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ABSTRACT

This publication describes applications and/or research involved with computer use for professionals in leisure, parks, and recreation. Papers presented are: (1) "Software in the Eighties: Information Exchange and Clearinghouse Applications" (Jeff A. Stuyt); (2) "Microcomputer Applications for the Manager of the Future" (Christine Z. Howe); (3) "Computer Applications in a Therapeutic/Outdoor Recreation Setting" (Alan Ewert); (4) "Introducing the Professional Office System" (International Business Machines); (5) "Taking Computers into the Field or How Long Is Your Extension Cord?" (Thomas S. Catherall); (6) "Computer Consciousness and Leisure Services" (Karla Henderson and M. Deborah Baileschki); (7) "Computerized Instant Scheduling: 'Having Your Cake and Eating It Too'" (Brian M. Haderlie); (8) "RDECIS: A Recreation Management Decision Simulation" (Robert T. Watts); (9) "Computerized Team Sports Scheduling" (Richard Chris Duke); and (10) "Computerized Meet Scheduling Utilizing Three Variables" (Thomas T. Gushiken and Joel B. Worra). (JD)

COMPUTER PERSPECTIVES IN RECREATION

Sponsored by:

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Editor

Brian M. Haderlie

PREFACE

Computer Perspectives is a publication describing applications and/or research involved with computer use in recreation for professionals in Leisure, Parks, and Recreation, and is sponsored by the Brigham Young University Departments of Recreation Management/Youth Leadership and Campus Recreation.

The purpose of Computer Perspectives is to enhance professional growth and awareness through publication of papers from practitioners, educators, researchers, etc. Computer Perspectives is intended solely as a means of sharing ideas and successes through publication. The format was not designed as a symposium or other such forums.

Computer Perspectives used a direct photographing process of "oversized" sheets. The oversized sheet is roughly equivalent to four (4) pages of double spaced copy each and five (5) sheets were targeted per position paper. Thus, five pages of "oversized" sheets can be photographed and accommodate a twenty page paper. This innovation created a substantial savings in the printing of the publication. This format also provided a way of sharing ideas and successes without requiring substantial travel expenses. We hope to continue in the future.

Brian M. Haderlie
Editor

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Jeff A. Stutz, Texas Tech University

Abstract

This paper describes one university's attempt to introduce parks and recreation professionals to computerized automation in office management. The need is shown for the newcomer to be convinced of the values of automation first, next of the multitude of options available to him, and finally of the relative ease of getting started. The current status of software development for microcomputers in our field is indicated. The paper continues with sections on information exchange between professionals on their computer applications, and the operation of a clearinghouse at Texas Tech University. Samples of newsletter items that are made available to state journal editors concludes this report.

Introduction

This paper deals with efforts undertaken at Texas Tech University to establish a bridge between the parks and recreation professional on the one hand, and the university on the other. The topic is the introduction of computers in administrative office management, an event that has become more widespread as the cost of data processing has been reduced over time.

Two activities in particular will be reported on here: the exchange of information available on computer applications, and the operation of a databank of information, or clearinghouse. Both have been in progress at Texas Tech for approximately two years now, in response to repeated demands from the users. Neither constitute full-fledged consultation-practices: they are intended solely as efforts to counter the myths that surround automation. There obviously is a market for consultants to the more or less experienced users. However, we see it as our task to lead the novice over the threshold, and bring him in touch with others who have gone through similar trials and tribulations.

In our approach, the newcomer to computer applications needs to be:

1. convinced of the value of introducing these new management techniques;
2. informed of the most promising options currently available to him; and
3. guided from interest to application while avoiding familiar pitfalls.

The contribution that we can make to this threefold process of facilitation is limited by the fact that our time is mainly spent in preparing and teaching courses to college students. However, there are several ways to exchange information about the topic in question that require a limited amount of time; they will be discussed below. The main strategy is one of mass-publicity: our most recent information regarding computerization is sent to the editors of several state journals in parks and recreation in the form of a newsletter. Depending upon space availability, these editors will then publish part or all of the bimonthly series. The follow-up to this is the actual goal of the clearinghouse: reprints can be mailed, questions answered--generally a much less efficient process.

Software in the Eighties

Computers will be most likely the dominant factor of change in office management ahead. There is a definite trend of smaller computers to replace the number of larger ones (minis and mainframes) sold. The advent of the more powerful 16-bit microcomputers, sharply decreased cost of hardware (the computer itself and it's accessories, not the programs run on it), and independence of the micro-operation are all contributing factors to its success. Parks and recreation is slow to wake up, but pioneers in different areas of the country are finally emerging with stories sounding of victory.

User-friendliness is improving, which means that the modern computer user no longer needs to go through lengthy training and be a technical wizard. In a profession, that to a great extent consists of men and women who entered it before the computer explosion, this opens up new avenues to those at middle and higher levels of management who would normally shy away from anything more complicated than a xerox machine. The growth of the small computer has been so fast that it is taking a lot of municipal operations by surprise. What could previously only be done by the central facility in city hall, is now all of a sudden possible in many different departments all over town, independently.

What is at stake here, most of all, is access to information. In order to gain access to any kind of information through a computer, one needs programs. The latter, also called software, is and probably will be for some time, the major obstacle in the path of the computerizing manager. One major reason is, that most general business software on the market is not directly suitable for our specific purposes. We need to modify much of it substantially in order to make it apply to our city size, number of parks, vehicles, personnel, etc. But what about programs that allow us to schedule sports leagues, swim meets or work-outs, tennis draws? One won't find these in the standard Computerland or Radio Shack store. They need to be tailor-made. A couple of small firms that realized the need have gone ahead and are now marketing software directly to parks and recreation operations. Market Computing (201 15th Ave. S.W., Puyallup, Washington 98371) was first and consists of a group of young people with various backgrounds, including recreation. This firm caters mainly to the Apple computer owner, although a few programs are also Radio Shack compatible. Their introduction of CP/M based software in 1983, will be helpful because it means that their programs can run on a great number of other computer brands. CP/M has been the initially adopted standard of a second company, Helios in Irving, Texas (3501 North MacArthur, Suite 308, Irving, Texas 75062).

Helios again consists of a mix of people, at least one of whom has considerable working experience in a recreation environment. These and other companies that may follow suit, can provide the manager with a standard package; adjustments that may be required for a non-standard situation are generally left up to the user. It is obvious that proper guidance and follow-up on behalf of the seller are essential for continued business. The same can be said for the hardware into which these programs are plugged: most frustrations derive from a lack of service for machines bought out-of-town, often from fly-by-night discount vendors. Buying from a reputable, in-town company that can guarantee quick repairs is recommended to avoid problems.

Information Exchange

Because the applications of computers in this field are relatively new, a gap exists between program developers and other potential users. No organizational structure was available to handle the new flow of information, neither in the state or national professional bodies, nor in the university departments preparing students for jobs in leisure services. At the National Workshops on Computers organized by the N.R.P.A., the need became apparent for a system that would provide information on computer use on a more permanent basis. A first step was taken at North Carolina State University, which published a reference guide to computer applications in 1980. A year later, it was decided to update this guide, which in the meantime had completely sold out. The new edition should become available toward the middle of 1983.

In 1981, the Department of H.P.E.R. at Texas Tech University started to collect information on computer hardware and programs related to parks and recreation. The goal was to fill a gap in information currently available to professional managers by collecting existing programs, literature references, and hardware reports in a manually accessible filing system.

Any interested professional would be able to use the information thus collected by submitting inquiries through the mail or telephone calls. At this point, a manual filing system was chosen instead of a computerized one. Even though the latter was a feasible option because of several available microcomputers and a mainframe, many items were considered to be too bulky for computer file storage, unless condensed to a minimum number of descriptors. Moreover, the upcoming survey (see below) would most likely enlarge the amount of information to be stored. We decided to wait for its results before making a commitment to an automated data retrieval system.

After some initial word of mouth publicity, a number of inquiries started coming in. But only after publication of a newsletter-column in several state journals (see below), the requests for information multiplied. Several questions are now handled daily, mostly by phone. The broad nature of many of these calls ("could you tell me what I need to know to get started in computers?") is often time-consuming. The availability of the upcoming survey results as well as ongoing newsletter publication will help to relieve some of this strain.

Information In Print

The journal of the state professional organization in Texas, T.R.A.P.S., commenced publishing a newsletter entitled "Computer Update" in which the most recent acquisitions of this clearinghouse are introduced to its readers. In addition to its individual subscribers, this journal serves approximately one hundred municipal and several state departments in the field. At present, the newsletter that is produced at Texas Tech is used in the state professional journals of California, Georgia, Idaho, Indiana, Iowa, Kentucky, Marvland, Michigan, Mississippi, Nebraska, New Hampshire, North Carolina, Pennsylvania, Tennessee, Vermont, Virginia, Wyoming, and the provinces of British Columbia and Ontario (Canada).

The items presented in this newsletter have been substantially reduced in length as compared to the first issues at the request of state journal editors. Space is limited, and therefore an item that originally was perhaps 500 words in length is now presented as one that counts 200-250 words. Examples of a couple of typical items have been included in the appendix.

The state journals were targeted after consultation with the staff of Parks and Recreation, the national publication. The latter did not desire to publish any particular newsletter, for fear that others would follow suit and insist on the journal accepting their newsletters as well: "the end would not be in sight."

Our statistics show that the mean number of state journal subscriptions is 1262.5, with a minimum of 250 and a maximum of 3,500. Average frequency of publication is quarterly, with about one-third appearing six times a year. All state journals that we could identify were initially surveyed with regard to their interest in topics related to computers. About eighty percent of the responses indicated a great need for articles in this content area, with most of these not publishing any in the past year. Those editors who reacted positively are now on our mailing list and receive a free subscription.

This simultaneous publication of new developments in computer applications has born fruit: the number of inquiries for further information has tripled in size, and now covers a much wider geographical area.

Appendix

The following are two sample items taken from a recent issue of the Newsletter, Computer Update.

1. Selling Like Hotcakes

Interface Age Magazine, a business-oriented data processing publication, recently put together a list of the top-10 in computer products for this year. A subjective list, no doubt, but we'd like to share some of its comments with you anyway since it may have implications for your purchasing decisions now and in the future.

In the section on hardware, IA calls to attention the designs of the $5,000 Corvus Concept, a smart terminal that is to be part of a local computer network. Variable position display, user-definable subscreens and multi-type front make this a state-of-the-art terminal for e.g. a municipal computer system. The IBM Personal Computer, now past its first birthday, is a microsystem available for about $4,000. With many third parties writing software programs for the PC, its business potential is growing. But Parks and Recreation-management programs have not yet been written for it, although the software produced by Helios in Texas is written for the CP/M operating language that the IBM will understand. Other outstanding hardware includes the portable Osborne, Grid Compass (very sophisticated and very expensive) and DEC personal computers.

2. Snowmobiling Computerized

The Iowa Conservation Commission in Des Moines will make copies of its software printouts available to interested colleagues elsewhere. Running what they call two "loosely coupled" IBM's (3033 and 370), they use BAL as a programming language.

BOAT is applied to display, change, and delete records, in their boat registration file; online disk storage is the memory device used. SNOW is the software that displays, adds and deletes records in the snowmobile

registration file.

In addition to the online programs described, Iowa is currently using batch programs (submitted without interactive capabilities) in COBOL, a business-oriented language common to large computers. The latter take care of edits, updates, and reports for swowmobile safety, hunter safety, and camping receipts and usage. For more information, contact: Jim Nelson at the Wallace Office Building, Des Moines, Iowa 50319.

MICROCOMPUTER APPLICATIONS FOR THE MANAGER OF THE FUTURE

Christine Z. Howe
The University of Georgia

Abstract

This article is directed towards the manager who is a novice microcomputer user, but wants to take an initial step towards computer literacy. This is attempted by familiarizing the manager with commonly used terms, identifying some of the relevant resources that are available, and discussing current and future applications for recreation and leisure service delivery systems.

Beginning Computer Literacy

The advent of the information explosion was not announced by a single, sudden big bang. Rather, we were greeted by the soft purrs and gentle hummings of microcomputers. Computers are machines that can accept information or data, process that information and provide results as output. These machines, much like telephones and hand held calculators, serve to make the manager more efficient and more effective in the delivery of leisure programs and services by allowing him or her to communicate and process information as never before. But in order to do this, the manager must first learn some of the language of this new technology. A microcomputer is a small, desk top computer that uses a microprocessor for its central processing unit (CPU). A microprocessor is the single microelectronic chip that holds all of the elements of a CPU. It is a small semiconductor whose matter permits electrons (which hold information) to move under the impulse of an infinitesimal amount of energy (Shane, 1982, p. 304). This chip is a tiny (smaller than a fingernail) silicon wafer that contains up to thousands of circuits for storing and processing information. The CPU is the brain of the microcomputer in that its electronic circutry oversees all of the activities of the machine. The CPU codes, stores and implements instructions, and monitors the execution of any program processed (Chandor, 1981).

In addition to microcomputers themselves, there are peripherals that exist or hardware and software. Hardware is a term used to describe physical apparatus or equipment such as display screens or boards. A cathode ray tube (CRT) is one type of screen; a vacuum tube that displays images. A video display terminal (VDT) is another type of visual monitor. A disk is a magnetized storage medium that records data by using a binary number system. The popular floppy disks or diskettes are magnetically coated flexible pieces of plastic on which information is stored. To enable computer communication over telephone lines and other media, a modem is used. Another peripheral device is a printer which is a device that converts electronic signals into print on paper in the form of letters, tables, graphs, charts, etc. A final piece of hardware is a terminal. Terminals usually consist of a keyboard (similar to a typewriter) through which data or input are entered and a visual display board on which data can be seen (Marbach, Lubenow, Cook, Gibney & Willenson, 1982; SYBEX, 1981).

Software is a generic term used to describe the collection of programs that a given microcomputer is capable of processing. Software is the set of instructions that directs the microcomputer in its operations. Software "tells" the hardware what to do and is written in a number of languages. Generally, a language is a set of words and rules that are used for constructing sentences and communicating. Computer languages are any of several codes composed of characters and symbols, in which software is prepared. The word program has two meanings. As a verb, to program is to create or develop a set of instructions. As a noun, a program is a series of instructions that directs the microcomputer to perform a task or sequence of actions. Soft copy describes output that assumes a visual, nonpermanent format in contrast to hard copy which is output that is produced in a printed, readable and permanent form. To debug is to locate and correct errors in the operating system, a particular program or any malfunction in the computing system itself. Other peripheral devices include voice synthesizers, letter quality daisy wheel printers, digitizers and plotters, each of which are available for the user to purchase at extra cost.

As stated earlier, microcomputers process information through using a microchip, a tiny piece of silicon that stores data in a binary code. A bit is a contraction of binary digit. It is the smallest defineable unit of storage (or the smallest amount of data) that the microcomputer recognizes. This is expressed in binary code as a one or a zero. A byte is a grouping of eight adjacent bits that are operated as one unit. It is the space needed to store one character of information. A microcomputer with a 16 bit microprocessor handles information in bundles of 16 binary digits at a time. A microcomputer with 64K or kilobytes of memory can store approximately 65,000 characters or about the same as 35 typed pages of information (Marbach et al., 1982, p. 56). The portion of the microcomputer that stores information is called its memory. Memory may be used interchangeably with storage. It is the storage area in the microcomputer for the program and the data: the RAM and the ROM chips. RAM or the random access memory holds the program and data, varies with each trial or usage and is lost when the power source is shut down. ROM or read only memory contains the program built into the microcomputer by the manufacturer. The contents of the ROM do not change, even when power is turned off. It is permanently stored information that is not accessible to the user. Its program directs the CPU to initially start-up, to hold to a specific computer language, to store frequently used languages, and generally to respond to information typed in at the keyboard (Chandor, 1981; Marbach et al., 1982). Lastly, a microcomputer system is interactive when it acknowledges and responds immediately to user commands. Today, virtually all microcomputers are interactive.

Computer Resources

Once the manager feels comfortable with some of the basic terminology associated with microcomputers, then he or she may want to know exactly what hardware and software exists for use in recreation and leisure services. There are a number of resources available to consult regarding this concern. First, there are newsletters, newspapers and magazines such as Byte, Compute, Creative Computing, 80 Microcomputing, Mini-Micro and Personal Computing. Secondly, retail salespersons may be approached for information on the particular microcomputers that they sell.

At present, the distributors of Apple have Apple II plus and Apple III, color video monitors, graphics tablets and dot matrix printers. They also have arcade quality games, musical selections and word processing programs such as Letter Perfect and Applewriter. Business packages including Visicalc, Visiplot and Visitrend are available as well as several database programs. Hewlett-Packard has the new HP125 with a letter quality printer and an eight pen plotter. The HP87 is a portable, desk top personal computer with a very small screen. It has black and white (monochrome) graphics capabilities and an RS232 interface capable of driving plotters, printers and other peripherals.

The Tandy Company's (Radio Shack) TRS-80 Model III is the largest selling personal computer (Marbach et al., 1982). Other microcomputers include the TRS-80 Color Computer, TRS-80 Model II and the new TRS-80 Model 16. Visicalc and Scripsit along with other graphics software can be used on the TRS-80 Model III although only the TRS-80 Color Computer offers color graphics. The TRS-80 Model II offers compatible communications for many of the IBM systems. IBM has its Personal Computer with a 16 bit microprocessor, color graphics and sound. It is highly versatile, but presently has much less software than the Apple II, for example (Marbach et al., 1982).

The Atari 400 and Atari 800, used primarily at home and in schools, are known for their color graphics and sound. Commodore has the PET, Commodore 64 and VIC 20. The VIC 20 has color and sound. The Commodore 64 is intended to compete with the Apple II. Osborne's Osborne 1 is the portable microcomputer that is advertised as being similar to carry-on luggage by fitting under the seat of an airplane. It is highly mobile. Texas Instruments 99/4A uses the popular children's instructional software, LOGO. Xerox has the 820, a business machine, while Monroe has both "educational" and "occupational" machines. Monroe's educational microcomputer has graphics and sound capabilities, while their occupational model has three programmable RS 232 interfaces which can support a variety of peripheral devices. This model has two built in 320K disk drives and a phosphor amber screen which is intended to alleviate eyestrain when viewed under flourescent lights. Supercalc (similar to Visicalc) and Wordstar (an extended Basic Language) are among the software available for both machines. Monroe has its own operating system but is also compatible with the CP/M operating system.

Other retailers have the Eagle II which is oriented towards small business and word processing applications. The Tektronic 4113 is an intelligent color rastor display terminal with a pallete of 4096 colors. The terminal is capable of design, limited animation, mapping and graphing. This discussion is by no means exhaustive. Therefore, for information beyond this brief introduction, it is suggested that the manager contact a sales or manufacturer's representative directly for brochures, discussion and demonstration.

A third resource is personnel at nearby colleges and universities. There are faculty members in departments of computer science and services, statistics, psychology, sociology, forestry, landscape architecture, business, recreation and leisure studies, and mathematics who have both an interest and expertise in the use of microcomputers. Further, the librarians at such institutions can direct the manager to a variety of books to read on the topic of microcomputers.

A fourth resource is professional associations. These organizations may be related to the computer industry, education or recreation and leisure services. Each is a tremendous source of information about microcomputers from differing perspectives. The National Recreation and Park Association (NRPA), for example, at its annual meeting typically has several educational sessions devoted to computer usage. Further, NRPA sponsors a symposium on computers and publishes proceedings from it. Parks & Recreation, a monthly magazine of NRPA, publishes practical and informative articles about computers several times a year. This merely highlights the involvement of NRPA as one representative professional organization, in the area of computers.

A fifth resource for information exchange is personal contact with fellow professionals who are actually using computers themselves. Ideally, these persons would be managers of recreation and leisure services and programs, too. However, small businesspersons, public employees, independent consultants, or even hobbyists can give the leisure service manager first hand insight into their experiences with microcomputers.

The last resource mentioned here is formal and informal educational opportunities. Formal coursework may be completed at community or four-year colleges. Or informal learning experiences through adult or continuing education programs, microcomputer clubs or other workshops may occur. What is important to note is that numerous resources and resource people relevant to microcomputers and their applications exist. They are waiting to be of service to the interested manager.

Current and Future Applications

When we reflect upon the quiet transition to the information age that we're currently making and then begin to ponder possibilities for the future, sometimes we may wonder if we're being too bold. Shane (1982, p. 304) questioned why "such an astute observer as Alvin Toffler failed to mention the microprocessor in Future Shock.". Well, Shane answers his own question with the fact that microprocessors did not even exist when the book was written in 1970! This serves to illustrate just how recently this technology has developed. The first widely distributed, commercially feasible microcomputer became available in 1975 (Shane, 1982, p. 304). Thus, looking into the future and attempting to make a singular, fixed prediction is a risky pursuit, at best. Thus, a review of some of the current uses of microcomputers by managers of leisure service delivery systems is in order to enable a sense of our current state.

Selected persons in the field of recreation and leisure have begun to report the managerial uses of minicomputers, microcomputers and recreation specific software in the published literature (Bentley & Siderelis, 1982; Howe, 1982; Sharpless, 1979; Shirley, 1980; Unkel & Van Doren, 1974; Unkel, Smith & Van Doren, 1975). As a result of this, several managerial applications that are presently occurring stand out. Among the tasks that microcomputers can do are: routine record keeping such as class or program registration; budget accounting, payroll and accounts receivable; establishing a database of participants' leisure activities; cost projections for park and facility development and maintenance in terms of

labor, equipment and materials; and an inventory of all items owned by the agency or department (Shirley, 1980). Siderelis (Bentley & Siderelis, 1982) has developed software entitled "Maintenance Management and Scheduling System" which has been specifically applied to the Blue Ridge Parkway. The package has four major components: job ordering, job scheduling, vehicle routing and work reporting (p. 43) and is compatible with the Apple II. It is a major maintenance management aid.

There are managerial applications beyond accounting, payroll, inventory, participant record keeping and maintenance scheduling. Some routine administrative functions include: preparing and storing mailing lists and address labels; assigning teams or classes to sites and officials or leaders to events; word processing for fliers, announcements and press releases for recurring activities, other routine mailings, and standardized program evaluation or other report forms (Howe, 1982). Market Computing of Seattle, WA has developed software specifically for some of these more routine recreation tasks. A recent "Bulletin" announced the following about Market Computing's current products:

The LEAGUE REGISTRATION program organizes and manages league records, using the microcomputer to keep track of team and player data, registration and insurance fees, and league age requirements. The number of teams and players that LEAGUE REGISTRATION can handle is only limited by the storage capacity of the system (3,000-4,000 players per diskette on TRS-80 Model II and approximately 1,000 players per diskette on Apple II plus). Multiple data diskettes allow virtually unlimited player capacity.

The SWIM MEET program manages swim meet records and events based on NCAA, AIAW, and AAU regulations. It also keeps qualifying times for each entrant and for each event, schedules events with up to 20 heats for six and eight lane pools, and follows procedures for preliminary and final heat events.

The TENNIS DRAW program develops random single-elimination draws for tennis tournaments with from eight to sixty-four players or teams in any of twenty-one events. The draw procedures conform to USTA regulations. TENNIS DRAW handles the complicated process of inserting seeded players in their correct positions in the draw. The program also creates preliminary matches and inserts byes as required.

EMPLOYEE MANAGEMENT is a personnel work-load planning program which keeps track of employee data, wage, job-classification and worksite records. The program allows one to add, revise or delete information, as well as to obtain printed reports. The program sorts and reports employee information by birthdate, beginning date of employment, worksite and district. A master list can also be produced. A special feature prints mailing labels from the master list (Hite & Stipe, Note 1).

Since Market Computing is a new software clearinghouse founded by leisure managers for the leisure industry, some elaboration is in order. Market Computing produces easy to use, time saving microcomputer programs to be used as management tools for delivery of leisure programs and services. They design their programs with the uniqueness and individuality of the leisure industry in mind. Market Computing programs put cost-effective management of both leisure and recreation activities programming and administration at the fingertips of leisure managers. Today, microcomputers are affordable, but until now generally available software has not been produced specifically and uniquely for the leisure industry. To fill this void, Market Computing has written low cost programs that are designed for even the moderately sized leisure organization. Their programs are written for managers in park and recreation agencies (public and private), social agencies, therapeutic recreation settings, college and university recreation departments, campus recreation or intramural associations, military recreation, private clubs, camps, industrial recreation programs and planned communities.

Market Computing software is authored by recognized leisure managers and microcomputer experts. Each program is carefully reviewed and field tested. The software package includes a floppy disk and an operating manual prepared specifically for the leisure service professional. Programs are written for Apple II plus and Radio Shack TRS-80 systems and will be available in CP/M in March of 1983. Also planned for release in March are CLASS REGISTRATION, which manages the registration of participants for class activities; UMPIRE MANAGEMENT, a program for the management and scheduling of officials; and BOWLING LEAGUE, which manages bowling records and matches based on ABC and WIBC regulations. Prices for these programs range from $60 to $350 (Hite & Stipe, Note 1).

Two other companies have designed software specifically for resident type camps. "EZ Camp" is a microcomputer-based camp management system that is available through EZR Micro, Inc. (Note 2). This management package can be used for tasks such as bunk assignments, scheduling transportation, payroll, accounting, inventory, camper records, counselor profiles, telephone and mailing lists and bulk "personalized" letters. Data Conceptions Unlimited has designed the "Total Flow Camper Control System." This is a software package that helps in the recruitment of prospective campers and in the day to day operations of the camp (Note 3).

In this era of diminishing resources, recreation and leisure service managers are more frequently being called upon to be accountable. That is, they must demonstrate the value and worth of the programs and services that they are providing. In this sense, microcomputers and this new recreation oriented software are invaluable applied problem-solving and evaluation tools for the manager of today who wants to be around tomorrow. Whether in a public agency, a college campus or a clinical setting, microcomputers and appropriate software help to meet the dilemma of the increasing demand and decreasing public resources for leisure services. Again, software that performs repetitive and routine tasks frees personnel to carry out the other more sophisticated responsibilities associated with their position. As Hite and Stipes (Note 1) suggest, software allows administrative and maintenance staff members to focus on managing their agencies and/or facilities without having to waste time with the repetitive work inherent in analyzing data and planning. Thus, the manager has an improved capacity for expanded data analysis which can result in more accurate and up to date information. A microcomputer has the capacity to retain and process large volumes of data much more efficiently than human beings. The speed at which these machines operate is unmatchable.

Sharpless (1979) described some other problem-solving applications for microcomputers in the leisure industry.

He suggested that "canned" statistical software packages that help the manager tabulate frequencies, percentages, correlations or other extremely complex analyses of numerical information, are great time savers. Further, if a manager needs to find support for a philosophical position or articles about the pros and cons of certain types of fees and charges, for example, he or she can conduct a computer assisted literature search. The manager can establish his or her own data base of "raw" information about the population served. There is no question that the results of broad based needs assessments and surveys of leisure attitudes, interests and/or participation can be best compiled by using a computer. In planning, models and simulations can be used to determine the probable effect of a particular course of action or decision. Thus, the use of microcomputers can help managers to stay "on top" of the information explosion and to better meet any possible requests for data from both outside and within the organization he or she directs. Telecommunications, animation and music can all occur with microcomputers, creating and transmitting pictures and sound via electronic impulses. In these days of small travel/long distance telephone budgets, such means of communication are increasingly more important. Interpersonal messages, financial transactions, information access and retrieval are among the many current managerial uses of microcomputers, let alone all the leisure/entertainment possibilities in video entertainment and games, community calendars, educational courses, sports and entertainment schedules, and shopping. We are indeed on our way to being the global village or "wired planet" that Marshall McLuhan anticipated.

Anyone who reads the newspapers is aware of terms such as "robotics," "electronic cottages," "computer camps" and "computer-aided instruction." These phenomena are only just beginning. The leisure services manager of the future will need to stay abreast of technological changes that will indeed affect the day-to-day work and lives of all industrialized people. The manager of the future may expect to have a greater number of information brokerage functions as a part of his or her job responsibilities. As a broker, the manager will be responsible for coordinating a number of different applications in his or her department or agency. Beyond what has already been described, the manager will see computer graphics and animation being created by persons enrolled in recreational art classes and hear computer music and voices being synthesized in leisure-time music workshops. In one-to-one or small group interactions with participants, managers will view computerized leisure needs and interests assessments, computer assisted leisure counseling and leisure resource identification, retrieval and referral. The manager will look in on coaches explaining team sport strategies, plays, defenses and offenses to persons involved in various athletic activities using VDTs. There will also be analyses and simulations of human movement in running and gymnastics for example, that participants and interested others will examine and use to improve performance. If we're lucky, the recreation and leisure service manager of the future will also possess the vision to submit new program ideas or applications to the various microcomputer and software companies to develop technology that will help us all, no matter how incredible the idea may seem. After all, who thought that the science fiction of yesterday would be the science facts that they are today?

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COMPUTER APPLICATIONS IN A THERAPEUTIC/OUTDOOR RECREATION SETTING

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Abstract

A recently initiated grant, Project Alliance, utilizes state-of-the-art computer technology to assist agencies which deal with disabled individuals in the outdoors. This paper discusses many of the factors involved in the integration of private agencies and higher education such as data management, information retrieval, networking, human resource management and planning considerations.

Introduction

The interface between computer-based technologies and the disabled population has usually been one of direct physical aid. Computers have been used in aiding the handicapped in tasks such as allowing a paraplegic to walk, text-to-braille synthesis, or portable speech prosthesis.[1] While useful in many such applications, computers can also play a valuable role in the less visible support services. Specifically, computer applications can be directed toward facilitating the agencies and organizations which work with disabled populations. Within this context, computer usage assumes a configuration which is similar to that of many different types of program and facility management such as inventory control.

A slightly different twist is injected into the operation when computer technology is applied in an educational setting, combining the multi-tiered functions of data management, information retrieval, inventory control, word-processing, and computer literacy. This paper discusses the integration of computer technology in the field of therapeutic and outdoor recreation education with respect to factors such as data management, communications, human resource management, and planning procedures.

The Setting

During the summer of 1982, The Department of Recreation and Park Management at the University of Oregon received a 99,000 dollar grant through the U.S. Department of Education, Office of Special Education and Rehabilitation Services. The grant, termed Project Alliance, was allocated for the development and implementation of an alliance of specialized outdoor recreation programs in the Pacific Northwest and eventually in a larger geographical area. Project Alliance was specifically designed to accomplish five primary objectives:

1. To establish a computer-based information-retrieval and data management system;
2. To develop, pilot test, and validate a practical and feasible evaluation model of client outcomes;
3. To implement an equipment-identification and sharing system;
4. To provide management consultation services for involved agencies;
5. To develop and implement a curriculum option combining the professional skills of therapeutic and outdoor recreation personnel.

With over 405,470 disabled people in the state of Oregon alone, and a growing number of agencies which deal with the disabled individual in the outdoor environment, information management was deemed a primary consideration.

To complement this management scheme, a computer system was viewed as an integral part of the project. Factors such as personnel hiring, time-line management, and project expectations had to be viewed in light of the computer imperative.

In regard to hiring procedures, a working knowledge of computers was deemed highly desirable for the position of Project Coordinator. Specific skills included experience with microcomputers, data-management procedures, and information retrieval systems. As in many situations, certain initial skills were of less importance when compared to an overall sense of computer compatability, perhaps more colloquially termed "computer friendliness". This same attitude of a willingness to work with rather than fear of computer systems was judged important in selecting other critical individuals in the Project, such as the secretary and student supervisors.

System selection was guided by several parameters including: cost, user-friendliness, and compatability with existing systems within the College of Health, Physical Education and Recreation. Toward this end, a TRS-80, Model 16 system with double disk drive, 128 K additional memory board, DWP-410 printer with the software components of word-processing, data management, and statistical analyses was acquired.

Conventional Computer Functions

Computer applications in Project Alliance include inventory control, information storage, information retrieval, word processing, mailing list generation, and statistical analysis. Inventory control consists of a cataloging of the existing adaptive equipment such as flip-skis, skiing pulks, and trail-adaptive wheelchairs, managed by the agencies and organizations involved in Project Alliance. Through the Project, agencies can readily determine who has the specialized equipment they need and how it can be shared.

This information storage/retrieval capacity has been enlarged to accomodate various literature reviews which focus on the information pertinent to special populations in the outdoors. This function serves two purposes: to enable participating agencies access to the literature in their particular field, and to give interested individuals a comprehensive literature review. This literature retrieval service is one of the products which the Department of Recreation and Park Management hopes to operationalize through Project Alliance.

Information storage/retrieval services are also utilized in survey returns, budgeting, and departmental concerns. An initial survey was sent to agencies and organizations which deal with services for special populations. The survey sought information concerning the extent of agency programming, personnel, and capabilities. A coding scheme was utilized to facilitate information storage into the computer. Information can be easily

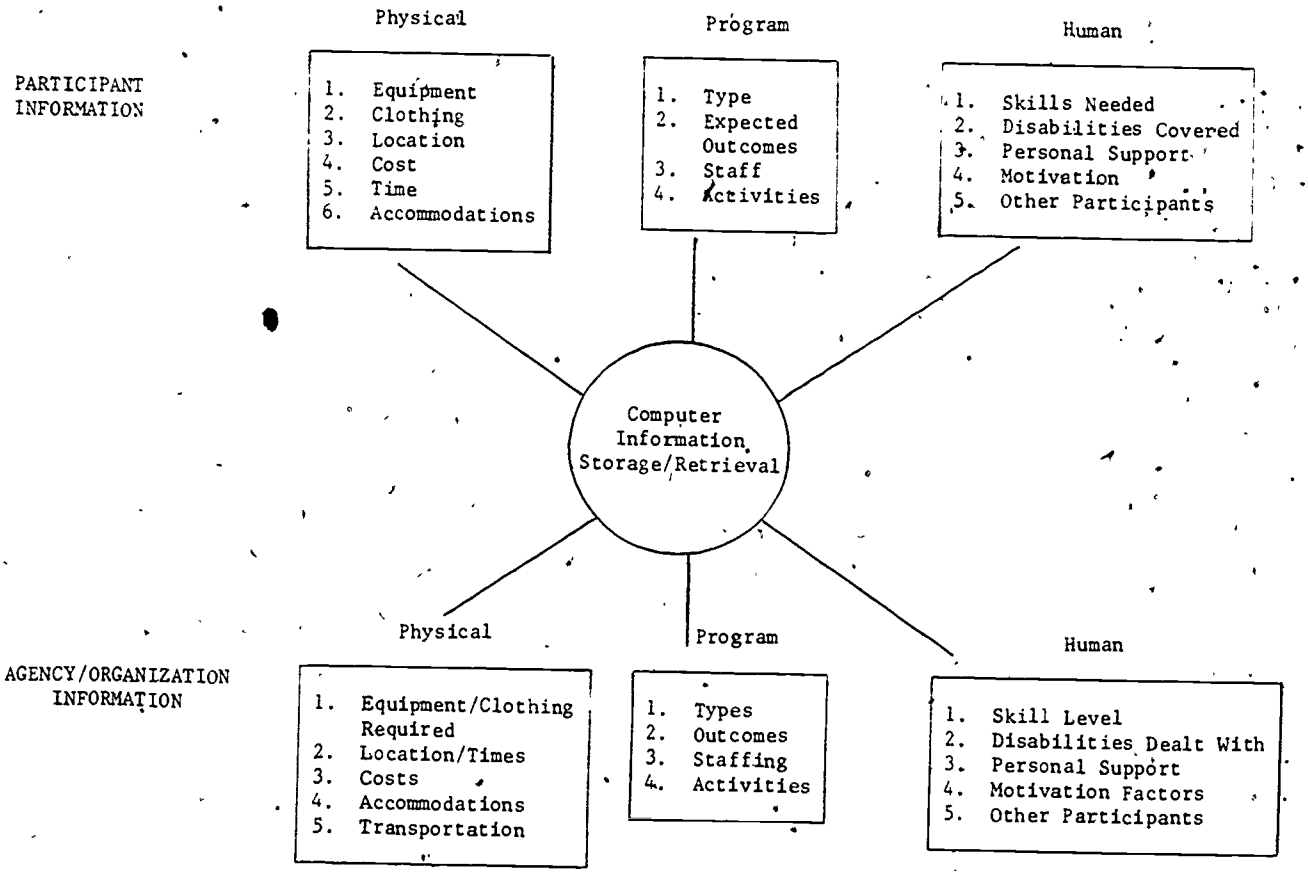
[1] Vanderheiden, G. "Computers Can Play a Dual Role for Disabled Individuals", BYTE, 7(9), Sept (1982), 136-162

updated with the computer as situations change. Eventually this information with its concomitant ease of access will allow for the creation of an information matrix, whereby an individual with a particular set of disabilities can be linked with the most appropriate agency in the region. Utilization of survey information to form the information matrix, equipment sharing, and literature reviews are but a few of the ideas which support the networking concept - a concept in which the computer plays a critical role.

The Concept of Networking

Within the context of Project Alliance, networking occurs in three areas: physical, programmatic, and human. In structural terms, these various networks consist of communication links between the various participating agencies with the computer system acting as the hub of the communication exchange system. Through the staff of Project Alliance, assisted by the computer system, data concerning the physical, programmatic and human capabilities, and needs of agencies or individuals can be determined. The following diagram illustrates this capability.

DIAGRAM 1
Information Exchange Using Computer Technology



As the preceeding diagram depicts, information is held and sought by both the potential participant and the potential agency or organization offering the service. In a similar fashion, information is exchanged between agencies. Information in these cases consists of items such as: available staff, training schemes, conferences or meetings, specialized equipment, common problems, and most importantly, a collective sense on how to solve those problems.

Currently, access to the information stores in the Model 16 system is limited to Project Alliance staff at the request of participating agencies. It is expected that with the use of modems and interactive terminals, those agencies or organizations which participate in Project Alliance will have direct access to many of the data management, literature review, and statistical packages now available. Password security will be imposed to maintain confidentiality concerning sensitive business-related information. This interlinkage between agencies (through the computer) will also allow for faster communications and information distribution.

Human Resource Management and Computers

While much has been said concerning the advantages of using computer systems, Project Alliance, like many other business or educational structures, will be subject to a deterioration of services if the staff resists the technology. In optimizing the interface between people and computer technology, managing the

stresses created by the influx of computers becomes of critical importance. Not only are there stresses involved which deal with computer illiteracy[2], but also stress can be induced by the change factor involved in the use of computer technology[3]. In dealing with this stress, three factors were recognized as being of critical importance: computer literacy, resistance to change, and operationalizing the computer system. It was realized that before the third factor, operationalizing the system, could be reached, the first two factors of literacy and circumventing the resistance to change factor would have to be overcome. These factors were also deemed insidious but present in the administrative staff, with the resultant need to develop skills in managing change as well as in retaining a balance between technical skill and people skills[4].

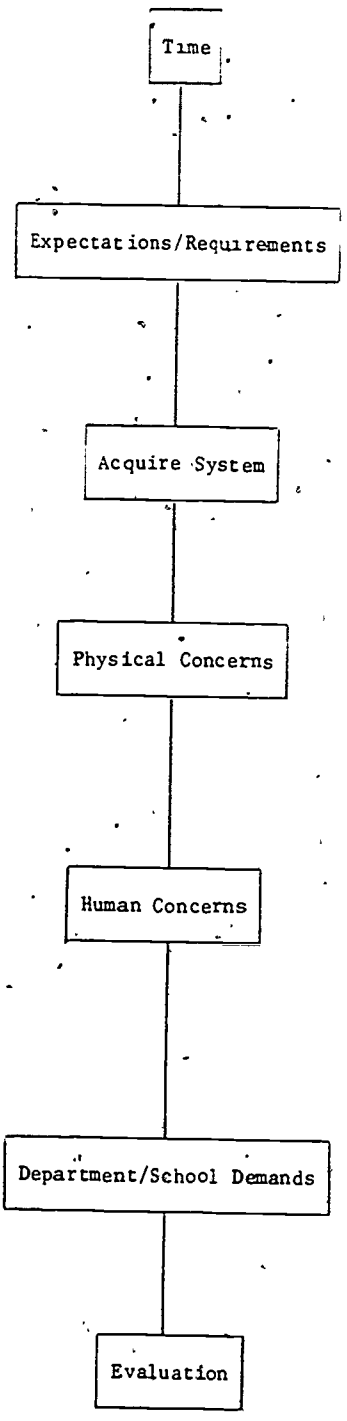
To deal with the technostress issue raised when people meet computers within the context of Project Alliance, a strategy involving computer orientation, progressive training, rehearsal, self-assessment, and a teacher/trainer network was employed. Project Alliance staff was encouraged to attend both on and off campus computer courses to familiarize them with the technology and nomenclature. In-service training was provided in group sessions with computer time made available for individual rehearsal. Individuals were encouraged to become proficient with the system and to use a self-assessment format to indicate their level of proficiency. High levels of motivation were expected and realized concerning learning the technology, in part due to the emphasis placed on college students to become computer proficient.

Because of the ever-changing nature of employing college students, it was deemed necessary to train a select corps of individuals who had a longer-term commitment to the Project. This teacher/trainer network provided for more computer "time" for the trainer and delegated some of the teaching responsibilities away from the administrative staff.

Planning Considerations

Concomitant to the impact that computer technology would have on personnel were the additional concerns about the computer in the school. Being the first computer system exclusively dedicated to the Department of Recreation and Park Management, a comprehensive planning process was employed[5]. Factors in this process are illustrated in the following diagram.

DIAGRAM 2
Factors in Implementing a Computer System



Using these guidelines, a minimum of unexpected difficulties were encountered. When unforeseen situations arose, decision-making was viewed in long-range, departmental terms, whenever possible.

[2] Luehrmann, A. "Pre- and Post-College Computer Education", The Computer in the School: Tutor, Tool, Tutee, Editor, Robert P. Taylor, Columbia University, New York, (1980), 146-147.

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[4] Maynard, W. "Skills Managers Need to Survive", Administrative Management, December (1982), 33-34, 70-71.

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Conclusion

Project Alliance has provided a unique opportunity for both the Department of Recreation and Park Management at the University of Oregon and the disabled citizens of the Pacific Northwest. By assisting those agencies which work with the disabled in the outdoor environment, through such areas as data management, information retrieval, and inter-agency communication, Project Alliance has successfully integrated computer technology with the skills of professional therapeutic and outdoor recreation specialists. With the aid of computer technology, a series of communication and informational networks have been established which contribute to the effective use of educational, physical, and human resources. Given the recent trend of increased participation of disabled individuals in the outdoors and their growing political power[6], computer technology can play an important role in a holistic approach toward the handicapped individual.

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Professional Office System (PROFS) makes good sense. From a single computer terminal you can get and send information by pressing only a few keys. PROFS also helps you manage your most valuable resource--your time. Although you need some familiarity with a computer terminal to use PROFS, you don't need to fully understand computer systems. The manuals for PROFS will help you learn to use your terminal quickly, and the time you save using PROFS will greatly outweigh any time you spend learning to use it.

Processing Schedules

Maintaining calendars, setting up meetings, and scheduling conference rooms and equipment are tasks that are simplified when you use PROFS. You can look at the activities on your own calendar for any given day or month, and you can also print a copy of your calendar. In addition to adding new events to the calendar, you can update your calendar with changes as they occur. PROFS will relieve you of making many phone calls just to set up a meeting. Just gives PROFS the possible times and dates, and the names of the PROFS users you want to have at the meeting, and it will search their schedules, find the most convenient times, and then will help you notify the people of the meeting. Tell PROFS the date and time you want to be reminded for a meeting, appointment, lunch date, or whatever.

Opening the Mail

PROFS works like the "in-tray" used in your office today--but it works elctronically without all that paper. Your desk is clean. When you open your mail, you see a list of all the contents in your incoming mail. You can then choose what you want to look at and work with. You can tell if something important is in the middle of your incoming mail. PROFS will put your note into the incoming mail of other PROFS users, and it will automatically keep a copy of your note for you.

Preparing Documents

Profs will aid you in simplifying the typing of documents like letters and memos. It will prompt you, based on the document style you have chosen, for information such as to whom you want to send the document, the subject, the reference, and the copy list. After you have typed your document, PROFS will proofread, print, send, file, erase, set aside temporarily, distribute for review, update, or make the document final.

Proofreading Documents

PROFS checks the spelling of words, it provides you with the correct spelling for any misspelled words. It will look up every word in the text quickly using its dictionaries. If a word is found in one of the dictionaries, it is considered correctly spelled. PROFS provides several dictionaries, it also provides a United Kingdom version of the basic English dictionary that contains the British-preferred spellings. You can add several of your own addenda dictionaries to contain words that you commonly use. If you do not know how to spell a word, PROFS can help you find the correct spelling. It uses a list of commonly confused words, such as "principal/principle" or "effect/affect." If a word appears to be incorrectly used in the sentence, PROFS can prompt you with alternative forms of the word, along with short definitions to help you decide which one is correct. It also provides you with a list of words that have the same meaning as the word you wish to replace. PROFS can point out phrases which are considered redundant, awkward, or too wordy. It shows you the possible alternative phrase, or informs you that there is no reasonable replacement.

Searching for Documents

Every document in PROFS is assigned a number so that it can be located using a variety of search techniques. When you file a document, PROFS automatically adds a mail log entry for you. The mail log is an accurate record of your documents. When you search for documents, you are really searching your mail log.

How PROFS Works

You use a display terminal to tell PROFS what to do, PROFS then shows you "menus" with lists of jobs that it will perform for you. The menu associates each job listed with a program function (PF) key on your terminal keyboard. You tell PROFS what to do by pressing the PF key associated with the job you want. If you are not sure what to do or how to do it, PROFS gives you "Help" screens to guide you. All you have to do is press the associated PF key for "Help". The main menu is the first screen PROFS will show you. On the right side of the screen, PROFS shows you:

*time of day
*current month's calendar (today is highlighted)
*day of the year

The rest of the screen shows you the jobs the PF keys will perform when you press them.

Processing Schedules

This screen lets you look at and update your personal appointment schedule or the schedule of other PROFS users you are authorized to see. You might be authorized only to look at another person's schedule but not to update it. PROFS will not show another PROFS user items you have marked as confidential.

Adding Automatic Reminders

You use this screen to type in a message that will automatically appear on your screen at the time you want to be reminded. PROFS will remind you several times, if you choose, with from one minute to 99 minutes between each message. If you like planning in advance, you can set the message to appear in the future, even more than a year from now.

Opening the Mail

PROFS shows you summaries of all your incoming mail. The summaries contain information about your mail, such as:

*who sent the mail
*to whom the mail is addressed

*subject of the document
*date when action is due
*document number
*document type

PROFS also shows much of the summary information about the document. That gives you a chance to quickly verify that you are looking at the piece of mail you wanted to see. PROFS gives you a set of jobs that you can perform on the document, such as:

*looking at the document text
*filing the document in your person mail log or note log
*erasing the document from your incoming mail
*printing the document
*looking to see who else has received a copy
*sending the document to someone else with an optional routing slip for your own personal message

Processing Notes and Messages

You use this screen to send a quick note or message to another PROFS user. You can look at or print notes that you have written or received and filed in your personal note log. You can also file notes in different note logs. This method then makes it easy for you to retrieve notes about a specific subject or item.

Preparing Documents

You use this screen to write documents that are more formal than notes or messages. You can:

*write a new document using a predefined, standard document style
*write a new document using other document styles. IBM sends you other styles: however, you can also define your own, as many as you need
*update a draft that you have not yet made final

While writing the document, you can use other PF keys that allow you to split lines of text, join lines of text, add lines, erase lines, and act as tab keys. In addition, you can use your IBM editor functions to set tabs, find text, copy text, change words or phrases or get text from other documents. When you have finished typing your draft document, PROFS gives you a powerful proofreading tool. The choice of how you proofread is up to you.

Searching For Documents

You will use this screen to look for documents that you have filed in your mail log. You can search through time spanning from a single day through a given quarter of the year to a full year. The screen gives you many choices for searching, and you can use as many of the lines as you want. Once you have typed in the information you want to search, PROFS will do the rest.

Operating PROFS

PROFS operates on the following IBM systems:

*System/370 Model 138, or larger
*3031, or larger
*3081
*4321 (model J11)
*4331, or larger

In addition, the system must have a minimum main storage memory size of 1M bytes, and a Direct Access Storage Device (DASD) supported by Virtual Machine/System Product (VM/SP).

Installing PROFS

The impact of introducing this much change into your organization makes it desirable to start with a pilot program followed by phased installation by department or division. The purpose of the pilot is to develop the procedures, and, if necessary, the system extensions to gain the greatest advantage from your office system. Specific areas which need to be addressed are:

*identifying your pilot group
*identifying the document styles you want to use
*identifying your educational requirements
*identifying your machine requirements
*identifying your system data base requirements

When you install PROFS, you may need to establish competency groups (that is, administration center, word processing centers, help centers) for specialized tasks and user assistance.

Identifying Document Styles

After you have identified the pilot group, you need to understand how they communicate, both formally and informally. Identify all documents used by the pilot group for formal communications and then analyze them as to the feasibility of including them in PROFS. After you have selected documents, review them further. Identify "boilerplate" (information that can be repeated) and establish a supporting file for it. Boilerplate might include such items as:

*letterheads
*author profiles
*text for form letters
*carbon copy lists

Identifying Educational Requirements

The success of PROFS will depend a great deal on the training your personnel receive. The depth to which you train your people will vary depending upon each person's job definition and needs. Some of the areas in which the operations staff will need training are:

*daily startup procedures for PROFS
*backup procedures for the system
*recovery procedures
*procedures for working with users
*equipment coordination

You will need to give your staff both formal and informal training. You should designate a central contact person for your staff to go to with their PROFS problems and questions.

Identifying Machine Requirements

With PROFS you might need additional machines and machine features to support your staff. Two primary areas are correspondence-quality printers and terminal keyboards. You might want to consider keyboards which have upper- and lower-case capability.

Identifying System Data Base Requirements

After the document styles you want to use have

been identified, you have primarily established your data base requirements. You must then decide whether you want to start with a new data base or to preload the data base from existing documents, which may take additional time and effort. If you decide to preload the data base, you need to establish just how far back you want to begin loading the documents. You will also be faced with questions about how to load the documents into the PROFS system. In addition, PROFS and VM/SP running in conjunction with VM/CMS make it possible for you to prevent unauthorized access to your data. You are responsible for the selection, application, adequacy, and implementation of these features and the appropriate application and administrative controls.

Responsibilites to PROFS

To help you make the most effective use of PROFS, IBM provides:

*technical support through a toll-free number
*publications about PROFS
*program updates that keep your PROFS programs up to date
*publication updates that keep your PROFS publications up to date

Certain things are your responsibility. You must:

*decide how you want to install PROFS
*choose and train everyone who will run or install PROFS
*decide when to start using PROFS and make sure you have completed the installation
*create your own security procedures
*schedule daily operations and make sure everyone follows the schedule
*performproblem determination procedures to isolate a problem before calling IBM
*enter updates to your PROFS programs when IBM sends them to you
*replace old publications with new ones sent by IBM

Program Updates

Before shipment, each program is tested thoroughly. Even so, errors sometimes occur. It is important to enter all the program updates that you receive. Even though you may not be aware of a problem, an update may not work properly unless all previous updates have been entered.

Publication Updates

From time to time, IBM will also send you changes to your publications. Make sure that you replace these pages or books promptly. It is important that this information be kept up to date--just like your programs.

TAKING COMPUTERS INTO THE FIELD
or
How Long is Your Extension Cord?

Thomas S. Gatherall
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The Problem

The traditional need for computers has been for administrative office work and because of this computers have been designed specifically for desk top operations. The size of the computer has certainly decreased from the gymnasium size Eniac of the 1940's to the compact microcomputer of the 1970's which is about the size of a typewriter, but computer manufacturers were still missing a crucial need.

Of all the multifaceted recreation needs for computers, the ones that are most often met are the administrative office procedures such as accounting, records keeping, and word processing. It is true that some recreation specialities like tournament scheduling and computer camping programs have been served with the existing microcomputer from the home or office. The Atari 400 for example with the membrane keyboard, has been used most successfully in a number of camp settings and its not unusual to find an Apple, Commodore, Radio Shack, or Atari computer in a recreation office.

There are however, times when the extension cord just isn't long enough. Some camp programs have wanted to take the computer to the nature center or the crafts cabin, but no electricity is available in the more remote outposts of camp. The same problem occurs when the computer is needed on the playing field, the track or stadium. To resolve the immediate problem, computers have had to be located at the electrical source and the data is then run from location to location.

Portable battery powered units have been developed for some microcomputers, but these computers are component systems, that is the disk drive, computer, keyboard and video display are often separate units and portability is cumbersome. Using them is much like carrying around all the components to a stereo system; the tape deck, amplifier, and speakers, rather than a portable tape player with earphones.

One person recently took an Apple computer flying with him in his ultra-light aircraft. He used the computer to record flight data as he experienced it. The unit was awkward and took up considerable space, each separate Apple peripheral had to be strapped down and connected to the computer. The pilot did the best he could with what was available at the time.

Other portable units developed in the past have either been data entry units with no information returned until the unit was connected to the mother system "back at the office", or were specifically programmed for single uses and would not fit the general computer needs of a recreation program. There are some small hand held computers with single line liquid crystal display, but these units do not fit general purpose computer needs either. They are mostly used for specific scientific or engineering purposes.

The Solution

Many companies are now making small integrated portable computers which can be run off battery packs. The integrated systems usually contain the keyboard, video output, computer, disk drives and memory in a compact case similar in size to a briefcase. These systems vary in price from under $1,800 to almost $10,000, price differences being the result of the peripherals which come with the computer. Most systems have the Z80 microprocessor which allows for the CP/M operating system, they also contain about 64K of RAM memory, two disk drives, and plenty of free software.

The form of video output varies and will be the most innovative change that can be expected in the future. Currently, systems range from 40 character line screens to the standard 80 character line which is the most prevalent in the portable microcomputers. Exceptions are on the Osborne I which has a 52 character line screen (an 80 character line adapter is available) and the Compucase which has a 40 character line plasma display in the lid of the attache case. The prospects for the flat plasma display or liquid crystal screens will cause the portable computer to become even smaller and applicable to field work in the future.

Users can select almost any combination of peripherals for their portable integrated system. Computers are available with 16 bit or 8 bit microprocessors, self contained printers, disks from 3 1/2 inch Sony type to 5 1/4 inch standard size or hard disks with up to 10 megabytes of storage.

Some portables offer connections to DC automobile battery through the lighter in the dashboard and others have battery packs that can be carried with the computer. The more you think you need in the integrated system, the larger the cost, so weigh your needs carefully.

The two most competitive portables currently on the market are the Osborne I and the Kaypro II, both of these units sell for $1,795.

Osborne I

The Osborne I is the more established of the two, it has a plastic case and contains two 5 1/4 inch single density floppy disk drives which are formatted specifically for the Osborne. This formatting limits users to the Osborne software unless they are willing to make changes in the software as it is entered into the memory on the Osborne disks.

The video display is a 5 inch screen with lines that are 52 characters long and 24 lines deep. The keyboard has an additional numeric keypad and upper and lower case letters. The computer has two serial ports, one of which is designed for modum connections while the other can be connected to a printer. Another port is available for IEEE 488 scientific instrumentation. The entire computer weighs 24 1/2 pounds and is slightly bigger than a briefcase.

One of the most attractive selling points of the Osborne is the software which is included in the $1,795 price. This "free" software includes 1) CP/M operating system, 2) MBASIC, 3) CBASIC, 4) a word processor (Wordstar and Mailmerge), and 4) an electronic spread sheet (Supercalc). All of this together makes quite an attractive package for the price.

Kaypro II

Non-Linear Systems of California, has made a very competitive portable to the Osborne I, called the Kaypro II. The Kaypro has a Z80 microprocessor and is encased in a metal cabinet which makes it heavier by 1 1/2 pounds than the Osborne, but it is about the same size and has the same portability.

The screen on the Kaypro is a 9" green phosphor video with a full 80 character line. It has two double density floppy disks formatted to accept any CP/M single density programs for the Xerox 820 series, with is the most common for the 5 1/4 inch CP/M. The keyboard is a superb unit from Keytronics with a numeric keypad, cursor movement keys and is detachable from the computer.

The Kaypro peripheral ports include one serial and one parallel, other ports can be added, as on any Z80 chip with a saddle socket being inserted between the Z80 chip and the host socket. The saddle socket can then branch off for other peripherals such as a hard disk drive. If users want a hard disk unit, the Kaypro 10 is available with one floppy drive and a 10 megabyte hard disk on the bottom where the second floppy usually resides. The price of the Kaypro 10 is only $1,000 more than the Kaypro II.

Like the Osborne, the most attractive part of the Kaypro package is the software. Kaypro offers 1) CP/M, 2)SBASIC (a compiler basic), 3) a spread sheet (ProfitPlan) and 4) a full set of Perfect Software which includes a powerful word processor and a 50,000 word spelling checker, a database manager and an electronic spread sheet.

Both the Kaypro and the Osborne offer excellent computers and software for the price, but what makes them most usable for recreation managers is their portability and the applications programs included with the computer.

Summary

Portable computers now allow the recreation specialist to take the speed and accuracy of a computer onto the playground, athletic field, classroom or camp. The more popular management programs are available for most portable computers and as more portables are used, the applications programs to fit special recreation needs will become available as they are written by users in the field.

Hopefully, recreation departments in the universities will help take the lead in development of software for recreation. If this can be done we may see in the near future, universities with data banks that are accessible through the telephone computer connections. These data banks should contain programs and information designed to fit those unique needs of recreation and supply data on national programs much like the business computer bulletin boards that are accessible by telephone do now. Local recreation programs in the future should also be able to access one another for assistance and sharing of data also, and this network of national and local resources will prove to be an advantage to recreation managers and program directors.

COMPUTER CONSCIOUSNESS AND LEISURE SERVICES

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Abstract

As effective recreation, park and leisure services professionals, "computer consciousness" and "computer literacy" must become a part of one's professional goals.

The purpose of this article is to explain the advantages and disadvantages of computer applications, considerations when purchasing a computer, and the future implications of computer technology.

Introduction

Computers are here to stay. They are not just some fancy toy or a passing fad. Unless you've been isolated on some deserted island in the middle of nowhere with no communication with the outside world, you probably know that computers are the greatest technological revolution to hit society since the invention of electricity. Furthermore, computers are no longer the property of the technocratically elite, but are available to evervone from the preschooler to the businessperson to the homemaker to the recreation, park, and leisure services professional.

You can not avoid computers. The pocket calculator you use each day is a limited version of a computer. The bills you receive from your bankcards, utilities, or magazine subscriptions were probably computer generated and printed. Your income tax was checked and verified by a computer. Every time you use a phone, you are using a computerized system. Many cars are now equipped with internal computers to monitor engine performance. If you read a newspaper today, it was probably computer typeset. Even the weather report was brought to you because of sophisticated interchanges between satellites and computers. It is impossible to escape computers since they impact upon our personal and professional lives in many direct and indirect ways.

Many recreation, park, and leisure services agencies have begun to use computers; others are still contemplating the advantages. If you are reading these proceedings, it is assumed that you already have a consciousness and awareness of computers; however, a great deal of basic information is necessary in helping co-workers (including Board members, supervisors, maintenance people, and clerical staff) understand the value and the justifications for the uses (or non-uses) of computers. The purpose of this article is to explain the basics of computer operation, the advantages as well as disadvantages of computer applications, considerations in making a decision when purchasing a computer, and future applications and changes which are likely to occur because of computers.

Brief Historical Perspectives

Change is as much an aspect of computers of society in general. Amazing developments are happening in the world of technology. Computers are but one part of a whole information technological expansion. Computers have been around for almost 35 years, but it has only been within the past five years that they have become available to the "masses." The first computers were very large, very expensive, and very delicate. Today the capacity of the average microcomputer is equivalent to the capacity of those first computers which weighed thousands of pounds and cost hundreds of thousands of dollars. If progress had been made on cars the way it has been on computers over the past 35 years, a Rolls Royce would cost about $2.50 and would get 100,000 mpg. (Of course, it would also be very, very small!)(Johnson 1982)

As intelligent human beings and as effective recreation, park, and leisure services professionals, it is imperative that "computer consciousness" as well as "computer literacy" are a part of one's professional and personal goals. Computer consciousness involves an awareness of the technological revolution which is occurring. Computer literacy is used to describe knowing what a computer can and cannot do, how computers can be used, and how they can change our personal and professional lives. The next step is computer competency which may or may not be necessary depending upon if or how a computer is used in one's personal life or agency.

The Basic Workings

Computers often seem like mystical machines with strange interworkings. It is not necessary to understand the intricacies of the machine, but it is useful to understand the terminology which is used when describing and discussing computers.

A computer refers to a special kind of device--an electronic digital machine. A computer is based on a system of 0's and 1's which, when combined in various ways, make numbers, letters, and instructions. One of the most impressive features of a computer is its speed. A computer can do more arithmetic in one minute than a person using a pencil and paper could do in a lifetime (Billings and Moursund, 1979). A computer has memory but it is not at all like the human memory. The computer memory storage is much like a magnetic tape recording. The data can be erased when it is no longer needed or it can be stored for years. However, a power source is needed before any storage is possible.

Computer systems are normally used to describe all the components which are necessary for using computers. Broadly conceptualized, computer systems are composed of two parts. The first part is the hardware--the physical, electronic, and electromechanical devices that we physically see as computers. The second part is software--the programs that control and coordinate the activities of the computer hardware and the direct processing of data. The success or failure of any computer application depends on the skill with which these components are selected and blended.

Computers generally can be classified into three types: mainframes, minicomputers, and microcomputers. They differ in their size, capacity, and cost although all three can do similar functions but with varying speeds and storage capacities. Mainframe computers cost millions of dollars and have a capacity for millions of calculations a minute. Minicomputers are smaller in capacity but offer the advantages of allowing great

quantities of information. These have generally been used as business machines. The newest computer which is now available to the masses is the microcomputer or personal computer. The capacity of these machines is becoming greater all the time, although they cannot handle huge quantities of information at one time. For many functions in a recreation, park, or leisure service agency, a microcomputer may be useful and it would be particularly useful for almost all functions of a small department.

For larger departments and big projects, it may be possible to "timeshare." Timesharing refers to sharing a larger computer with several agencies or groups. For a computer to be used to peak efficiency, it must be used 24 hours a day. When one considers that most calculations take only seconds, it is evident that a number of users could share a minicomputer or buy time on a mainframe.

All computers work similarly. The three steps involved are: input, processing, and output. Input is usually done directly onto a keyboard since keypunching cards are becoming a function of the past. The processing occurs in the computer's central processing unit (CPU), a component which is in charge of fetching, decoding, and executing instructions. The final step is the output where the results of the computing are displayed on a screen, printed on paper, or stored in memory for future use.

Other terms which may be useful to know are:

Chip: thin, flat slice of silicon measuring up to a few tenths of an inch square, containing an integrated circuit on its surface. It is used for processing and memory in the computer.

Diskette (floppy disk): a flexible disk that rotates inside a special jacket; diskettes are used to store information from a microcomputer.

Documentation: the written support material for a computer or a program.

K: means "1000." It is used as a measurement of memory capacity. A computer with 64 K can handle approximately 64,000 characters at any one time.

Language: In relation to computers, any unifed related set of commands or instructions that a computer can accept, or "read."

Word processing: A text editor system for writing, editing, formatting, and storing letters and reports prior to printing.

Many other terms are used with computers, but these provide a basis for beginning to access the usefulness of computers.

It is also necessary to understand a bit about computer languages. It is possible to become quite computer competent and never learn a computer programming language since so much software presently exists. However, it is important to realize that in the field of computer science, languages exist which programmers use, Some of these are BASIC, PASCAL, FORTRAN, AND LOGO. Each language, just like a foreign language, has its own grammar, vocabulary, and syntax. For most recreation, park and leisure services computer users, it is not necessary to know a language but it is sometimes helpful to have an elementary understanding of how programs are written.

Computer Uses in Recreation

Wide computer applications are currently being made with almost unlimited potentials. Computers are presently influencing the field of recreation, park, and leisure services, in two distinct ways. First, computers are providing a great deal of recreation to both adults and children. Secondly, computers are aiding in programming and managing leisure services. These managerial potentials have only begun to be explored. As indicated in a study of attitudes of park and recreation directors toward computers, professionals hold favorable attitudes toward computers, but do not personally have a good understanding of computer use (Sharpless, 1979). Findings such as these indicate the need for training leisure service professionals in present computer technology.

Computers are being used as a sophisticated electronic toy for many people. The growth in the video arcade business has been immense. Atari games and the proliferation of other similar computer based systems has dominated the "toy" market. In addition, many children as well as adults spend great amounts of time developing their own software, swapping software (just like children of 30 years ago used to swap baseball cards), and even attending computer camps and computer fests. Computers have definitely become a recreation activity in and of themselves even without business and economic applications. Leisure service professionals must be aware of the kind of possibilities which exist for the "worthy use of leisure" with computers. It is possible that some people may become "humpty dumpty's" sitting behind these electronic machines, but it is also possible that computers are one other opportunity which people have for experiencing recreation and leisure in a non-physical, self-directed atmosphere. This idea could lend itself to a great philosophical discussion, but for now the awareness of the computer's impact on personal recreation should simply be noted.

In a recent six page ad for APPLE computers in a news magazine, 100 uses for computers were listed (Newsweek, 1982). Among some of the current recreational uses were: sending letters, cockpit flying simulations, helping people learn to meditate, information about growing geraniums, rocking a baby cradle when the baby cries, predicting the winners of sports events, keeping track of exercises performed, teaching relaxation, keeping a liquor inventory in a bar, learning to read music, Computer Merit Badges through the Boy Scouts, learning to eat properly, playing chess and other games, and the list goes on and on. Most of these are related to personal recreation and leisure. Computers have and will continue to have a very profound effect on what people do. It should also be noted (and is discussed further in the "futures" section of this paper) that computers may free many people to have more time for other non-computer recreation and leisure pursuits.

A great opportunity for computer usage in recreation, park, and leisure services lies in its potential for management, programming, and office record keeping. Right now it is possible to use most existing business software for the office and managerial functions which would be needed by a recreation, park, or leisure service agency. Several companies are now developing software specifically for recreation while much of the useful software which has been developed for small businesses can be easily adapted to the leisure services setting. Many possible management applications exist:

budget analysis, accounting procedures, payrolling, inventories, class and league registrations, class and league scheduling, staff scheduling, employee records, tree and landscape inventories, mailing labels, word processing, maintenance records, energy audits, electronic mail, phone answering, typesetting, teaching skills, staff training, graphics creation, summarizing evaluations, time budgets, bookkeeping, tying into information services, and the list can go on and on.

The first step for anyone contemplating the use of a computer is to determine just what can be done for the agency with the computer. Finding the software which can do these things comes next. The last step is to finally purchase a computer that can run that software or to buy timesharing. Most important, the potential applications are always the first thing to consider.

Advantages of Computers

It is evident that there is much that computers can do. They can provide new ways of grouping data for analysis and storage. Computers provide a means for storing large quantities of information in a small space. Computers can communicate with other computers through a device known as a modem. Computers can eventually free the time of people so they can spend this time in other direct, human kinds of contact rather than in record-keeping. The usage is really only limited by the imaginations of the users, the limitations of the machine, the resources available, and the willingness of the users to learn and apply the technology.

As useful and as important as computer technology may be, there are a number of things which computers cannot and/or will not do:

1. A computer will not necessarily save money, at least not initially. In fact, it may cost a bit, due to overlooked extras such as maintenance, software, peripherals, and security. Moreover, you probably will not, nor should you, eliminate employees because of a computer. But, it will provide new ways of doing procedures more efficiently and thoroughly and will expand opportunities for creative use of employees.

2. A computer will not make your agency run right. If problems exist, a computer may only make them worse. However, a computer will provide better and faster ways of doing what you already do right.

3. A computer will not solve every problem. A lot of important decisions go beyond the bottom line. The answers may require a subjective evaluation, something that computers cannot do. Computers are a tool to be used appropriately and judiciously. They do not, however, provide the "only, right" answer for a problem.

4. A computer will not run itself. It takes a dedicated group of individuals to make a computer run right. Utilizing that group of people can make the difference between successful and not-so-successful computing.

5. A computer will not always be right. The information it puts out is only as good as the information that is put into it. Human judgment is still the most important ingredient of computer usage.

6. A computer will not protect itself automatically. The information that you put into a computer can be stolen or destroyed by anyone else unless safeguards are installed. In addition, computers can be manipulated; you must make sure you or your staff are managing the system.

7. A computer will not meet all its own needs. A well operated computer system requires attention, from the temperature of the environment to the maintenance schedule. A little preventive maintenance can eliminate a lot of costly downtime.

8. A computer will not become obsolete. Certainly, there will be new and improved computer systems, and the features will become faster and more powerful. But as long as the system is cost effective and provides the services your agency needs, its obsolescence is only a state of mind (Makower, 1982).

It is essential that one understands the boundaries of computers. Computers only do what they are programmed to do. Imprecise requests simply will not be understood. Currently, almost all computer input is based on typing and not on handwriting or voice input. It takes time to get information into a computer system. Initially, very little time may be saved; however, much more can be done with the data that are entered. Computers require that we classify, categorize, and quantitize data before it can be used. Not all information can be treated in this manner. Input must be able to be used to formulate output. People make mistakes on computers--computer output is by no means correct all the time. For example, a computer cannot comprehend subjective relationships among multiple pieces of data.

Communication with computers is not as easy as it may appear. It is not easy to program into computers many of the things which people find easy to do: associative reasoning, retrieving relevant past experiences, distilling intelligence from masses of data, or leaping intuitively to or guessing intelligently at solutions to complex problems. Human characteristics can never be duplicated in a computer, although computers can provide information and data to enable better decision-making.

Decisions About Using Computers

A computer is a big purchase and is not the type of purchase which can be made without a great deal of careful thought. Several steps are necessary in making the decision:

1. Review your present operation for sizing. Determine how large your agency enrollments, budgets, inventories, etc. are so you can more accurately decide how large a computer system you will need and what the benefits might be for its use.

2. Set goals/objectives and criteria for what a computer can do. This may be one of the most difficult tasks since it is the crux of all decisions. Do not buy a computer or buy timesharing and then decide how to use it. The applications and uses must be determined first.

3. Find a vendor and locate software sources. It will be necessary to consult with more than one vendor to determine what is the best buy and who will provide the most support services.

4. Design an implementation schedule to determine how you will begin to use the computer and its software. It is possible to do everything at once, so decide systematically how you will begin to use the system within your agency.

5. Begin implementing applications with a continual

emphasis on evaluating and adding potential software.

The following list provides some additional guidelines for selecting a system from among the variety of computers and peripherals which are on the market. It is paramount to first consider, however, the objectives for using the computer and the software or programming which is available.

1. Which machine will fit the software applicable to your plans?

2. What size of machine is needed to run the software?
   a. CPU/disk memory
   b. screen size
   c. printer width

3. Is the machine expandable; can more memory be added if needed?

4. How easy is the machine and software to use? Is training available?

5. What dealer support is available?
   a. Can a machine be borrowed in the event of breakdown?
   b. Can the shop do its own component-level repairs? If not, how long does it take to send the machine out? What is the cost of service?
   c. Does the dealer know enough about computers to help get the software running?
   d. Does the dealer know of other agencies/businesses in the area who use the same machine and/or software?
   e. What is the vendor's reputation? References?

6. What is the warranty and does the shop offer any kind of extra service contract?

7. Will this machine brand still be around in five years?

8. What aspects comprise a good packaged program (software)?
   a. wide application.
   b. menus (list of choices to take you through the program).
   c. good documentation (explanation).
   d. local dealer support.
   e. user words and format.
   f. updating (or correcting).
   g. easy backup.
   h. a hotline to call for help.
   i. potential modifications.
   j. training opportunities.

In summary, shopping around for a trustworthy dealer may be a major part of the computer implementation process. Make sure you understand the dealer and especially find out how you or your staff can be trained in the use of the computer. Be sure to "test drive" the computer and the software which you wish to purchase. Make sure the factors such as memory capacity, storage system, display screen, keyboard, interfaces, and documentation are appropriate for the use you will make of the computer and the software. It is important to remember in all cases: cost does not necessarily equal price. Beyond the initial outlay for a computer, printer, and software, the greatest cost is learning. Once the learning occurs, however, the potential is unlimited.

Computers in the Future

What lies ahead in this computer industry? It is evident that computers are here to stay. In fact, in many ways the future is NOW when it comes to the next generation of computers. The demand for new products is unbelievable. When a computer is selected "Man of the Year" by a major news magazine and the 80's are dubbed the "decade of the computer," it is evident that we have only seen the beginning of what is possible.

Computers will continue to become more sophisticated and powerful. Already the market is teeming with many brands and numerous possibilities for improvements. It is also likely that the prices for computer systems will go down somewhat, although what may really happen is that computers will get better and one will get more for the same amount of money. New products will become available every day and software will become increasingly abundant. The size will become small enough that a microcomputer system may be booksize. The explosion in the memory capacity of computers will continue to occur. In fact, electronic circuits will give microcomputers rapid access to almost eight billion units of information which is equivalent to the number of nerve cells in the human brain responsible for memory (Makower, 1982).

Electronic mail will become commonplace in the future. The postal service will be edged out as it becomes more and more expensive and inefficient. Computers will become the means for important, fast communicating between individuals and agencies.

The "digitalization" of America is not far away. A universal code for information (using 0's and 1's) will allow all elements such as phones, televisions, computers, and satellites to be used compatibly. This will create even more convergence in the society where distance will no longer be a problem. You could play a chess game with a partner in Japan by using computers and satellites. Or you could register for a recreation class by programming your television set. The implications for information dissemination and leisure education are immense.

In the very near future, computers will no longer require only keyboard input. It will be possible to speak to a computer and have the information recorded. It will then become possible for phones, telecopiers, computers, and people to "converse" with one another. Computers will be able to speak and to listen to human voices.

Artificial intelligence or the ability of the computer to make decisions and take actions on its own, is being billed as the second computer age. Computers may act as intelligent assistants in making specialized management decisions. This may not occur in the next year, but it is possible within the decade with the current rate of change (Makower, 1982).

These changes will not occur without creating societal changes. It is predicted by 1990 some 60% of all jobs will require familiarity with computers (Griffith, 1982). Park, recreation, and leisure services are not likely to escape this trend. All professionals and staff will need to have this familiarity with computers. If within the next three to five years, computers are able to understand voice commands, great changes will occur among clerical staff. It is also possible that computerized robots could do many of the common maintenance functions now performed by unskilled laborers. What implications this will have to the management of

recreation, park, and leisure services as computers continue to transform the workplace!

The impact on personal recreation and leisure of computers cannot be overlooked, particularly by leisure service professionals. Electronic communities which link people together for specific purposes may change some of the ideas we have about leisure and recreation. Computers will provide easy access, maximum personal freedom, a variety of ways to participate, novelty combined with continuity, supportive but not a confining environment, evolutionary changes, and the opportunity for adventure and not escape (Jennings, 1982). Computers will also put information power into the hands of the masses and not just institutions. The potential for decentralization is definitely available. This decentralization will need to be considered by leisure services professionals from a variety of perspectives. For example, if people have the opportunity to work at home with a computer, it is likely that they will choose to recreate other places in the community (Toffler, 1980).

It is also evident that computers will create social problems with which we are not equipped to deal. Because of computers, many people may not need to work a traditional 40 hour workweek. How will these people be taken care of? What will they do with their free time? How will the society's values concerning work, leisure, and meaningful activity change? The economy may need to be completely restructured. Answers to many of these questions which are being raised are not yet available. However, it is very likely that leisure behavior will become an important influence on the answers to these questions. As leisure service specialists in the area of parks and recreation, it is essential that we have expert advise to offer. Therefore, the recreation, park, and leisure services professionals' computer consciousness will influence many of the suggestions which will be offered.

No one can accurately predict where this computer technology will lead or what its full impact will be. It opens the doors to a new world, but it also threatens a familiar one. The computer age must be understood. Already a whole generation of children is growing up and taking computer technology for granted. Computers can help people to enjoy life and to perform jobs more effectively. While there are many things which computers can do, there are also many things which they cannot do. The wisdom lies in knowing the difference between what machines can do and what can only be done by a human being.

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COMPUTERIZED INSTANT SCHEDULING: "HAVING YOUR CAKE AND EATING IT TOO"

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Abstract

Recent literature shows that there are definite advantages to both instant scheduling and computerized scheduling. This paper describes a scheduling process that combines advantages of both instant scheduling and computerized scheduling; this process is designated computerized instant scheduling.

Introduction

A major responsibility of any intramural or recreational sports staff is that of scheduling competition for all sponsored activities. Instant scheduling, a somewhat new approach, has been popularized throughout the country. As described by universities which use this scheduling process, instant scheduling places most of the scheduling responsibility on the teams and allows the staff to use this extra time to improve other areas of the program.

On the other hand, computerized shceduling, an even more recent innovation for the scheduling process has established itself in the recreation field. The computerized scheduling process is a method of allowing an unbias computer to schedule teams and to track student participation, game results, team standing, etc. It also provides ways of easily printing schedules to post, season schedules for teams, and score sheets to better manage each game.

As can be readily seen, there are definite advantages to both instant scheduling and computerized scheduling. Logically, if an intramural department was able to somehow combine the advantages of these two methods and develop a new process, say--computerized instant scheduling--they would have in their possession a more superior form of team sports scheduling than either instant scheduling or computerized scheduling could provide.

Related Literature

According to Maas, instant scheduling of intramural sports has become increasingly popular in the past few years. The movement apparently began in California, with the University of California at Berkeley and the University of California at Davis being two schools who were early users of this scheduling process (Maas:26)

Maas describes instant scheduling as a process which places the brunt of the scheduling responsibility on the team.

> In "instant scheduling" the team representatives come in to sign up teams as usual but go to bulletin boards where schedules for various divisions/ classes are posted for each day of the week, schedule their team, copy their schedule down and leave. The process is finished. (Maas:26)

The University of North Carolina--Chapel Hill has also found the instant scheduling process to be a big success.

> What we have developed at UNC is basically a week by week, ever changing self-scheduling strategy. Typically, all the possible playing areas and times for a given sport are posted at the beginning of the season on a large board. Team captains can then enter their teams to play at the most preferred time, providing that time slots remains for their chosen divisions of play. (Pomerantz:22)

Computerized scheduling, as of yet, is not as widespread or popular as instant scheduling. However, with the pressure of the computer being felt more and more in all aspects of our lives, the use of computers to schedule and manage intramural sports competition will no doubt increase.

Holley describes computerized scheduling as a method of scheduling intramural teams which has reduced paperwork involved in the scheduling process and has freed up staff members to better serve the students and the program needs.

> When a team enters an activity, the coach fills out an entry form. This includes all team statistics, names, student numbers, telephone numbers, etc. Each team is assigned a division (e.g. competitive or noncompetitive) and league. The team information is then entered into the computer via the CRT (computer terminal) screen in the intramural office. This is the master record from which all other programs will function. The master record will track individulas and teams, keeping vital statistics on all they do in intramurals. (Holley:20)

Methods

The computerized instant scheduling process is a combination of the instant scheduling and the computerized scheduling processes and involves the following steps:

1. The graduate assistant in charge of the activity gathers all information regarding field availability (days and times), number of expected teams in each division, length of season, etc.
2. The complete season is then scheduled by use of a computer program developed by PDSI, Inc., (6-7 games per team). (Why be inconvienced each week when you can be done with it all at once?)
3. Any number of copies of a season schedule can then be produced by just a touch of a button.
4. Beginning with the first day of classes a team captain can come in during office hours and enter a team. During the entry process the team captain: a) Fill out entry form listing the team demographic data. b) Select appropriate division (Men's, Women's, Independent). c) Pre-classifies the team within an estimated ability level, either 1A, 2A, 3A, or 4A. This will better insure similar competition throughout the season. d) Selects a schedule within the chosen ability level that will best suit the team members schedules (instant scheduling).
5. The schedules are printed on 8 1/2 x 11" paper with holes punched to fit in a three-ringed binder. Two copies of the season schedule

are placed in 6 binders entitled Monday, Tuesday, Wednesday, Thursday, Friday, and Saturday. Within each binder the schedules are arranged according to playing time 18:00, 19:00, 20:00, 21:00, 22:00. The first copy is given to the team captain while the second is stapled together with the entry form and given back to the graduate assistant for entering into the computer.

6. After the team captain has entered the team and receives their schedule there is no need for further contact between office personnel and the team.

7. To better inform participants a schedule is produced weekly by the computer and is posted in six key locations around campus.

8. If a duplicate schedule is needed, the computer program can reproduce one in seconds.

9. At the end of the season each team still eligible is reclassified either 1A, 2A, 3A, or 4A according to the ratings they had recieved druing seasonal play and placed in their respective tournament division.

Conclusion

Instant scheduling has quickly become a viable and popular method of efficiently scheduling intramural team sports. Many intramural programs have found this method to be successful for their programs. On the other hand, computers and computerized scheduling are quickly becoming the ways of the future, if not the present. By combining these two methods into the computerized instant scheduling process, one has all the advantages of instant scheduling along with the efficiencies and capabilities of the computer. In essence, we have our cake and eat it too.

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RDECIS: A RECREATION MANAGEMENT DECISION SIMULATION

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Abstract

Participants in a recreation management computer simulation are managers and staff of selected recreation organizations. Each playing period they must make decisions which will affect the operation of their organization. Abbreviated player instructions and guidelines for running the computer simulation are presented. The computer program is listed with sample input and output.

Introduction

The world of simulations is well established. This world includes its own societies[1], journals[2], numerous other publications[3], and even a bit of academic public relations (Jacobson, 1979). Computer simulation is a major part of this world and includes a number of computer languages developed specifically for the purpose of doing simulations[4].

Researchers in the applied discipline of parks and recreation have been late entries into the world of computer simulations but the benefits of this method are rapidly being recognized, both as a research technique and a management tool (Gueter, 1969; Shechter, 1975; McCool et al, 1977; Stynes, 1979;). Computer simulations save time, money, and provide the student and researcher with opportunities to participate in experiences which, in all probability, they would not be able to do easily in "real" life. Because of this the use of computer simulations as a teaching tool in parks and recreation is beginning to take place (Kamp, 1979; Watts, 1979; Manning, 1980).

Many computer simulations used today which relate to parks and recreation are in outdoor recreation or sports. There is a need for this tool to be appled to municipal and agency parks and recreation management. This is especially true because of the impact of tax initiative programs in a number of States and the resulting trend toward the use of cost-benefit data as an aid in the decision-making process.

Purpose

The computer simulation, RDECIS, evolved from a management decision game developed by Joseph Nordstrom (1971) and made available through the Hewlett-Packard contributed library. While RDECIS is not sophisticated enough to aid in real management decisions it has been useful in the classroom for stimulating thinking, discussion, and research. Recreation management decision making models and the use of the computer provide students with an opportunity to make decisions routinely made by the recreation manager which would normally happen over a period of several years. The simulation allows several individuals or teams to participate over a simulated period of time and to see how the decisions of one will affect another. This allows one to see the ramifications of these decisions and encourage the student to consider more carefully many of the major variables involved in the operation of a recreation facility.

The simulation, or educational game, can be played for any number of periods or trials. Each period can be designated as a day, week, month or other length of time which meets one's purpose.

Scenerio

You are on the management team for a recreation facility in a medium size metropolitan area and in competition with other recreation facilities public, private, and commercial. For this simulation each facility is similar in nature, providing a maximum of 30,000 scheduled participant-hours activity per month.

The budget for the year is $720,000, or $60,000 per month. Of this mount $35,000 is for staff, utilities, supplies, bond repayment, and other fixed costs. That leaves an additional $25,000 which is related directly to program costs.

Your objective is to generate enough revenue to balance the budget or be faced with closing the facility and losing your job. At the same time you must keep the cost-per-participant low enough to be competitive in the local market.

Player Instructions

You are a member of a closely knit management team that is competing directly with several other organizations and agencies for a share of the parks and recreation market. All of the organizations and agencies are selling, whether directly or indirectly, a service that is similar: recreation. Fees charged and promotional effort are the key elements affecting the number of participants which participate each month. Success results from a careful assessment of the market demand, competitior's activities, sound program planning, and control.

Each period you must determine and report: (1) the average fee to be charged for your organization's activities, (2) promotion expenditure, (3) number of scheduled participant-hours each period, (4) maximum number of participant-hours which the facility can be scheduled; (5) amount of investment in planning and research, and (6) amount of investment in professional staff development (see Figure 1).

These decisions, in the form of data, will be put into a computer simulation which represents a competitive market situation and the results will be given back to you by the Recreation Director. Your team's results will be determined by: (1) your team's decisions, (2) your competitor's decisions, and (3) market conditions. Additionally, there will be some random variation.

A Sample Run

Results of each team's decisions are measured in terms of: (1) number of participant-hours, (2) program costs, (3) admin- istrative costs, and (4) cost-per-participant hour. In addition, total number of participant-hours, or market, and average number of participant-hours per team organization are presented (see Figure 1).

Guidelines for Running The Computer Simulation

The instructor, or "Recreation Director," determines how many times the simulation will be run and the length of time represented by each period. For example, the simulation might be run once each class period for one or two weeks; or it might be run once each week for a semester. The simulation can be run 10 or more times in one class period although the author has found this method to be the least beneficial.

Each computer run can be designated to equal any length of time, such as a day, week, month or year. The decision should be based upon the setting and purpose for using the simulation. RDECIS is set for one month periods.

Student teams are formed. A team manager is picked by the team or the instructor and other team members are given roles to play. Often teams will identify with real organizations in the community such as the YMCA, commercial sports center, or a municipal community center. Another method is to designate each team to represent the same kind of establishment such as four different municipal swimming pools in a large community or four different community centers.

Team members play their role, gather supporting information, and make decisions which they think most appropriate.

The "Recreation Director" gathers team decisions in the form of data (see Appendix A) which are entered into the computer. On the computer program listing (Appendix B) data statements for four teams begin at line 1080. The number of data statements must equal the number of teams participating and this number must be entered manually on line 110; N equals the number of teams participating. Line 120 must be changed manually after each period of play so P equals the current period of play.

The simulation runs on a Hewlett-Packard 3000. It is written in HP BASIC which may be translated into other BASIC dialects. The program is not long and could be modified to run on a microcomputer. The author uses a HP 2621A terminal to enter new data, enter the weighted data (see line 1130), and to change the period of play on line 120. This takes just a moment using the local terminal mode and built-in editor functions. Most computers and terminals provide similarly quick and easy methods for modifying line statements.

```
RDECIS
PERIOD  0

 TEAM   AVE. FEE   PROMO.   SCHED. PART. HRS. PER MO.   MAX. PART. HRS.PER.MO.   PLAN. & RESEARCH   PROF. DEV.

   1        0        0              0                        30000                  0                0
   2        0        0              0                        30000                  0                0
   3        0        0              0                        30000                  0                0
   4        0        0              0                        30000                  0                0

 TEAM      # PART.HRS      PROG. COSTS      ADMIN COST      COST-PART.HR.

   1           0              1254             35000            36254
   2           0              1254             35000            36254
   3           0              1254             35000            36254
   4           0              1254             35000            36254

 TOTAL NO. PARTICIPANT HOURS PER MONTH 0
 AVE. NO. PART. HOURS PER MONTH, PER TEAM 0

    *    *    *    WEIGHTED DATA USED NEXT PERIOD    *    *    *

 1130   DATA 0   , 0   , 0   , 0   , 35000   , 0
 1140   DATA 0   , 0   , 0   , 0   , 35000   , 0
 1150   DATA 0   , 0   , 0   , 0   , 35000   , 0
 1160   DATA 0   , 0   , 0   , 0   , 35000   , 0
```

Figure 1. Data for current period.
Results for current period.
Weighted data used next period.

Results of each computer run, or simulation, may be returned to team meanagers immediately, at the first of next class, or at a mutually agreed upon time and place. Preparation begins for the next series of decisions and the process repeats itself.

Weighted data which are used in calculating results for the next period of play are figured automatically by the computer. They must be re-entered after each play as data statements starting at line 1130 (see Figure 1). As with the team data statements one must be sure the number of weighted data statements equals the number of teams participating.

Modifications

A variety of modifications could be made to the RDECIS computer program. Data entry techniques might be changed so team members could enter their own organizations name and data. Printed output could be changed so team members receive only their own results. Graphics could be used and data files added to keep all team data as play progressed through the semester. Variables could be changed or added to make the simulation more complex. Weightings used for each period could be changed to increase or decrease the impact of different variables. The addition of real data and more sophisticated variables would enhance the simulation greatly.

Conclusion

RDECIS has been useful as an alternative method to stimulate critical thinking and to enhance the learning process. At appropriate times it can be used in conjunction with readings and other resource material as concepts are discussed and applied. The use of teams generates active group participation and social interaction. Role playing is not always a successful method for all individuals but for many it is a way to identify with a task and make it more meaningful. Often there are surprising results when some class members, especially the quiet ones, take their roles very seriously.

Notes

[1] The Society for Computer Simulations, P.O. Box 2228 D, La Jolla, CA 92038; North American Simulation and Gaming Association, Box 100, Westminister College, New Wilmington, PA 16142.

[2] Simulation and Games, Sage Publications, Inc., 275 South Beverly Drive, Beverly Hills, CA 90212; Simulation, Published by the Society for Computer Simulation; SIMAGES, Published by the North American Simulation & Gaming Association.

[3] For example, see Simulation and Games: An ERIC Bibliography, edited by Donald R. Cruickshank and Ross A. Telfer, ERIC Clearinghouse on Teacher Education, Suite 616, One Dupont Circle, Washington, DC 20036; or Simulation and Gaming Reference, Creative Computing, Sept./Oct. 1978, pp. 72 and 82.

[4] For example: GPSS, GERTS, GASP, SLAM, SIMSCRIPTII, TUTSIM, DYNAMO.

[5] This recreation facility is loosely based upon a hypothetical one which has the following programmable areas: an indoor swimming pool, gymnasium, four racquetball/handball courts and two multipurpose rooms. In the classroom we try to conceptualize the team's facility in one of two ways: (1) the instructor picks a facility in town with which students are familiar and each team pretends to manage that facility, or (2) we choose four different recreation facilities in town, assume they are similar in size, and each team manages one of the different facilities. Students seem to role-play more easily when they can identify with a real facility.

Appendix A

RDECIS

RECREATION DIRECTOR'S FORM

Class_____ Date_____

Number of Teams_____ Director_____

Location	Designation	Team #	Fee	Promo.	Part. Hrs.	Max. Hrs.	Research	Prof. Dev.
	DATA							
	DATA							
	DATA							
	DATA							

```
RDECIS
   10 REM       *** RECREATION FACILITY MANAGMENT SIMULATION ***
   20 REM       *** ADAPTED FROM HP TIME-SHARED PROGRAM LIBRARY  ********
   30 REM              36065:  DECSN (A606) REV B -- 9/71
   40 REM       *** BY R. T. WATTS, IDAHO STATE UNIV., POCATELLO, 1979,82
   50 REM ************************************************************
   60 REM          *********  INITIALIZE SIMULATION *****************
   70 REM *** N= NUMBER OF TEAMS. THIS NUMBER MUST BE THE SAME AS THE
   80 REM          NUMBER OF DATA STATEMENTS WHICH BEGIN AT LINE 1080.
   90 REM *** P= PERIOD OF PLAY. EACH PLAY SIMULATES ONE MONTH. P MUST
  100 REM          BE CHANGED MANUALLY FOR EACH PERIOD OF PLAY.
  110 N=4
  120 P=0
  130 REM          ****** READ & PRINT STUDENT'S NEW DATA  ***********
  140 REM *** A= DATA STATEMENTS BEGINNING AT LINE 1080. SET FOR 8 TEAMS
  150 REM *** C= WEIGHTED DATA BEGINNING AT LINE 1130. THE NUMBER OF
  160 REM          DATA STATEMENTS MUST EQUAL N AND BE RESET AT THE
  170 REM          START OF A NEW GAME.
  180 REM *** B= ADD NEW DATA AND WEIGHTED DATA.
  190 REM *** M= RESULTS FOR EACH PERIOD
  200 REM
  210 DIM A[8,7],B[8]
  220 PRINT "PERIOD ";P
  230 PRINT
  240 MAT READ A[N,7]
  250 PRINT TAB(6);"AVE.";TAB(19);"SCHED. PART.";TAB(33);"MAX. PART.";&
      TAB(47);"PLAN. &"
  260 PRINT "TEAM";TAB(6);"FEE";TAB(11);"PROMO:";TAB(19);"HRS. PER MO."&
      ;
  270 PRINT TAB(33);"HRS.PER.MO. ";TAB(47);"RESEARCH";TAB(57);&
      "PROF. DEV."
  280 PRINT
  290 FOR I=1 TO N
  300   PRINT I;A[I,2];A[I,3];TAB(20);A[I,4];TAB(35);
  310   PRINT A[I,5];TAB(50);A[I,6];TAB(58);A[I,7]
  320 NEXT I
  330 REM ****** ENTER NEW WEIGHTED DATA FROM LAST PERIOD & CALCULATE
  340 REM ****** INCLUDING RANDOM GENERATION USING FEE AND PROMOTION
  350 TO=0
  360 PRINT
  370 DIM C[8,6]
  380 MAT READ C[N,6]
  390 FOR I=1 TO N
  400   IF A[I,3]>=500 THEN 430
  410   LET H[I]=A[I,2]*2
  420   GOTO 440
  430   LET H[I]=A[I,2]*4
  440   LET X=0
  450   FOR J=1 TO (N*P)
  460     LET X=RND(P)+X+J
  470   NEXT J
  480   LET H[I]=H[I]-.1*RND(P)
  490 NEXT I
  500 REM ****************** CALCULATE EFFECT OF FEE ******************
  510 FOR I=1 TO N
  520   X[I]=0
  530   Y[I]=0
  540   IF A[I,2]<=10 THEN F[I]=-5555
  550   IF A[I,2]>10 THEN F[I]=4444
  560   IF A[I,2]>=25 THEN F[I]=1111
  570   IF A[I,2]>45 THEN F[I]=-4321
  580   IF A[I,2]>75 THEN 600
  590   GOTO 630
  600   F[I]=-4567
  610   LET X[I]=-2222
  620   LET Y[I]=-543
  630 NEXT I
```

```
  640 REM ****************  CALCULATE RESULTS FOR THIS PERIOD ********
  650 REM ****************  AND WEIGHTED DATA USED NEXT PERIOD *******
  660 DIM M[8,5]
  670 FOR I=1 TO N
  680   LET M[I,1]=I
  690   IF A[I,4]=0 THEN 750
  700   LET M[I,2]=(A[I,4]*.5)+(A[I,3]*.4)+(C[I,1]*.4)+H[I]+C[I,2]+F[I]
  710   IF M[I,2]>A[I,4] THEN 730
  720   GOTO 760
  730   LET M[I,2]=A[I,4]
  740 GOTO 760
  750   LET M[I,2]=0
  760   REM ************  FAC.CAP.;ACT.HRS.;& PROG.COSTS  **********
  770   IF A[I,4]=0 THEN 830
  780   IF A[I,4]<10000 THEN 810
  790   LET M[I,3]=(A[I,4]*.66)+(A[I,3]*.66)+3345
  800   GOTO 850
  810   LET M[I,3]=(A[I,4]*.9)+(A[I,3]*.9)+5345
  820   GOTO 850
  830   LET M[I,3]=A[I,3]+1254
  840   REM ************  CALCULATE RESEARCH COSTS  *****************
  850   LET C[I,3]=C[I,3]+(A[I,6]/1.5)+Y[I]
  860   LET C[I,2]=(.985*C[I,3])+C[I,2]+X[I]
  870   LET M[I,5]=M[I,3]+A[I,6]/3+C[I,3]/3
  880   REM ************  CALCULATE PROFESSIONAL DEVELOPMENT  *******
  890   LET C[I,6]=.4*C[I,6]+A[I,7]
  900   LET M[I,4]=C[I,5]+(.2*C[I,3])+(.2*C[I,6])+(.75*C[I,4])
  910   LET C[I,4]=A[I,3]
  920   LET C[I,5]=A[I,5]+5000
  930   LET C[I,1]=A[I,3]*.33
  940   LET M[I,5]=(M[I,3]+M[I,4]+A[I,3])/(M[I,2]+1)
  950   LET TO=TO+M[I,2]
  960 NEXT I
  970 REM ****************  PRINT RESULTS FOR THIS PERIOD ************
  980 PRINT "TEAM ";"  # PART.HRS";"    PROG. COSTS";"   ADMIN COST";
  990 PRINT "    COST-PART.HR."
 1000 PRINT
 1010 FOR I=1 TO N
 1020   PRINT M[I,1];TAB(10);M[I,2];TAB(24);M[I,3];TAB(40);M[I,4];TAB(&
    52);M[I,5]
 1030 NEXT I
 1040 PRINT
 1050 PRINT "TOTAL NO. PARTICIPANT HOURS PER MONTH";TO
 1060 PRINT "AVE. NO. PART. HOURS PER MONTH, PER TEAM";TO/N
 1070 PRINT
 1080 DATA 1,0,0,0,30000,0,0
 1090 DATA 2,0,0,0,30000,0,0
 1100 DATA 3,0,0,0,30000,0,0
 1110 DATA 4,0,0,0,30000,0,0
 1120 REM
 1130 DATA 0,0,0,0,35000,0
 1140 DATA 0,0,0,0,35000,0
 1150 DATA 0,0,0,0,35000,0
 1160 DATA 0,0,0,0,35000,0
 1170 REM
 1180 PRINT "  *   *   *   WEIGHTED DATA USED NEXT PERIOD   *   *   * "
 1190 PRINT
 1200 FOR I=1 TO N
 1210   REM ***DANGER! ******* IF THE PROGRAM LISTING IS RENUMBERED ****
 1220   REM      THE FIRST # IN THE NEXT PRINT STATEMENT MUST BE CHANGED
 1230   PRINT 1120+(I*10);"DATA";C[I,1];",";C[I,2];",";C[I,3];",";C[I,4&
    ];",";
 1240   PRINT C[I,5];",";C[I,6]
 1250 NEXT I
 1260 REM *** FINE TUNING CAN GO ON FOREVER...BUT THAT'S ALL FOLKS!
 1270 END
>
```

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COMPUTERIZED TEAM SPORTS SCHEDULING

Richard Chris Duke

The use of computers in the area of intramural and recreational sports programming is becoming increasingly popular due to the introduction of computer software designed to organize and schedule team events. The value of such a system is that it saves time that can be used better elsewhere and it provides complete team records that are easily accessable to the user at the touch of a button.

One software package, "The Intramural System" by PDSI Inc., offers a total program that allows a user to establish and maintain a complete file of each team event as it is in progress. This program is currently in use at Southern Illinois University at Carbondale and at Brigham Young University. By using the Apple II computer, this program enables scheduling data for up to one hundred teams per each computer storage diskette. The scheduling data is divided into the following areas: team data, league data, place data, scheduling data, game data, printouts, and miscellaneous utilities.

An important ingredient of the PDSI Intramural system is the ability to create, maintain, and change information regarding each intramural team. The team data file enables the user to insert each intramural team. The team data file enables the user to insert information pertaining to one hundred teams per diskette. Specific information which is included in this file includes team names, the league in which the team is a member, the coach's name and phone number, the organization which the team represents. a list of twenty-one team players, player's eligibility status, and the number of games a team or player has played. These lists can be continually updated or changed as the season progresses.

The purpose of the league data file is two fold. First it is to name the various leagues that will be kept on a particular diskette. Second, it is used to assign teams to each league. Each diskette is capable of establishing fifteen leagues which may include up to twelve teams per league. This file can also be updated as the season progresses when teams are disqualified of a realignment of leagues may become necessary.

The purpose of the place data file is to enter the various fields/courts that will be used in scheduling team play. Up to twenty of your own facilities may be listed in this file.

The scheduling data file is the heart of the "Intramural System." It is here that one establishes the parameters that will come into use as each team is scheduled to play in a round robin format against teams within their particular league.

The game data file is where the information about games played is located. In this file, the computer will show the game, the name of the opponent, the scores achieved by each team, and its sportsmanship rating.

A major time saving feature of the computerized Intramural System is the printouts which it is capable of producing for season schedules; weekly schedules, game sheets, and lsitings of teams. Season schedules are printed for each team which is involved in a particular program. This schedule contains a complete list of opponents, dates and time of each game, and location where each game will be played.

Weekly schedules contain the date, time, location, and opponent of all teams which are playing during the upcoming week. These printouts are excellent for posting around campus at various locations to provide information on a weekly basis.

Game sheets are printed for each contest which will be played. Information provided on these sheets includes the teams which are playing, the coach, a list of all team players, and the eligibility status of the players. These sheets are taken to the actual game site and used to check in participants and for recording scores and classifications of the teams for that particular game.

Team listings can be printed for the convenience of the director for quickling looking up any team. Information provided in this printout includes all teams, coaches, and telephone numbers. This list can be printed in alphabetical order, league order, or according to the organizations which the team represents.

Utility programs which are included in this program allows the user to copy information from one diskette to another, look up individual players to find out which teams they play on and their eligibility status, update the current date, and a special program which fixes the information on a diskette in case the computer was accidently turned off prior to the completion of a program.

With the implementation of a computer in the intramural and recreational program, much time can be saved that can be used more efficiently in other areas. Although it is now a convenience to have computers assisting with intramural and recreational sport programs, people who are interested in the quality of a program will find that computers will allow them to actively use their time in improving their present programs.

COMPUTERIZED MEET SCHEDULING UTILIZING THREE VARIABLES

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Abstract

Scheduling of events typically is based on the sex and age of the individual. Very seldom is the ability of the individual also considered. The format for scheduling individuals has frequently discouraged potential entrants because of their concern for failure. The format for Special Olympics participation encourages participation and the computerized program developed makes it simple, accurate and convenient.

Introduction

During the past six years, the Department of Recreation and Parks, University of Wisconsin-LaCrosse, has been actively involved in providing Special Olympics opportunities for qualified participants. These participants have come from over 24 agencies, six counties and have numbered approximately 400 individuals.

Available for individuals to participate in include the area games which are held during the Winter and Spring of each year. Like others who are involved in scheduling events for athletes, the same types of problems typically exist for the programmer which includes; the large number of entrants; coaches not meeting the entry deadline; and individual changes just prior to the meet.

The philosophy of Special Olympics has been to encourage anyone who is qualified (which includes training for the events entered) to participate. This has tended to magnify some of the problems listed above.

As in most event scheduling, Special Olympics is very similar to other situations in that for individual events, participants are initially classified according to their sex and are placed in age groups (eight groups). What is unique about Special Olympics scheduling is that based upon performance (time or distance), athletes can compete against others with similar times, distance or performance level. Thus, divisions have been established based upon the ability of the performer with age and sex also considered. The obvious advantage of this is to encourage participation and competition for all who are qualified to participate rather than to emphasize "the best performance" for an individual event only. With these divisions, rather than having one first place winner for the boys 8-9 year old group in the 50 meter dash, conceivably, there could be six winners (depending on the number of entrants and how they are classified). This provides opportunities for more participants to excel based on their level of performance. This is similar to the typical golf tournament which includes different flights for different abilities.

Description of the Program

The Special Olympics scheduling programs were written in Hewlett-Packard BASIC on a Hewlett-Packard HP2000 educational time shared computer. The system consists of two programs and a random access disk file.

The file contains the following information on each competitor: name, the sponsoring agency or school, sex, age and a list of times or distances for each of the possible events. The file currently contains 17 scores for each competitor but space has been reserved for 25 and further expansion would be simple. The records of the file are simply kept in the order in which they are entered.

The entry program (OLMPEN) is first utilized to input information. This program simply allows the programmer to add new records to the file or to edit them. The program begins by reporting the number of records on the file (i.e. you have 243 people in the file) and then allows the programmer to branch to the desired function (add, edit or stop). In adding entrants, the name, agency, sex and age are typed. The age group is then calculated and the program will request which event is to be entered. The programmer then types the event number (all events have a designated number) and the time or distance which has been provided from the entry form. The computer will then repeat the information and request if the information is correct. If the information is correct, then the information is stored. After each session of entering new information, a brief report containing the number of entrants in each age group in each event may be requested.

Editing of the program allows the programmer to have a list of all entries printed if needed. The program will request which entrant needs to be modified. This allows each entrant the opportunity to sign up later for another event or to delete oneself.

When all entries are in and no further changes are needed, the final list program (OLMPCS) is utilized. This program prints entry lists for each event. It is categorized by age group and sex. The competitors are also sorted in order of the best reported time or distance so that event heats may be set up on the day of the event.

The number of competitors in each heat can be adjusted based on the number of lanes available (for running events) as well as the range of abilities of individual competitors. The program allows the scheduler flexibility in selecting the number of participants in each heat which can vary in number.

Conclusion

Due to the variables in scheduling (age, sex and ability level) and the complications of late entrants and deletes, it was almost impossible to develop an accurate schedule manually. This computer program has made the process of scheduling individual and relay events for special olympics very simple, accurate and convenient. The fact that these schedule programs were written on a Hewlett-Packard HP2000 means that they are not totally compatible with other brands of computer (or microcomputer). However, most of the statements can work on other brands, but many computers differ in the method of keeping information on disk files. Each statement which stores or retrieves information would need to be modified. Another possibility for individuals who wish to use a computer for this task would be to use a good data base management program.