Laser Printers, HP5si, <u>et al</u>.
- **ALSO:** Other hardware from major vendors, such as DEC, DG, Apple Macintosh, <u>et al</u>.

<u>Operating Systems:</u>
- **BULL:** GCOS7 <u>et al</u>.
- **IBM:** MVS, TSO, VM, CMS, PC-DOS <u>et al</u>.
- **<u>MICROSOFT</u>:** MS-DOS, Windows, Windows 95, Windows NT <u>et al</u>.
- **ALSO:** Operating Systems of other major vendors, such as....UNIX, XENIX, CP/M, Apple-DOS.

<u>Networking:</u>
- TCP/IP, OSI, SNA, Novel Netware, Token Ring; wide area (WAN) and local area (LAN)communications and telecommunications; client-server applications; internet.
- Also, a variety of networking and communications hardware such as repeaters, bridges, routers, gateways, modems and various wiring schemes; (<u>PBXs?</u>).

<u>Application Systems:</u>
- Financial/Purchasing/Payroll
- Human Resources
- Hospital Patient Information System
- Court & Land Records Management

<u>Miscellaneous:</u>
- Internet (<u>administrator?</u>)
- E-Mail (<u>administrator?</u>)

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