

## **Internet, O\*Net, and Vocational Evaluation \***

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The past decade has seen remarkable growth in the area of computer technology, and desktop computers have become commonplace in both the worlds of business and in our personal lives. Marketing research figures from Ziff Davis (1998) indicated 35% of individuals access the Internet from their office. Additional data from the same survey showed 43% responding that they logged on

to the Internet from home. Even when used to perform minimal tasks, such as balancing a checkbook, sending mail, or typing correspondence, it is evident that computers have become as much a part of our daily routines as punching a time clock or brushing our teeth.

At the core of a PC is a central processing unit (CPU) or "brain" of the computer. The CPU is supported by other hardware, such as random access memory (RAM), one or more hard drive's (HD), and various other pieces of "support" hardware (e.g. sound cards, video cards). Tying all of these components together is the system board or "motherboard" whose function is to allow efficient communication between all hardware devices.

The CPU is the main piece of "hardware" in a PC. In concert with the computers operating system (OS), the CPU's general function is to "run software" (programs) by executing the specific instructions of each program being used by the computer operator. Software is "run" while in "memory space", and the CPU coordinates the efficient use of this resource. The CPU keeps the amount of "available memory space" maximized by continually arranging data and culling out information it no longer needs. Potential memory space can be broken into three different types; 1) cache memory 2) RAM, and "virtual" memory.

Cache memory is a very small "memory space" usually one-half of a megabyte (mb), or less. This memory chip is found either on the system board or can be an "on-board-cache, which is connected directly to the CPU. Because of its proximal location and design, cache memory is the "quickest" memory space for the CPU to use.

Random access memory, or RAM, is manufactured by combining small quantities of specialized chips, similar in appearance and design of cache memory, on small plastic cards called "modules". These memory modules can range in size from 1 mb to over 100 mb. RAM modules may be combined on the system board to give the CPU more memory space with which to work, and while not as potentially fast as cache memory, RAM is much faster than "virtual memory". When the CPU has used up all of the available memory provided by the cache and RAM, it must look elsewhere for additional room to perform operations. For this, the OS helps out by giving the CPU some created "virtual" memory" to use. Creation of virtual memory is accomplished by using a portion of the hard drive to emulate memory space. Although the virtual memory is not as efficient as RAM or cache memory, it is sufficient to allow the ongoing operations to continue, albeit at a reduced pace. Manufacturers of both hardware and software are constantly working to extract every tiny bit of performance from the available technology, and although the basic principles of computing have

remained largely unchanged, the product the consumer has available to them today is considerably different.

Ten years ago, the CPU of a personal computer (PC) contained just 275,000 transistors, had a clock speed of 33 megahertz (MHz), and was capable of carrying out 9.4 million instructions per second (MIPS) (Burd, 1998). The PC in which this CPU was installed generally shipped with 4 mb of RAM and a HD capable of storing 20 mb of information. Today, the latest CPU contains 7,500,000 transistors and has a clock speed of greater than 533 MHz. This chip can process 7.59 billion instructions per second (BIPS) (Burd, 1998), and an average PC available to John Q. Public now ships with 128 mb of RAM and a 10 gigabyte HD. For comparison purposes, a "gigabyte" is 1000 megabytes, so "10 gigabytes" is equal to 10,000. Given the above figures, the increase in overall system performance can be approximated at 250% or higher. Improvement of that magnitude is truly remarkable considering the current pricing on a mid-level computer system is almost exactly the same, and in many cases less (Dell Computer, 1999), as it was ten years ago. With the influx of affordable, high performance, computing equipment into the public sector has come the mainstreaming of otherwise obscure resources, in particular, networking. Once available only to large corporations, the government, and universities, the benefits of computer networking are now being enjoyed by the average world citizen.

The Internet was actually created as an indirect result of a directive given by President Eisenhower in response to the Russian's launch of "Sputnik" in 1957. President Eisenhower created the Advanced Research Project Agency (ARPA) as a "core technical group" which would work on technologically advanced projects. So in 1969, the Department of Defense (DOD) asked the ARPA to conduct research into "computer networking". The result was ARAPNET, which, by 1973, had 15 "networked" sites in the United States. By 1971, the ARAPNET had gone international with the inclusion of England and Norway in the network. Some ten years later, in 1982, the Transmission Control Protocol/Internet Protocol, or TCP/IP, was created, and is still the major protocol used today for network communication. Finally, in 1990, ARAPNET ceased to exist, and "The Internet" as we know it today, was taken over by private organizations.

By definition, the word "Internet" can be broken down into two parts, Inter, meaning between or among, and net, a system of interrelated stations, especially over a large area. In the past year alone, 20 million Americans have begun using the Internet (Ziff Davis, 1998), and in a survey conducted by Mediamark Research in the spring of 1998, 35.3% of polled households indicated PC ownership. Internet usage has been shown to decline as age increases; 25 to 34 year-olds - 40% usage, 35 to 54 year olds - 33%, and 55 years-old and over - 9%, but as a group, 75% of Internet users indicate that they log on weekly, while 28% indicate daily usage (Ziff Davis, 1998).

As a resource and communications medium, the Internet is unparalleled. As an entity, the Internet seems to be perpetuated by the very advancements which it inspires, making it both a "driving" and a "driven" force of technological advancement. Truly, the Internet has taken on a life all its own, and the synergy between technological innovation and the popularity of the Internet has helped to shrink the vastness of our planet down to the size of a fifteen-inch computer monitor. Generally referred

to as a singular entity, "The Internet" is actually a Gestalt, meaning that the "whole" is greater than the sum of its parts. There are many arguments as to exactly what should be considered part of the Internet. Four of the widely agreed-upon component parts are, 1) The World Wide Web (WWW), 2) Email, 3) Newsgroups, 4) File Transfer Protocol System (FTP). These elements, along with others, form what is collectively referred to as "The Internet" or "The Net".

Not surprisingly, the lack of agreement on exactly what makes up "the net" leads to another problem;

how to measure it. Estimates of both the current size and expansion rate of the net are widely varied, as are the measurement techniques being used. Of the major Internet components, the WWW has enjoyed the most relatively explosive expansion.

Some at Ziff Davis(1998) approximate the growth of WWW as, "Doubling every 53 days." More conservative estimates cite the growth rate of "The Internet" as, "Doubling each year". Given the data, it is obvious that even if one leans towards staunch conservatism, the Internet's rate of growth has been exponential.

### **Using the Internet**

The way to keep updated on helpful sites on the Internet for the information desired is to use the Internet search engines to look at different places where information is located. It takes persistence and time surfing the web more so than knowledge to find those information gems which are really helpful. There are several procedures which can be followed to reduce that time and there are some general hints which can be of assistance. The first procedure which can make the Internet of use in vocational evaluation is to think Internet when a problem is confronted. For those of us born before 1980, the Internet is not something we grew up with and it is not a tried and true source of information in our thinking as more traditional tools such as a dictionary, encyclopedia, or the library. For those of us who can be classified as a technosaurus, we have to think Internet when confronted with a problem. After enough success in finding solution on the Internet, it will begin to not be such a forced process. When we do think and try the Internet to find that special information, a second procedure is to try different search engines. It is comfortable to make a habit out of one search engine, however, of the estimated 350,000,000 pages of information on the world wide web, less than one third of it is classified and the various search engines do not always overlap on what they have listed. A third recommended procedure in searching on the Internet is to look at the hypertext links on sites which seem to have the right or nearly the right type of information desired. The forth and last recommended procedure is to find sites which catalog other sites of interest and use them in our

searches. For example, the authors have a site with numerous other hypertext links in rehabilitation, medical information, disability information, vocational statistics, etc. at <http://www.auburn.edu/~mcdanrs>. Another interesting site for cataloging rehabilitation counselor tools can be found at <http://www.rehab.state.al.us/tool>.

### **Internet Tools for Vocational Evaluators**

#### **Job Finding**

Vocational evaluators are interested in a variety of differing sites however, to provide a focus in this

paper, sites of main interest shall be explored in the areas of vocational information, disability information, test information, and rehabilitation information. The vocational information can consist of vocationally related data such as job and wage trends and it can be formed of information and help in locating jobs. The government provides a number of excellent sites on general vocational information and while those will not be covered here, a look on the Internet at the article by McDaniel, Beadles, and McDaniel (1997) will provide links to many of those. Job seeking is a major thrust of Internet activity and can be carried out on a national or local basis at numerous sites. At the national level, there are a multitude of private vendors that maintain job listings, resume listings, and employer - job seeker matches. These commercial sites generate income by having the employers pay a fee to be listed and the job seekers can usually access those listings free. Some sites also allow the posting of resume's free and all of them have helpful information, tips, or advice for the job seeker. Some have headhunting possibilities while others have interest or personality tests on the site such as a modified version of the Myers - Briggs personality type indicator complete with job oriented interpretation. A representative example is The Monster Board located at <http://www.monster.com>. The advantage of utilizing these job services are the thousands of jobs they list coupled with their ease of use. Some even focus on certain career areas so that a seeker can save time in finding the most appropriate job area. In vocational rehabilitation, this is available at the non commercial Oklahoma Clearing House in their Rehabilitation Recruitment Center, <http://www.nchrtm.okstate.edu/rrc> which encourages submissions for state vocational rehabilitation agencies and can be browsed free of charge. The main disadvantage of the commercial job posting services for much of the vocational rehabilitation population is that the bulk of the jobs listed are highly skilled, often technical jobs, requiring college degrees. This has been broadening somewhat however, it is usually these jobs which are in high demand to the extent that employers are willing to pay to nationally advertise them. These sites have also been criticized for listing jobs from the same places so that two different sites claiming thousands of different listings may in fact have multiple overlaps.

Before venturing into the territory of commercial job hunting sites, it might be good to read the most authoritative source on the web concerning these programs, the Riley Guide located at <http://www.dbm.com/jobguide/>. In her guide, Margaret Riley Dikel offers up to the minute reviews of the various job services and has added information on where to search, non Internet sources of information on jobs, information on job trends, and good advice on getting started.

Another good source of information which is at once intimately familiar to most job seeker are the classified ads on-line. These programs take newspaper advertisements of jobs in the local papers of most major cities and some smaller communities and offer a computerized search capacity of those. Generally the best results can be found by looking at the previous Sunday listings and searching multiple newspapers in the same geographic area. A favorite example of this can be found at Career Path: <http://www.careerpath.com>.

In addition to the national commercial services, the federal government does an excellent job of posting jobs primarily from it's network of thousands of listings at local employment offices run by the U.S. Department of Labor. The best known site is America's Job Bank at <http://www.ajb.dni.us> which is a huge web page with more information on jobs than can be absorbed in several visits to their

site. Jobs can be searched for in multiple states or single zip codes or cities and by specific titles or

in aggregate groups using Office of Employment Statistics, OES, codes. It is expected that this will change to O\*Net codes as O\*Net becomes fully functional. The America's Job Bank site can customize the search to your area and even provides a classified ads search. As might be expected, there is no charge to access the site or use the information. For vocational evaluators, needing documented information on openings in certain fields for their clients, this should be bookmarked and

often visited. In addition to information about the job opening, the site lists the hourly wage, required

education, and any experience, certifications, or licenses required. While the exact employer is not given, the evaluator or consumer will know that a visit to that employment service office can result in a referral for an available job within their capabilities. Each state receives funding for a State Occupational Information Coordinating Committee which is known under differing titles in each state

and they often have the same information as America's Job Bank, however, it is supplemented with additional information about educational opportunities and other facts relevant to that state so that they might be even a better source of this information. For Alabama, they are found on the Internet at <http://soiccal.huntingdon.edu/SOICC/default.html>.

Beyond programs useful in finding out information on jobs, there are some ancillary sites which have

data that might be helpful in finding that job. For example, some of the job hunting programs require the use of a DOT code number. Where better to look for it than the DOT online at [http://www.wave.net/upg/immigration/dot\\_index.html](http://www.wave.net/upg/immigration/dot_index.html). Other programs which are not targeted for job seekers have useful features. For example there are numerous mapping programs which given an

address will print a map to that address. This is excellent to provide a consumer needing directions to a work site. Some of those programs even provide the specific directions on how to go from one place to another in simple clearly stated directions. A popular one can be found at Yahoo.com or by searching for Maps with one of the search engines.

### Disability, Test, and Rehabilitation Information

Name a disability and there likely is a site or multiple sites on the Internet which focus on that disability. From support groups to medical education to individuals with a home page, the Internet is the great sharer of information on disability. The National Institute on Disability and Rehabilitation

Research (NIDRR) provides funding to a Research and Training Center on disability statistics which can be accessed at their site at <http://dsc.ucsf.edu> or with other sites at the National Center for the Dissemination of Disability Research at <http://www.ncddr.org/index.html>.

As might be anticipated, test publishers have their commercial sites in which vocational evaluators can review their offerings and purchase materials such as can be found at <http://www.biz.rtd.com/valpar> for the Valpar system or <http://www.psychorp.com> for the Psych Corporation. What may be of more interest to evaluators however are sites in which actual tests can be given. The O\*Net site <http://www.doleta.gov/programs/onet/> will contain downloadable version of their interest and work values test and as previously stated, some of the job search services post

interest or personality tests.

With the preponderance of government resources dedicated to service support for working with those with disabilities, those service programs have gravitated to providing their goods on the Internet. For example, the Job Accommodation Network (JAN) which use to be a write or call only service, can now be accessed on the World Wide Web. Similarly, one of the most useful programs for those wanting to look at annotated bibliographies on rehabilitation materials, NARIC, is available on the web at <http://www.cais.net/naric/>. Similarly, ABLEDATA, the information database on assistive technology has also been moved to the Web at <http://www.abledata.com/index.htm>.

### The Near Future of the Internet for Evaluators

The Internet is changing so rapidly that it would be foolish to expect to predict the future of the Internet with any accuracy. However, there are several current developments which portend the direction of the Internet for evaluators in the near term. For example, a new program, Access.Net/VR

has come on-line which takes a person by disability and provides a modifiable configuration of their functional limitations. It works with counselors to develop realistic goals to modify those limitations and provides information from JAN and ABLEDATA on modification strategies for specific jobs as

categorized by O\*Net. This opens the door for vocational evaluation services which can be completely conducted on the Web. Similarly, most software is expected to be available by download from the Internet and testing, job search, and other vocational evaluation specific software should not

be an exception. Sites are already on the Web which market vocational evaluation services and that trend to could be expected to increase, particularly in the private sector. Finally, states with Internet based case management systems are already geared towards communication and case activation/development files on the Internet. Vocational evaluators can expect to receive referrals and

referral materials, and we will be providing vocational evaluation results back to the referral agents or consumers via the Web. The communication is instant and can be made coincidental which places it a step ahead of regular mail. At a previous National Forum on Issues in Vocational Evaluation, McDaniel (1997) made the point that future evaluators will be spending more time on the computer and less with the consumer. That has been happening and it appears the direction of the field in the future will encourage both this trend and the continuing education of consumers via the Internet who can develop their own evaluation plans with minimal help from rehabilitation professionals. This can no better be illustrated than in the development of the O\*Net which is available to all and continues the strength of the Internet in decentralizing information power by getting it out of professional hands and into consumer hands. The next section will provide an update on O\*Net's development.

### **Discovering O\*Net**

For the past sixty years, rehabilitation professionals have relied on the Dictionary of Occupational Titles for occupational information. Currently, the Occupational Information Network, or better

known as O\*NET, is replacing the DOT. Slowly but surely, the change is being made, with a completion date set for 2001. The most important aspect of this drastic transformation, is that all who use the DOT learn the answers to the following questions: What is O\*NET? Where do I find it?, and How do I use it?

### What is O\*NET?

Unlike the DOT, O\*NET is occupational information retrievable only by computer. It has reduced the 12,741 job titles of the DOT into 1,172 occupations (Jist, 1998). Each occupational listing is filled

with information that previously was not available in the DOT. For example, O\*NET offers four hundred additional descriptors on worker knowledge, skills, and abilities. Along with these descriptors there are also more details of work activities, job characteristics, and labor market information. Further, there is a related jobs section under each category. This section is available within the profile of each job. The profile produces a list of several jobs that are similar and related to the profiled job. The related jobs are similar to the profiled job according to worker requirements and characteristics, and specific job duties.

Each job category in the O\*NET program is assigned a series of five to six numbers and letters. Unlike DOT number assignment, with certain numbers representing data, people, things or specific vocational preparation, individual O\*NET numbers carry no meaning. Similarly though, the jobs are

not arranged alphabetically but are grouped in related job sections, e.g.: sales workers, services workers, administrative support workers, etc.

In early 1999, O\*NET programs will run only on Windows-based personal computers. The program is literally filled to the brim with information acquired by job analysts for the DOT and adapted to O\*NET. In the future, information will come not only from these and other job analysts, but actual employers and workers. The department of labor encourages feedback from anyone in either public or private sectors who use O\*NET so that more detailed and accurate information on jobs in this country can be accessed.

### Where Do I Find O\*NET?

Two sources are available for retrieving O\*NET data: in a book and through the O\*NET viewer computer program. The book version of O\*NET data may be helpful for those who like a hard copy of the data. While there are some similarities, it is quite different from DOT structure and content. Similarly, there are lead statements and work activities, but in the O\*NET version, there are also related jobs and yearly earnings information. To use the O\*NET book, however, the DOT or at least a DOT code number is needed. There is no other way to look up a job title in the print version of O\*NET. To keep the size of the book to a minimum, writers have only listed skills that are required at an average level or above. For example, a ship or boat captain may be required to use mathematical

reasoning at a below average level, but is required to use it nonetheless. This information can be extremely important when researching jobs by transferable skills. Therefore, if you're looking for

a

more thorough and faster information search, the best bet will be the O\*NET viewer.

The O\*NET viewer is the official computer program for occupational information. There are two methods of obtaining the viewer data; downloading it from the O\*NET web page and on a CD-ROM. It is available through the department of labor in Washington, DC. The easiest way to acquire the viewer program is from the official O\*NET internet site. At this site, users have the option of ordering the CD-ROM version of the program or downloading the program for free. The benefit of

ordering the CD-ROM is that the program can be installed and used in multiple computers. The faster

way of acquiring the viewer is downloading onto your personal computer, which can take as few as three minutes and six megabytes of your hard drive.

### How Do I Use O\*NET?

Depending on the goals and background of the user, O\*NET can be used in several different ways. For example, a career counselor might use the viewer differently than a displaced worker or rehabilitation counselor. There are several different ways to search the viewer for occupational information. A search can be made for a job by using the job title, code, or key word. If the O\*NET title or code is unknown, a title or code from another source can be used. This process is called a crosswalk. Other sources of codes and titles are: Apprenticeship Information Management System (AIM), 1990 Census Occupations (CEN), Classification of Instructional Programs (CIP), Dictionary of Occupational Titles (DOT), Military Occupational Codes (MOC), Office of Personnel Management Occupations (OPM), and Standard Occupational Classification (SOC). The crosswalk advantage is only temporarily available. By 2002, there will only be one way to classify job titles: Occupational Employment Specialty codes (OES).

When looking at a particular job using O\*NET, all 435 descriptors for that job can be viewed. These can be viewed all at once, or chosen one at a time to see at what level the job requires the particular descriptor, how important it is to the job, and how frequently it is required. Each descriptor is ranked on a scale from 0-100, zero meaning the job descriptor is not even required or important and 100 meaning that the skill is extremely important, constant, or required at the top level of performance. For example, a ship or boat captain may be required to delegate authority at a high level, but this particular task may not be very important to the job.

Using the O\*NET computer program opens up a vast insight to every detail of a job. Each description includes knowledge, skills, and abilities, labor market information including yearly earnings, crosswalks to titles in other areas, and related job titles. Already, this program has allowed rehabilitation professionals to find more occupational information than they could with the DOT. Data

collection continues for a more complete and accurate database of information. Any input or feedback of ideas on O\*NET is welcomed by the department of labor so that they may reach a broader range of people needing occupational information.

### Future Development of O\*NET



The department of labor is currently conducting research needed to further enhance the existing O\*NET data. Sources say that by 2001, a complete set of new data will comprise the final, more thorough and accurate O\*NET. By May 1999, the department of labor will be completing the designs for four tests to be incorporated with O\*NET data. These tests will be the Abilities Profiler, Work Values Profiler, Work Interest Inventory, and a Literacy test. The Abilities Profiler measures nine different abilities and is a new version of the General Aptitude Test Battery (GATB), minus manual dexterity sections. The Literacy Test is already available and the other three tests will be available in print version in the near future. There is a possibility that a downloadable version may become available simultaneously.

Private vendors of computerized job search programs are in the dilemma of having to deal with the changes to O\*Net from the DOT database with which they are familiar. They apparently are in the process of determining how their new products will be able to interface with O\*NET. For example, one vendor, LifeStep, reports they are releasing version six with a full O\*NET interface. Within LifeStep Version 6, you can view, search, print and report O\*NET information, without having to connect with O\*NET. This version has been produced with subscription capabilities, meaning that the software will constantly update itself when O\*NET is updated. Another computer job search program, OASYS, on the other hand, reports that it will wait to interface with O\*NET when there is more complete, updated data. O\*Net has missed most of it's past deadlines and a skeptical view is that it will still be some time before full completion, however, it is coming and is the new database structure of the Department of Labor for classifying jobs. Therefore, it is not too early for vocational evaluators to examine how it will change/affect their evaluation process. Between the development and release of O\*Net and the rapid changes fostered by the Internet, vocational evaluation will need to maintain it's technical orientation as we enter the new millennium.

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