International Institute for Applied Systems Analysis
IIASA www.iiasa.ac.at

A Community Based Office Automation Center for Women: Intellectual Property Based Organizational Setting No. 2

Costello, D.F.

IIASA Working Paper

WP-81-165

December 1981

A COMMUNITY BASED OFFICE AUTOMATION CENTER FOR WOMEN: INTELLECTUAL PROPERTY BASED ORGANIZATIONAL SETTING NO. 2

Donald F. Costello

December 1981
WP-81-165

INTERNATIONAL INSTITUTE FOR APPLIED SYSTEMS ANALYSIS
2361 Laxenburg, Austria

ABSTRACT

The impact of information technology on society may be observed in process in the radical changes that are taking place in today's office. This impace will perhaps affect women more radically than the invention of the typewriter itself. The paper develops an organizational setting built in the managerial principle of intellectual property, the values of community and the need to provide an educational and training environment that helps women more naturally deal with this impact.

CONTENTS

INTRODUCTION	1
BACKGROUND	2
THE NEED	4
THE OPPORTUNITY	5
THE ROLE OF INTELLECTUAL PROPERTY	6
CONCLUSION	9
APPENDIX	11
REFERENCES	13

A COMMUNITY BASED OFFICE AUTOMATION CENTER FOR WOMEN

INTELLECTUAL PROPERTY BASED ORGANIZATIONAL SETTING NO. 2

Donald F. Costello

INTRODUCTION

Office automation can be viewed as a threatening spectre to women's role in the work place or it can be seized as an opportunity to gain advantage in a new order that depends on reasoned skills and managerial acumen in the new electronic office. The Community Based Office Automation Center for Women is an idealized community organization attempting to build on the managerial experiences gained in the growth of computing and data processing centers in the 1960's and 1970's, the possibilities for new cottage industries provided by micro-electronics, and the managerial and economic principle of the developing value associated with intellectual property.

Since the introduction of office automation is a revolutionary concept, it is reasonable to expect that new ideas, inventions, and know-how will develop in this arena just as it did in the computing and data center in the 1960's and 1970's. The legal and managerial understanding of protecting these innovations as intellectual property has advanced considerably in this twenty-year period. The successful spin-off enterprises that came out of the data centers can once again be expected to come out of office automation centers. However, the organizational structure to encourage and permit this happening is not in place. What is more important the facilitating education and training component that is necessary before any successful innovations can take place must be vigorously addressed.

BACKGROUND

Most researches in demographics and sociology agree that the world of electronics is radically changing the world of work. Nowhere is this happening more completely and more quickly than in the world of office automation. There are many who combine this technological perspective with the projection of the number of women in the work force involved in office work and realize that a revolution of momentous proportions will confront education, industry and most important--women--in the next twenty years (Armstrong 1980). Traditional educational and training institutions are simply not designed to address this question.

A community based office automation center for women is a new organizational construct* built upon the economical principle of cost and profit sharing, the social principle of the need for specialized educational and training opportunities for women and the management principle that developing intellectual property is an essential ingredient to the successful operation of such a center.

The rapid decrease in the price of electronic components and the commitment by older computer companies and newer electronically based office automation companies to provide various new office products is seen as a fifteen-billion-dollar (eight-billion-pound) business by 1982 (Sadler 1980). Office management is faced with a bewildering variety of devices having enormous potential power for transforming office work. The current secretarial work force has not been educated to understand nor trained to operate these devices. What is even more serious is that the large majority of educators working in this field have not even begun to plan curriculum to address the skills required in an electronic office. Some training is needed for even the simplest of devices, but the office automation complex will, at least for the near future, require considerable training. It is also generally agreed that the short term impact on office management is even more drastic than the invention of the typewriter itself. In Figure 1 we list a sample of the electronically based devices that are currently being considered in office automation decisions.

---

* Carter (1981) asks the academic community to go out on a limb and present new suggestions to address the problems of a coming drastic drop in the number of available jobs.

[The Academic Community] "could be more helpful if it would stop explaining people to themselves and instead go out on a limb sometimes with suggestions of new ways in which employers and unions could resolve future problems. The academics could also report their ideas and findings in language that was accessible to more people outside their own circles.

It would be useful if some of these people, with their wider views, could go out and gather insights, opinions, and ideas, not only about how to produce more or better goods and services, but also about what goods and services need to be offered. In several countries workers in imperilled industries have been involved in major restructuring along work-sharing lines; often they can participate more effectively if people from the academic community take part in the fact-finding and disseminating aspects of the project. This kind of participation in the real issues of our time can also improve the credibility of the academics themselves."

This paper is an attempt to answer that challenge.

Memory Typewriter (Tape)
Copying Machine
Intelligent Telephone
Acoustic Coupler
Printing Terminal
CRT Terminal
Printing Terminal with memory
CRT Terminal with memory
Printing Terminal with memory and communications interface
CRT Terminal with memory and communications interface
Facsimile Sender
Facsimile Receiver
Copying Machine with memory
Copying Machine with memory and communications interface
Microfiche Reader
Work-Processing System
Information Storage System
Information Retrieval System
Editing Software
Indexing Software
Communications Software

Figure 1. Office automation technology

Office automation devices are generally sold from a marketing posture that documents the rapidly increasing cost of office correspondence, office mail, office filing, etc. The claim is generally valid that the new devices are cost-effective on the basis of increased productivity. This increased productivity is usually argued on the bases of more work produced per secretary or less secretaries for a fixed amount of work. It is also true that opportunities for developing management information systems within the office already exists. Current marketing efforts, of major office automation vendors, like early computer marketing efforts, are avoiding that thrust and concentrating on the lack of increased productivity in the office as compared to other industries.

THE NEED

The need for a community based office automation center arises out of the recognition of rapid proliferation of devices to buy or lease and the implied technological understanding that is required to make this decision. Smaller business have already found it economically useful to employ temporary help to address many of the traditional office problems. It seems reasonable to postulate that appealing to managements' desire to avoid the capital and operational expense associated with acquiring office automation products along with avoiding the costly employment of trained office automation personnel provide a possible foundation for an office automation center. Indeed many early version of these enterprises have already been established as variants of copying centers and small printing establishments.

The organization of such a center requires considerable understanding of the functional capabilities of office automation hardware. As already indicated the number and variety of devices is growing daily. Each device has its own set of functions which may or may not be comparable to a similarly named function on a device from another manufacturer.

Newer office automation products have the additional feature of being programmable. That is, in addition to the main functioning hardware, there is available from the original manufacturer (and secondary suppliers) special programs that increase and extend the function of the original hardware. Some of these machines also permit the owner to program their own applications. More sophisticated devices begin to look like full blown computers and data processing machines.

Another variety of hardware and software is required if you wish the equipment to have communication capability. It may be that the office environment would find remote operation of the equipment convenient or necessary. Special devices such as facsimile transmitters and printers are especially designed for remote operation.

Most offices have already faced the "copying" problem with some form of technology. This "copying" problem when it requires that the copied document become more elegant in its format and printing variety leads to an in house printing or publishing function. Communication copiers permit an office secretary to reproduce a copy of a letter in a remote location by tieing the traditional copier to a telephone line and requiring a receiving copier at the other end of the line.

Large and small offices could find all these services useful and only differ in the size of their demand for such a function. Amortizing the cost of selected equipment in a central environment seems a natural consideration.

The Community Based Office Automation Center would have to make investment decisions on the variety and quantity of these devices they wish to support.

While the center would provide real services for real customers it is primarily organized around and an educational and training concept. Women would be provided many levels of training and education in the theory and operation of the machines, the theory and operation of the

software and the theory and operation of the associated communications systems. They would also be provided management and systems training and education which would permit them the opportunity of joining the many management opportunities rapidly developing in this field. Since many women would not not able to afford this relatively expensive education, one rationale for the service service function of the center is the necessity of producing offsetting revenues. From an educational point of view, the experiences provided in an environment encouraging the use of many different systems would also be very valuable. Students would learn by doing and begin to appreciate the subtleties of comparing these equipments.

Many women find it impossible or undesirable to leave the home to become involved in full time work. The center would also provide the training and equipment necessary to permit "learning and earning" from the home. A woman could come to the center whenever it was convenient (day care of course should be provided) where courses or work station assignments would be made available. By permitting hardware (terminals, semi-portable printers, etc.) to be checked out, work and training could also be brought back to the home. Training materials such as audio tapes, video tapes, and computer augmented instruction could be made available for use at home.

A large center would have organizational and management problems of its own. Marketing, operations, training, admissions, student records, equipment maintenance, accounting, record keeping, etc. are all functions which must be performed. The center would make every effort to permit women to participate in on-the-job training in these organization and management activities. For example, comparative staff studies on cost benefit studies for new proposed equipment, communications alternatives, production scheduling, etc. are projects that the center would continually need. The development of research data and the preparation of these reports would provide valuable educational experience to the students involved.

THE OPPORTUNITY

The Community Based Office Automation Center for Women builds its opportunities on the past experiences of many data processing and computing service centers that have proven so successful over the past twenty years. It differs significantly from the exclusive service orientation of computing centers, by adding the education training function to the central core of the organization's goals. Developing an organization structure that defrays the cost of training by extending the services of the center in a business like fashion to the community is a further refinement of the traditional role of the computing center. The International Education and Information Center (SZMOK) (Gal et al. 1979) located in Budapest, Hungary, is organized as a computing service center with programmer- analyst- training as its main function. It is an example of a multi-purpose facility that has addressed both the training and service aspects of the computer business.

The center should be flexible enough in its charter to permit profit making firms to form and are the center to offer special services to special clients by building on the existing hardware and software and perhaps adding special function not available through the center. It is generally known that in the past many computer companies "spun-off" from the computing center when employees developed an idea that could not be internally supported for one reason or another. The Community Based Office Automation Center would recognize this entrepreneurial possibility in their charter and develop management procedures to encourage it. This aspect of encouraging new business formations is essential as it more probably insures that productivity increases remain with the workers rather than being absorbed in a more general management.

Appealing to the special needs of women and building on their special skills is a new, exciting and pressing problem. A recent radio broadcast, "Take a Letter Miss Twity, Please" (BBC 1981) chronicled the changing role of the secretary over the past hundred years. In the beginning, obtaining a secretarial position was, for most women, the key to success and self reliance. Many feminist recognize the current dead-end opportunity that today's secretarial employment statistically provides. Our assessment of the impact of office automation technology suggests that without significant innovative approaches in the educational area, women will find even less opportunities in the work force than they find today (Armstrong 1980)*. The Community Based Office Automation Center is an attempt to both stem the tide and provide a path to build opportunities for women to stake out a piece-of-the-action in this new field.

THE ROLE OF INTELLECTUAL PROPERTY

Both the economic and social justification for the Community Based Office Automation Center are built around a more general principle. Namely, the future world of work will more and more be based on the use of intellectual properties. Individuals and organizations skilled in researching, developing and systematizing the building of these properties will participate in the eventual rewards.

Managing intellectual property include many legal, financial, marketing, production distribution, management, etc. aspects. It is important that sensitivity to the existence and possibilities inherent in these properties be recognized by the management of the Community Based Office Automation Center. Not only will computer programs, computer data files and maybe even hardware inventions come out of a well organized center, but "know-how" and skill are intellectual properties that can be protected and exploited. Other authors treat the problem of legally protecting these properties and management is well advised to seek special legal advise as to the best form of protection (Costello 1981). In each country of course the legal situation is different. In many countries, it is not at all clear that sufficient legal protection exists to justify the full

* In addition women are significantly far behind men in hourly wages. It is reported a woman with a four year degree earns on the average less than a male with an 8th grade education.

disclosure of these ideas to copyright or patent protection. Many companies and governments are resorting to trade secret protection as the only safe approach. Individuals and small enterprises can often not afford the expense of patent protection and the protection given by the existing copyright may not be sufficient to justify disclosure. The management of the Community Based Office Automation Center will have to devote a portion of their management time to this problem. If expert advice is not available (or even if it is) once again student/staff assignments to research the current state-of-the-art of Intellectual Property Management and apply it the local situation would appear worthwhile.

Other management aspects to the intellectual property issues are best introduced by example situations. These example situations are built around the organizational structure given in Figure 2 and the goal statement for a MIS described in Appendix I.

- Management has decided that both the training and operational aspects of the center require that a new software product be either acquired or built. Students, part-time employees and advisors are available to work under the guidance of the full time staff to build the program. Internal market research shows that significant improvements could be made to existing packages that are currently available on the market. The market for the improved packages seems large enough to recapture the required investment in four years.
- How does this investment rank with other opportunities for labor and capital available to the center? Is the center mature enough in its structure to attempt such a project? How will the eventual royalties be split between the center and the staff?
- A new entity is about to "spin-off" from the center. They intend to build their services around a particular graphics package which allows important business information to be displayed in attractive, easily readable color charts. The center is renting the package on a month to month basis and needs to decide on the distribution of the rental costs between the center and the new entity.
- A student who has not yet completed the management internship has contracted with a company on her own to do systems analysis. The possibility exerts that the company has been led to believe that the center's reputation and resources sits behind the students consulting, how should management address this question?
- The center's mailing list program and data base has become the most valuable and accurate data base of its kind in the community. The growth in the utilization of the list presents many new management problems. The question of privacy to names on the list needs to be addressed more thoroughly. the growth of the system has reached a stage where a significant amount of the center's resources are being used in the operation and maintenance of this system. New data base management approaches to the list structure are being proposed that will involve the center even further in the project. What should

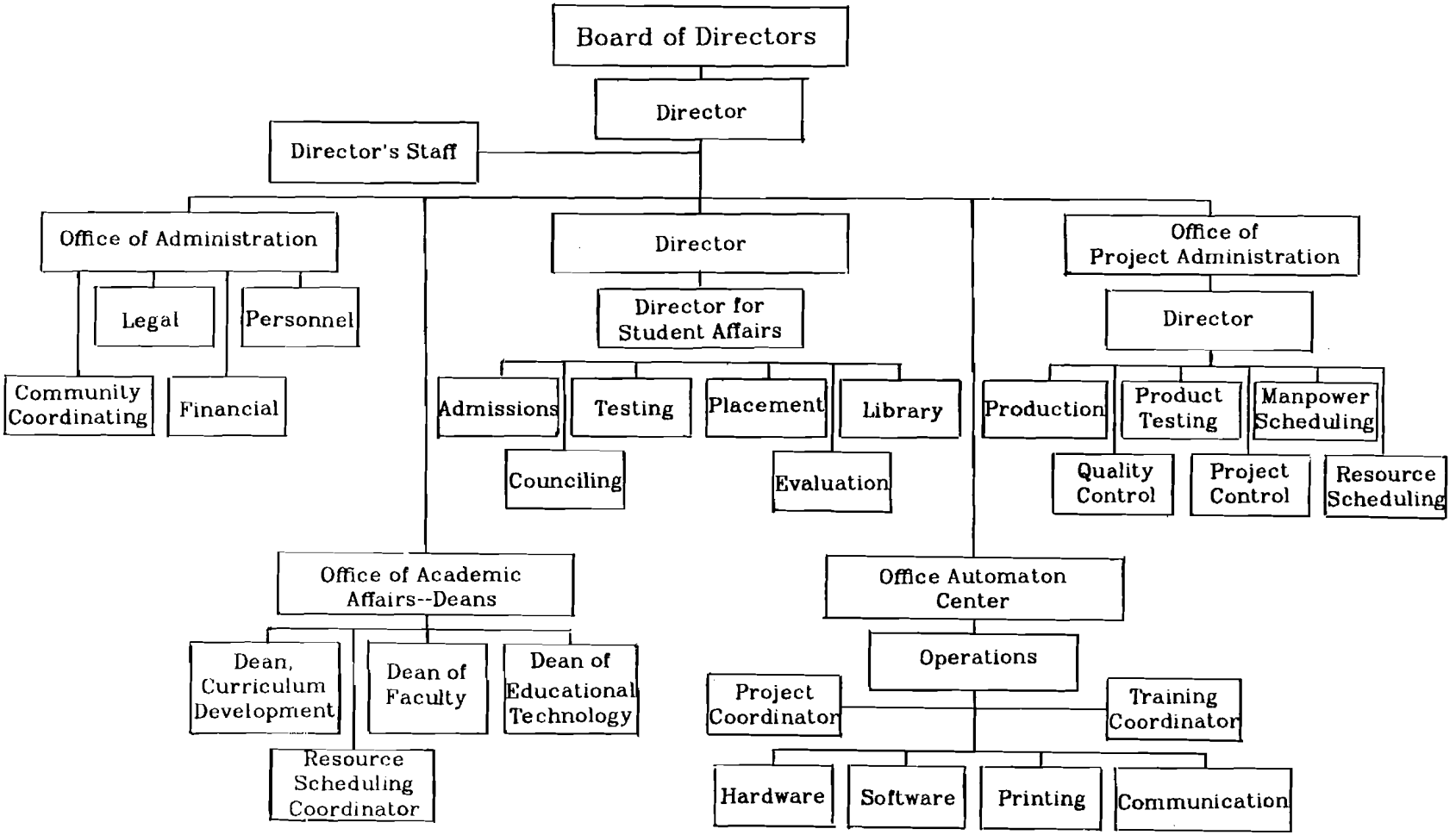

Figure 2. Organizational Structure of A Community Based Office Automation Center for Momen

management do? Is it time to sell this system? Should the center encourage staff to form a new corporation and "spin-off" the system? Should the center form a subsidiary corporation exclusively addressing this system? How does management value these and other alternatives?

CONCLUSION

The Community Based Office Automation Center is an organizational structure built around the growing technology of office automation and a perspective that radical forms of education and training are needed if women are to effectively participate in the positive aspects of this new technology. By not only positively addressing the problems that office automation will cause for women but by suggesting that new opportunities for entrepreneurial activity exist and devising a structure to address these possibilities, it is hoped that the adverse impact of this new technology on women will be avoided.

APPENDIX: GOAL STATEMENT FOR MIS

Goal: To provide a flexible and comprehensive project and student records management information system to ensure that

1. Students receive education, training and experience in time and in sequence and that appropriate education or training units are completed appropriately.
2. Clients' projects are accepted, assigned and completed in accordance with agreed upon schedule.
3. Resources are appropriately arranged and rearranged as student and client supply and demand change.
4. Students, workers and clients are paid and billed appropriately.
5. Sufficient data and information are provided for transaction, operational and strategic planning.

Observations: The Community Based Office Automation Center for Women attempts to combine realistic experiential based education and training with a service function to the community. Changing patterns of student/worker availability and client demand dictates that a rather sophisticated management information system be designed.

REFERENCES

Armstrong, L.C. 1980. Appropriate Technology and Appropriate Roles for Women. Futurist. 4(3),(4).

BBC. 1981. Take a Letter Miss Twity, Please. August 1981.

Carter, A. 1981. Will 1990 Mark the End of the Will to Work-- or the Right to Manage? Long Range Planning. 14(April).

Costello, D.F. 1981. Effect of Technology on Management of Intellectual Property in United States Colleges and Universities. WP-81-xx. Laxenburg, Austria: International Institute for Applied Systems Analysis.

Gal, G. et al. Ed. 1979. Report of the 1969-1979 Academic Years. Budapest: International Computer Education and Information Center.

Sadler, C.D. 1980. Office of the Future--New Challenges for Operational Research. Omega. 8(1).